Amateur Radio

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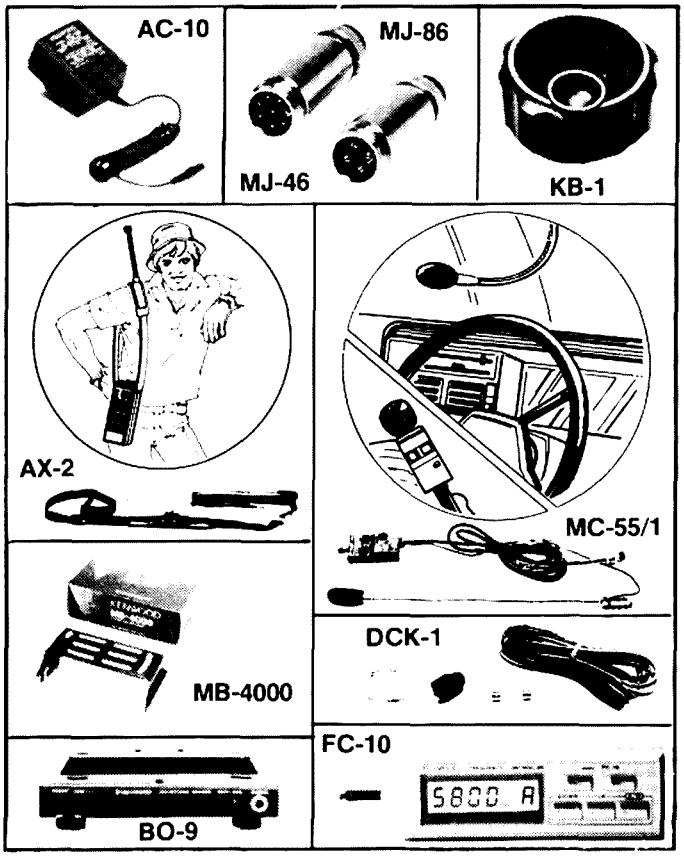
KENWOOD SUMMER CLEARANCE



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Amateur Radio

Publications galore on all aspects of the hobby were handled by Victoria WIA Councillor and Outwards QSL Manager John VK3DHE, being ably assisted by his young daughter Megan. Ian VK3CIS (right), was one of the many amateurs who kept John and Megan quite busy over the weekend whilst extending their technical libraries.

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DEADLINE

All copy for inclusion in the March 1988 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, January 19, 1988.

Amateur Radio

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HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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Editor's Comment

GLASS BOTTLES

An era has recently ended in Melbourne, and the glass milk-bottle is no more. Instead, the milkman brings plastic bottles or plastic-coated cardboard cartons. Neither is recyclable, but apparently they are more cost effective.

This superseding of glass by plastic seemed at odds with another recent news item, about glass fibre succeeding microwave links as they in the past succeeded coaxial lines and the old open wires. Melbourne and Sydney are now linked by optical fibres providing something like a hundred times the bandwidth of microwave and coax together. Soon the world's longest optical fibre will cross the Nullarbor, linking West and East with thousands of phone conversations and dozens of video links simultaneously, not to mention data circuits. Telecom triumphs again!

In amateur practice we have also seen the phasing out of glass bottles. Who but old-timers now talk of 807s and 6V6s? How many old-time exponents of CW had to give the code away because they developed the dreaded "glass arm"? Still, in place of CW we can use radio-teletype, perhaps in its most developed form with CRT output. "Glass RTTY" on a "modulated milk-bottle"! This is one kind of "bottle" still unsurpassed. Look at any TV set.

Glass seems to have had, and still is having, a great effect on society. Glassy-eyed, I lapsed into a reverie and found myself aboard HMS Sirius, heading for Botany Bay towards the end of 1787. The sea was glassy, unruffled by any breeze. Captain Phillip raised his glass to his eye and scanned the horizon.

"The glass is falling, captain, we will have wind soon", announced one of his lieutenants.

Sure enough, the wind came, and the fleet arrived on January 20, 1788. Preferring Port Jackson, they moved from Botany Bay, and on January 26, proclaimed the Colony of New South Wales. They raised their glasses in a toast to the King; and abruptly I returned to the Bicentennial present!

Perhaps, you say, it might have been better had I stayed in 1788! But seriously, may we all remember happily this year of 1988. May Australia's 200th birthday as first a colony but later an independent Commonwealth be a joyful occasion for all. And without needing rose-coloured glasses!

Bill Rice AX3ABP
Editor

"Never mind the QSL card, OM — just sent the IRCs! ! !"

—VK2COP

FEDERAL NEWS

There is no Executive Meeting to report on this month — I'll have two meetings to report on in February *Amateur Radio*. Also, a Joint DOTC/WIA Meeting was held on November 25, 1987 — there will be a report on this meeting in the next issue of *Amateur Radio*.

There was a Publications Meeting held in this office on Tuesday, November 10, 1987. General discussions took place on front covers, technical articles, various lettersto the Editor and his replies, and the financial position of the magazine. The Secretary reported that costs would run over budget for 1987.

BACK ISSUES OF AMATEUR RADIO

The Federal Office and some of the Divisions have some back issues of the magazine. Not every month is represented, but we have copies going back to 1983. These are for sale at $3.00 each, plus postage of 95 cents in VK3 Division, and $1.05 everywhere else.

NOVICE STUDY GUIDE

Don't forget the Novice Study Guide is available from the Divisional Bookshops and the Federal Office — priced at $2.50 plus post. The Institute's Federal Education Co-ordinator, Brenda Edmonds and her committee have worked very hard to put this together. The following endorsement comes from the Department of Transport and Communications:

"This guide has been developed in conjunction with the Department of Transport and Communications and is endorsed by the Department as suitable for use by persons studying for the Novice Amateur Operators Certificate of Proficiency."

SPECIAL CALL SIGNS

The Department of Transport and Communications have written regarding the difficulties associated with the issue of non-standard special call signs to amateur stations. They explain that in Australia the prefixes VK, AX and VI have been allotted to the amateur service. The latter two prefixes are, at present, only utilised on a temporary basis to signify special events. Formation of the full call sign issued to an individual station is subject to strict provisions contained in the Radio Regulations. In the case of amateur call signs, the formation prescribed is two characters and a single digit followed by a group of not more than three letters (VK1GD, VK3GDA, etc).

Call sign combinations which might be confused with distress signals and operational terms, such as SOS or the Q Code are prohibited. Similarly, combinations commencing with a digit when the second character is the letter O or I are not allowed.

Requests received by the Department for call signs that do not comply with the format outlined (ie VI88NSW, etc) require approval to be sought from the International Telecommunications Union.

It is not appropriate for the Department to initiate an approach to the ITU unless the requested call sign is for use during a special event of national significance. The number of any such requests will be restricted to a reasonable level.

An approach was made to the ITU and special approval received for the Australian Amateur Service to employ several non-standard commemorative call signs during the 1988 Bicentennial. The Department is, however, continuing to receive requests from individual amateurs and clubs requesting authorisation to use non-standard call signs as part of the 1988 celebrations.

The Department advises the amateur community that no further approaches to the ITU will be considered as part of the Bicentennial activities.

I have been taken to task for using initials in writing this Federal News column. I apologise to those members who have not been able to follow parts of this page because of the use of initials. I also apologise to those members who know and understand their meaning, because I'm now going to give the words for the initials!

Here are just a few:

DOTC	Department of Transport and Communications
FTAC	Federal Technical Advisory Committee
ITU	International Telecommunications Union
IARU	International Amateur Radio Union
IREE	The Institution of Radio and Electronics Engineers Australia
EMC	Electro-Magnetic Compatibility

1988 SUBSCRIPTIONS

If you have not paid your subscription for 1988, yet — please give it some thought. It would be a shame to miss continuity of your magazines!

1988 CONVENTION

It is time to start to think about Conventions again. Remember this is the member's forum to have his say on a range of topics close to an amateur's heart. The correct procedure, if you feel sufficiently strongly on a particular subject, is to write in the first instance to your *Federal Councillor* in your Division. The Federal Councillor plays his part by collating all the ideas from the members of his Division and forwarding them in the form of *Agenda Items* to the Federal Office. These are then numbered and forwarded to all other Divisions to discuss with their members at meetings or at club level, to gauge how to vote at the Convention.

When the Agenda item comes up for discussion during the Federal Convention, the Federal Councillor, and the Alternate Federal Councillor will discuss and vote on your behalf.

I hope to have the agenda items from Divisions in as early as possible so as to be able to print them in *Amateur Radio* before the Convention.

The 1988 Federal Convention is scheduled to be held on April 23, 24 and 25, 1988.

ITEM OF INTEREST

USSR/CANADA 1988

In February 1988, a joint Soviet-Canadian expedition will leave the Severnaya Zemlyn Archipelago to cross the North Pole to Canada by ski. The trip will end at Cape Columbia on Ellesmere Island, a distance of some 2 000 kilometres, and will take 90-100 days.

Team members. Soviet and Canadian, will carry all the necessary equipment in their rucksacks, including food, a tent, sleeping bags, pneumatic dinghy-boats, radio and navigational equipment for carrying out the scientific experiments and observations in the fields of medicine and geophysics.

There will be six planned air-drops, with no landing, except in case of emergency.

The Canadian Radio Relay League, Inc, representing Canadian amateur radio operators, has agreed to act as the expedition co-ordinator for all amateur radio communications, to and from Canada, in support of this important expedition, which is a unique example of international co-operation.

To their knowledge, it represents the first time that amateur radio has been used to provide basic radio communications for an undertaking of this magnitude.

Just something to think about whilst enjoying our January weather!

Compiled by: Ann McCurdy

YOUR TWO METRE YAGI VERTICAL OR HORIZONTAL?

George Cranby VK3GI
PO Box 22, Woodend, Vic. 3442

I am sure that many other amateurs have found themselves in the same predicament as I did — how to change the polarisation of a two metre Yagi beam from vertical, for FM, to horizontal, for SSB.

My two metre antenna, a 12-element ZL Special with four added reflector elements, is mounted on a 1.8 metre wooden extension above my HF beam. The use of wood — a 35 mm diameter pole — is, of course, necessary to prevent field distortion when using vertical polarisation.

I originally designed and built a manual tilting device. It was operated by pull-lines from ground level and used an over-centre cam to keep the beam either in one or the other position. A disadvantage of the device — apart from the usual tangled pull-lines — was the fact that my aerial tower is located 30 metres from the shack; the frequent cold and wet weather at this QTH made the prospect of leaving the shack for the wild outdoors every time I wanted to switch from FM to SSB and vice-versa was most unattractive.

The solution? Remote control by the new-fangled electric power. But how? I could not install a power line because all my cabling is run in underground conduit, and the conduit is full.

I am in a difficult television reception area and had constructed a masthead amplifier. This device is fed with 12 volts DC via the coaxial antenna line, the +ve being injected into the centre conductor and the earth -ve into the copper braid. The DC voltage is blocked on both ends by capacitors in the -ve line to prevent it feeding back into the television set on one end, and being shorted by the balun on the antenna end. Chokes on both ends prevent RF entering the DC supply.

I realised that I could send 12 volts DC up the coaxial feedline!

My tilting device operated by raising and lowering a short lever attached to the boom of the antenna at 45 degrees. I decided to operate this lever, via a connecting rod, by a half turn of an old windscreen wiper motor. Of course, that would be fine during the day when I could see the antenna and operate a control switch until the antenna had accurately changed position. But what about at night? Limit switches? Yes, but how to reset them without another cable connection?

The answer was a timer which could be set once, in daylight, to exact time required to move the antenna through 90 degrees. I chose a 555 device operating a 12 volt relay. Figure 1 shows the timer circuit.

Figure 2 shows the control box wiring and the timer PCB. Provision is made for manual adjustment and for automatic timing, as well as for LEDs indicating "power on" and "operation". The box is a small commercial type and the control switch is a DPDT type, momentary

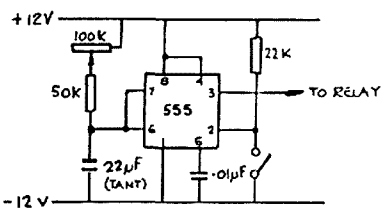


Figure 1: Timer Circuit.
Time variable from one to three seconds approximate.

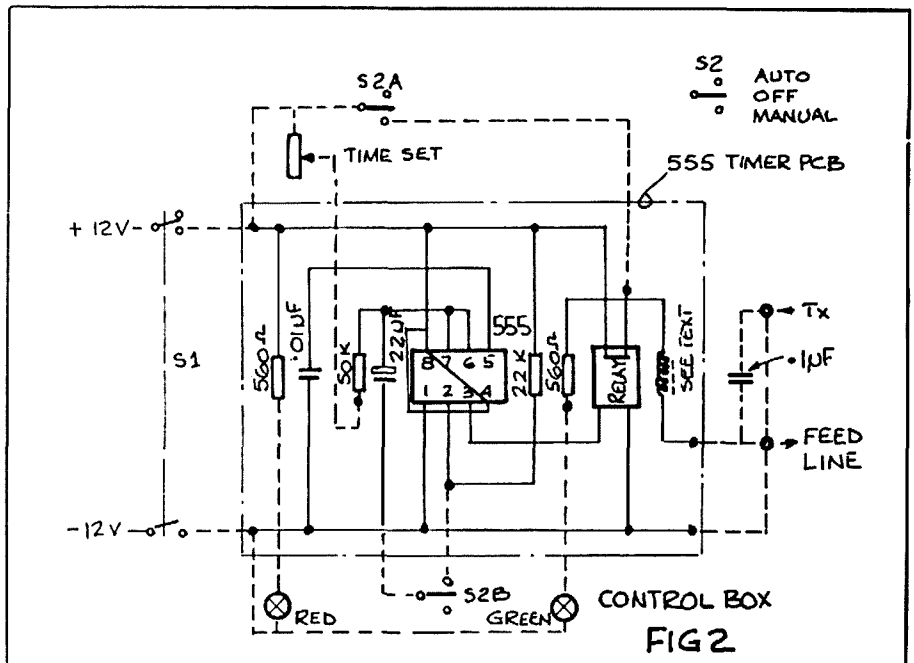


Figure 2: Control Box.

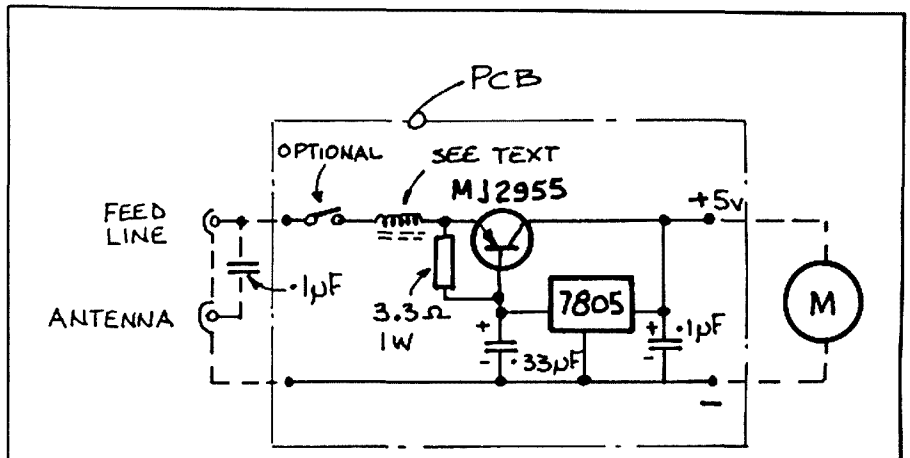


Figure 3: Masthead Voltage Regulator.

action with spring return to centre. Two coaxial sockets connect to the transmitter and to the feeder cable. Test for correct operation on the bench before connecting to the feeder.

In order to slow the wiper motor down and avoid inertia effects on the beam, I used the slow speed terminal wires — most wiper motors have three wires, giving a choice of speeds — *and* reduced the voltage to five volts. This was achieved with a 7805 regulator located in the masthead box which houses the wiper motor.

Figure 3 shows the masthead box circuitry with DC and RF blocking, the 7805 voltage regulator and an MJ2955 power transistor to obtain adequate current rating. The RF blocking chokes shown in Figures 2 and 3 consist of 10 turns of 22 gauge enamelled copper wire wound on small balun cores.

The motor has a short rotating lever arm; for proper operation the length of the antenna tilting lever must be *exactly* $\sqrt{2}$ times the length of the motor lever. Referring to Figure 4, it can be seen that, starting from the vertical down position of the tilting motor arm, one half turn of the motor will raise the antenna tilting lever, via the connecting rod, from the -45 degrees to the +45 degrees position, thus turning the beam from vertical to horizontal. The next half turn of the motor returns the beam to its initial position. Due to the vertical speed characteristic of the tip of the motor lever there is slow acceleration, rapid intermediate lift and slow deceleration; this virtually eliminates inertia effects on the beam. (See Figure 7).

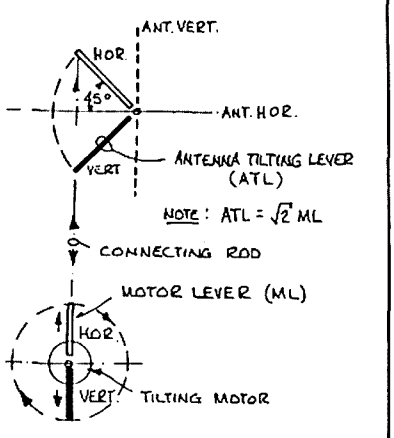


Figure 4: Tilting Scheme.

The construction of the masthead box depends on the dimensions of the motor used. Figure 5 shows the box I made up. It is using 1.6 mm A1 sheet and self-tapping A1-compatible screws. Drain holes are drilled in the bottom shelf which is fitted with two panel mounted coaxial sockets, for the feeder and antenna cables. As an after-thought, I also fitted an on/off switch to cut off the DC supply; this proved to be invaluable during installation and testing, saving many trips between shack and tower — 30 metres each time.

Now, set the timer, by means of the 100k adjusting pot, to allow the tilting motor to do exactly one half turn. This is done on the bench, using the proposed 12 volt supply and a short length of coaxial cable between the control box and masthead box.

You can now fit the masthead box to the mast, fit the connecting rod — I used six millimetre A1 tubing — and adjust the motor box position so that both the motor lever and the antenna tilting lever are aligned as shown in Figure 4, with the antenna in the vertical position. The first push on the automatic switch will then turn the motor one-half turn, tilting the beam 90 degrees into the horizontal; the next push will return it to the vertical. A small amount of over or under travel will not substantially affect the beam position until after several operating cycles. As a matter of interest, 30 degrees over-travel of the motor will move the antenna only seven degrees off the vertical. (See Appendix).

My motor came from a wrecked Torana. At five volts it takes about two seconds per half turn. If your motor requires a different voltage, refer to Figure 6. Check the current taken by the motor at that voltage to make sure that the relay contacts are adequately rated.

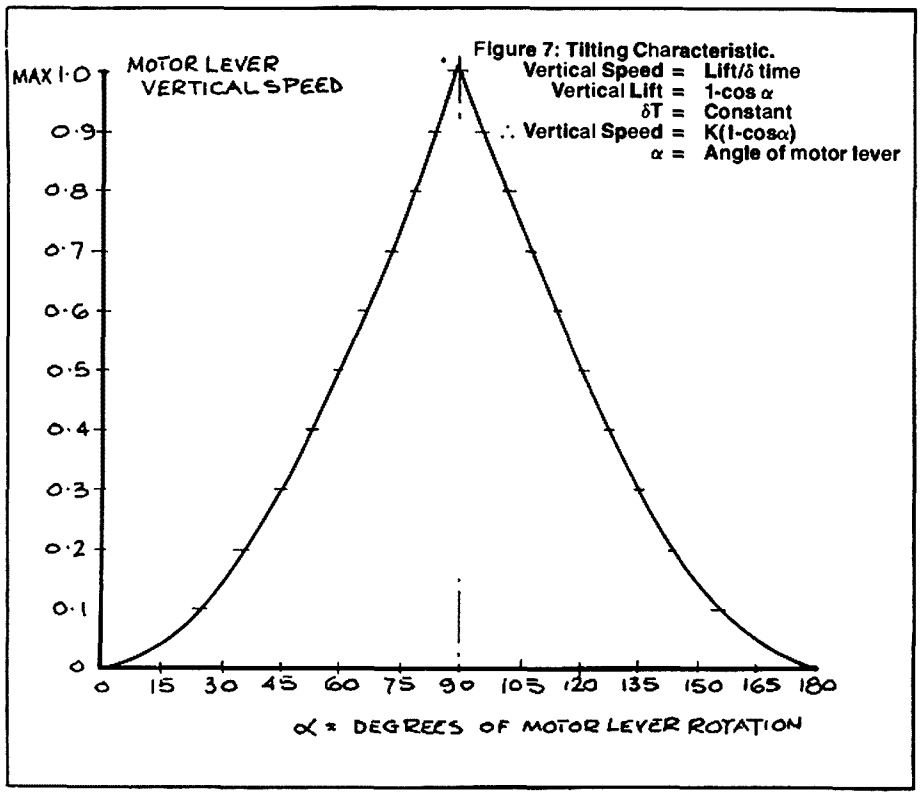


Figure 7: Tilting Characteristic.

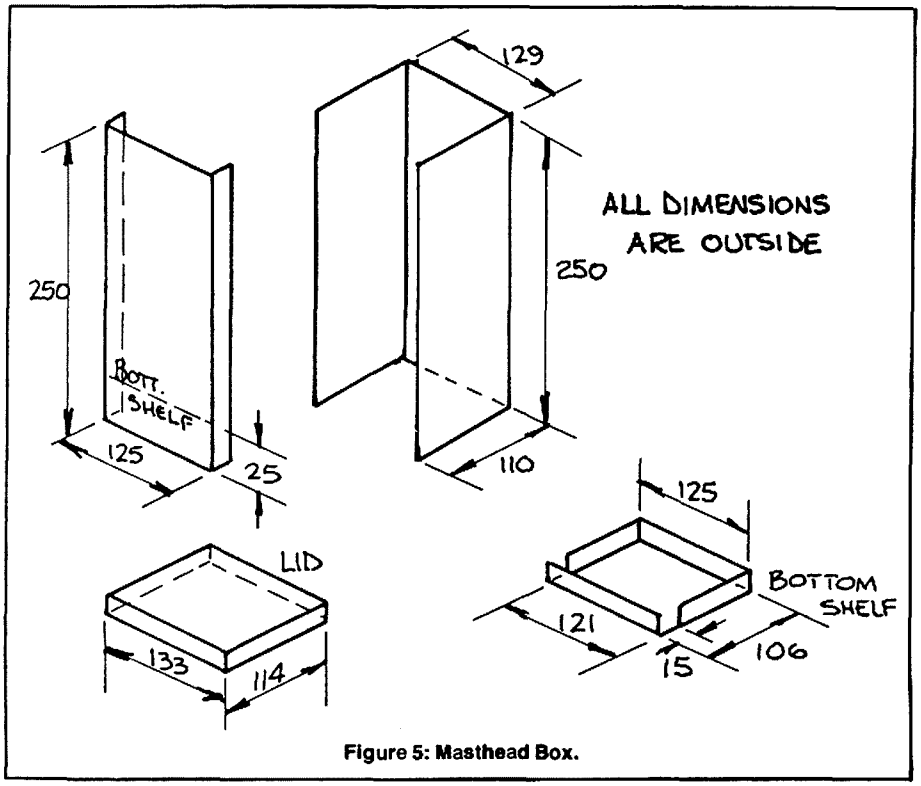


Figure 5: Masthead Box.

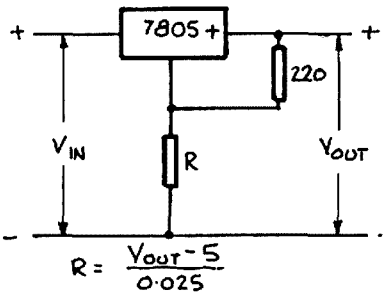


Figure 6: Increasing the Regulated Voltage.

V_{OUT}	6	7	8
R	40	80	120

The cost of the whole project — apart from the motor — was in the order of $30. The cost of an old wiper motor from a car wrecker's yard should be about $10.

In actual use, it has become evident that the motor speed, and hence the angle traversed by the motor lever, the antenna lever and the antenna itself, will vary somewhat with temperature. I have set the automatic timer for low temperature operation and use the manual adjustment, which is very accurate, to adjust the actual position on a hot day, if necessary. At night, when I cannot see the beam, the timing is quite accurate.

APPENDIX

Taking the length of the motor lever L_m as unity (1) the vertical lift of the end of L_m, due to rotation, equals 1-cos. The end of L_m will be cosα vertically down from the centre of rotation.

The connecting rod lifts the end of the antenna lever L_a also to cosα below its centre of rotation.

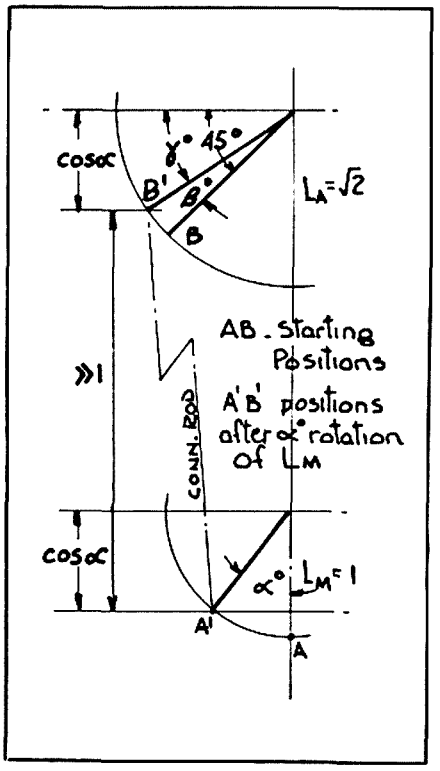
L_a must be two times L_m, ie $\sqrt{2}$. Therefore $\cos\alpha = \sqrt{2}.\sin\gamma$, where γ is the angle of L_a below the horizontal.

γ is therefore arcsin $\cos\alpha/\sqrt{2}$. The angle β of rotation of L_a from the -45 degree starting position (and with it that of the beam from the vertical) is 45 degrees $-\gamma$.

Table 1 shows the necessary calculations for angles α from 0 to 180 degrees. It can be seen that, as stated, a 15 degree over-run of α will cause only two degrees of misalignment of L_a and the beam, rising only to seven degrees for a 30 degree over or under run.

TABLE 1

$\alpha°$	15°	30°	60°	90°	120°	150°	165°
cos α	.966	.866	.500	.000	-.500	-.866	-.966
cos α / 2	.683	.612	.354	.000	-.354	-.612	-.683
$\gamma°$	43.08	37.76	20.70	0	-20.70	-37.76	-43.06
$\beta°$	1.92	7.24	24.30	45	65.70	92.76	98.08



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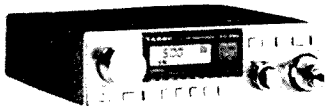

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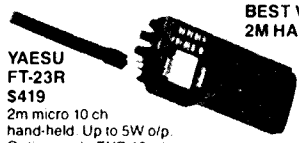

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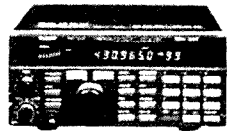

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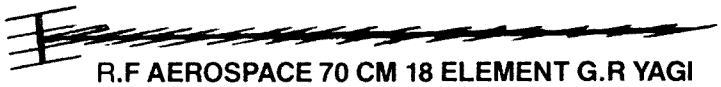

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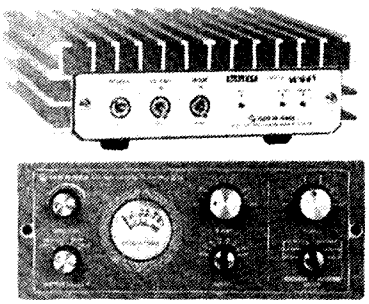

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It is not difficult to purchase or manufacture a broadband antenna — a standard 50 ohm artificial (dummy) load is a perfect example.

The above title may be subject to some debate, considering the range of antennas to be mentioned in this article. Perhaps the best definition of an ideal broadband antenna is one which exhibits a constant impedance over an infinite frequency range.

In practice we are generally unable to obtain constant, non-reactive load impedances, so we usually settle for perhaps less than 2 to 1 SWR at a nominal impedance — this relatively constant load is however usually only obtainable over a finite frequency band, (SWR bandwidth). On High Frequency bands, most amateurs are concerned with the range 1.8 to 30 MHz. For long distance contacts, the range 3.5 to 30 MHz, is satisfactory in most cases.

It is not difficult to purchase or manufacture such a broadband antenna — a standard 50 ohm artificial ("dummy") load is a perfect example. How far can one communicate on such an antenna? Hang a metre of wire on the load, and you do have an antenna that radiates, together with a low SWR. But how effective is it?

The antennas to be described are useful over all or some of the above ranges. I recently had occasion to review a number of *Wire Beam Antennas* (See October 1984 *Amateur Radio*), and a flood of inquiries revealed the need for a treatment of the present subject — also a number of close friends, wishing to manipulate as few band-changing knobs and controls as possible, sought my assistance with "tunerless" antennas. We are all aware of the almost universal use of 50 ohm output transmitters, and many are designed to "close down" when the SWR is greater than 2 to 1 — hence the impedance limits it is proposed to include in this article. These modern transceivers have adequate harmonic suppression due to inbuilt bandpass filters, and the further need for an ATU is somewhat reduced.

1. TERMINATED TWO WIRE FOLDED DIPOLE (T2FD)

GENERAL

First aired for amateur use in 1951, this was perhaps one of the earliest broadband antennas introduced to the amateur scene — condemned by many as a "lossy" type, few were willing to consider it seriously, as nothing was really gained — an antenna tuning unit was still required as it used 300-600 ohm open wire line.

It appeared again during the 1970s in commercial work, where a 50 ohm to 300 ohm "balun" transformer gave a constant load over a large part of the high frequency range, for use in the Outpost Radio Service, Fixed and Mobile services, etc. Its use as a sloping antenna running from the top of a "free-lite" or windmill tower, to a convenient fence post was popular (and still is). See Figure 1.

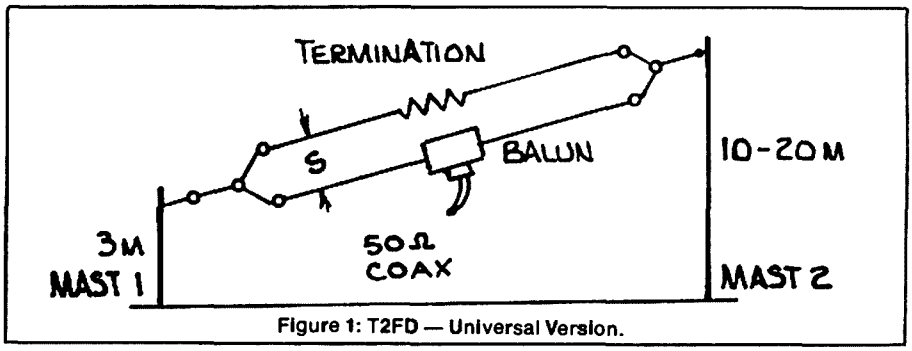


Figure 1: T2FD — Universal Version.

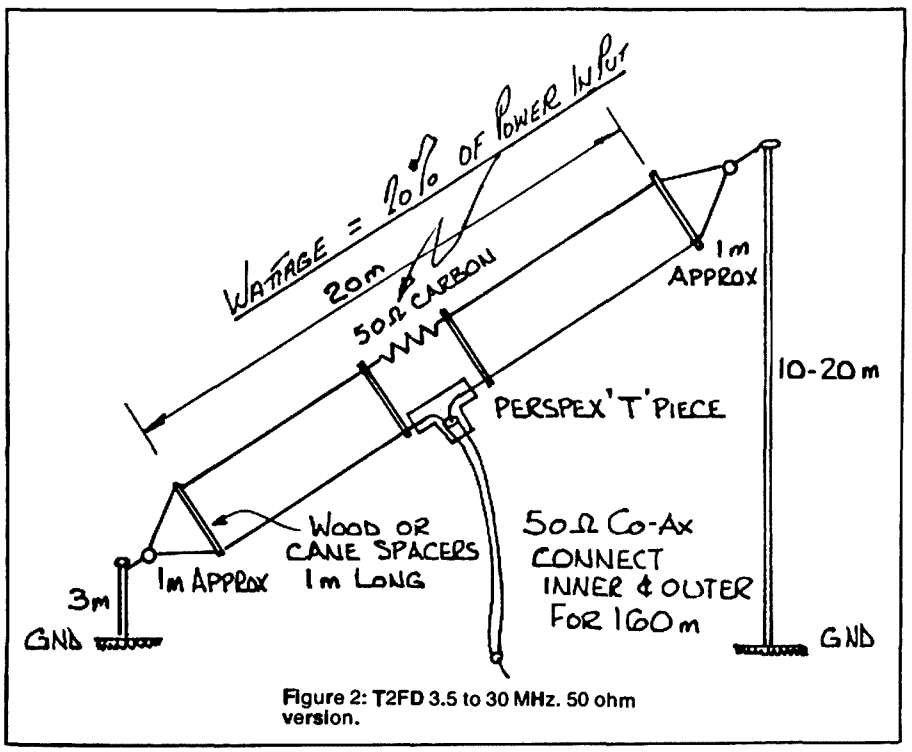


Figure 2: T2FD 3.5 to 30 MHz. 50 ohm version.

DIMENSIONS

The overall dimensions appear to have been universally accepted as:

$$\text{Total length of wire (L) in metres} = \frac{100}{f(\text{MHz})}$$

$$\text{or in feet, L} = \frac{328}{f(\text{MHz})}$$

$$\text{Spacing (S) in metres} = \frac{3}{f(\text{MHz})}$$

$$\text{or in feet, S} = \frac{9.84}{f(\text{MHz})}$$

In the above, f = lowest frequency required; eg for 1.8 MHz L = 55.6m, S = 1.7m (182 feet, 5 feet 6 inches).

The termination, located opposite the feed point, is historically 300 ohms to 600 ohms. This appears to be related to earlier line impedance standards, and a belief that the antenna could be related to a "Squashed Rhombic", which also had the 600 ohm termination.

An article using a 50 ohm termination on such an antenna appeared some years ago, and there is *no* reason why such a value should not be used — feedline matching would be much simpler. See Figure 2.

The use of "balun" feed is generally indicated, although a sloping wire over ground is a doubtful "balance" to feed to. Direct feed via 50 ohm coaxial cable, with a 50 ohm termination should produce acceptable results.

2. A "RHOMBI-QUAD" ANTENNA

An antenna concept for situations where the use of high masts is precluded, has become popular in various areas — this consists of a horizontal loop, usually square, raised above fruit trees, etc, by short masts, and fed in a number of ways — either at a corner or in the middle of one side.

Two such constructions of which I am aware are praised by their owners as good for noise reduction, and suitable for DX net operation. The configuration may be a continuous loop, open circuited opposite the feed point, or terminated as shown in Figure 3.

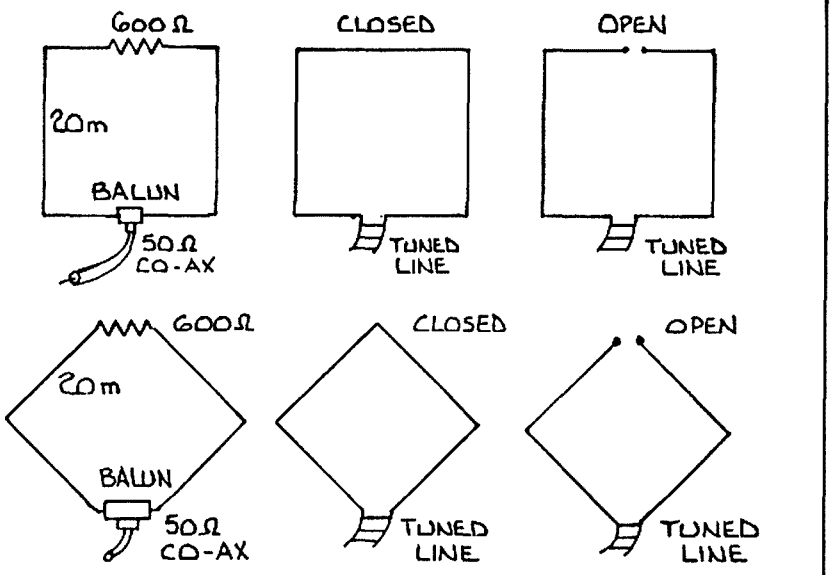


Figure 3: Rhombi-Quad.

Preferred lengths seem to be 20 metres on each side, but shorter lengths should not be discounted. The use of the terminating resistor permits broadband operation, and such an antenna could well be the starting point for suburban experiments in broadband antennas. If unterminated, an ATU is required.

As the antenna is horizontal and fractionally above ground, it presumably radiates vertically upwards — the thought that it is a miniature "rhombic" might be discarded. Additional wire in the form of a grounded loop set up under the antenna loop may enhance its operation by providing a reflector surface.

A termination of 750 ohms was used in the source article — a matching balun feed to this may be awkward — try it with a 200 ohm or 600 ohm termination, for which balun details are generally available.

3. CONICAL MONOPOLE AND BICONICAL MONOPOLE

The use of discone antennas on VHF and UHF bands for wide band coverage is appreciated by most enthusiasts. The benefits of lower than horizon radiation patterns, and apparent gain over a dipole on some frequencies, are valued.

When such antennas are considered for High Frequency use, the size of the structure may at first be frightening, and placement of a large diameter disc on top of a cone would be a hopeless engineering project. The solution is of course, to invert the whole array. This results in a radiation lobe just above the horizon, (typically 30 degrees) with the resultant benefits of DX performance.

Such an array, made of wire with perhaps 8-12 sections, and using ground level radials, is known as a Conical Monopole Broadband operation is obtained with low impedance feed at the base; however the bandwidth may not be adequate for all purposes. In practice, a second "cone" is mounted, inverted, on top of the original, to assist in extending the frequency range to a lower limit.

Conical monopoles are used extensively in marine, and broadcasting reception by professionals — additionally such an antenna, due to its omnidirectional property, can be actually calibrated and used for field strength measurements, at Monitoring or Receiving stations. Its main benefit is the need for only one pole on which to mount it.

Some suitable construction information can be found in the ETI and AR references. The main benefit in my observation is the ability to achieve wide band coverage over say 4 to 30 MHz, *without* the use of loading resistors. Thus it is totally efficient and dedicated to radiating energy on all frequencies in that range. If a higher SWR can be tolerated, a Biconical Monopole only seven metres high, could be used efficiently and effectively from 3.5 to 30 MHz. If 50 ohm coaxial cable is fed direct to the base insulator section, you could expect satisfactory results. In tropical situations with heavy static buildups, I have found the shunting of the base insulator with a five megohm resistor assisted greatly in reducing the interference from this source.

Some models are marketed for professional use, but prices may be out of reach of the amateur. An economical approach may be to construct one of those in the ETI or AR references.

4. "INVERTED VEE" BEAM ANTENNA

The configuration I speak of under this title is the low, obtuse angle, terminated beam, that looks somewhat like a half rhombic turned sideways. That, in fact, is exactly what the antenna is.

Consider a rhombic turned through 90 degrees on its main axis, and perhaps a ground reflection to fill in for the "missing" side.

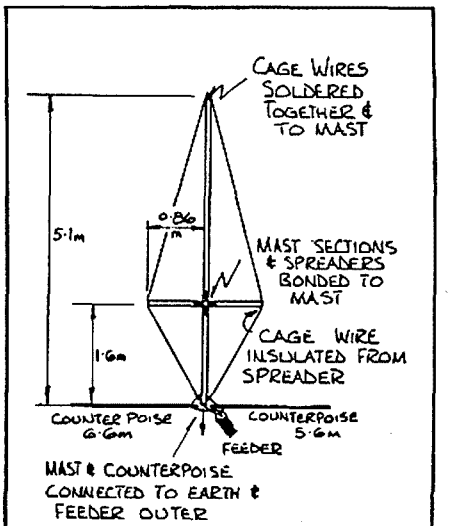


Figure 4: Biconical Monopole.

In its practical application I have seen it used effectively for point to point circuits over moderate distances. I first encountered it at Macquarie Island in 1952 where it had been used for contact with Australia since 1948. This one was 25 metres high at its apex and 100 metres on the base line. See Figure 5. The terminating resistors were interesting — a selection of carbon filament "capped" incandescent lamps mounted in series/parallel to give a 400 ohm resistance. The mean output of our AM/CW transmitters was only about 800 watts, however enough was dissipated in the load to give it a moderate glow — imagine wandering around the ANARE base on a dark night with a "ghost" light flickering on and off!

The direction of radiation was along the line of the wire towards the termination, with a gain of about 6-10 dBi, depending on the specific frequency. It was used over a 4 to 30 MHz range, but as it was fed with 400 ohm line by a complex balanced/unbalanced pi-coupler network of an AT20 transmitter, I was never at that stage interested in its SWR.

Later, back in Australia, I found myself working for a PMG monitoring station, and found exactly the same antenna in use for listening to overseas broadcasts — the long open wire line, adjacent to other similar lines never impressed me, so some years later, when responsible for the operation of the same station, I arranged to have the antenna fed via coaxial cable and a 400 ohm to 70 ohm

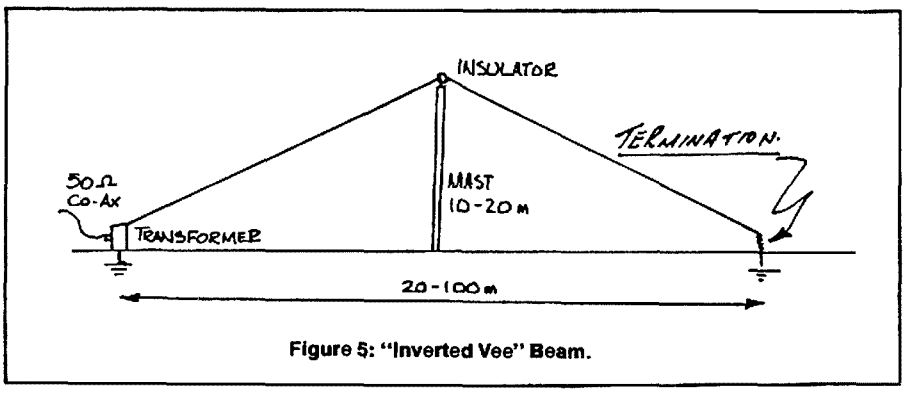


Figure 5: "Inverted Vee" Beam.

transformer. The improvement, particularly its improved rejection of "static" noises from nearby transmitters was worthwhile.

I had occasion, when establishing a monitoring station in Port Moresby in 1958, to revert to the same antenna for multi-frequency listening — comparing it with the many dipoles on co-sited communications receivers, I found it to be less prone to some forms of thunderstorm static than the dipoles. I had my own version at home for a short period, and used it mainly for scheds with Australia, where its 14 to 30 MHz performance proved most acceptable.

The antenna has been perpetuated for amateur use by Barker and Williamson, who are (in recent issues of *QST* and *Ham Radio*) advertising their version for 1.8 to 30 MHz use. An advertisement in *CQ*, November 1973, shows a price tag of $149.50 — it must obviously have some useful properties.

I suggest the configuration in Figure 6 for maximum effect on HF amateur bands — the load should be of about a quarter to a third of the transmitter output power and of 400 ohms, non-inductive (resistive). The input transformer may be wound on a bundle of ferrite rods or on an HF toroidal ferrite, with an appropriate turns ratio to give 50 ohm or 75 ohm match to a 400 ohm load. Note, this is not "balun". See Figure 6. Earthing should be via an electrical stake at both ends, and, if available, a length of wire (old coaxial braid) should be used to bond the stakes together.

GROUND SYSTEM

In my own home experiments I have laid out old coaxial cable on the ground using the copper braid for bonding to the termination tower and the feed points, with success. In the commercial versions mentioned above, no earthing other than a few close spaced stakes into the ground were used, the soil conductivity being reasonable in all cases.

I have been recently provided with some text book extracts which show a recommendation for ground radials, over 180 degrees at both ends of the Vee — these radials covering the two quadrants in the direction of the main lobe.

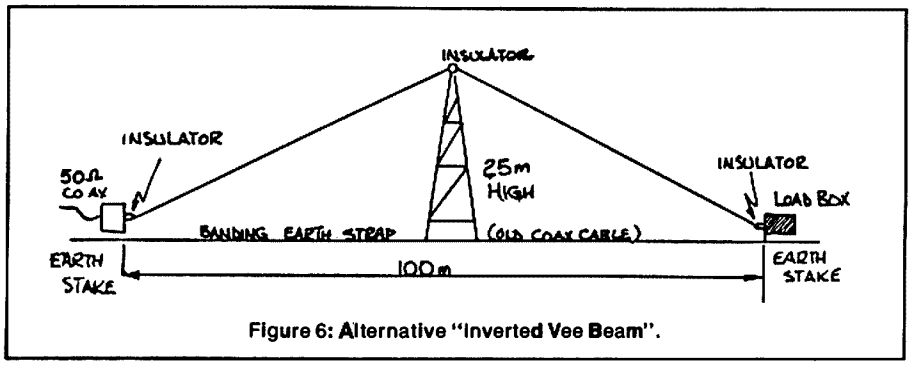


Figure 6: Alternative "Inverted Vee Beam".

5. TRAVELLING WAVE DIPOLE

This antenna has been featured extensively in overseas and Australian publications. It is marketed in Australia by AEA, however suitable dimensions for amateur construction were given in *Amateur Radio*. Reference to this source article should give further information. The antenna is used extensively throughout Australia in commercial installations where coverage of the whole HF band is required. From the bus stop where I board for my homeward journey each night I can see three such antennas at different locations on tops of nearby buildings. Suitable dimensions are shown in Figure 7. These were extracted from *Amateur Radio*, 1983.

The antenna is not too elaborate, however some care may be necessary in "rigging" it, as a twist in the wrong place may be difficult to remove! The terminations used are described, and from various articles appear to be non-critical.

Radiation patterns and gain on various frequencies have not been mentioned in any local papers — Ian Wall of *Codan* recently drew my attention to an article in a German publication of 1966(!) where both horizontal and vertical patterns are plotted. These show essentially unidirectional horizontal patterns to 10 MHz, and four leaf clover break ups at higher

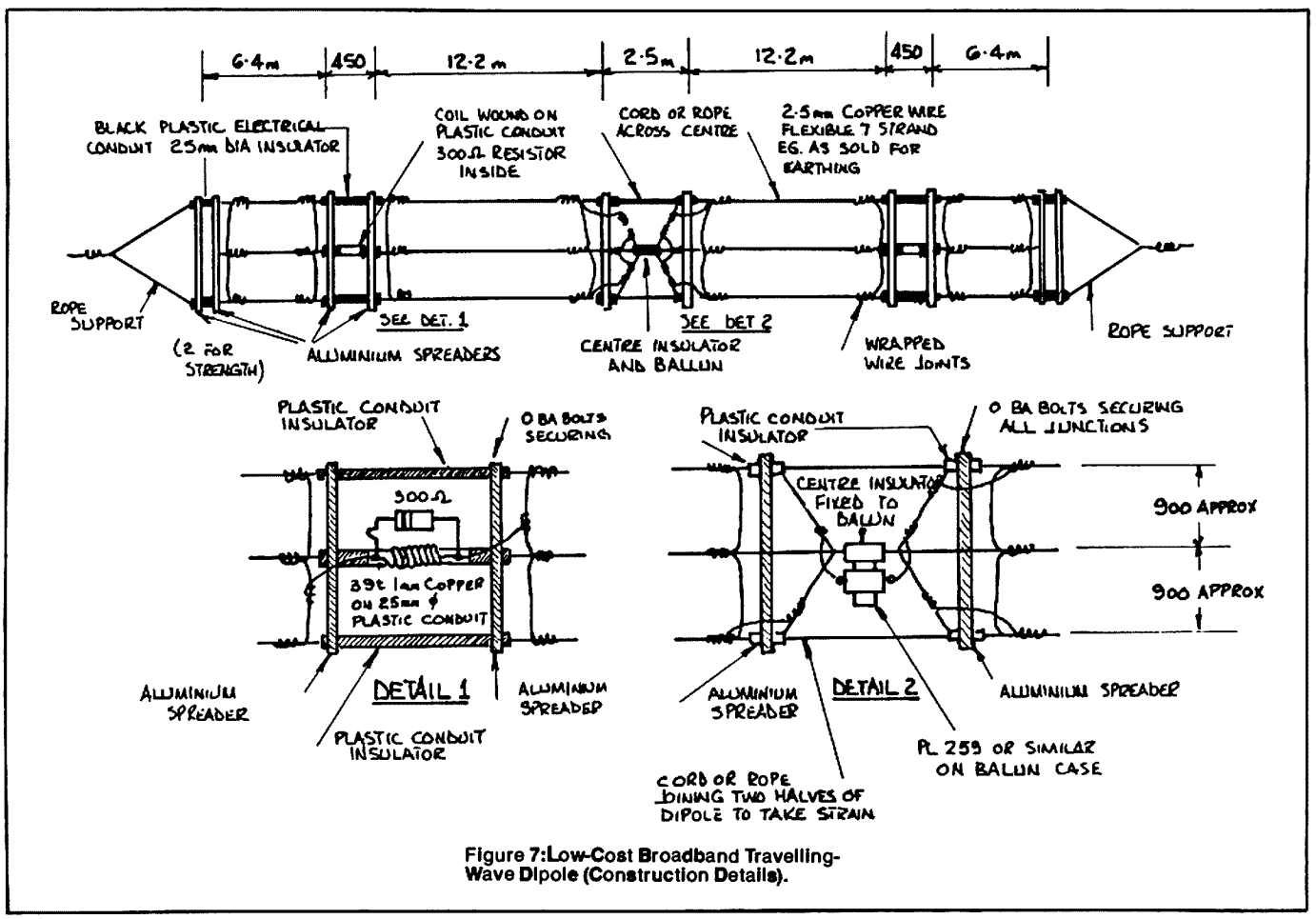
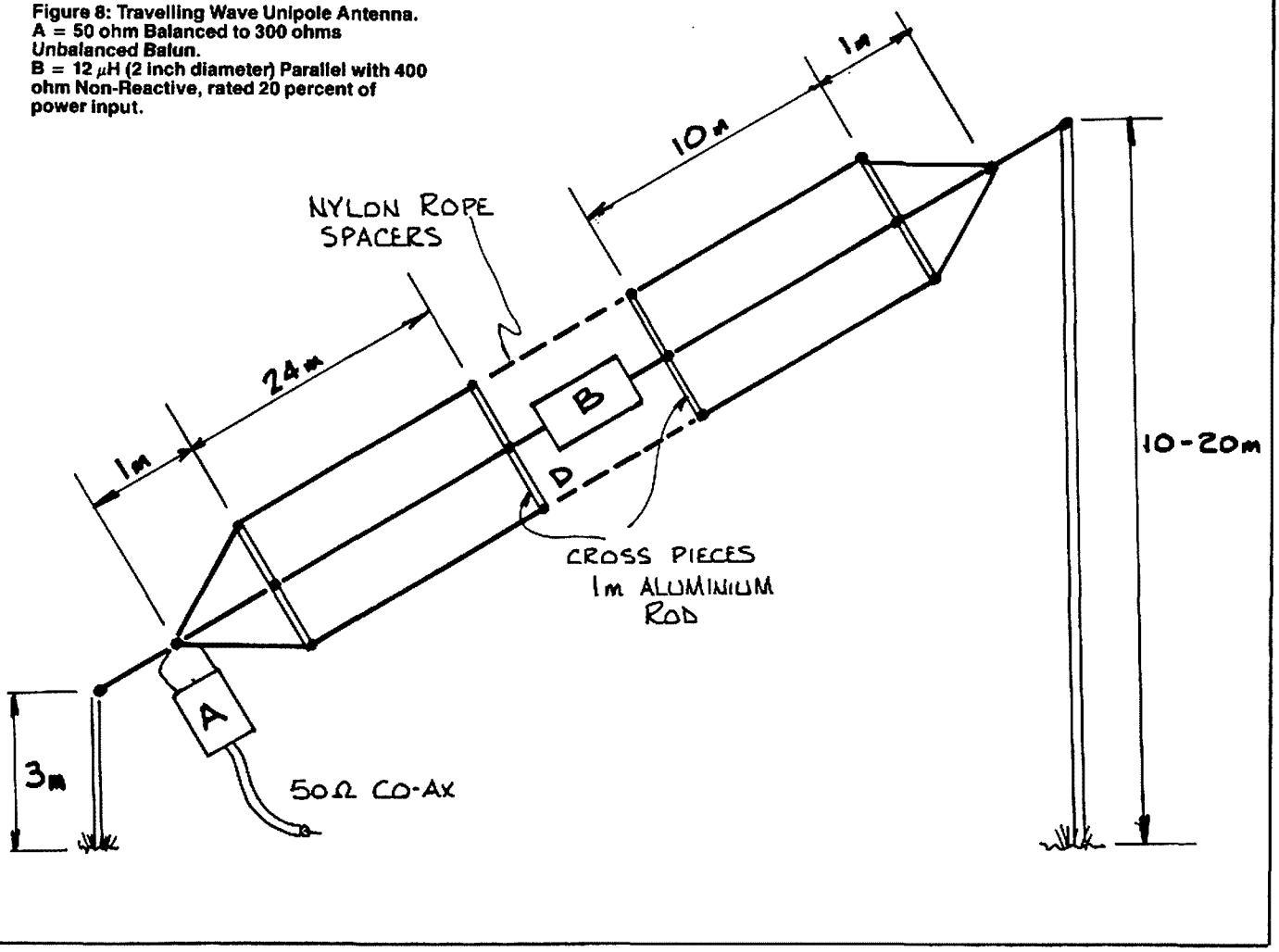


Figure 7: Low-Cost Broadband Travelling-Wave Dipole (Construction Details).

Figure 8: Travelling Wave Unipole Antenna.
A = 50 ohm Balanced to 300 ohms Unbalanced Balun.
B = 12 μH (2 inch diameter) Parallel with 400 ohm Non-Reactive, rated 20 percent of power input.



frequencies. Vertical radiation is high to over 5 MHz, however is 40 degrees at 10 MHz and 25 degrees at 15 MHz. In general, a good all-round aerial for inter and intra state contacts, as well as long distance on 10 MHz upwards.

6. TRAVELLING WAVE UNIPOLE

This antenna must be one of the most versatile in use in Australia. Developed during the boom period for commercial SSB conversion, two Australian companies, *Codan* and *AEA* have both put much practical design and knowledge into its construction.

It is essentially a sloping half section of a "travelling wave dipole". Designed for erection on outback properties, with a minimum of supports, the aerial is usually rigged from one moderately high tree, mast or tank stand, to a short mast, three metres high to clear moving vehicles, tractors, persons, etc.

Frequency coverage for less than 2 to 1 SWR is about 2 to 15 MHz, which is adequate for its design purpose. Mast heights recommended are in the order of 15 metres and three metres, and a separation of 20 metres. Is application to amateur radio portable operation is obvious.

An amateur version is fact was described in a 1960 issue of the WIA SA Division Journal, and is reproduced in Figure 8. Note the mysterious termination is only parallel resistance and inductance.

7. HIGH FREQUENCY DELTA ANTENNAS

Low angle radiation antennas have always been the goal of DX operators on amateur bands./ To achieve this on 7 MHz and below has been a difficult proposition for most; those that do achieve it usually find some degradation in their close-in signal strengths, and are sometimes *confused* about the overall results.

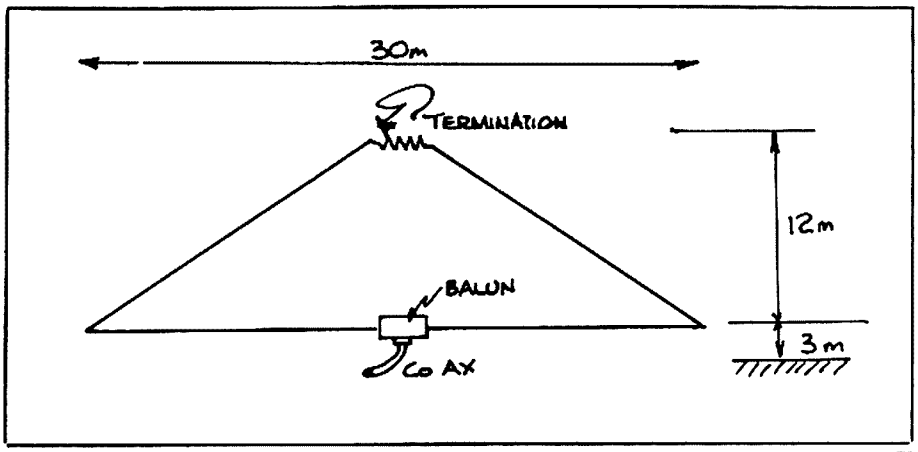
For coverage over short distances, 100-500 kilometres, it is better generally to utilise vertical incidence propagation arrays. This is in effect a total abandonment of the low angle radiation concept, with a deliberate use of the ionosphere to "spray" the RF back towards the earth surrounding the transmitter. Vertical incidence ionosphere sounding is carried out in a number of locations through Australia to determine heights of the various ionosphere layers — signals sent vertically towards the ionosphere on a band-sweeping transmitter, are reflected back to earth by various layers at specific frequencies. Some frequencies are actually absorbed and not reflected. The vertical radiation from an antenna does not form a narrow beam, rather a broad "spray", hence it covers the ionosphere over a large radius above the antenna — the "spray" then is reflected back towards the earth over quite a sizable area, depending on the angle of contact with the ionosphere, and the instantaneous surface contour of that layer.

The method is used extensively for local area broadcasting on High Frequency — I've seen it used successfully in Papua-New Guinea, and more recently observed its introduction at stations in Alice Springs and other Northern Territory towns.

For radio communications use it has become a practical antenna for HF mobile use in country and outback property and business systems — the limited range of VHF/UHF has made the HF mobile systems more practical, and to obtain coverage beyond ground wave limits, a variety of successful and practical "Vertical Incidence" arrays have been developed. Frequency range can be extensive, however a 2 to 10 MHz coverage is normally adequate. In amateur work, with some tolerance, a system could be used over the whole HF band.

In this respect, the radiation of higher frequencies vertically above ground will, at times, result in direct penetration into the ionosphere, and thus loss of communications — an amateur should have a lot of fun experimenting with this type of antenna, particularly investigating its DX usefulness over the whole HF band.

A commercial model available in Australia from Antenna Engineering Australia Pty Ltd utilises



a two wire cage assembly where the horizontal and sloping sections consist of dual wires, connected at each end, but spread apart in the centre. I am not sure what results from this, other than suspecting it maintains the SWR below 2 to 1 on certain frequencies.

The use of this system for reliable local contacts on 60 and 40 metres is recommended — performance in base to mobile contacts should be improved over a dipole, and for point to point contacts over paths below 1000 kilometres, an appreciable improvement should also be noted.

8. TERMINATED LONG WIRES

Amateur experiments with unterminated long wire antennas can be most frustrating and inconclusive — my own efforts in various locations and in field days, have led me to conclude that a resonant dipole, (or two), may sometimes be more effective. I have also concluded that the reason for the apparent anomalies come from the following.

1 Useful lobes (major and minor) are never in the direction of the desirable or active DX.
2 "Nulls" between lobes are in the direction of the wanted DX.
3 The main lobes, being in the general line of the wire, cover some 60 degrees of azimuth leaving the minor lobes and associated "null" to cover the remaining 300 degrees.

Hence, before one constructs a long wire antenna, it is worth spending some time and effort establishing:

1 Angles of major lobes. (See Figure 10.)
2 Angles of "Nulls". (See Figure 11.)
3 Bearing of preferred target areas.

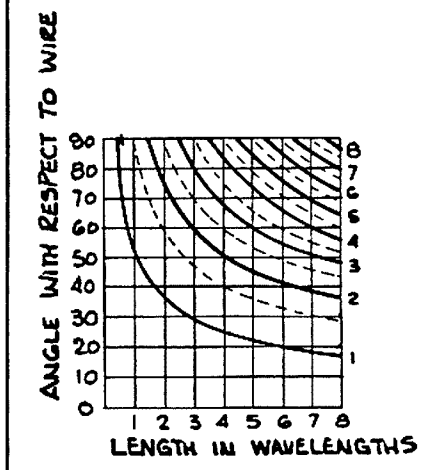


Figure 11: Angles at which radiation from long wires is maximum (solid curves) and zero (broken curves). The major lobe, No 1, has the power gains given by Figure 1. Secondary lobes have smaller amplitude, but maxima may exceed the radiation intensity from a halfwave dipole.

At this point I should mention that a long wire, in this context, could be defined as more than two wavelengths — the term is purely relevant to the specific circumstances, available space and frequency bands of use. A 40 metre end fed antenna in a suburban yard might, for example, be a "long wire" for 10 metre use, but is only short for 80 metres.

Some useful calculation of where one can expect to find the minor and major lobes, and the position of nulls, may be assisted by charts in the *ARRL Antenna Book*. My 1982 issue, page 7-1, Figure 1 gives the angles of the four major lobes, and their gain in dB over a dipole (see Figure 10). An interesting observation is that for lengths over six wavelengths the angle holds close to 15-20 degrees to the wire — this means no matter how long the wire becomes, radiation is never maximum in line with the wire. This lacks conformity with practical advice given by old-timers of "point it to the place you wish to target, and you can't go wrong". Be warned, this may be false guidance. Even to terminate the long wire will not destroy this radiation pattern, it will only give the antenna a constant impedance (broadband).

In Figure 2 of page 7-2 of this ARRL reference, a chart guides us to the angles at which we find other "minor" lobes, and most important, the angle at which the zeros or nulls occur (se Figure 11). I cannot stress this last point sufficiently — don't spend time and money on long wire antennas or their derivatives (Rhombics, Vees, etc) without giving some consideration to the fact that, to obtain gain, power had to come from somewhere!

Another interesting alternative is to "tilt" a long wire — a wire's radiation is improved if it is tilted at the same angle as the main lobe. This makes it more directional towards the lower end of the wire — radiation in the reverse direction is reduced. See Figure 12.

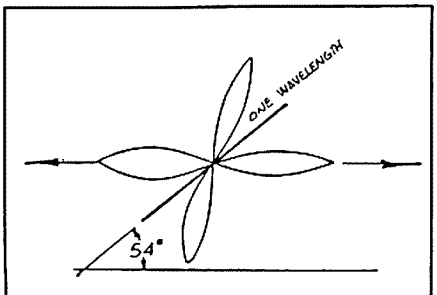


Figure 12: Example of how tilting antennas aligns major lobes to a more useful angle.

To feed an undetermined long wire we must use resonant feed lines, or locate a low impedance point for direct feed of coaxial cable — if this is done, use on other random frequencies is precluded. Some useful radiation patterns are given in Pat Hawker's (G3VA) *Amateur Radio Techniques*, Ed 7 p 296, for anyone wishing to follow this method. The "Slewing" of patterns for end, centre, and off-centre feed is very interesting. If a wire is terminated, it is only necessary to match a coaxial line to the termination impedance.

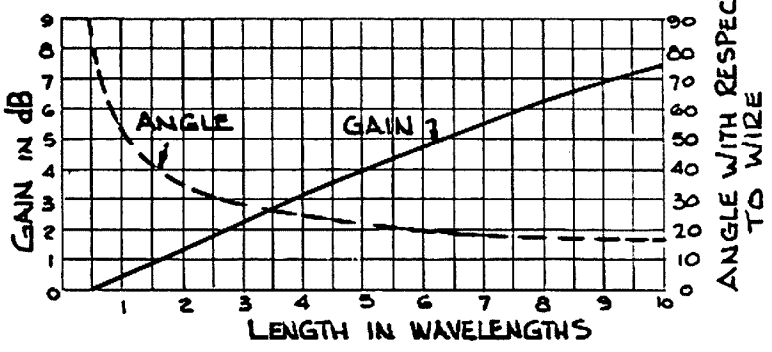
Hence to target a particular area for a terminated long wire we must ensure all the above parameters are considered.

What about using multiple, sloping, terminated long wires, held up by a central tower or pole? If you do this you have one of the most practical HF direction finding systems possible.

In fact, such an array is known as a "Baldock System" and used in the UK and Australia for just that purpose!

The configuration is simple — two long terminated sloping wires 15 degrees apart, are in combination to give selective major lobes every 30 degrees around the compass — hence 12 such wires would, by switching in pairs, give a positive bearing ever 30 degrees. By use of the property of the single wire, and readings on adjacent wires, bearings to an accuracy down to five degrees are common

Figure 10: Theoretical gain of a long-wire antenna over a dipole as a function of wire length. The angle, with respect to the wire, ar which the radiation intensity Is maximum also is shown.



with this system. Its use as a world-wide DX transmitting antenna for 1.8 to 30+ MHz is wonderful — so is its cost!

9. TERMINATED "VEE" BEAMS

In Part Four I covered the inverted "vee" beam — traditionally "vee" beams have been horizontally polarised and made up of two long wires, using both unterminated and terminated conditions. An unterminated vee requires a tuning unit for adjustment to specific frequencies — only when it is terminated will it become broadband, and, of course, both legs must be terminated. This application was mentioned in Part Eight, when the "Baldock" DF system was discussed. (See Figure 13 (a)).

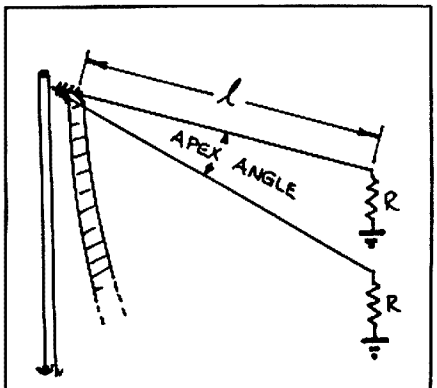


Figure 13a: The sloping Vee Antenna.

Certainly two terminated long wires in the form of a "Vee" can give a simple and reliable beam, where the same direction is required throughout a long period of time. Amateur use may be precluded, as you never really know which direction you will wish to work to next.

The antenna is most useful for specific directions — from the ARRL tables, the most desirable angle for maximum gain is 30 degrees (15 degree lobes reinforce) — leave the terminations off for bidirectional use.

Again, as for long wires, there is an advantage in sloping the wires toward the same direction. Thus with two sloping, terminated wires, quite large gains can be experienced over a 3 to 1 frequency range. An eight wavelength terminated "Vee" would have in the order of 10 dB gain over a dipole.

The height of a long wire above ground is also of interest — the resultant wave angle is influences along the lines shown in Figure 14.

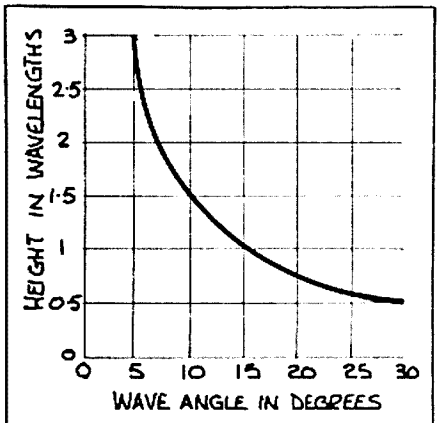


Figure 14: Antenna Height to be used for securing maximum radiation at a desired wave angle. This curve applies to any type of horizontal antenna.

As is obvious, few of these antennas could be erected in a suburban allotment for 3.5 MHz, etc, however, for frequencies 20 MHz and above, something practical may be possible.

In all terminating arrays, ground conductivity plays an important part — the laying of extensive radials is of value. The use of old coaxial cable as a "return" earth, laid on the ground between termination and feedpoint is quite acceptable. "Doubtful" coax is always appearing at "buy-sell" evenings at bargain prices and its use for ground radials or mats for any antenna is encouraged.

With respect to the termination, it is usual with the "Vee" to terminate each leg to ground through a 400 ohm load.

I have noted in the Product Information for the AEA Model 4131 HF Sloping Triangular Antenna, the innovative approach to the termination — in this model, each distant end of the "Vee" is continued across the base of the triangle and at the centre, a single load/termination is used (see Figure 13b).

I think this is the antenna those farmer/amateurs with an acre or two of gum trees, may have been dreaming of for some time. It is simple, non- critical and providing symmetry is maintained, you should not go wrong. The termination resistance should not be critical, and if you wanted to reduce it to 200 or 300 ohms, some useful results should be evident. Make sure you point it at the desired target or you may not be very pleased — see comments made in Part Eight, "Terminated Long Wires".

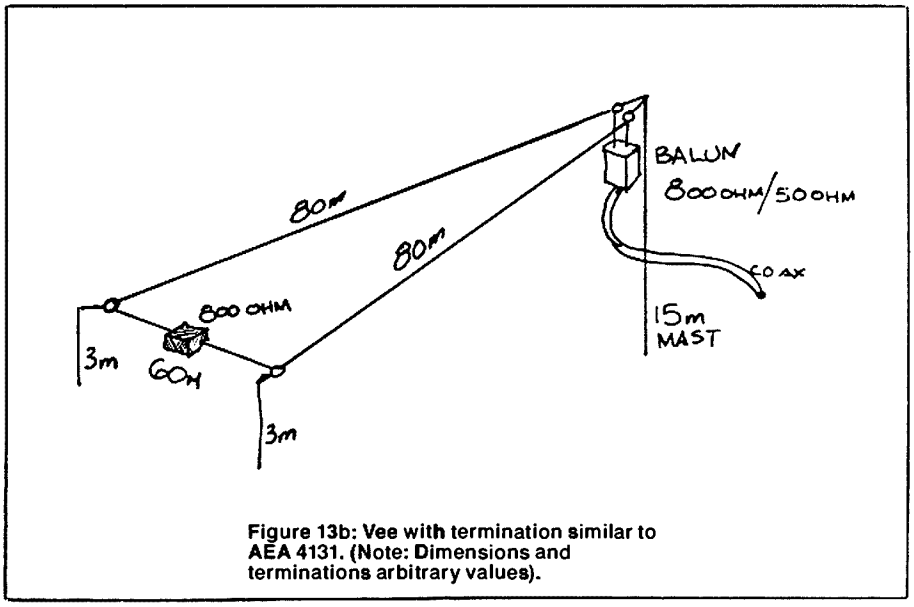


Figure 13b: Vee with termination similar to AEA 4131. (Note: Dimensions and terminations arbitrary values).

10. RHOMBICS

Unfortunately, this very valuable antenna is usually put in as an appendage to the "broadband" articles for amateurs. This is not because it is not used very much, but because its description and dimensions can become very prolonged. Basic construction is shown in Figure 15.

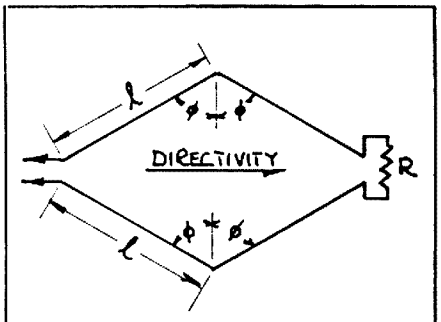


Figure 15: The nonresonant rhombic antenna.

I like the Rhombic — in essence it is two Vee beams back to back to give yet another 3 dB gain. I have been an admirer of the antenna for 40 years, and use every opportunity to listen on one, or use it, or photograph it. I have collected many "Rhombic Farm" layouts, and investigated a number of radio frequency interference problems with radio communications systems using them. Unfortunately, I have never owned one, but through the co-operation of my friend, Stuart Millowick VK5MS, have had recent amateur involvement with one. Another friend, Ray Naughton VK3ATN, continues to use these antennas for HF and more historically, his first EME successes were on 144 MHz with this antenna.

For the purpose of the present article I can only refer the reader to some of the literature in amateur magazines and text books I have listed. Some observations on amateur Rhombics that may be of value are:

1 The angles of the wires are fixed, but as you vary the frequency of use, the angle of the main lobes varies (see *ARRL Antenna Book*). There is only one frequency where the lobes totally reinforce one another to make a single major lobe — on other frequencies some distortion of the major lobe is evident but symmetry remains. (Refer to Figure 16).

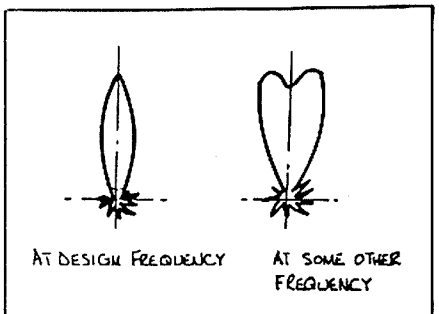


Figure 16: a. At design frequency. b. At some other frequency.

2 Vertical angle of radiation is controllable (or predetermined by fixed dimensions), hence some experience and appreciation is needed.
3 The nulls between lobes are very sharp and front to back ratios may be confusing under some conditions.
4 Directivity is very good and predictable — antenna may appear useless in all but the target direction.
5 It may be reversed by using a feedline from each end to a central point, where, by switching, either end may be fed and/or terminated.

At VK5MS, experiments continue on all bands, but the following Rhombic is presently giving excellent results. (See Figure 17.)

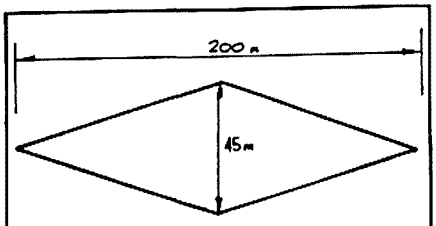


Figure 17: The Rhombic at VK5MS.

The antenna in Figure 17, at 33 metres, has been compared with a five element Yagi on 14 MHz at the same height. In the design direction it has gain in excess of 6 dB over the five element. This same five element has a gain of 6-8 dB over a comparison TH6DXX at 33 metres.

The Rhombic thus shows 12 dB above a TH6 when terminated and operating on the long path to Europe. This is an unbelievable figure academically, but when you see S-meters indicating these worthwhile figures, you realise that lobe angles vary as do angles of arrival, some latitude is necessary!

The amazing thing about these grand aerials is that overseas stations hear you louder, more call you, and you sometimes have to ask for call sign repeats, due to the co-channel interference.

The Rhombic at VK5MS has been tried with its termination switched for short path working for specific experiments — instantaneous switching for front- to-back and gain comparisons has not yet been installed, however these experiments are continuing.

One interesting constructional feature about use of extremely long wires — it is sometimes necessary to erect additional support masts for the wires. Hard-drawn copper wire is essential, however it cannot be stretched to avoid sag without endangering support structures — it is better to reduce sag by the use of these additional masts. The need to go to extremely long wires may be impractical however, as the law of diminishing returns (narrow aperture misplaced nulls) may beat you ultimately.

11. LOG PERIODICS

I have had little personal experience with this antenna, but it keeps popping up so often in amateur and commercial use, it should not be omitted from this article. I saw my first in Rabaul in 1959 where it was used on point to point circuits. Later, I was able to listen on receivers connected to rotatable LPA 50 metres high. Even later I witnessed their use for High Frequency broadcasting from Radio Australia in Darwin. There was certainly a use established in broadcasting and commercial work, but in amateur circles little early development was apparent. The configuration of elements was physically impractical in some of the earlier designs, and the handbooks were slow to pick up the new antenna, restricting its application to VHF and UHF Articles in the *ARRL Antenna Book* still promote most-complex mechanical monsters, for 13 to 30 MHz only.

The most practical articles that have come to my attention have been written by G E Smith W4AEO, in *Ham Radio*, from September 1972 through to May 1983. He seems fortunate in having a large number of tall trees at his disposal, and I am sure some VK amateurs may be in the same position — whether they are in the right location for a fixed beam to your favourite DX area, may be another problem.

Rotatable HF log periodics for amateurs became popular in Australia some years ago when ATN Antennas marketed a practical version running five or eight elements over the 13 to 30 MHz range. This range was developed to cater for the five bands we now have in this part of the spectrum — from all accounts they perform to specification.

Log periodics to cover 3 to 30 MHz do not exist — their practical design range is only up to just over 2 to 1 in the physical size an amateur can handle — VHF/UHF ranges of 3 to 1 are the subject of an article or two. Commercial larger sizes are usually 6 to 30 MHz, but the use of loaded elements and sophisticated boom and element construction is necessary, with as many as 12 elements in use.

Gain considerations are worthwhile — up to 9 dB over a 2 to 1 frequency range with an SWR less than 2 to 1 seems interesting! In my case, I would have to settle for the fixed wire types, using masts, towers or gum trees to support a maze of nylon cords and wires — W4AEO is extremely good practical reading on this approach, whilst the AEA Product Catalogue for the Models 638 and 690 provides interesting reading for those wishing to try a commercial version.

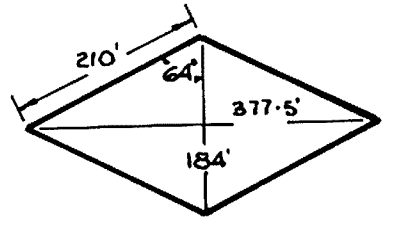


Figure 18: Rhombic antenna dimensions for a compromise design between 20- and 10-metre requirements, as discussed in the text. The leg length is 6 λ on 10 metres, 3 λ on 20.

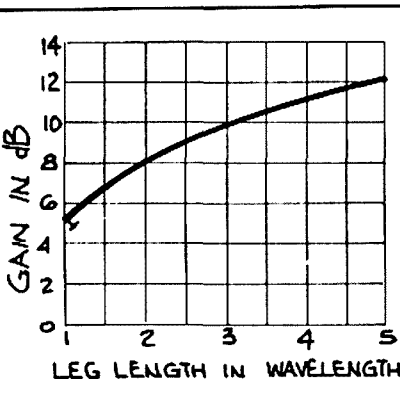


Figure 19: Theoretical gain of a non-resonant rhombic antenna over a half-wave dipole in free space. This curve includes an allowance of 3 dB for loss in the terminating resistor.

12. GENERAL

Numerous antennas utilised in commercial High Frequency communications are of interest to amateurs. Some appear from time to time in amateur literature, but few venture to develop their own versions, usually due to a lack of constructional information. I have attempted to list as many sources of practical information as possible, however, once the concept is appreciated, most amateurs should be able to some up with suitable construction techniques of their own.

This article was first presented as a lecture to the South Australian Division of the Institute in early 1986 and later to the Naracoorte Amateur Radio Club. It has been video taped and is available from the WIA Video Library run by John Ingham VK5KG. I strongly recommend this for club lecture nights.

I thank also Ian Wall of Codan and Ian Wade of AEA for their helpful comments and permission to mention their products. The Editor also should be praised for his patience at the long time he has waited for the manuscript!

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1. See Figure 4.

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12 AEA Product Information (HF Dipole Model 4104)

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Storage Idea For End-Fed Antennas

Peter Parker VK6NNN
C/- Witchcliffe Post Office, WA. 6286

A device to allow storage and protection of end-fed wire antennas.

The main part of this system is the reel from a spool of solder. The reel is used to wind the antenna around when not in use

Place the reel inside a face-cream container, 5.5 cm high and 6.5 cm in diameter. A hole 5 mm in diameter is drilled through the side of the container to allow the wire, wound around the reel, to protrude. This wire is connected to a crocodile clip which is fed to the equipment.

Two holes are drilled, one in the top and one in the bottom to allow for a support wire. To erect, the crocodile is pulled to unwind the wire.

To retract the antenna, disconnect the clip from the equipment, untie the supporting wire, unscrew the lid and rewind the wire onto the reel until the crocodile clip meets the container. Replace lid.

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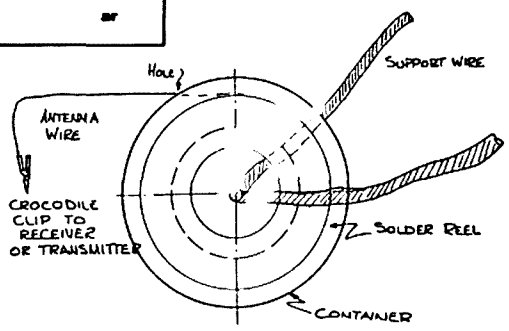


Figure 1:
Construction of Antenna.

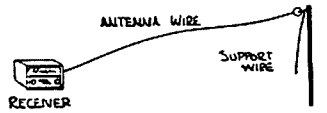


Figure 2: Erected Antenna.

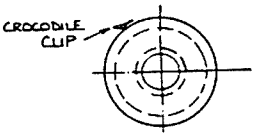


Figure 3: Rewound Antenna.

STANDBY BATTERY CHARGING

Mike Groth VK5AMG
11 Branch Road, Stirling, SA. 5152

This article is a collection of solutions to battery charging problems encountered over the years.

Lead-acid storage batteries are widely used as a power source in amateur stations, repeaters, alarms, and lighting systems, but if they are not correctly charged and maintained, they will have a limited life and may fail to supply the required power *in an emergency*. This article is a collection of the author's solutions to battery charging problems encountered over the years. The designs were tailored to use the components on hand at the time, and may be modified as required for different applications.

THEORY

A lead-acid cell has a nominal EMF of two volts, but the terminal voltage of a 12 volt battery may vary from 10.8 volts when fully discharged to nearly 15 volts at the end of a fast charge. The sulphuric acid in the electrolyte is consumed during the discharge reaction. The state of charge may be estimated by measuring the specific gravity of the acid with a hydrometer. The electrolyte in a fully charged cell should have an SG above 1.20, decreasing to nearly 1.00 when discharged.

A standby battery is usually charged at a current, in amperes, not exceeding one tenth of the battery capacity in ampere-hours although a higher current can be used for the initial part of the charge. As the battery approaches full charge the surplus charging current will decompose the water in the electrolyte into hydrogen and oxygen which is vented to the atmosphere through the cell caps.

A car battery should give five to 10 years service in an amateur station, but many batteries lose much of their capacity within a year or two as a result of neglect or improper charging methods. When a battery is left in a discharged state the lead sulphate formed in the discharge reaction becomes insoluble in the very dilute acid and the battery cannot be readily recharged. A modest overcharge will not harm a battery provided the cells are topped up with distilled water but a prolonged overcharged or too high a charging current can result in excessive electrolyte loss and plate damage.

UNREGULATED BATTERY CHARGERS

A simple battery charger (Figure 1a) consists of a transformer, rectifier and light globe whose resistance rises with the current and protects the charger from shorted output leads or reversed batteries. The lamp brilliance will reduce as the battery approaches full charge and the terminal voltage rises. The current may also be controlled by a 240 volt light globe in the primary circuit (Figure 1b), but an output fuse is necessary to protect the rectifier from a reversed polarity battery.

Some small home battery chargers (Figure 1c) provide partial regulation by using a lower voltage transformer, so that the rectifier only conducts at the voltage peaks when the battery is fully charged. The thermal cut-out will limit the average current if the charger is used on a very flat battery or the output leads are shorted or reversed.

The unsupervised use of a trickle charger often leads to serious overcharging which is a common problem with the batteries in amateur stations, rural fire engines and emergency lighting systems. The pulsating nature of the charging current can *introduce* hum into any equipment operating from the battery. The full output voltage of the charger which is typically 16-20 volts, will be applied to the equipment if the battery is disconnected while on charge.

FLOAT CHARGING

A float charger is a current limited power supply with an output voltage equal to the terminal voltage of a fully charged battery and the current tapers off as the battery reaches full charge. Float charging is widely employed in radio repeaters and applications where batteries need to be maintained at full charge indefinitely. Because the charger's output voltage is limited to the full charge battery voltage

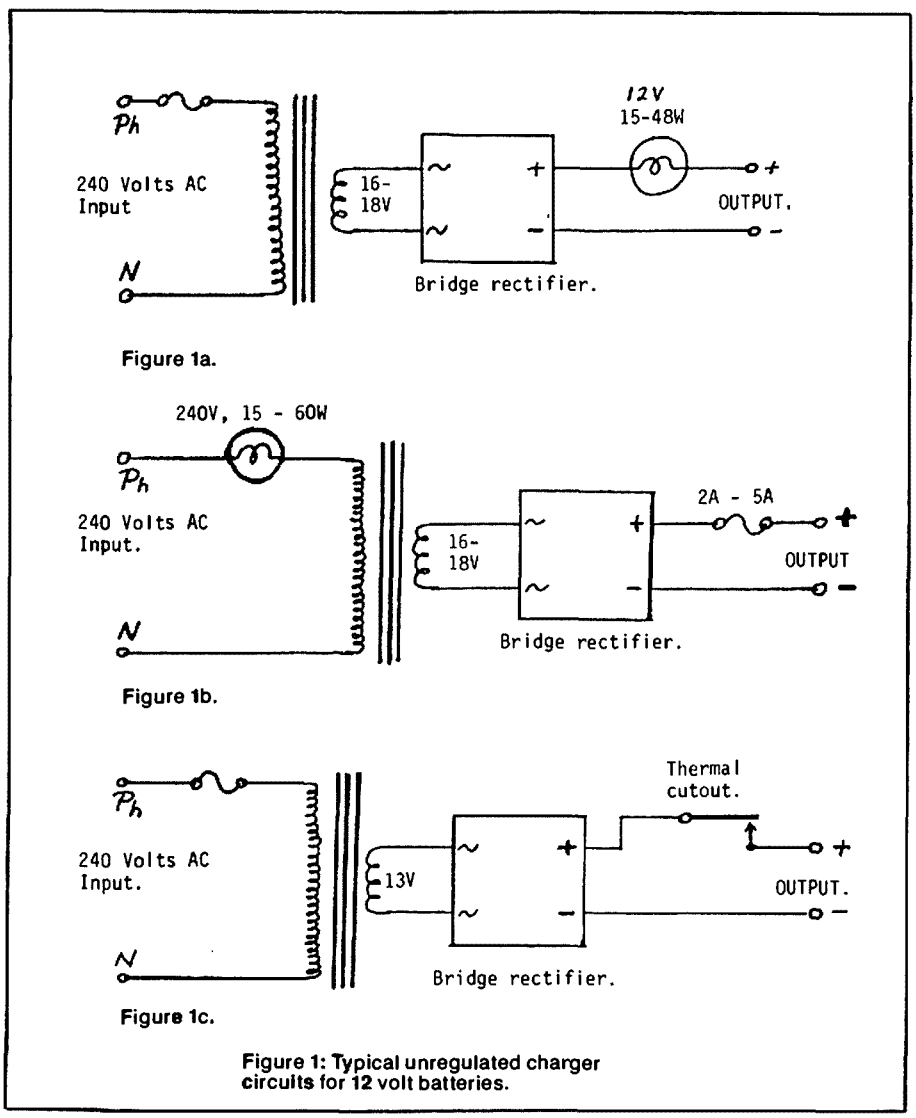


Figure 1a.

Figure 1b.

Figure 1c.

Figure 1: Typical unregulated charger circuits for 12 volt batteries.

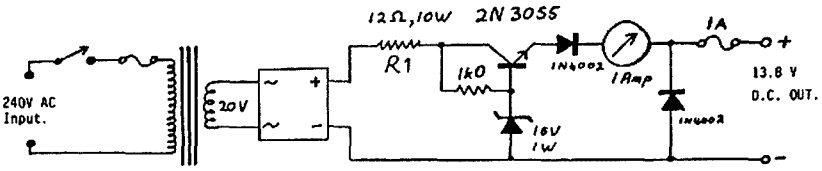


Figure 2: A simple voltage limited charger for 12 volts motorcycle batteries.

there is no possibility of damage to electronic equipment if the battery is disconnected while being float charged.

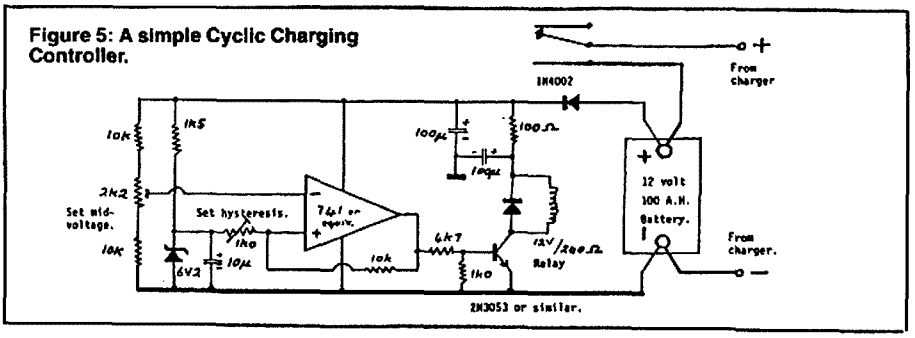
The simple charger of Figure 2 was constructed by the author for the overnight charging of 12 volt motor cycle batteries used to provide power for portable instruments. The batteries would be put *on* charge at the end of one working day and removed at the start of the next. The initial charging current, set by R1, was about 800 mA which reduced to less than 50 mA when the battery reached full charge. A 12 volt battery may be float charged at 13.8 volts for several days but the voltage should be reduced to between 13.2 volts and 13.4 volts for long term float charging.

An adjustable float charger using a three terminal regulator is shown in Figure 3, and other regulators may be substituted for the LM309K if the values of R1 and R2 are altered to suit. This circuit is used by the author for float charging a car battery which provides the 12 volts power for the station. The one amp current limit is adequate to cope with the quiescent power drain of the radio equipment and charge the battery from flat over two or three days.

Storage batteries benefit from regular exercise and a battery should be discharged occasionally to maintain its capacity. The author's batteries are discharged each month through a lamp bank (Figure 4) until the terminal voltage falls to 11 volts.

CYCLE CHARGING

A cycle charger charges a battery to a preset voltage. The charger is then turned off until the battery has partially discharged. The circuit of Figure 5 was used to control a commercial five amp charger connected to the 12 volts 100 amp/hour battery used to supply power for the alarms and emergency lights at the local fire station.

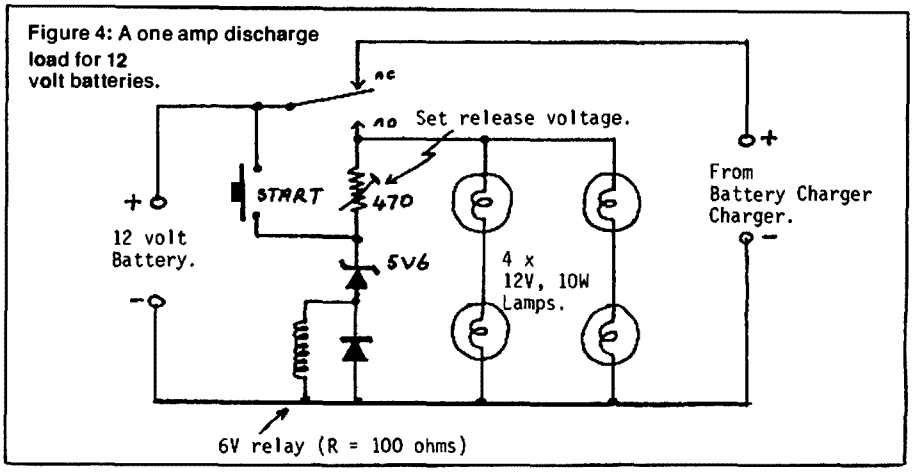


The controller is set to turn the charger on when the terminal voltage falls below 12.6 volts and off at 13.8 volts. There is some merit in using a larger amount of hysteresis, say 12.0-13.8 volts, to allow the battery to partially discharge each cycle. The voltage must be sensed at the battery posts via a separate pair of wires or the controller will include the voltage drop along the charger's output leads and the battery terminals.

SAFETY PRECAUTIONS

Battery acid is very corrosive, burns the skin, and can cause blindness if splashed in the eyes. A gassing battery will generate a fine acid mist above the battery and may even eject drops of acid if the charge current is too high. This will result in corrosion of the battery terminals and surrounding area as well as presenting a safety hazard when handling the battery.

The hydrogen-oxygen gas mixture generated by a charging battery is highly explosive and can be easily ignited by a flame or spark. The resultant explosion can easily rupture the battery and spray acid over a wide area. Several people are blinded or killed each year as a result of removing a live charging lead from a gassing battery or smoking while checking the acid level.



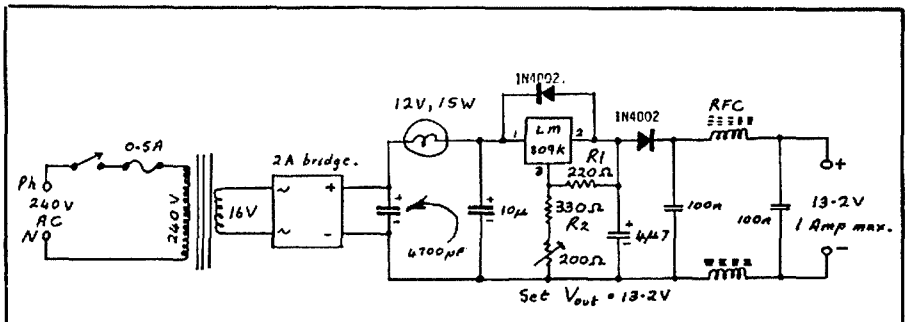


Figure 3: An adjustable Float Charger using a three terminal voltage regulator. Note — RFC = six turns through a ferrite bead. (Recommended to prevent RF Feedback).

TECHNICAL EDITOR'S NOTE

Batteries for stationary service are available. They have explosion-proof vent caps. They are also suited to float operation. Other batteries for cyclic operation such as solar charging are available.

Car batteries, whilst readily available, have been built for automotive use. They are less than ideal for stationary and float charge service.

Stationary batteries are available from Chloride Batteries, Besco Batteries, Dunlop and other suppliers. They are dearer than car batteries but do not suffer from acid spray and explosion problems due to sparks. They will also last much longer.

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PEP REVISITED

Ron Cook VK3AFW
7 Dallas Avenue, Oakleigh, Vic. 3166

Back in 1981 I wrote an article with the intention of clarifying the meaning of PEP. Judging from some of the recent letters to the editor of AR it is time to try again.

AC VOLTAGES

A little revision of some AC theory is a good way to start. Consider the AC waveform shown in Figure 1. It represents a complete cycle of a sinusoidal signal; the frequency is unimportant.

The symbol v represents the instantaneous voltage at time t. As t varies so does v, reaching a maximum positive value before falling to zero and then achieving a negative value of the same maximum value as the previous positive voltage. This value which occurs at the peaks of the waveform is called, not surprisingly, the peak value, and is given the symbol Vp in Figure 1.

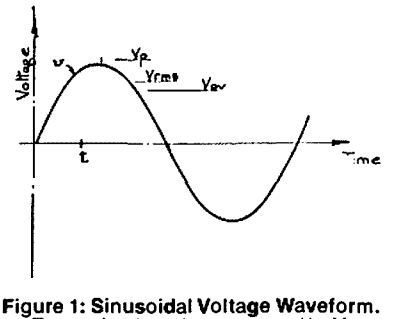

Figure 1: Sinusoidal Voltage Waveform.
The peak voltage is represented by Vp.
The effective voltage or root-mean-square voltage is represented by Vrms.
The average voltage (for any complete half-cycle) is represented by Vav.
Vrms = 0.707 Vp.
Vav = 0.637 Vp.

It should be obvious that the average value of the voltage over any half cycle must have an amplitude of something between 0 and Vp. For a sinusoidal signal as shown the average value is 0.637 Vp or 63.7 percent of Vp. Thus an average reading voltmeter calibrated on DC would read 63.7 percent of Vp. The more common type of permanent magnet moving coil meter used on DC will not indicate anything as the average value of a sine wave over a whole cycle is 0. The rectifier circuit shown in Figure 2 allows such a DC type meter to read the average value of an AC signal over more than a half cycle and is used in most moving pointer multimeters.

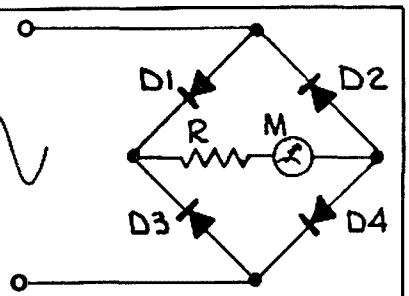

Figure 2: Rectifier Voltmeter.
This circuit enables a DC voltmeter, M, to indicate the average value of an AC waveform. It can be scaled to read RMS voltages providing the voltages are sinusoidal.

The same circuit, with a simple modification, enables the meter to indicate the peak value of the waveform. See Figure 3. A capacitor placed across the rectifier output charges to the peak and, provided that it is large enough, it does not discharge appreciably through the meter before the next peak arrives to top up the charge. A halfwave rectifier or a bridge rectifier may be used.

If the capacitor is too large it may not reach the peak voltage due to the limit on charging current imposed by the diode resistance and the voltage source impedance. Some care and compromise may be required in designing a peak-reading meter.

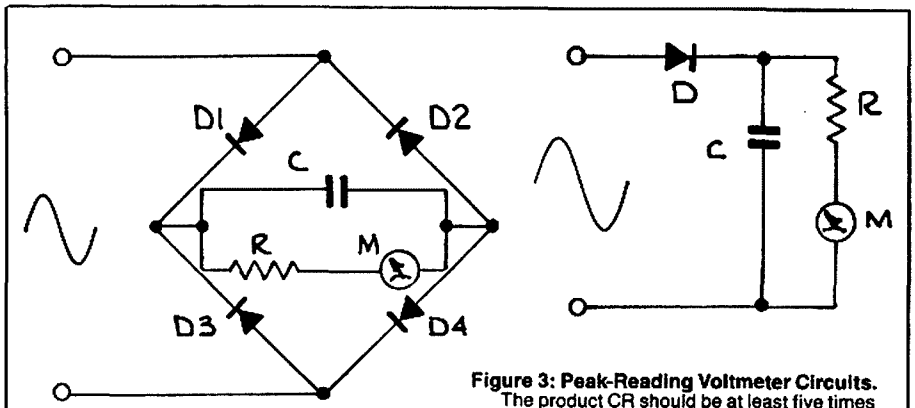

Figure 3: Peak-Reading Voltmeter Circuits.
The product CR should be at least five times the period of the applied signal. The meter, M, will indicate the peak value independent of waveform, providing the waveform remains constant or changes only relatively slowly.

POWER

So far, so good, I hope. If we apply a DC signal with a value of V volts to a resistor of value R ohms the power dissipated, P, is given by:

$$P = V^2/R \qquad (1)$$

Now suppose we were to apply an AC signal to the same resistor R. What voltage should we apply to generate the same amount of heat? It happens that the peak voltage should be greater than the DC voltage V. As the peak is sustained only momentarily it is only to be expected that the effective heating will be less than would be calculated from Vp when average power is concerned. It may be thought that the correct voltage to be used would be the average voltage, however a mathematical analysis or a practical experiment would soon show that a slightly larger fraction of the peak voltage needs to be used. The AC voltage that has the same effect as a DC voltage V is called the effective voltage and has the same size, in volts, V. For example, if a 10 volt DC signal is applied to a 1 ohm load then it will produce 100 watts of heat. The AC voltage that has to be applied to a 1 ohm load and also produce an average 100 watts of heat would be called 10 volts also. This effective voltage is called the RMS voltage to distinguish it from the peak or average or DC voltages but as it is the most commonly used measure of AC voltage the letters RMS are sometimes dropped. The RMS or effective voltage is 1/1.41 times the peak voltage or .707 Vp. The name RMS voltage comes from the mathematical form it takes when derived from theory (root-mean-square).

A small calculation shows that the RMS voltage is 1.11 times the size of the average voltage. Thus an average reading AC voltmeter can be rescaled to indicate the RMS values, providing that the waveform is substantially sinusoidal. If the signal has 10 percent distortion and this is essentially second harmonic distortion, then an average reading meter may be in error by up to five percent. If the distortion is essentially third harmonic then the meter error may be up to 3.3 percent. For many applications a true RMS voltmeter is necessary. These are very expensive if they are required to measure RF voltages thus alternative approaches are used.

For RF signals the peak voltage is easy to measure so RF wattmeters are *sometimes* constructed by placing a peak-reading voltmeter across a matched line or a resistive load. The power P is given by:

$$P = Vp^2/2R \qquad (2)$$

Thus, for a 50 ohm load a voltmeter reading of 10 volts represents a power of:

$$(10x10)/(2x50) = 1 \text{ watt.}$$

An RMS voltmeter would have indicated 7.07 volts.

ie power = 7.07x7.07/50 = 1 watt as before.

Because of the squared voltage term, such wattmeters have a nonlinear scale which is compressed at the top part of the scale. Note that this applies regardless of the frequency of the waveform; it may be 50 Hz or 28 MHz or 10 GHz.

At this stage it is necessary to restate that the power we have been talking about is average power. That is, the power dissipated over an appreciable length of time. The minimum length of time for which the preceding statements apply is one half cycle of the AC waveform.

INSTANTANEOUS POWER

It is permissible to talk about instantaneous power, which is the power being dissipated at a split instant of time which is specified. If we

return to Figure 1, the instantaneous power at any instant is given by:

$$P = v^2/R \quad (3)$$

where v is the instantaneous voltage and the other symbols have their usual meaning.

Instantaneous power is not a good guide to how fast you can boil a kettle full of water; average power is.

The peak instantaneous power occurs when v - Vp and, although it is a useful measure when selling Hi-Fi equipment and the intent is to get the largest numbers, again it is not a good guide as to how quickly you can boil water. Water requires sustained heat to boil and so average power computed from RMS voltage is required.

PEAK POWER

In a communications circuit it is the power received that is important. Usually the received signal must be more than one cycle of RF and often 10 000 cycles or more of RF are required for any piece of information or transmitted intelligence. Thus, even for radar signals, which use short pulses, the important measure of power is average power of the RF waveform. If the waveform is pulsed, then the signal has an envelope as shown in Figure 4. This is the same waveform we might see from a CW transmitter sending dots. The power during key down is given by equation 3:

$$P = Vp^2/2R \text{ or}$$

$$P = Vrms^2/R \quad (4)$$

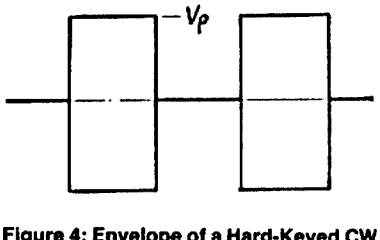

Figure 4: Envelope of a Hard-Keyed CW Signal.

Two dots are shown. The peak voltage of the envelope is Vp. The power with the key down is $(Vp)^2/2R$. The individual RF cycles are not shown as there would be at least 2000 per dot.

This is the same power that would be measured if the dots were extended until they became very long — the duty cycle could remain unaltered. Assume that the pulses are five seconds long. A fast responding wattmeter measuring the output would show zero power for five seconds and the key-down power, P, for the next five seconds. The average power over 10 seconds is however P/2. If the pulses were still sent at a 50 percent duty cycle but the repetition rate were changed to 1000 per second then the power meter reading would drop to P/2. This occurs because the response time of the meter is too short to follow the pulses and so gives an average indication. The key-down power is the significant one in determining performance. Hence it is necessary to describe this in an unambiguous way. Key-down power is an acceptable term, an alternative name which is often used is CW power. Peak envelope power (PEP) is also an acceptable description. It is the average power during that part of the waveform when it is at a maximum. In this example, the signal is either at zero or maximum and there is no ambiguity. In Figure 5 the keying waveform has been filtered to avoid the terrible key clicks that would be generated by the signal in Figure 4. Because of the changed waveform, the indicated average power may be different but the power during the peak part of the waveform is as before. Of course, the usual way of measuring CW output is to hold the key down long enough to get a meter reading, say two seconds, so few operators would be aware of the difference.

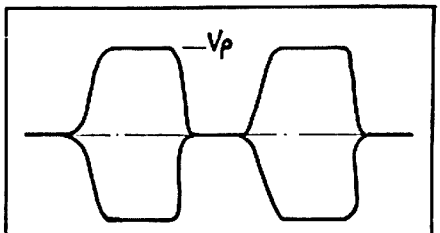

Figure 5: Envelope of a Soft-Keyed CW Signal.

The peak voltage of the envelope is Vp. The power, with the key down is $(Vp)^2/2R$.

If we were to send dashes as well as dots the duty cycle would change, the indicated power on a typical power meter would change but the PEP power would remain the same, assuming no changes in power supply voltages or load resistance.

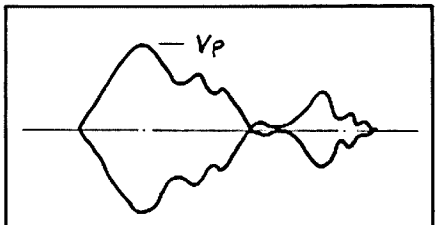

Figure 6: Envelope of an SSB Signal.

The peak envelope voltage is Vp. The Peak Envelope Power, PEP, is given by $(Vp)^2/2R$.

Suppose the waveform was as shown in Figure 6; similar reasoning applies. The envelope has a different shape and the maximum envelope power is developed only for a small fraction of the key-down time.

Restating what has been said so far, the peak envelope power (PEP) is the average power for one or more RF cycles at the peak of the envelope.

Thus for an SSB signal, the PEP is obtained from measurements made of the average power during the few RF cycles when the modulation waveform or RF envelope is at a maximum. These measurements may be made using an oscilloscope to measure Vp at the waveform maximum and then calculate the power using the equation (3) given.

Alternatively, a waveform of specified shape may be used and a conversion made from average indicated power to PEP. This procedure is given in the "current" *Amateur Operator's Handbook* published by DOC. Figure 7 shows the envelope of a two tone signal from an SSB transmitter. Two audio tones of equal amplitude, but not harmonically related, are fed into the transmitter and the audio gain adjusted until the envelope just begins to flatten on peaks. At this point, the transmission becomes broader — splatter starts. This is therefore the maximum output to which the transmitter should be driven. A calibrated peak voltmeter or oscilloscope could be used but the DOC preference has been to measure the power by using an RF ammeter in series with the load. Up to 20 years ago, RF ammeters were available from disposals stores, but are a rarity now. The RF ammeter contains a low value resistor which becomes quite hot from the passage of current through it. This heat is applied to a small thermocouple. A sensitive millivoltmeter indicates the thermocouple output on a scale that is marked in milliamps or amps. The scale is a square law one as would be expected. These meters can be calibrated on DC once their frequency response is established.

Of course the power calculated from the reading, I, of such a meter is average power, not PEP.

$$P = I^2R \quad (5)$$

The handbook states that this power must be multiplied by two to obtain PEP. This has led to the erroneous ides that all power meter indications must be multiplied by two to obtain PEP If a peak reading voltmeter is used, the PEP could be overstated by a factor of four.

It should be noted that DOC have moved with the times and now allow a range of methods to be used to measure PEP.

PERPETUAL MOTION

A number of construction articles recommend using a circuit similar to that shown in Figure 3, to measure the power dissipated in a 50 ohm load. Often they calculate the power on the basis of V^2/R, where V is the indicated voltage for a steady tone or key-down carrier. This of course gives twice the actual power which is flattering but quite untrue, as alas, most flattery is. Few small linear amplifiers exceed 30 to 50

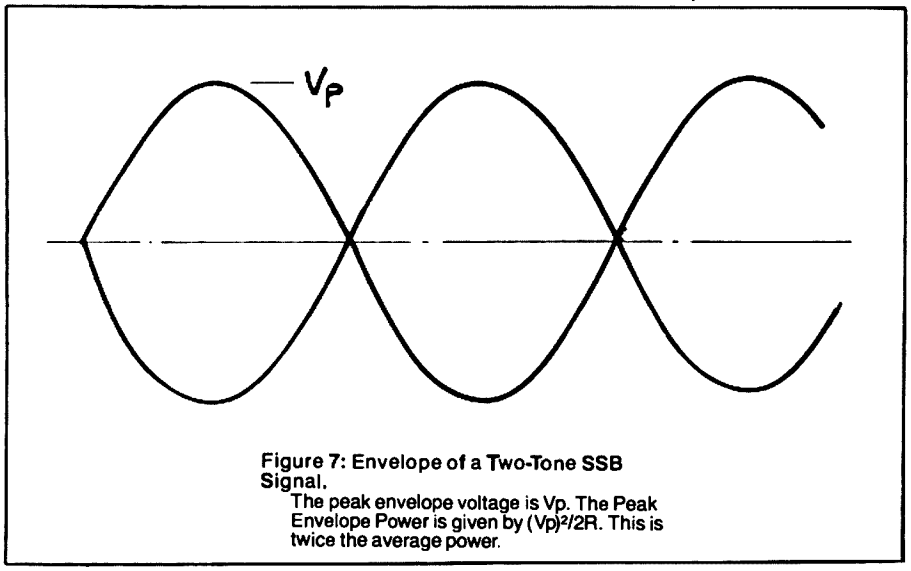

Figure 7: Envelope of a Two-Tone SSB Signal.

The peak envelope voltage is Vp. The Peak Envelope Power is given by $(Vp)^2/2R$. This is twice the average power.

percent effective efficiency while, for larger ones, the efficiency ranges from 30 to 65 percent. Using the method indicated by some authors leads to a PEP output which exceeds the DC input. If this were true, once the rig had been fired up, it could be used to supply its own power and still have enough left to sell back to the electricity supply authority.

Most *modern* multimode transceivers give the same peak output for CW and SSB so a rig giving 100 watts out on CW with the key held down can be expected to give 100 watts PEP out on SSB. Older valve rigs with poorly regulated power supplies managed up to 50 percent more PEP out, and many tended to self destruct if the key was held down for long, so the CW rating was reduced to avoid overheating. CW has a higher duty cycle than uncompressed SSB, hence the extra heat. This has no doubt contributed to the common use of various "corrections" to arrive at a PEP rating, some of which seem to promise a form of perpetual motion.

TWO-TONE MEASUREMENTS

To conclude this part of the discussion, it is worthwhile considering why the factor of two is used. The two-tone envelope in Figure 7 is produced by the two tones combining to form a voltage which is the sum of their values at every instant. When both tones are positive, a positive signal results. When the tones are both negative, a negative signal results. If they have equal magnitudes, but opposite polarity, then the signal goes to 0. The maximum voltage is twice the value of either tone. We can calculate the power in each tone from:

$$P = I_t^2 R \qquad (6)$$

where I_t is the current produced by one tone alone.

The average power is obviously the sum of the power produced individually by each of the two continuous tones. This is the power that the RF ammeter indication would give.

Suppose that the ammeter read 0.707 A for a single tone and the load was 50 ohms.

$$\text{Tone power} = 0.707 \times 0.707 \times 50$$
$$= 25 \text{ watts}$$

If both tones were applied together we might expect the ammeter to read 1.0 A, giving an average power of:

$$1.0 \times 1.0 \times 50$$
$$= 50 \text{ watts}$$

Remember that in a linear amplifier each tone contains the same (average) power, thus the combination of both tones gives twice the (average) power of either single tone.

The combined tones produce a current envelope of the same form as the voltage waveform in Figure 7. The transmitter will be driven harder on peaks with two tones together than with either tone alone. If one tone produces 0.707 A then this is doubled to 1.414 A at the peak of the current envelope.

Thus:

$$PEP = 1.414 \times 1.414 \times 50$$
$$= 100 \text{ watts.}$$

Because of the waveform the average current shown on the ammeter will be only 1.0 A as expected from the foregoing.

Thus, PEP = 2x(average power) for a two-tone signal.

DOC POWER LIMITS, A HISTORICAL NOTE

When Australian amateur radio operation resumed after the war, the maximum allowable power was (I think) 50 watts DC input to the final amplifier. As the only modes used were CW and AM, this presented no measurement problems. There were a few experimenters using other modes but they were technically advanced and power measurement presented little problem. The power limit was raised eventually to 150 watts DC input. As SSB and, for a brief time, DSB began to appear in quantity on the bands the DC power input required revision. It was argued by Harold VK3AFQ, and other members of the WIA, that the PEP power input for a 150 watt AM final amplifier was 600 watts. If a final amplifier efficiency of 66.7 percent were assumed, then the PEP output would be 400 watts. At the time there was considerable pressure from AM exponents who thoroughly disliked SSB (Duck Talk) and did not want to be disadvantaged in terms of input power. The 400 watt limit was of course accepted. The British Post Office also adopted the same limit.

The rating of equipment in terms of its output is clearly a more sensible approach. This has been followed by DOC. The 120 watt output rating for FM and other transmissions appears to be based on a final amplifier efficiency of 80 percent which is more generous than the consideration for SSB. Another matter which may influence future decisions is the rating of commercially available equipment manufactured for the amateur market. But that's another story.

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1 GRAY, A, WALLACE, G A. *Principles and Practice of Electrical Engineering*, McGraw-Hill. 1955.
2 *Amateur Operator's Handbook*, Revised December 1978, Postal and Telecommunications Department.
3 *Care and Feeding of Power Grid Tubes*, Varian Eimac, 4th Printing, 1982, 67-30070.
4 Novice Notes, *Amateur Radio*, June 1981.
5 Novice Notes, *Amateur Radio*, November 1981.

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MILITARY RADIO COLLECTING

An interview with Colin MacKinnon VK2DYM

How does one become interested in collecting military radios?

In recent issues of Amateur Radio *we have featured a series of articles on vintage receivers and military radio equipment. In 1983,* Amateur Radio *magazine printed a series on modern Army surplus radios. The author of these articles was Colin MacKinnon VK2DYM. Following is an interview with Colin.*

"My interest in electronics began in the early 1950s at about the age of 12, whilst living in Orange, NSW, and was due to trying to listen to Sydney radio stations on an old four valve radio. To improve reception I built longer and higher aerials, and the family radio was heavily modified, not always successfully. I haunted the local radio repair shops, scrounging spare parts, and did repairs of the neighbours' radios. I learned by trial and error, mostly error.

"I became interested in amateur radio after finding and visiting a local amateur, Norm Skulander VK2JW, who had an ex-RAAF AT-14 transmitter (capable of 500 watts AM). I would sit in his shack listening to people such as John Moyle VK2JU, and Joe Reed VK2JR. I was fascinated by the big black AT-14, and watching the 866 rectifier valves glow lovely shades of purple in synchronisation with Norm's voice, as he transmitted.

"My first real radio was a BC-348Q, which I saved up for months for and purchased from Tom Thorpe VK2QT. With the set I could listen to both local and overseas amateurs. The BC-348 was soon improved with miniature valves and converters for other amateur bands.

"My next venture was to purchase an SCR-522, by mail order, from Deitch Brothers, in Sydney. In due course it arrived at the local railway station and I pedalled my bicycle the three miles to town to retrieve it. I was a little shocked when I discovered it was not the one foot cube size I had imagined from the magazine photographs, but instead was in a wooden box about five feet long and three feet square, weighed a ton! I did get it home but the bike was never the same. It took ages to get the SCR-522 operating because I had no technical details on it, and could not find anyone in Orange to talk to on two-metres anyway.

"Perhaps these early experiences with military radios are the reason for my current interest in collecting them.

"In 1959, I became a foundation member of the new Orange Amateur Radio Club, joined the WIA, and commenced studying for my licence. However, other activities, such as earning a living intervened, and I was unable to pursue my interest in amateur radio. I moved to Sydney and it was another 20 years before I took up a serious interest in radio again. In February 1981, I gained my amateur licence as VK2KCM, and upgraded to a full license in May, as VK2DYM.

"It was Ian O'Toole VK2ZIO, who introduced me to the Sydney surplus dealers (what few were left by 1981) and the joys(? ?) of military surplus radios. From picking up one or two useful bits here and there, I have progressed to having a garage full of junk that will someday come in handy? ! ?

"I found that many people were throwing out old surplus radio equipment because it was no longer of any use for conversion or parts.

"I felt it would be a shame to see it lost forever, so have become a collector of military communications and very old amateur gear. I think of it as my contribution to saving history. My wife just thinks I am mad.

"Often the families of Silent Key amateurs are at a loss to know what to do with the equipment, papers, QSLs, etc, some of which may be of relevant historical interest. I try to assist, but so often I hear of the lot being dumped to clear the space! As a plea to all readers, if you want your radio gear, precious log books, etc, to be saved, make a list now and tell someone of your wishes.

"My collection numbers about 150 different military radio sets, plus a fair amount of technical data. The sets range from the CPRC-26, a Canadian walkie-talkie of about one kilogram, to an AT-13 which weighs 600 kg and stands nearly six feet tall. Most of the radios are Army equipment, but I do have some Air Force and Navy equipment too.

"I also collect literature relating to the early technical history of radio, and particularly if it relates to amateur activities.

"Unfortunately, I only began collecting three or four years ago, so have missed out on the mass of surplus equipment that was available in the 40s and 50s. For example, I do not have an AR8/AT5, even though there are probably hundreds still around, in various junk piles.

"One day I hope to place my equipment on working display, but in the meantime, I do write articles for the amateur press describing items in my collection in the hope that others will derive some interest and pleasure from them. I also research and write items on aspects of early radio, with emphasis on the technical details. These articles appear in the magazine of the Historical Radio Society of Australia. As well, I participate in exhibitions at local schools, etc, with some of the pieces of equipment.

"The equipment in the photograph comprises, from top left: a No 62 MKII set, used by the Australian Army; a WS 208 MKII, which is a small portable Army set; A no 19 MKII (Aust); and a BC-611-F , the US walkie-talkie. On the middle shelf are an RC7C set; an R-110, a US receiver of Vietnam vintage; a PRC-10 as used by many armed forces up to the 70s; next an ARB aircraft communications receiver; and a British R-1155 receiver. On the lower shelf are a TA-12B, an aircraft transmitter; an ATR-4, which was in use as an RAAF portable set; and a Collins 51J-4 communications receiver. I am in the photograph to stop the rack from collapsing! There is one inescapable feature of military radios, they are usually very heavy.

Colin is always on the lookout for any surplus military equipment or technical manuals. He is also prepared to copy any manuals. Contact him before you take a trip to the rubbish tip at the above address.

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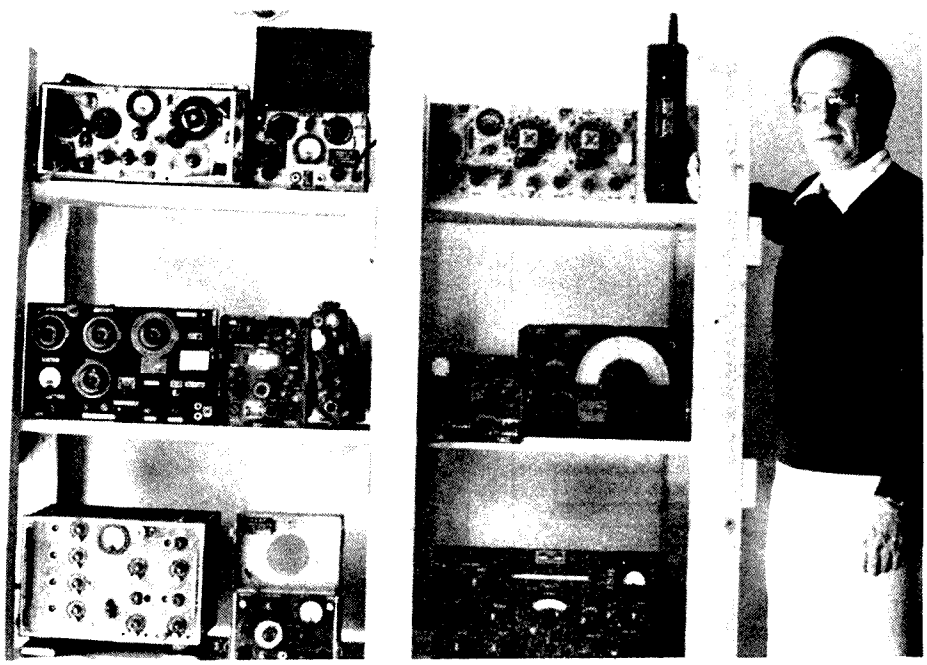
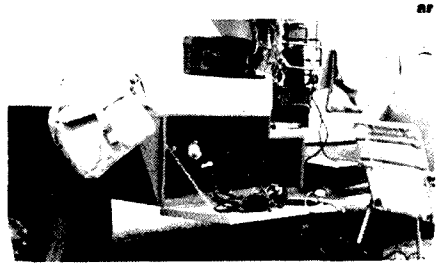


Part of the military radio collection of Colin VK2DYM.



A No 11 set installed in a Reo 4 wheel-drive truck, painted in desert camouflage. (From Colin's album).

MOBILE HF RADIO AT THE WOOMERA RANGE

Lloyd Butler VK5BR
18 Ottawa Avenue, Panorama, SA. 5041

During the height of activity at Woomera, there were people who ventured into vast areas of uninhabited land in a range 2000 km long, their only communication, HF radio. Here we discuss the mobile radio equipment they used and the background of its development.

On April 1, 1987, the Laboratories of the Defence Science and Technology Organisation, at Salisbury, celebrated the 40th anniversary of its first formation as the Long Range Weapons Establishment (LRWE) in 1947. The establishment was formed to support a range at Woomera which experimented with guided weapons, pilotless aircraft and air launched equipment as a joint venture of the United Kingdom and Australian governments. Over recent years, the operation of the range has been gradually phased down and the function of the establishment has changed, with several changes in name and departmental control.

During the height of operations at the Woomera range, the establishment was called the Weapons Research Establishment (WRE) and, as shown in Figure 1, the range firing area was extended 2000 km over vast areas of uninhabited land to Talgarno on the north-west coast[1]. Various parties were required to venture into this land, often as lone individuals who drove Landrover vehicles where there were no roads and who had to survive the harsh environment of the bush for weeks or months at a time before returning to civilisation. Amongst these individuals is the name of Len Beadell, well-known for his many books published about his experiences in the bush.

People who ventured into the bush came from various sections and departments with various functions to carry out. They included survey parties, the reconnaissance section, national mapping, works personnel, Commonwealth police and range security, native affairs officers, the range missile recovery team and many others. Each of these vehicles used by these parties had to be equipped with HF radio because HF radio communication was the lifeline back to civilisation. The purpose of this article is to discuss this mobile radio and, in particular, the radio transceivers progressively used over the years to do the job.

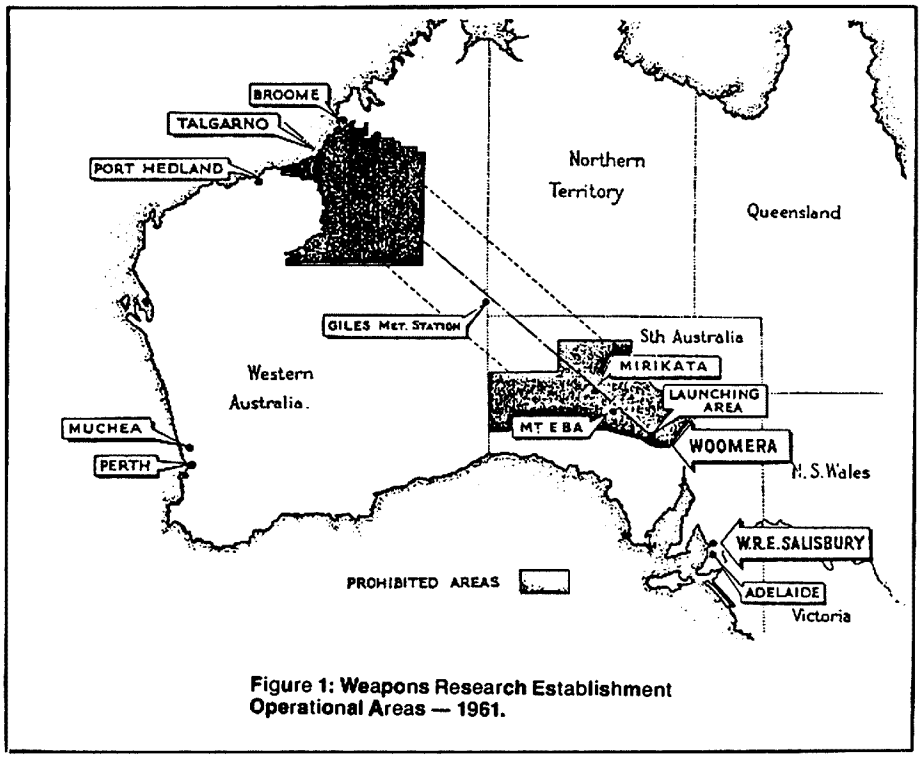


Figure 1: Weapons Research Establishment Operational Areas — 1961.

THE TRANSCEIVERS

Outside the research establishment, what will generally be unknown is that two models of mobile HF transceiver were designed and built by the establishment and provided for the bulk of mobile HF radio installations during the height of activity at the range. Much of the initial discussion concentrates on these transceivers, the basis of their development and their application in the field. Reference will also be made to some of the people involved.

The environment of the bush was harsh and the radio equipment often had to endure extremes of vibration and mechanical shock due to the rough terrain. Added to this were the high temperatures encountered within the vehicle from the hot northern sun and the dust which could get into switches and connectors to cause problems.

The harshest treatment was probably given to radio sets installed in the missile recovery vehicles. Considering the endless supply of whip aerials needed for replacement and the extent of tree foliage which finished up in the radio equipment, it would seem that these vehicles were driven straight through the bush to their target just as one would drive a tank.

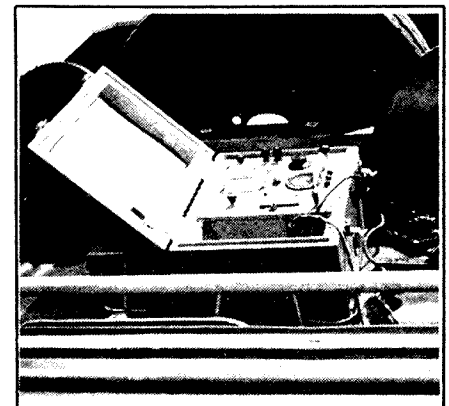


Figure 4:LRWE Type 1 Transceiver — Installation.

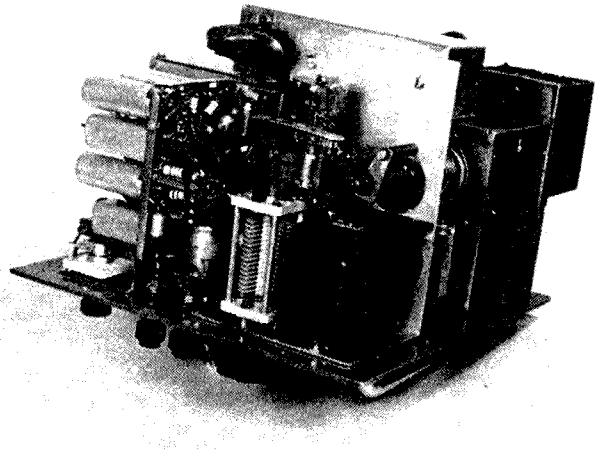


Figure 2: LRWE Type 1 Transceiver — Front.

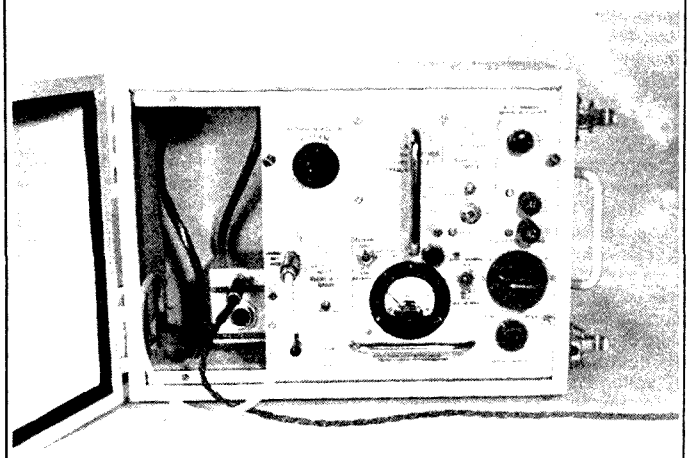


Figure 3: LRWE Type 1 Transceiver — Rear.

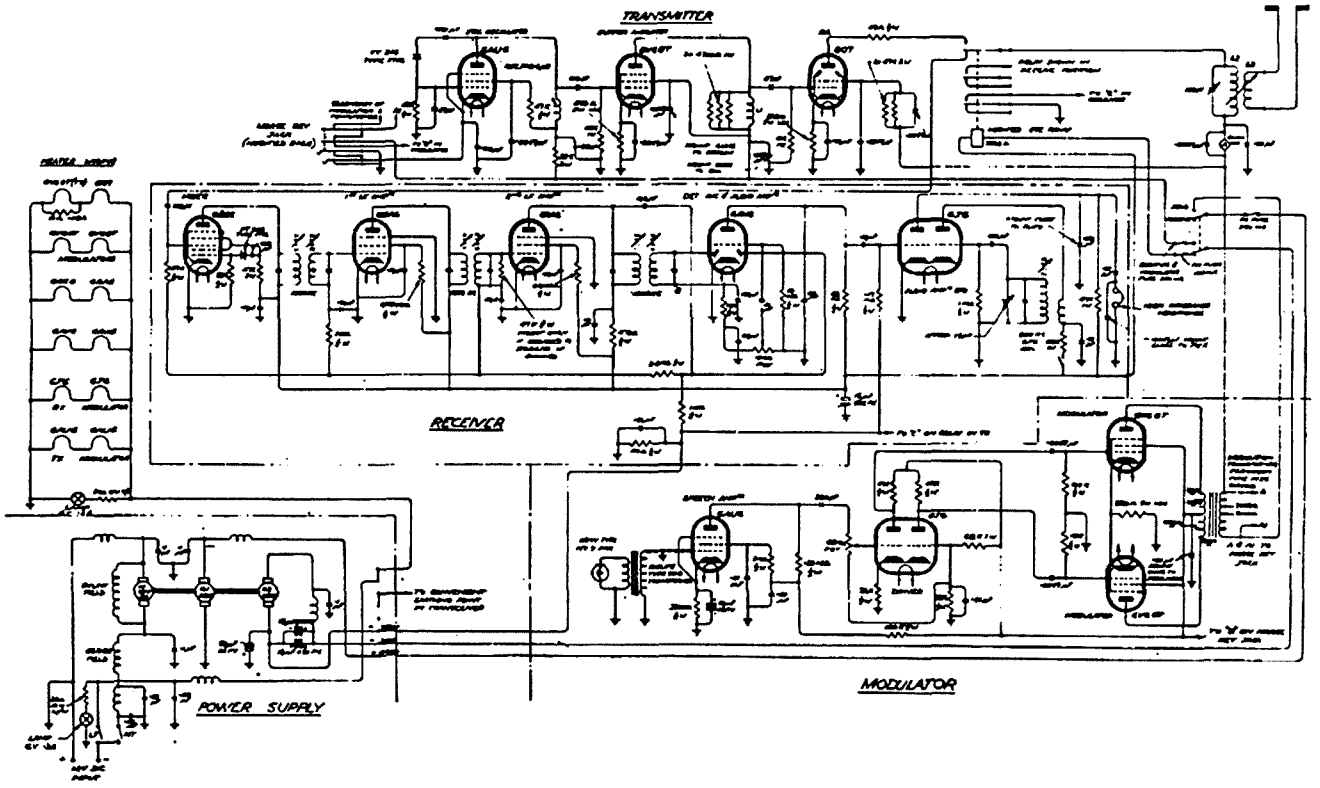


Figure 5 — LRWE Type 1 Transceiver — Circuit Diagram.

THE TYPE 1 TRANSCEIVER

The first transceiver, called the LRWE Type 1, was developed by Ted Peppercorn around the period 1950-51[2] and this is shown in Figures 2, 3 and 4. The design of the Type 1 unit followed a review of commercial market and defence service sources for a HF transceiver suitable for mobile operation. The Army No 122 wireless set was found to be suitable but setting up and adjustment of this set was complex, requiring the attention of a trained radio operator, hence it was decided to build a more basic unit, simpler to use in the field.

The transceiver was an all valve unit with crystal locked transmitter and receiver, frequency changeable within the range of 5 to 8.5 MHz using plug in crystals. The high voltage supplies were derived from a genemotor, originally designed for the Army No 19 wireless set and operated from the 12 volt vehicle battery. HT voltages were 450 volts, used for the RF power amplifier and 250 volts for the remainder of the transmitter stages and the receiver. Battery load current was 12.7 amps on transmit and 7.7 amps on receive. Operational mode was either CW or AM.

The circuit diagram for the earlier units constructed is shown in Figure 5. These had a valve type 807 as the final transmitter amplifier which delivered an RF output power of 15 watts. Later versions, designated Mark 2, were fitted with a valve type 2E26. In the receiver, two IF stages were used but the designer had aimed at simplicity and not included a premixer RF stage. A high IF frequency of 1600 kHz was employed to compensate for the resulting reduction in image response but this also set the bandwidth quite wide at 12 kHz. The output tuning and aerial coupling circuit for the transmitter was also used as input tuning and coupling for the receiver.

Vehicles were provided with whip aerials for mobile operation and wire dipoles to hang from available trees for stationary operation. Dipoles were fed via twin wire feeders cut to an electrical half wavelength to ensure that the dipole centre impedance was reflected at the transmitter, independent of the dipole to feeder mismatch. The feeder cable was ordinary PVC household twin cable and according to Ted Peppercorn[2], was quoted by the manufacturer to have a characteristic impedance of 160 ohms and a loss per 100 feet of 2 dB at 45 MHz. Obviously, its loss would be quite low at the low frequency end of the HF band, a fact which might surprise many who would discard it as unsuitable for aerial use. A disadvantage of the dipole was that a separate one had to be carried for each frequency channel required.

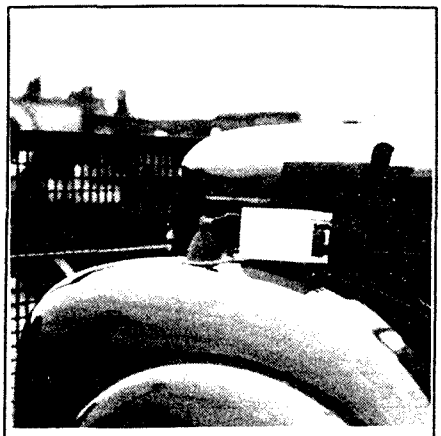


Figure 7: Whip Aerial Switch Box.

Whip aerials were base loaded as helical whips were not in common use at that time and whips with centre loading coils were too top heavy to stand up to the rough treatment through the bush. A conventional base loading coil is shown in Figure 6 fitted into the whip. Later installations had a tapped loading coil fitted in a switch box adjacent to the whip base, so that the loading inductance could be selected to suitably match the aerial for the channel frequency used. (Refer Figure 7).

Exactly how many Type 1 transceivers were manufactured is not known, but in June 1960 there were 50 mobile stations recorded as working into base stations at Woomera (VL5BW, Figure 8), Giles meteorology station (VL6DJ) in the centre of Australia and Talgarno (VL6DU) on the north-west coast. Of these 50 mobile stations, 37 were Type 1 transceivers. For the record, the other 13 were Traeger Type 51 MA valve transceivers. (Alf Traeger is, of course, famous for his early pedal radio and connection with the Royal Flying Doctor Service. Alf was also radio amateur VK5AX/VK8XT).

To make the HF communications picture complete, there were also AWA 5A teleradio transceivers installed for early warning purposes at six station homesteads in the range area and a base station at Salisbury (VL5BV) which sent timing signals to Woomera and provided an emergency communications link between the two locations when required. Some mobile stations also operated into the Royal Flying Doctor HF network as well as the range network.

Some personalities associated with early installations of the Type 1 transceiver were Bill Lloyd and the late Fred Brown. (Fred was later responsible for radio maintenance at Woomera base). Another was Lofty Turner, who spent many hours in the screened room at Salisbury clearing faults on Type 1 units and carrying out alignment.

In later years, an attempt was made to decrease the bandwidth of the Type 1 receiver by using a second stage of frequency conversion to an IF frequency of 100 kHz. Some transceivers were modified by the addition of a transistorised conversion module but full scale conversion was superseded by the development of the Type 2 transceiver.

SKIP ZONE

HF communication relies on the ionosphere and communication difficulties were sometimes experiences because of the skip zone. Recovery teams required continuous com-

Figure 6: Base Loaded Whip Aerial.

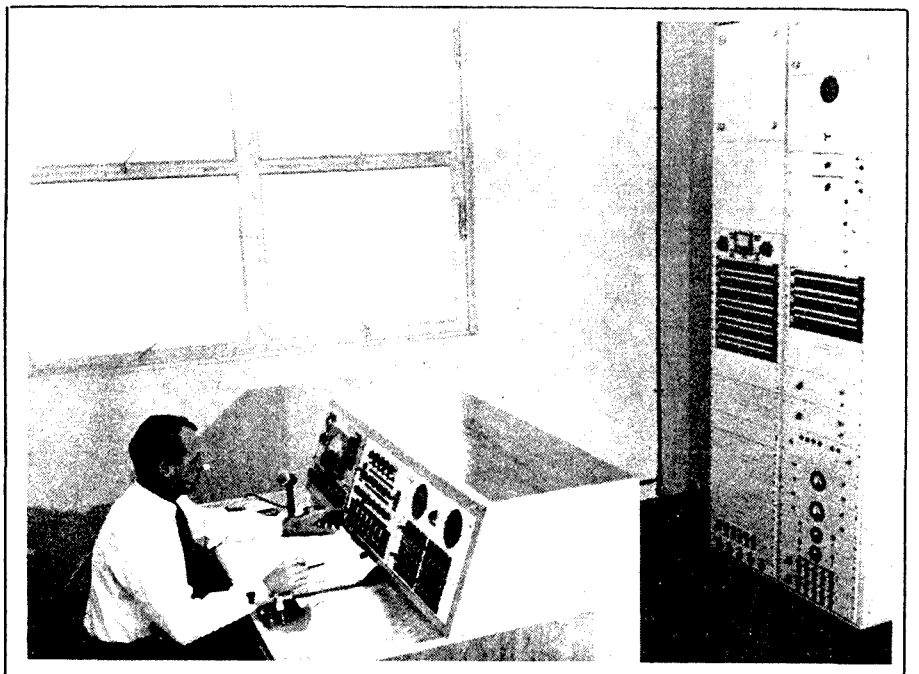


Figure 8: Woomera Base Station Control Centre.

munications as they proceeded down range and signal fade out was initially experienced as they moved out of the ground wave region into the skip zone. Communication was improved by installing remote receivers, connected via landlines, part way oown the range at the Knoll and later, further down at Mirikata. Communication is the reverse direction was also assisted by locating the recovery channel transmitter some distance to the rear of the range proper at Woomera technical area.

THE TYPE 2 TRANSCEIVER

As years progressed. germanium transistors commenced to replace valves in low frequency applications. During the period 1958-59, small signal RF transistors, extending operation into the HF spectrum, became available to open the door for the design of a new transceiver, all transistor except for RF power amplification. Such a design would result in considerable reduction in battery load current in the mobile vehicle. At the time, there was no available transistorised unit on the market and the writer, Lloyd Butler, set about the design and development of a new unit based on the existing state of the art transistor technology[3]. The new unit was to be called the WRE Type 2 transceiver.

Quite apart from the advantage of reduced battery load, there were a number of other reasons why the new unit needed to be developed. There was a proven need for a wider frequency range than available in the Type 1 unit to allow for changing conditions of the ionosphere and the wide range of different distances covered. Receive capability up to 20 MHz was desirable to allow survey parties to tune the higher frequency channels of WWV. An additional amenities service could also be provided by the addition to the receiver of the MF broadcast band. There was scope for improvement in the receiver performance. Finally, the Type 1 transceivers were starting to respond unfavourably to the rough treatment they were getting and there was a clear need to give attention to prevention of damage from vibration, mechanical shock and dust.

With the help of John Langman, who also played an important part in the development, a prototype was assembled to the follow specification:

Transmitter — Three crystal locked channels within the range of 2.5 to 12 MHz
RF Power 10-12 watts
Receiver — Tunable range 2.5 to 20 MHz and 550 to 1500 kHz
Two crystal locked channels within the range 2.5 to 12 MHz
Mode — R/T or CW
Battery Load — Receive only 18 mA
Standby 820 mA
Transmit 5 A

The circuit of the Type 2 transceiver is shown in Figure 9. The receiver, modulator and transmitter power supply were all transistor, but at that stage of the technology, power RF transistors were yet to be introduced and use of RF power valves in the transmitter was still the only option. There were problems in maintaining temperature stability in the early germanium transistors of that era and considerable attention was given to this in the circuit design resulting in satisfactory performance to above 70 degrees Celsius. At that point in time, such a temperature was considered to be quite an achievement for germanium transistors.

The faithful 2E26 RF power amplifier was again used, but a more complex aerial loading circuit was included to allow internal pre-setting of the matching, for each channel, to a single long wire. The circuit was duplicated for whip aerial operation so that neither channel change, nor change from long wire to whip, required any adjustment by the operator. The circuit also eliminated the need for more than one wire aerial when using more than one channel. Use of a long wire was possibly not as effective as the dipole used in the Type 1 transceiver, but the thoughts were that it was difficult enough to find single trees for aerial support in parts of Central Australia, let alone two trees spaced, at a suitable distance to hang two ends of a dipole.

For the transmitter oscillator and power amplifier driver stages, special quality ruggedised versions of the 6AU6 and 6AQ5 valves were used.

The transistor HT power supply only operated on transmit, delivering 350 volts to a fully loaded transmitter at a current of 100 mA. Power supply efficiency was 70 percent.

The receiver employed an RF stage and two IF stages operating at a frequency of 455 kHz. Sensitivity for the HF bands was within one to two microvolts for 6 dB signal to noise ratio, degrading a little at temperatures approaching 70 degrees Celsius. Image performance was good except at frequencies approaching 20 MHz, not expected for an IF of 455 kHz.

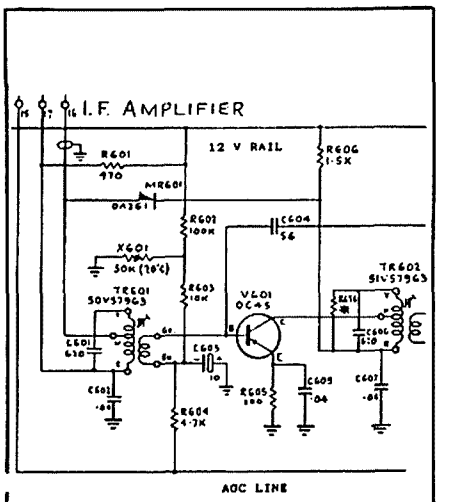


Figure 10: IF Amplifier with AGC Control.

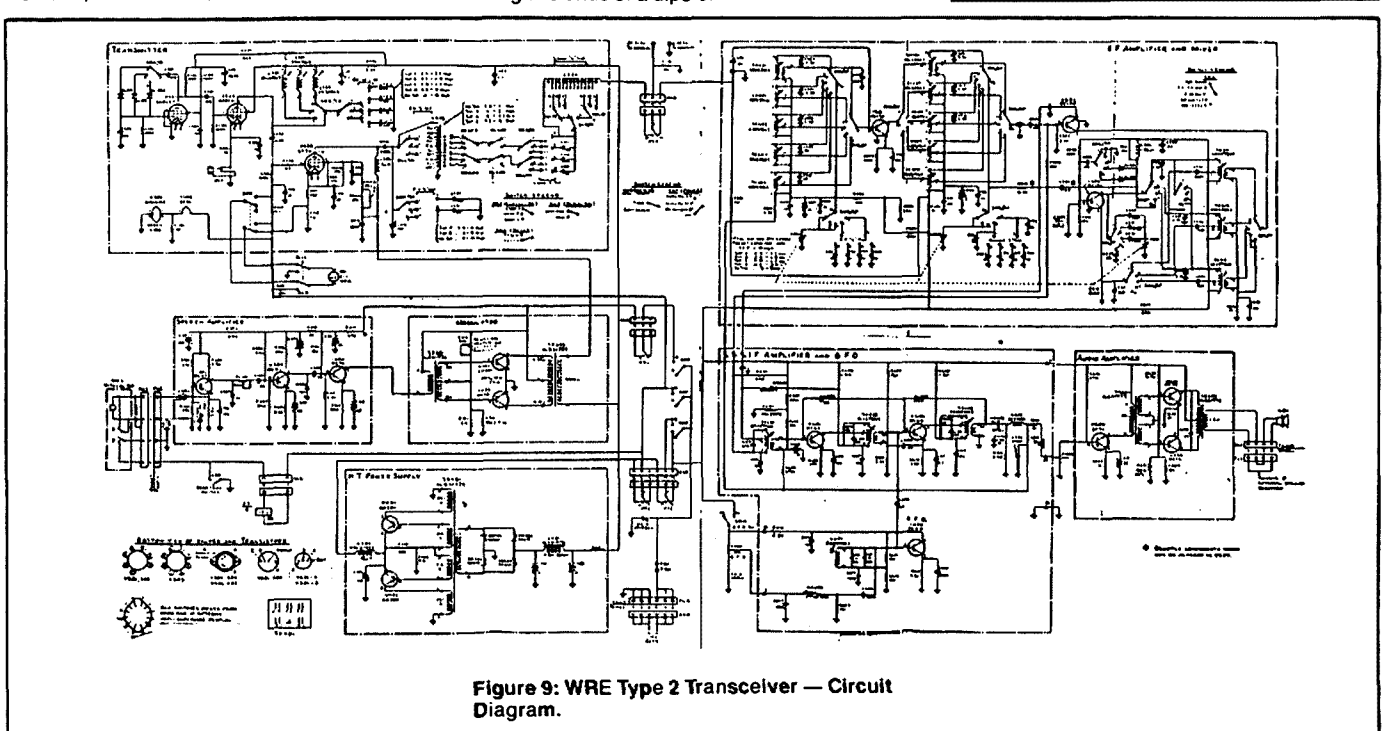


Figure 9: WRE Type 2 Transceiver — Circuit Diagram.

An interesting innovation was used in the RF amplifier and first IF amplifier, the latter being shown in Figure 10. In this circuit, DC feedback from the emitter is reduced by restricting the value of emitter resistor with resultant loss in temperature stability. This is compensated by the inclusion of a thermistor in the base bias circuit. The DC feedback works against the AGC control voltage and reduction of that feedback results in a dramatically improved AGC characteristic.

ENVIRONMENTAL TESTING

Assembly of a prototype led to the manufacture of two production models of the transceiver and the first of these was subjected to a range of environmental tests to stimulate field conditions including vibration, shock, temperature and dust tests. Available within the Establishment for this purpose was probably the best equipped environmental test facility in the Southern Hemisphere. (This facility still exists, as part of the Advanced Engineering Laboratory, providing an excellent service). A second production unit was tested operationally in a number of field trials.

In carrying out environmental tests, the help of Eric Grant from the environmental test section must be acknowledged. One interesting aspect of the program was a test carried out on a Landrover vehicle itself. With portable vibration test equipment on board, Eric and the writer sought out the roughest tracks which could be found around Salisbury to resolve just what vibration components were generated in the vehicle. This was necessary to select vibration mounts which reduced best those components which had the highest acceleration and did the most damage. For a given amplitude, the higher the vibration frequency the higher the acceleration and it was the high frequency high acceleration components which had to be reduced. This was at the expense of tolerating high amplitude but low acceleration low frequency components. What appears visually to be the best vibration isolation does not necessarily lead to the best result and without suitable vibration test equipment, selection of a mounting system would have been guesswork.

Before finalising drawings of the transceiver, it was necessary to look for components or parts of the assembly that exhibited mechanical resonance at a vibration frequency. This was done by mounting the unit on a vibration table and sweeping the vibration frequency through the anticipated range. Resonance was observed by flooding the unit with light from a stroboscope, chopped at a frequency near that of the vibrator. Components or sections of the assembly showing resonance had to be restrained to prevent mechanical fatigue and consequent changes were made to the manufacturing procedure. A lesson on environmental testing is not intended but the discussion does give some background to the work carried out before manufacturing detail of the transceiver was finalised.

PRODUCTION

A total of 29 Type 2 transceivers were manufactured apart from the prototype. Of these, eight were manufactured by WRE workshops and 21 were manufactured under contract by Amalgamated Wireless (Australasia) Ltd (AWA). The AWA units were similar to the WRE units except for minor construction details made to suit their own production system. (A typical unit is shown in Figures 11 to 13). The first two WRE units were made in 1960. These were followed by the AWA units which came off the production line in 1962 and a further six WRE which were made later on.

Personalities who assisted with the development and testing of the Type 2 transceiver included John Langman and Vin Agius. John, in particular, stayed with the work of the Type 2 to see them all tested and installed long after the writer had moved to other fields of endeavour. Drawings were prepared for production by draughtsmen, Dick Osborne and the late Mike Winterson.

Records show that by October 1967, 73 AM HF radio transceivers were in service around the range. By this time, Traeger was well into the production of a transistorised version of their transceiver and a number of Traeger types TM2 and TM3 were acquired to supplement the numbers of WRE Type 2 sets and replace some of the Type 1 sets. Consideration had been given to granting a contract for the manufacture of a further 20 Type 2 units but, with commercial transistorised transceivers then on the market, purchase of the latter appeared more cost effective.

The idea of the long wire, visualised for the Type 2 transceiver, suffered some change as vehicle installations proceeded. Traeger supplied a 35 feet telescopic whip which was put together from a number of short tubular sections and could be carried in the vehicle. A number of these whips were purchased for the Type 2 installations instead of, or to supplement, the use of the long wire in fixed location operation. The whip base support could be driven into the ground for support or the whip otherwise supported by fixing to the side of the vehicle. The high whip, of course, eliminated the need for those rare trees. Operationally, the high whip would have been ideal for ground wave and long hop paths, but not as good as the horizontal wire for short hop high angle paths. One danger of the high whip was the possibility that it could be erected near power lines, with the potential for electric shock from accidental contact with the lines. There is one disastrous accident on record to bear testimony of this.

THE TRAEGER SETS

As far as the Type 2 transceiver was concerned, the attention to environmental testing and vibration isolation paid off and they withstood the vehicle vibration better than the Traeger units. Notwithstanding this, towards the end of the AM era, the Traeger Type TM3 (refer Figure 14) replaced a number of Type 2 units for various reasons which will be discussed in the following paragraphs. Firstly, the Type 2 unit was designed to work with positive battery earth, the general standard in Landrover vehicles at the time of design. As time progressed, a number of new vehicles purchased were fitted with negative earth and the Traeger units were favoured because they had provision for earth on either rail. Some Type 2 units were modified for negative earth but to do this was not a simple process.

Another reason for changing to the Traeger unit was that it was smaller than the Type 2 and could be easily fitted under the vehicle dashboard.

A problem encountered with recovery vehicle installations was the variation in load impedance presented to the transceiver output by the short whip. A reason for this was that, when the vehicle was mobile, the top of the whip was tied down to reduce damage from trees passed and this resulted in a change in the electrical characteristics of the whip. Another reason was variation in contact resistance of the whip joints which in turn, varied the antenna loss resistance. The Type 2 loading system was based on pre-set adjustment with the idea that the unskilled operator be relieved of the task of aerial tuning. Apparently, the Traeger unit suited the application better because a simple aerial tuning adjustment was available to the operator which could be used to correct for the impedance change.

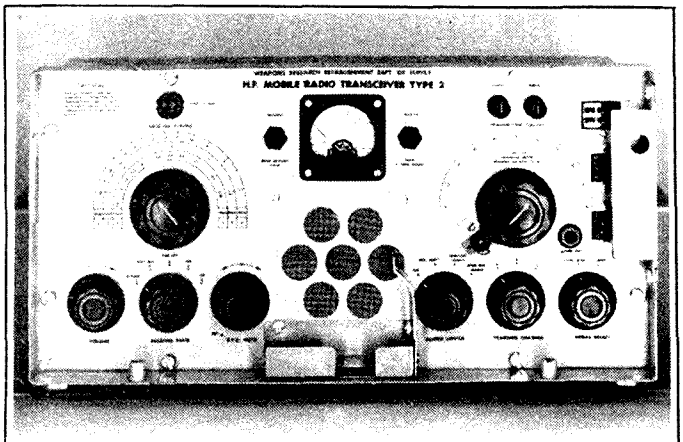


Figure 11: WRE Type 2 Transceiver — Front.

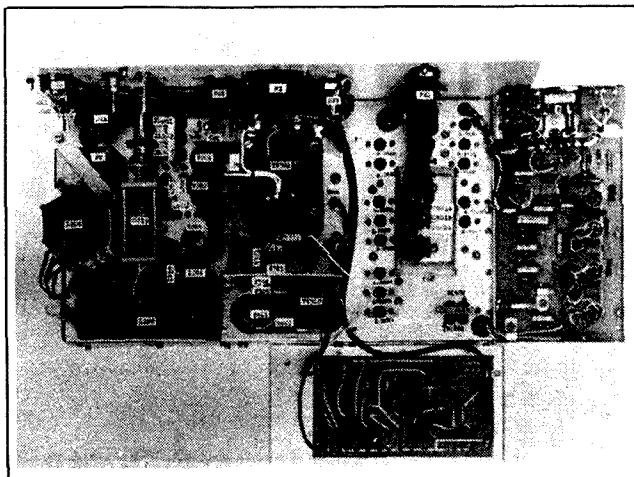


Figure 12: WRE Type 2 Transceiver — Rear.

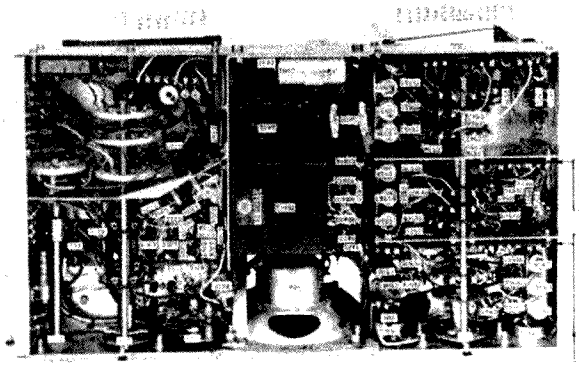


Figure 13: WRE Type 2 Transceiver — Under Chassis.

The Traeger units could transmit on frequencies in the range of 1.5 to 10 MHz and receive in a range of 1.5 to 16 MHz, plus the broadcast band. A disadvantage was that lug in units were still used to change transmit frequencies, or change receiver bands, as had been the case for previous Traeger all valve transceivers. Units Type TM2 and TM3 were similar except that the TM3 had the feature of a quick heat RF power valve which eliminated valve heater load on receive. RF power output of the TM3 could be as high as 25 watts with 14 volt battery supply.

Records updated in 1976 showed a mixture of WRE Type 2 transceivers, Traeger Type TM2 and TM3 transceivers and a few Traeger Type 59M10 transceivers. The 59M10 was an all valve unit and it is not clear how it was introduced or why it was still in the network at that late stage. (It is probable that the 59M10 units were surplus from one of the other Departments which provided support services to the range).

THE RECENT YEARS

A lot of water has passed under the bridge since those early days of the Woomera range. The range still carried out a few trials, but today it is a mere shadow of its former self. The HF radio change to single sideband was completed in 1978 some 28 years since the first Type 1 transceiver was developed. At that stage, time for our AM mobile radios ran out.

Planning for change of the whole range HF system to single sideband commenced as early as 1970, taking some eight years to complete. The mobile radio part of the network now consists of approximately 16 Codan SSB transceivers Type 7515 which have a rated output of 50 watts peak envelope power, somewhat of an improvement on the old AM units which had the equivalent single sideband powers of around three to five watts. The Codan 7515 can operate on up to 10 channels within the frequency range of two to 11 MHz. Aerials used are helical whips and mobile stations are expected to operate to other stations at distances up to 400 kilometres.

Future plans anticipate the use of a number of Codan Type 8525 transceivers which are state of the art synthesised SSB units with such features as automatic aerial tuning.

After 37 years of HF radio, our story ends. Particular reference has been made to the two early transceivers developed in our Establishment during the 1950-1960 era, a period in which the writer was closely associated with the radio communications of the range. To complete the picture for more recent times, much of the information recorded is the result of helpful discussions with other people who have been involved, such as John Langman, Vin Agius, Tony Bell and Geoff Fuss.

Looking back over those years during the peak of activity, we see a mobile radio network some 70 units strong, communicating over vast areas of uninhabited land in a range 2000 kilometres long. Where else in the world would such a network be found?

Most of those old AM transceivers have been disposed of now and one just has to wonder where they might now be gathering dust, or what other fate they might now have met.

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THE AUTHOR

Lloyd Butler is employed on developmental work in the Communications and Electronic Engineering Division of the Advanced Engineering Laboratory, Defence Science and Technology Organisation, Salisbury. During the period 1955-61 he was associated with the provision of HF and VHF radio communication facilities for the Woomera Range. As part of his work, he was responsible for the design and development of the WRE Type 2 HF transceiver discussed in this article.

Publication of this article has been approved by the Department of Defence.

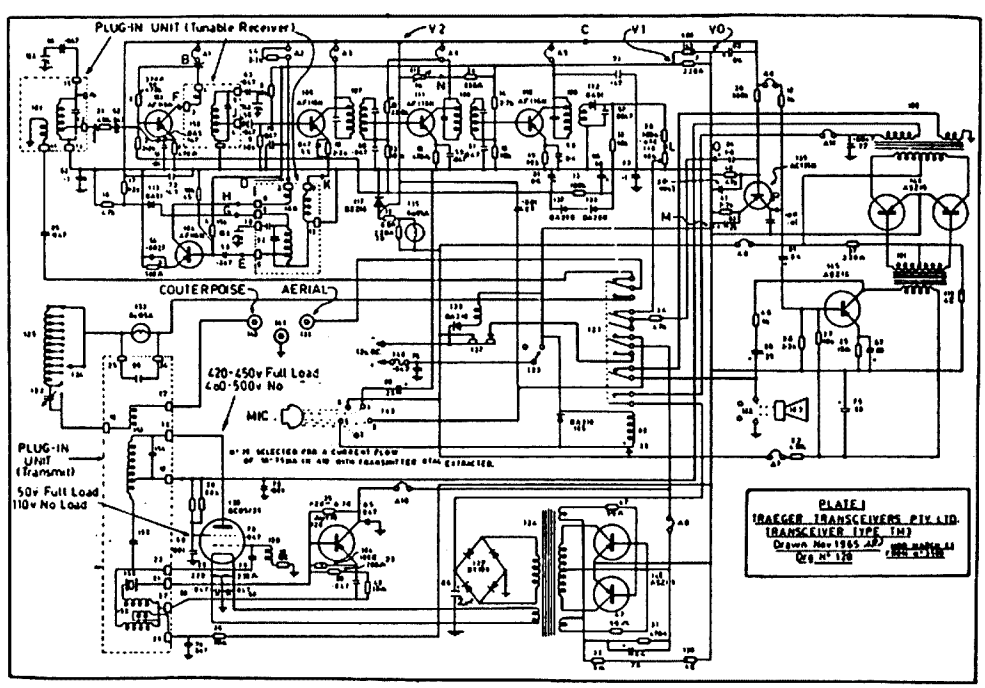

Figure 14: Traeger Transceiver Type TM3.

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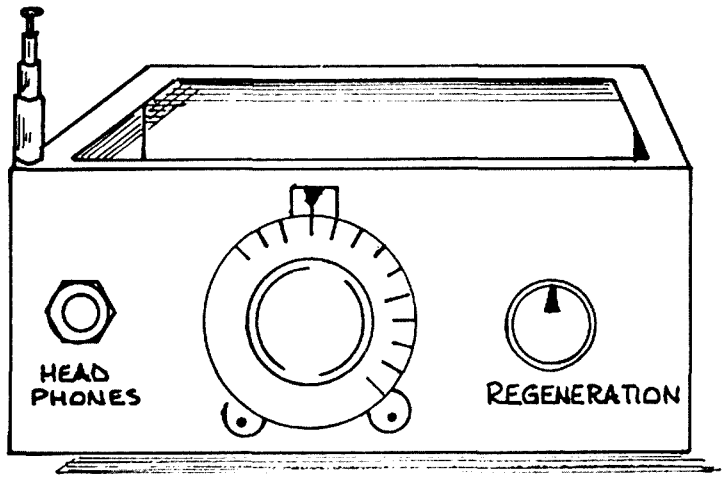
The dial has a 6:1 reduction and is available from suppliers such as Dick Smith Electronics stores. The headphones require an impedance of 2 kohms. It is better to connect the audio output to the pickup terminals of another radio receiver to amplify the audio output. (Technical Editor's Note: This is a facility on old valve radios.)

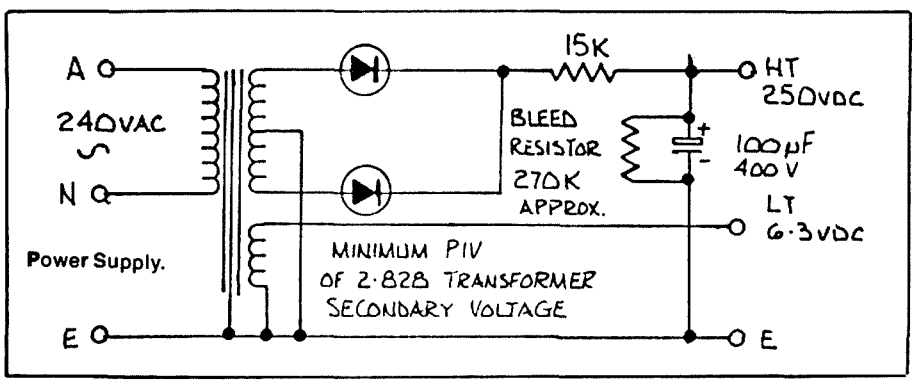
The valve is a 6EA8 with the pentode side only being used. Other valves like the EF89, 6AU6, etc, could be used instead, but the writer has not experimented with them.

Most of the components can be salvaged out of old radio or television sets. In the prototype, all parts were salvaged except the vernier dial.

The 8 uF 250 volt capacitor must not be leaky or the receiver performance will be degraded.

The regeneration control is advanced until the sensitivity is optimum. Ensure there is no external aerial connected to the receiver or there will be poor, or no, regeneration. The receiver noise should be a high hissing noise when the regeneration is working. If stations are not tuned in, reverse the connections to the regeneration coil socket. The 22 pF capacitor should be increased if there is not regeneration in all parts of the band.





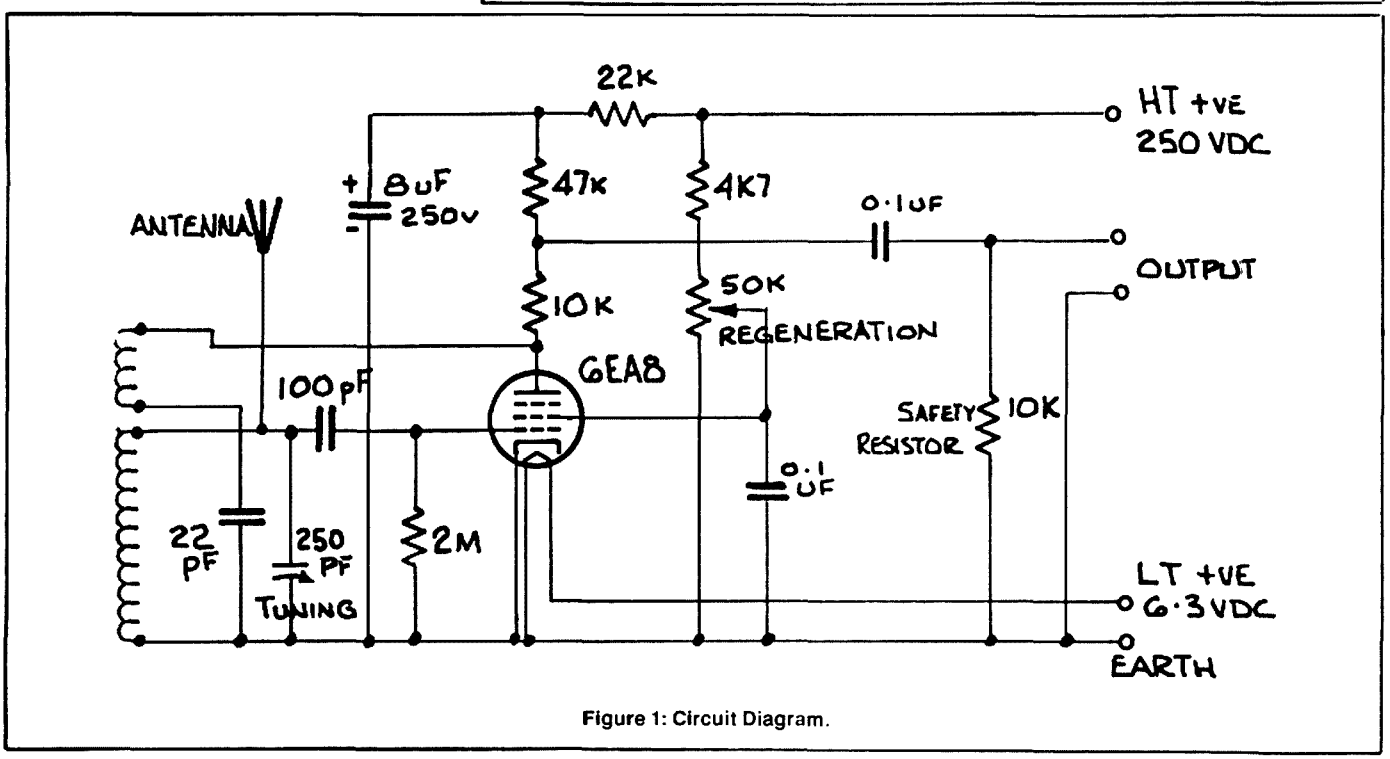
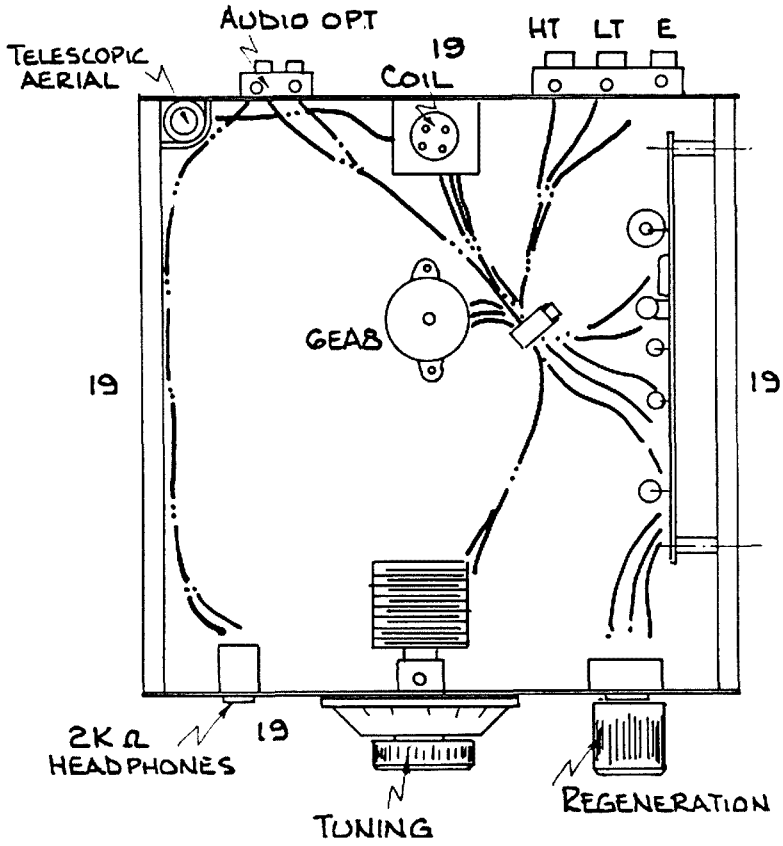
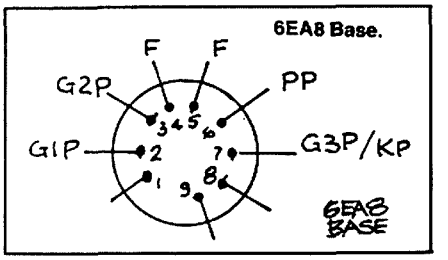
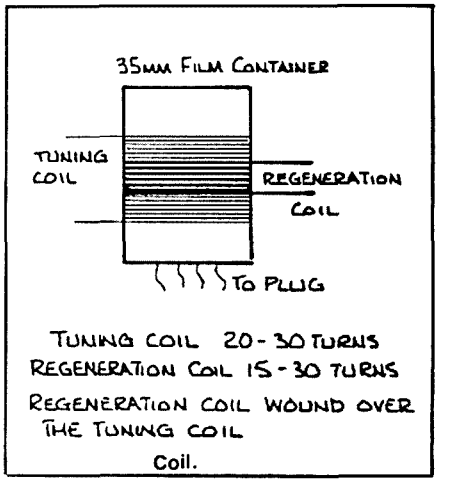


Figure 1: Circuit Diagram.



Component Layout.





Coil.

The 250 pF tuning capacitor can be 415 pF, but the tuning range would be greater. Only one gang need be used out of the two or three on the capacitor. For the prototype, a wooden box was used, but if hand- capacity is a problem, the front panel should be metal and earthed.

The coil is wound on a readily available 35 mm plastic film container and is connected to a small four-pin plug. The receiver can receive AM, CW and SSB.

About 250 volts DC and 6.3 volts AC or DC are required to operate the receiver. This can be obtained from a power supply, which will also prove useful for other valve projects. The transformer has to be in good condition with no nasty smells which would indicate imminent problems. The filter capacitor should be new or in near new condition otherwise it may explode.

The diodes can be ordinary diodes salvaged from an old radio. The resistor values are given as a guideline — it may be necessary to vary them if the voltage is not in the region of 200-300 volts. ***Beware of high voltages. Never reach inside the receiver when it switched on.***

The receiver can be constructed on perforated circuit board. Valve receivers are simple, easy to build and work much better than receivers with the equivalent number of transistors.

(Technical Editor's Note: AC mains and high voltages should be handled with extreme caution. Do not work on such devices while they are switched on or plugged into the mains.)

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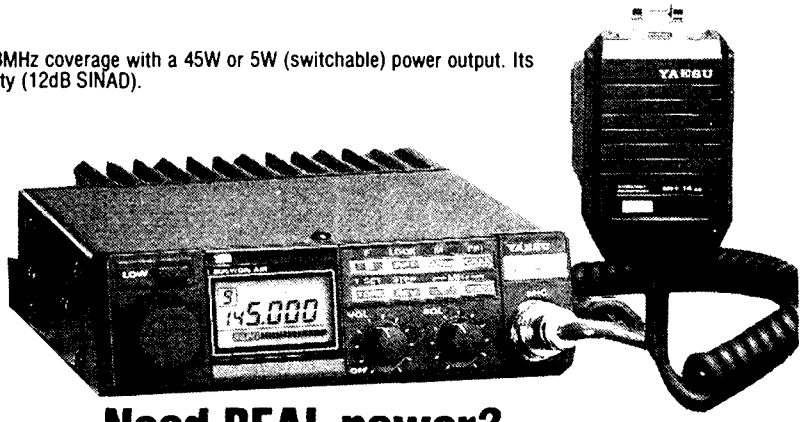

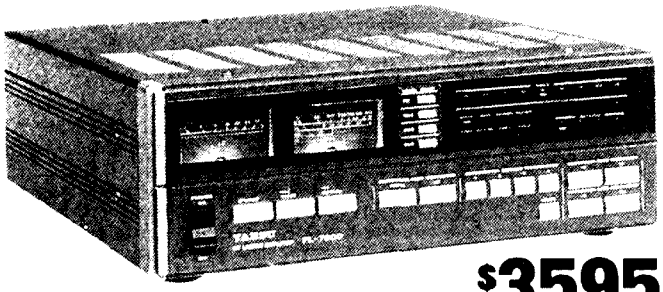

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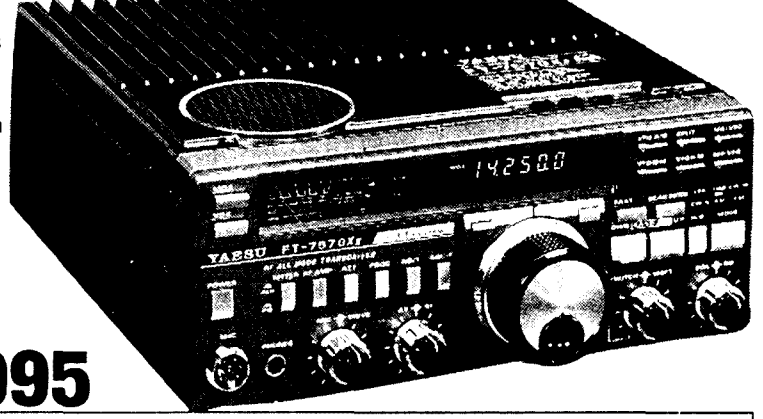

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VK1RAC	579.250	426.250	ATV	Black Hill	Can
VK2RSN	53.625	53.025	Voice	Mt Sugarloaf	Ne [illegible] e
VK2RWI	53.850	53.250	Voice	Dural	Sydne
VK2RMB	144.800	144.800	Packet	Terry Hills	Sydney
VK2RWI	144.800	144.800	Packet	Dural	Sydney
VK2RPH	144.900	144.900	Packet	Hornsby	Sydney
VK2RLD	146.625	146.025	Voice	Razorback Range	Sydney
VK2RPI	146.625	146.025	Rtty	Sugarloaf Range	Newcastle
VK2RCH	146.650	146.050	Voice	Bruxner Park	Coffs Harbour
VK2RDX	146.650	146.050	Voice	Mt Bindo	Western Blue Mts
VK2RMI	146.650	146.050	Voice	Terry Hi Hi	Moree / Inverell
VK2RTY	146.675	146.075	Rtty	Blacktown	Sydney
VK2RAO	146.700	146.100	Voice	Mt Canobolas	Orange
VK2RMU	146.700	146.100	Voice	Milton	Ulladulla
VK2RPM	146.700	146.100	Voice	Middle Brother Mtn	Taree
VK2RAG	146.725	146.125	Voice	Somersby	Gosford
VK2RFS	146.750	146.150	Voice	Mt Mumbulla	Bega
VK2RTM	146.750	146.150	Voice	Mt Crawney	Tamworth
VK2RWG	146.750	146.150	Voice	Mt Flackney	Wagga
VK2RTZ	146.775	146.175	Voice	Mt Sugarloaf	Newcastle
VK2RCC	146.800	146.200	Voice	Needle Mt	Coonabarabran
VK2RIC	146.800	146.200	Voice	Parrots Nest	Lismore
VK2RLS	146.800	146.200	Voice	Heathcote	Sydney
VK2RTD	146.800	146.200	Voice	Mt Kendall	Tumut
VK2BGN	146.825	146.225	Voice	Goulburn	Goulburn
VK2RAB	146.850	146.250	Voice	Porcupine Res	Gunnedah
VK2RAW	146.850	146.250	Voice	Mt Murray	Wollongong
VK2RGF	146.850	146.250	Voice	Mt Bingar	Griffith
VK2RMB	146.875	146.275	Voice	Terry Hills	Sydney
VK2RAN	146.900	146.300	Voice	Mt Sugarloaf	Newcastle
VK2RRT	146.900	146.300	Voice	Boona Mount	Condobolin
VK2RGR	146.925	146.325	Voice	North Ryde	Sydney
VK2RNE	146.950	146.350	Voice	Mt Rumbee	Glen Innes
VK2RAN	146.975	146.375	Rtty/Vo	Mt Sugarloaf	Newcastle
VK2RWI	147.000	146.400	Voice	Dural	Sydney
VK2ROT	147.025	147.625	Voice	Paddington	Sydney
VK2RBM	147.050	147.650	Voice	?	Blue Mountains
VK2RWM	147.100	147.700	Voice	Grenfell	Grenfell
VK2RZL	147.100	147.700	Voice	Muswellbrook	Muswellbrook
VK2R	147.125	147.725	Voice	Portable	WICEN
VK2RWS	147.150	147.750	Voice	Chatswood	Sydney
VK2R	147.175	147.775	Voice	Portable	WICEN
VK2BBB	147.200	147.800	Voice	Byron Bay	Byron Bay
VK2RSD	147.200	147.800	Voice	Mt Cambewarra	Nowra
VK2RST	147.225	147.825	SSTV/Vo	Lane Cove	Sydney
VK2RNS	147.250	147.850	Voice	Asquith	Sydney
VK2RIL	147.275	147.875	Rtty/Vo	Sublime Point	Wollongong
VK2RTS	147.300	147.900	Voice	Lower Blue Mtns	Sydney
VK2RHR	147.350	147.950	Voice	Mt Gibraltar	Mittagong
VK2RAO	147.575	147.575	Packet	Mt Canoblas	Orange
VK2RAW	147.575	147.575	Packet	Mt Murray	Wollongong
VK2RCH	147.575	147.575	Packet	Bruxner Park	Coffs Harbour
VK2RPM	147.575	147.575	Packet	Taree	Port Macquarie
VK2RPN	147.575	147.575	Packet	Sugarloaf Range	Newcastle
VK2RPS	147.575	147.575	Packet	High Range	Southern Highlands
VK2RAG	147.600	147.600	Packet	Somersby	Gosford
VK2RTI	438.025	433.025	Voice	High Range	Southern Highland
[illegible]RAG	438.075	433.075	Voice	Somersby	Gosford
VK2RMB	438.175	433.175	Voice	Terry Hills	Sydney
VK2RNT	438.175	433.175	Voice	Armidale	Armidale
VK2RUW	438.225	433.225	Voice	Port Kembla	Wollongong
VK2RWS	438.275	433.275	Voice	Chatswood	Sydney
VK2REE	438.325	433.325	Voice	Mount Marie	Taree
VK2RWM	438.325	433.325	Voice	Grenfell	Grenfell
VK2RUT	438.375	433.375	Voice	Kurrajong	Blue Mountains
VK2RUH	438.425	433.425	Voice	Hurstville	Sydney
VK2RRS	438.475	433.475	Voice	Chatswood	Sydney
VK2RPM	438.525	433.525	Voice	Taree	Port Macquarie
VK2RWI	438.525	433.525	Voice	Dural	Sydney
VK2RUM	438.625	433.625	Voice	New Lambton	Newcastle
VK2RAN	438.675	433.675	Voice	Mt Sugarloaf	Newcastle
VK2RSC	438.675	433.675	Voice	Mt Nardi	Lismore
VK2RTW	438.675	433.675	Voice	Willans Hill	Wagga
VK2RIL	438.725	433.725	Rtty/Vo	Sublime Point	Wollongong
VK2RTG	579.250	444.250	ATV	Kariong	Gosford
VK2RTN	579.250	426.250	ATV	Newcastle	Newcastle
VK2RTS	579.250	426.250	ATV	Lower Blue Mtns	Blue Mountains
VK2RTV	579.250	426.250	ATV	Chatswood	Sydney
VK2RTW	579.250	444.250	ATV	Willans Hill	Wagga

VICTORIA — VK3

VK3RHF	29.640	29.540	Voice	Mt Dandenong	Melbourne
VK3RTN	53.675	53.075	Voice	Lake Mountain	Melbourne
VK3RMH	53.900	53.300	Voice	Mt Dandenong	Melbourne
VK3REG	146.650	146.050	Voice	Donalds Knob	East Gippsland
VK3RGV	146.650	146.050	Voice	Mt Wombat	Shepparton
VK3RML	146.700	146.100	Voice	Mt Dandenong	Melbourne
VK3RNC	146.700	146.100	Voice	Mt Mitta Mitta	Corryong
VK3RON	146.700	146.100	Voice	Ouyen	Ouyen
VK3RBA	146.750	146.150	Voice	Mt Bunningyong	Ballarat
VK3RLV	146.800	146.200	Voice	Mt Tassie	Latrobe Valley
VK3RMA	146.800	146.200	Voice	Mildura	Mildura
VK3RMM	146.850	146.250	Voice	Mt Macedon	Melbourne
VK3RBS	146.900	146.300	Voice	Smeatons Hill	Ballarat
VK3REB	146.900	146.300	Voice	Mt Nowa Nowa	Bairnsdale
VK3RSH	146.900	146.300	Voice	Swan Hill	Swan Hill
VK3RWZ	146.950	146.350	Voice	Mt William	Grampians
VK3RGL	147.000	146.400	Voice	Mt Anakie	Geelong
VK3RNE	147.000	146.400	Voice	Mt Big Ben	Wodonga
VK3RGO	147.050	147.650	Voice	Mt Livingstone	Omeo
VK3RVL	147.050	147.650	Voice	Robinvale	Robinvale
VK3RWL	147.050	147.650	Voice	Mt Warrnambool	Warrnambool
VK3RCR	147.075	147.675	Voice	Montrose	Melbourne
VK3RPB	147.100	147.700	Voice	Mt Porepunkah	Bright
VK3RSG	147.100	147.700	Voice	Bass Hill	South Gippsland
VK3RWA	147.100	147.700	Voice	Ben Nevis	Ararat
VK3RGC	147.125	147.725	Voice	Montepellier	Geelong
VK3RCV	147.150	147.750	Voice	Mt Alexandria	Bendigo
VK3REM	147.150	147.750	Voice	Marimingo Hill	Mallacoota
VK3REC	147.175	147.775	Voice	Mt Dandenong	Melbourne
VK3RWG	147.225	147.825	Voice	Mt Baw Baw	West Gippsland
VK3RGS	147.250	147.850	Voice	Mt Fatigue	Toora
VK3RMK	147.250	147.850	Voice	Mt Kerang	Charlton
VK3RWP	147.300	147.900	Voice	Portable	WICEN
VK3RTY	147.350	147.950	Rtty	Mt Dandenong	Melbourne
VK3RBB	147.525	147.525	Packet	Mt Tassie	Gipsland
VK3RMC	147.550	147.550	RTTY/BB	Lilydale	Melbourne
VK3RPA	147.575	147.575	Packet	St Albans	Melbourne
VK3RPC	147.575	147.575	Packet	Mt Warrenheip	Ballarat
VK3RPL	147.575	147.575	Packet	Mt St Leonards	Melbourne
VK3RPM	147.575	147.575	Packet	Specimen Hill	Bendigo
VK3RPN	147.575	147.575	Packet	Mt Stanley	Wodonga
VK3RPW	147.575	147.575	Packet	Mt Wombat	Shepparton
VK3RPA	147.600	147.600	Packet	St Albans	Melbourne
VK3RPK	147.600	147.600	Packet	Broadmeadows	Melbourne

Call Sign	Frequency - MHz Output	Input	Mode	Site	Area
VK3RMU	438.075	433.075	Voice	Mt St Leonards	Melbourne
VK3ROU	438.225	433.225	Voice	Mt Dandenong	Melbourne
VK3RWE	438.275	433.275	Voice	Portable	WICEN
VK3RGU	438.375	433.375	Voice	Carrajung	Gippsland
VK3RBU	438.425	433.425	Voice	Mt Hollowback	Ballarat
VK3RAD	438.525	433.525	Voice	Mitcham	Melbourne
VK3RNU	438.525	433.525	Voice	Mt Stanley	Wangaratta
VK3RRU	438.525	433.525	Voice	Merbein	Mildura
VK3RWI	438.625	433.625	Voice	Portable	WICEN
VK3RWU	438.675	433.675	Voice	Mt William	Grampians
VK3RPA	439.200	439.200	Packet	St Albans	Melbourne
VK3RCU	439.275	434.275	Voice	Mt Macedon	Macedon
VK3RDU	439.425	434.425	Voice	Chessney Vale	Benalla
VK3RAU	439.575	434.575	Voice	Mt Anakie	Geelong
VK3RPU	439.725	434.725	Voice	Arthurs Seat	Melbourne
VK3RMZ	579.250	426.250	ATV	Bendigo	Bendigo
VK3RTV	579.250	444.250	ATV	Mt Dandenong	Melbourne
VK3RIC	1253.500	1241.500	Voice	Mt St Leonard	Melbourne

QUEENSLAND — VK4

VK4ROM	146.650	146.050	Voice	Cambells Park	Roma
VK4RTA	146.675	146.075	Voice	Longlands Gap	Atherton
VK4RAR	146.700	146.100	Voice	Mt Archer	Rockhampton
VK4RAT	146.700	146.100	Voice	Mt Stuart	Townsville
VK4RGC	146.700	146.100	Voice	Mt Tamborine	Gold Coast
VK4RMI	146.700	146.100	Voice	Mt Isa	Mt Isa
VK4RDD	146.750	146.150	Voice	Mt Mowbullen	Darling Downs
VK4RDT	146.775	146.175	Voice	Gammimbah	Toowoomba
VK4RBU	146.800	146.200	Voice	Mt Goonaneman	Bundaberg
VK4RSC	146.850	146.250	Voice	Maleny	Sunshine Coast
VK4RCH	146.875	146.275	Voice	Red Hill	Chinchilla
VK4RAI	146.900	146.300	Voice	Mt Crosby	Ipswich
VK4RGA	146.900	146.300	Voice	Calliope Range	Gladstone
VK4RCA	146.950	146.350	Voice	Mt Bellenden Ker	Cairns
VK4RBH	147.000	146.400	Voice	Mt Glorious	Brisbane
VK4RMK	147.000	146.400	Voice	North Mackay	Mackay
VK4RGY	147.100	147.700	Voice	Mt Boulder	Gympie
VK4RAG	147.150	147.750	Voice	Spring Hill	Brisbane
VK4RWI	147.150	147.750	Voice	Portable	WICEN
VK4RBS	147.250	147.850	Rtty	Mt Goonaneman	Bundaberg
VK4RQT	147.300	147.900	Voice	Mt Glorious	Brisbane
VK4RII	147.350	147.950	Voice	Mt Inkerman	Burdekin
VK4RBT	147.650	147.050	Rtty/Vo	Mt Cotton	Brisbane
VK4RBT	147.675	147.075	Rtty/Vo	Mt Cotton	Brisbane
VK4RSC	438.075	433.075	Voice	Buderim	Sunshine Coast
VK4RAT	438.225	433.225	Voice	Mt Stuart	Townsville
VK4RGC	438.225	433.225	Voice	Mt Tamborine	Gold Coast
VK4RWM	438.375	433.375	Voice	Ipswich	Ipswich
VK4RMU	438.425	433.425	Voice	Boveys Lookout	Mackay
VK4RBC	438.525	433.525	Voice	Mt Coot-tha	Brisbane
VK4RWI	438.625	433.625	Voice	Portable	WICEN
VK4RBU	438.675	433.675	Voice	Mt Goonaneman	Bundaberg
VK4RDB	438.700	433.700	Voice	Mt Mowbullan	Darling Downs
VK4RDU	439.275	434.275	Voice	Toowoomba	Toowoomba
VK4RIK	439.350	434.350	Voice	White Rock	Cairns
VK4RAT	579.250	426.250	ATV	Mt Stuart	Townsville
VK4RTV	579.250	444.250	ATV	Spring Hill	Brisbane

SOUTH AUSTRALIA — VK5

VK5RNC	146.650	146.050	Voice	Naracoorte	Naracoorte
VK5RSV	146.675	146.075	RTTY	Willunga Hill	McLaren Vale
VK5RMN	146.700	146.100	Voice	The Bluff	Port Pirie
VK5REP	146.800	146.200	Voice	Coolanie	Eyre Peninsula
VK5RHO	146.850	146.250	Voice	Houghton	Adelaide
VK5RMG	146.900	146.300	Voice	Mt Gambier	Mt Gambier
VK5RAD	147.000	146.400	Voice	Crafers	Adelaide
VK5RBV	438.425	433.425	Voice	Angaston	Boroosa Valley
VK5RVP	438.525	433.525	Voice	Crafers	Adelaide
VK5RCN	444.250	426.250	ATV	Barunga Range	Clare Valley
VK5RTV	579.250	426.250	ATV	O'Halloran Hill	Adelaide
VK5RWH	1246.250	444.250	ATV	Willunga Hill	McLaren Vale
VK5ROH	1253.850	1241.850	Voice	Willunga Hill	McLaren Vale

WESTERN AUSTRALIA — VK6

Call Sign	Frequency - MHz Output	Input	Mode	Site	Area
VK6RAP	0.000	0.000	ATV	Roleystone	Perth
VK6RHP	29.630	29.530	Voice	Darling Scarp	Perth
VK6RSM	53.800	53.200	Voice	Tic Hill	Perth
VK6RSW	146.650	146.050	Voice	Bunbury	Bunbury
VK6RCA	146.675	146.075	Voice	Carnarvon	Carnarvon
VK6RAL	146.700	146.100	Voice	Albany	Albany
VK6RAP	146.700	146.100	Voice	Roleystone	Perth
VK6RWH	146.700	146.100	Voice	Derby	Derby
VK6RWR	146.700	146.100	Voice	Wickham	Wickham
VK6RTH	146.750	146.150	Voice	Tic Hill	Perth
VK6RAA	146.800	146.200	Voice	Mt Barker	Albany
VK6RTH	146.800	146.200	Voice	Tic Hill	Perth
VK6RWP	146.800	146.200	Voice	Karratha	Karratha
VK6REX	146.850	146.250	Voice	Tower Zero	Exmouth
VK6RKB	146.850	146.250	Voice	Kambalda	Kambalda
VK6RBY	146.900	146.300	Voice	Mt William	Bunbury
VK6RMN	146.900	146.300	Voice	Mt Newman	Mt Newman
VK6RPD	146.950	146.350	Voice	Bentley	Perth
VK6REE	146.975	146.375	Voice	Portable	WICEN
VK6RAK	147.000	146.400	Voice	Kalgoorlie	Kalgoorlie
VK6RAW	147.000	146.400	Voice	Mt Lathan	Wagin
VK6REE	147.000	146.400	Voice	Portable	WICEN
VK6RGN	147.000	146.400	Voice	Geraldton	Geraldton
VK6RNW	147.000	146.400	Voice	Port Hedland	Port Hedland
VK6RTY	147.050	147.650	Rtty	Roleystone	Perth
VK6RWC	147.100	147.700	Voice	Lesmurdie	Perth
VK6RIC	147.175	147.775	Voice	Portable	WICEN
VK6RCT	147.200	147.800	Voice	Cataby	Cataby
VK6RMS	147.250	147.850	Voice	Mt Saddleback	Boddington
VK6REN	147.300	147.900	Voice	Ocean Hill	Eneabba
VK6RBN	147.350	147.950	Voice	Busselton	Busselton
VK6R	147.575	147.575	Packet		Perth
VK6RTH	438.225	433.225	Voice	Tic Hill	Perth
VK6RUP	438.525	433.525	Voice	Roleystone	Perth
VK6RBN	438.675	433.675	Voice	Busselton	Busselton

TASMANIA — VK7

VK7RAD	146.625	146.025	Rt/Data	Mt Duncan	N.W. Tasmania
VK7RHT	146.700	146.100	Voice	Mt Wellington	Hobart
VK7RNW	146.750	146.150	Voice	Ulverstone	N.W. Tasmania
VK7REC	146.900	146.300	Voice	Snow Hill	Eastern Tasmania
VK7RAA	147.000	146.400	Voice	Mt Barrow	N.E. Tasmania
VK7RAF	147.250	147.850	Multi		Hobart
VK7RTV	426.250	444.250	ATV	Mt Duncan	N.W. Tasmania
VK7RIN	438.500	433.500	Voice	Barren Tier	
VK7RIT	438.525	433.525	Voice	Sandy Bay	Hobart
VK7RAB	438.550	433.550	Voice	Mt Arthur	N.E. Tasmania
VK7RTC	438.600	433.600	Voice	Mt Nelson	Hobart
VK7RAC	438.650	433.650	Voice	Table Cape	N.W. Tasmania
VK7RAE	579.250	444.250	ATV	Kelceystier	Devenport

NORTHERN TERRITORY — VK8

VK8RMS	146.650	146.050	Voice	Gove	Gove
VK8RDA	146.700	146.100	Voice	Karama	Darwin
VK8RCA	147.000	146.400	Voice	Alice Springs	Alice Springs
VK8RTE	147.000	146.400	Voice	Palmerston	Darwin

Number of repeaters listed = 248

These lists were printed from the WIA Data Base. Please forward any additions or amendments to the: Federal Technical Advisory Council (FTAC), C/- Federal Office, PO Box 300, Caulfield South, Vic. 3162.

WIA BEACON DATA BASE

Call Sign	Frequency MHz	Site
VK2RCW	3.699	Dural
VK5WI	28.260	
VK2RSY	28.262	Sydney
VK6RWA	28.264	
VK6RTW	28.266	Albany
VK8VF	28.268	Darwin
VK4RTL	28.270	Townsville
VK0CK	52.150	Macquarie Island
VK8VF	52.200	Darwin
VK2RBH	52.300	Broken Hill
VK6RTT	52.320	Carnarvon
VK2RHV	52.325	Newcastle
VK3RGG	52.330	Geelong
VK4ABP	52.345	Longreach
VK6RTU	52.350	Kalgoorlie
VK7RST	52.370	Hobart
VK1RCC	52.410	Mt Majura
VK0MA	52.418	Mawson
VK2RSY	52.420	Sydney
VK2RGB	52.425	Gunnedah
VK3RMV	52.435	Hamilton
VK4RTL	52.440	Townsville
VK4RIK	52.445	Cairns
VK5VF	52.450	Mt Lofty
VK6RPH	52.460	Perth
VK6RTW	52.465	Albany
VK7HNT	52.470	Launceston
VK8RAS	52.485	Alice Springs
VK6RBS	144.022	Busselton
VK4RTT	144.400	Mt Mowbullan
VK1RCC	144.410	Canberra
VK2RSY	144.420	Sydney
VK3RTG	144.430	Melbourne
VK3RMV	144.435	Hamilton
VK4RIK	144.445	Cairns
VK6RTW	144.465	Albany
VK7RMC	144.470	Newham
VK8VF	144.480	Darwin
VK8RAS	144.485	Alice Springs
VK3RGG	144.530	Geelong
VK3RGI	144.535	Gippsland
VK5RSE	144.550	Mt Gambier
VK6RPB	144.565	Port Hedland
VK6RTT	144.600	Carnarvon
VK5VF	144.800	Mount Lofty
VK2RCW	144.950	Sydney
VK6RPH	145.000	Perth
VK6RBS	432.066	Busselton
VK6RPR	432.160	Nedlands
VK1RBC	432.410	Canberra
VK6RTT	432.410	Wickham
VK2RSY	432.420	Sydney
VK3RTG	432.430	Melbourne
VK3RMV	432.435	Hamilton
VK4RBB	432.440	Brisbane
VK4RIK	432.445	Cairns
VK4RTL	432.445	Townsville
VK3RAI	432.450	Melbourne
VK6RTW	432.465	Albany
VK3RGG	432.530	Geelong
VK3RMB	432.535	Ballarat
VK4RAR	432.545	Rockhampton
VK6RPB	432.565	South Headland
VK6RPB	576.753	South Headland
VK6RBS	1296.198	Busselton
VK1RBC	1296.410	Canberra
VK2RSY	1296.420	Sydney
VK4RIK	1296.445	Cairns
VK6RPR	1296.480	Nedlands
VK6RPB	1296.695	South Headland
VK2RSY	2304.420	Dural
VK6RVF	10300.000	Roleystone
VK4RIK	10445.000	Cairns

These lists were printed from the WIA Data Base. Please forward any additions or amendments to the: Federal Technical Advisory Council (FTAC), C/- Federal Office, PO Box 300, Caulfield South, Vic. 3162.

12th November 1987

VHF/UHF DISTANCE RECORDS

VHF / UHF DISTANCE RECORDS

Following receipt of record claims for new modes of operation and discussions with Federal Executive, FTAC has introduced new categories for distance records on the VHF/UHF bands.

Five categories of record have been recognised, as follows;

1. Home/portable category (the majority of claims),
2. EME category,
3. ATV category,
4. Mobile category, and
5. Digital modes category.

Existing records and new applications have been assessed and the record table is now as follows. Note the records recognised since the last published list in the 1986 callbook as indicated by the # symbol.

AUSTRALIAN VHF, UHF and SHF RECORDS.

Correct as at 11 Oct 87.

These lists were printed from the WIA Data Base. Please forward any additions or amendments to the: Federal Technical Advisory Council (FTAC), C/- Federal Office, PO Box 300, Caulfield South, Vic. 3162.

LEGEND

* - Australian record # - New record since last Callbook edition.

1. HOME/PORTABLE CATEGORY.

AUSTRALIAN CAPITAL TERRITORY

50 MHz		No claim			
144 MHz	#	VK1RH	to VK1ZJR	1/03/87	16.3 km.

NEW SOUTH WALES

50 MHz		VK2BA	to WB4OSN	6/04/84	15,068.8 km.
144 MHz	#	VK2ZRU	to VK6AOM	13/12/86	2,697.9 km.
432 MHz		VK2AHE	to ZL1BVA	27/01/81	2,260.2 km.
576 MHz		VK4ZRF/2	to VK4SH/4	11/12/81	255.4 km.
1,296 MHz		VK2BDN	to ZL1AVZ	9/12/82	2,132.7 km.
2,300 MHz		VK2ZAC/2	to VK2BDN/2	19/05/73	159.9 km.
3,300 MHz		VK2AHC/2	to VK2SB/2	16/01/77	114.1 km.
5,650 MHz	*	VK2AHC/2	to VK2SB/2ZND/2	12/04/75	114.1 km.
10,000 MHz		VK2AHC/2	to VK2SB/2ZND/2	12/04/75	114.1 km.

VICTORIA

50 MHz	*	VK3OT	to VP2VGR	17/03/81	16,663.3 km.
144 MHz		VK3YLR/3	to VK6KZ/6	23/01/80	2,784.2 km.
432 MHz	*	VK3ZBJ	to VK6KZ/6	23/01/80	2,715.9 km.
576 MHz		VK3AOT/3	to VK3ZKB/3	11/07/71	237 km.
1,296 MHz		VK3AKC	to VK7ZAH	17/02/71	439 km.
2,300 MHz		VK3ZHP	to VK7HL	12/01/85	427.3 km.
3,300 MHz	#	VK3KAJ/3	to VK3ZBJ	25/01/86	245.8 km.
5,650 MHz		No claim			
10,000 MHz	#*	VK3KAJ/3	to VK3ZBJ/3	8/02/86	261.9 km.

VHF / UHF DISTANCE RECORDS

QUEENSLAND

50 MHz		VK4AYX	to DL3ZM/YV5	18/03/81	15,582 km.
144 MHz	*	VK4ZSH/4	to JA7OXL	24/04/83	6,616.9 km.
432 MHz		VK4LC	to ZL3TAL	24/11/82	2,283.4 km.
576 MHz	*	VK4ZRF/4	to VK4ZSH/4	7/12/81	377.6 km.
1,296 MHz		AX4NO/4	to AX4ZT/2	12/04/70	402 km.
2,300 MHz		No claim			
3,300 MHz		No claim			
5,650 MHz		No claim			
10,000 MHz		VK4ZNC/4	to VK4ZSH/4	9/11/81	170.6 km.

SOUTH AUSTRALIA

50 MHz		VK5KK	to KE1GE	9/04/79	14,078 km.
144 MHz		VK5ZEE	to ZL1HH	15/01/86	3,458.8 km.
432 HHz		VK5NY	to VK7JG	21/05/85	995.0 km
576 MHz		VK5ZJL/5	to VK5QZ/5	28/12/69	314 km.
1,296 MHz	*	VK5MC	to VK6KZ/6	23/01/80	2,289.4 km.
2,300 MHz	*	VK5QR	to VK6WG	17/02/78	1,885 km.
3,300 MHz	#*	VK5QR	to VK6WG	25/01/86	1,885 km.
5,650 Mhz		No claim			
10,000 MHz		VK5CU/5	to VK5MW/5	30/12/71	95.7 km.

WESTERN AUSTRALIA

50 MHz		VK6BE	to JA8BP	30/10/58	8,833 km.
144 HHz		VK6KZ/6	to VK3YLR/3	23/01/80	2,784.2 km.
432 MHz	*	VK6KZ/6	to VK3ZBJ	23/01/80	2,715.9 km
576 MHz		VK6KZ/6	to VK6HK	16/01/83	196.4 km.
1,296 MHz	*	VK6KZ/6	to VK5MC	23/01/80	2,289.4 km
2,300 MHz	*	VK6WG	to VK5QR	17/02/78	1,885 km.
3,300 HHz	#*	VK6WG	to VK5QR	25/01/86	1,885 km.

TASMANIA.

50 MHz		VK7JG	to W5FF	17/04/82	13,765 km.
144 MHz		VK7ZAH	to VK7ZAZ	1/01/67	1,910 km.
432 MHz		VK7JG	to VK5NY	21/05/86	995.0 km
1,296 HHz		VK7ZAH	to VK3AKC	17/02/71	439 km.

NORTHERN TERRITORY

50 MHz		VK8GB	to 9Y4LL	10/04/82	18,665.4 km.
144 MHz		VK4ZSH/8	to JA7OKL	24/01/82	6,460.9 km.

2. EME CATEGORY

144 MHz		VK3ATN	to K2MWA/2	28/11/66	16,761 km.
432 MHz		VK6ZT	to K2UYH	29/01/83	18,726.4 km.
1,296 MHz		VK3AKC	to W2NFA	6/10/73	16,713 km.

3. ATV CATEGORY

432 MHz		VK7EM/T	to VK3ZPA/T	13/12/72	413 km.

4. MOBILE CATEGORY.

144 MHz	#	VK3KAJ/M	to VK6BE	25/ 1/86	2,226.5 km.
432 MHz	#	VK3KAJ/M	to VK6BE	25/ 1/86	2,226.5 km.

5. DIGITAL MODES CATEGORY.

no claims

OLD EXAMINATION PAPERS

The following papers are published courtesy of DOC. They are some of a series of yesteryear papers which are published so readers may test themselves. Would the OTs still be able to pass with flying colours? How would the newcomers go with this type of exam?

COMMONWEALTH OF AUSTRALIA

"C"

POSTMASTER-GENERAL'S DEPARTMENT
AMATEUR OPERATOR'S CERTIFICATE OF PROFICIENCY

SECTION M (Theory) **APRIL 1955**

Time allowed — 2½ hours
NOTE — Seven questions only to be attempted

1 With the aid of diagrams explain two distinct systems of modulation suitable for use in amateur transmitters. List the advantages and disadvantages of both systems.

2 (a) Explain, using diagrams, how DC voltages for a transmitter may be obtained from an AC source.
(b) What is meant by "Voltage Regulation" as applied to a power supply? What measures should be taken to ensure satisfactory voltage regulations?

3 (a) Define the terms Amplification Factor, Plate Resistance and Mutual Conductance (or Transconductance).
(b) Describe the internal construction and explain the function of each element of a valve suitable for use as a second detector in a receiver of the superheterodyne type.

4 With the aid of sketches, explain fully the construction and principle of operation of a meter suitable for measuring radio frequency currents.

5 (a) Discuss the theory of operation of a microphone suitable for use in an amateur wireless station.
(b) By means of a diagram show how you would connect the microphone described to an amplifier.

6 Two resistors of 60 and 30 ohms respectively are connected in parallel across a 100 volt DC supply.
(i) Calculate the value of the circuit resistance.
(ii) What is the total current drawn from the supply.
(iii) Show on a sketch circuit how you would connect an additional resistor so that the supply current is doubled.
(iv) What is the value of this additional resistance?

7 (a) Explain, with the aid of a diagram, how grid leak bias may be obtained in a radio frequency power amplifier.
(b) Is it desirable to include some additional form of bias in a RF power amplifier when grid leak bias is employed? Explain.

8 (a) Define (i) Specific Inductive Capacity, (ii) Dielectric Strength, (iii) Dielectric Efficiency.
(b) Explain what is meant by the term time constant of a resistance-capacity network.

9 With the aid of curves indicate the current and voltage points on a half wave 7 Mc/s aerial. Show whether even or add quarter wave sections of resonant feeders are necessary to provide series tuning at the transmitter end when the aerial is to be (i) current fed (ii) voltage fed.

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COMMONWEALTH OF AUSTRALIA

"C"

POSTMASTER-GENERAL'S DEPARTMENT
QUARTERLY EXAMINATION PAPER FOR AMATEUR OPERATOR'S CERTIFICATE OF PROFICIENCY

SECTION K (Regulations) **APRIL 1958**

Time allowed — 30 minutes
NOTE — Three questions only to be attempted. Credit will not be given for more than three answers. All questions carry equal marks.

1 Indicate the regulation requirements regarding the sending of test signals from an amateur station.

2 (a) What is meant by "Third Party" in connection with operations of Amateur Wireless Stations?
(b) State fully the regulations regarding the handling of messages for "third parties" by Amateur Wireless Station licensees.

3 (a) Indicate the regulation requirements regarding the avoidance of interference to other services.
(b) For what purpose is a monitor used in an amateur station?

4 Name the "Q" Code abbreviations for the following: (a) Your note varies (b) Shall I send faster? (c) Who is calling me? (d) I am closing my station (e) Resume sending.

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COMMONWEALTH OF AUSTRALIA
POSTMASTER-GENERAL'S DEPARTMENT
AMATEUR OPERATOR'S CERTIFICATE OF PROFICIENCY

SECTION M (Theory) **APRIL 1953**

Time allowed — 2½ hours
NOTE — Seven questions only to be attempted

1 With the aid of diagrams describe the construction and principle of operation of a crystal microphone and show how it should be connected in a preamplifier circuit.

2 (a) Explain what is meant by the "Q" of a circuit.
(b) Use diagrams to show and explain how the selectivity of a series resonant circuit varies with the value of resistance in the circuit.

3 Three condensers of 3, 5 and 6 microfarads respectively, are connected is series across a DC supply of 1000 volts. Calculate
(i) the total capacity of the condenser combination.
(ii) the voltage appearing across each condenser.

4 Draw a circuit diagram and explain the theory of operation of a grounded grid RF stage for use in a receiver operating in the VHF range. What are the advantages of this type of amplifier compared to normal types when operated at these frequencies?

5 (a) Draw a circuit diagram of a triode Class C plate- modulated RF amplifier and its associated modulator and explain how modulation of the carrier wave is achieved.
(b) Describe the procedure to be followed in neutralising the RF amplifier if it is necessary to do so.

6 With the aid of diagrams explain three methods for obtaining grid bias for radio transmitting valves. List the advantages and disadvantages for each method.

7 (a) With the aid of a diagram explain how rectification is obtained in a full-wave rectifier circuit.
(b) Discuss the advantages and disadvantages of condenser input and choke input when used with high vacuum and mercury vapour type rectifiers.

8 Draw the voltage and current curves for a half wave Hertz aerial and explain why tuned feeders require a different method of tuning when connected to the centre as compared to the end of the aerial.

9 Describe the theory of operation of the "mixer" stage of a superheterodyne receiver and list the advantages to be gained by including a stage of tuned radio frequency amplification between the aerial and mixer stage.

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SOLAR ACTIVITY AND THE RISE OF THE NEW SOLAR CYCLE

Richard Thompson
IPS Radio and Space Services
PO Box 702, Darlinghurst, NSW. 2010

Man has been fascinated by the sun ever since he first walked the earth.

IT HAS BECOME evident during the last year that solar minimum was reached in September 1986, and that the new solar cycle has begun. Solar minimum is determined by the yearly average of the sunspot number falling to a low point. In this case, the sunspot number reached a trough of 12.4 in September and has been increasing since that date, reaching 21.9 in March 1987. There were bursts of solar region growth in October 1986, in April-May 1987 and again in July-September 1987. This region growth has produced the first few solar flares of the cycle but, as yet, has not produced a really outstanding event.

Before we look at solar activity during the year in detail, it is worthwhile to review some of the basics about the sun and the solar cycle.

THE SUN AND THE SOLAR CYCLE

Man has been fascinated by the sun ever since he first walked the earth. Initially, the fascination derived from the role of the sun in providing light, heat and the seasons. However, when detailed observations began with Galileo it was realised that the sun and its surface held many other fascinations.

The occurrence of sunspots was especially interesting. Sunspots are visible as dark regions on the sun contrasting with the brighter background photosphere. They vary widely in size, complexity and lifetime. Newly formed spots may be smaller than the angular resolution of most telescopes and last only a few hours. The largest spots may have areas of more than one thousandth of the entire visible disc of the sun. This corresponds to more than 10 times the surface area of the earth. Large spots may persist for periods of several months.

A typical spot has a dark centre, or umbra, surrounded by a less dark area called the penumbra. The boundary of the penumbra and the photosphere is usually quite sharp but is often irregular in shape. Spots nearly always form in groups which can be quite complex, often having overlapping penumbras.

Despite the frequent observation of sunspots, it wasn't until the middle of the 19th century that the sun's 11 year sunspot cycle was discovered. This cycle is defined by the variation in the occurrence of sunspots on the solar surface. During some periods, there are many spots visible on the surface whilst at other periods there are few or none at all. The time of peak visibility of sunspots is called solar maximum whilst the time of least spots is called solar minimum.

The period of the sunspot cycle shows up in the variation of a host of solar phenomena. For this reason it is better to talk about the 'solar cycle' rather than 'sunspot cycle'. However, the occurrence of sunspots is frequently used to define the solar cycle through a number called the sunspot number. Contrary to popular belief, this is not the actual number of sunspots visible on the solar disc. Rather, it is a number constructed by a mathematical formula taking in account the number of sunspot groups and the number of individual spots. The formula also contains a factor to make it consistent with historical observations which used different instruments and techniques. There are now better indices available than the sunspot number (eg the solar flux at a wavelength of 10 centimetres) but the sunspot number has the virtue of a longer series of consistent observation than any other index.

Figure 1 shows the variation of the sunspot number during the last five solar cycles and demonstrates the variability of the cycle in both amplitude, duration and shape. Although the solar cycle has an average length of 11 years there is a wide variation. Some cycles have been only 7.5 years long, whereas others have lasted up to 16 years. Each cycle tends to rise faster than it declines — the average rise time is 4.5 years whereas the decline averages 6.5 years.

Solar cycles also vary considerably in amplitude which is defined by the peak value of the sunspot number. During the period 1645 to 1715, called the Maunder Minimum, there was hardly any variation of the sunspot number. After this time there have been a number of cycles which reached a sunspot number of around 50 and the average cycle amplitude has been slightly above 100.

The last five solar cycles, shown in Figure 1, have been larger than this average. The smallest of the five was cycle number 20 which still reached a peak sunspot number of 111. The five cycles are notable in that they include cycle 19 which is the largest cycle ever recorded. The peak sunspot number for that cycle was 210. The last of the five cycles, cycle 21, was the second highest on record.

THE END OF THE LAST SOLAR CYCLE

The end of cycle 21 in September 1986, makes it appropriate to review its statistics. The following table lists some key facts.

Solar Cycle Number 21

Start of Cycle	June 1976
Peak of Cycle	December 1979
End of Cycle	September 1986
Peak Yearly Sunspot Number	165
Peak Monthly Sunspot NUmber	188

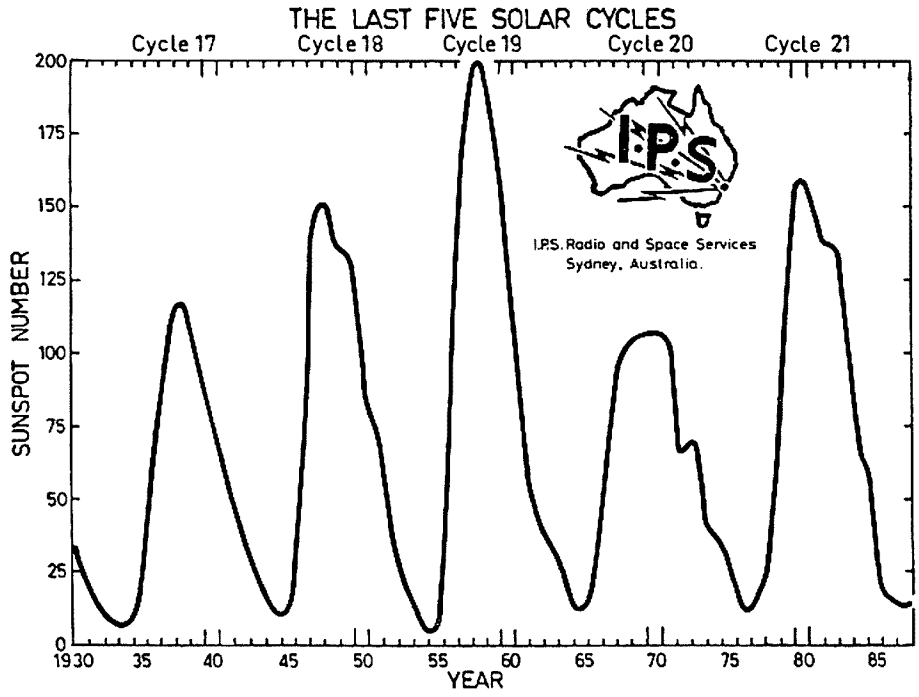


Figure 1: The variation of the yearly-averaged sunspot number over the last five solar cycles.

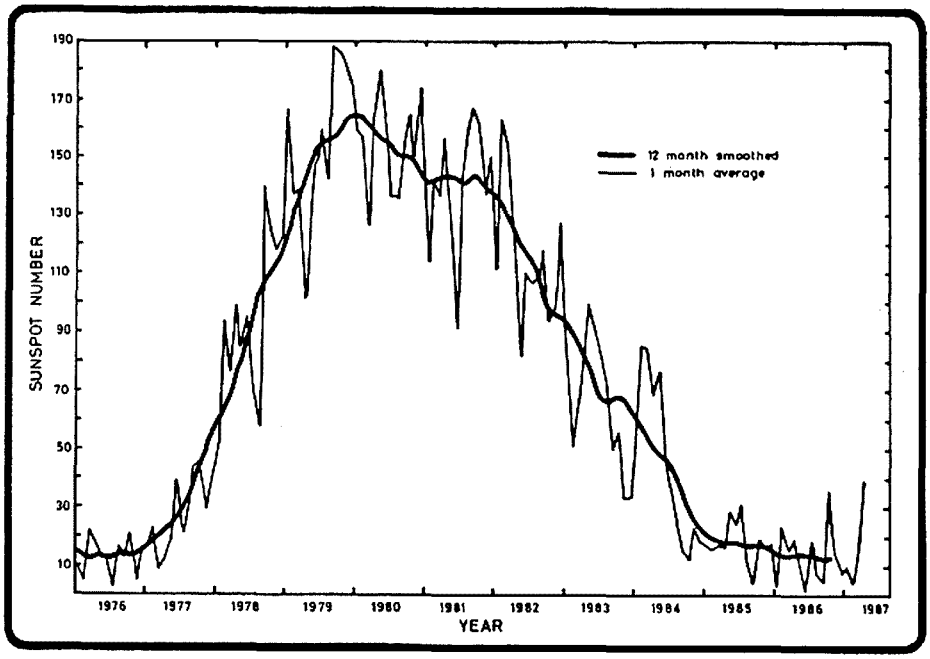


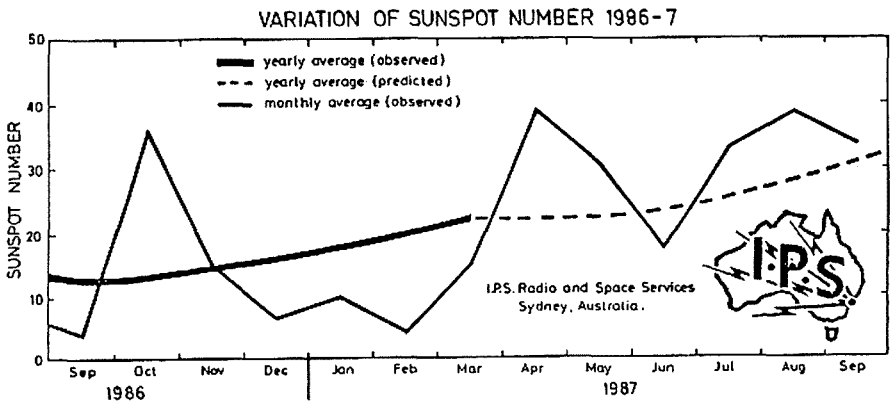
Figure 2: The variation of the sunspot number during the last solar cycle. The thick line is the variation of the yearly-averaged sunspot number whilst the thin line is the monthly-averaged sunspot number.

Figure 2 shows the variation of the sunspot number during cycle 21. The thick line, the sunspot number averaged over a period of one year, traces the general progress of the cycle. The thin line is the sunspot number averaged over a month and this indicates bursts of higher solar activity.

Figure 3: The variation of sunspot number since the last solar minimum. The thick solid line is the yearly-averaged sunspot number whilst the thin solid line is the monthly-averaged value. The dashed line is the estimated trend of sunspot number based on observed and predicted sunspot numbers.

THE RISE OF THE NEW SOLAR CYCLE

Figure 3 shows the variation of the monthly-averaged sunspot number and of the yearly-averaged sunspot number since solar minimum in September 1986. It is apparent that the monthly values have peaks in October 1986, in April 1987 and again in August 1987. These correspond to periods of region growth on the sun. As yet, there has been little flare activity from these regions. The most energetic solar flares are denoted "M" class or "X" class according to their power radiated at Xray wavelengths. There have been M class flares in October 1986 (one flare); and in April, May and July (two flares each month), August (nine flares) and in September 1987 (one flare). These flares were energetic enough to have caused a short-wave fade-out on some circuits at some frequencies but are unlikely to have had much effect on most circuits. As yet, there have been no *really* energetic flares (X class flares) which would have had a dramatic effect on shortwave communications.



How will this new cycle compare with previous cycles in terms of its amplitude? In the past few years, scientists have been discussing this question using a variety of techniques.

There is a wide range of predictions from a very low to a very high cycle. Out of this jumble of predictions there is one bright note. Of these predictions, those which use 'precursor' techniques tend to suggest that the cycle will be larger than average (ie the sunspot number will peak at more than 100). 'Precursor' techniques use observations of the behaviour of the sun in the declining phase of a solar cycle to predict the amplitude of the next cycle. A majority of scientists in the field agree that the precursor techniques are basically correct.

On the basis of predictions using the 'precursor' technique, IPS Radio and Space Services have adopted a value of 130 for the amplitude of the next solar cycle. This value is used in producing long-range frequency predictions for people wishing to set up communication networks for use into the next decade. The rapid rise in solar activity that we have seen in the past year suggests that this value is reasonable.

The next year of solar activity should enable this prediction to be confirmed or otherwise.

So the outlook for the new cycle is that it is likely to be larger than average! This will mean that there will be a wide band of frequencies open for HF communications. But cycles of strong activity also have disadvantages. Solar flares are more frequent and these produce shortwave fade-outs. Also, the material ejected by solar flares can produce terrestrial ionospheric/magnetic disturbances degrading communications, disrupting surveys for minerals and causing a host of other problems.

The next year should see a continuing rise in solar activity. IPS Radio and Space Services expect that the yearly-average sunspot number should reach 38 by January 1988 rising to 57 by June 1988. Along with the increase in sunspot number there should be an increase in the number of energetic solar flares (and shortwave fade-outs) and more frequent disturbances to the ionosphere and the geomagnetic field. Conditions for the next year will certainly be different from the rather unexciting solar minimum conditions experienced for the last few years.

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GOING PORTABLE

Dmitri Perno VK4BDP
190 Currie Street, Nambour, Qld. 4560

There have already been many articles on DXpeditions to remote places and other articles on portable antennas — this is not intended to be either, but rather a simple description of how one amateur went portable.

Hopefully, it may be of interest to some, perhaps amusement to others, and even encourage others to "have a go" along similar lines and prepare them for some of the problems encountered along the way.

It is not my intention to carry out extensive analysis of equipment, although for ease of description, trade names are unashamedly used throughout.

Perhaps I should also mention at this point, that the keyword is *portable*, not mobile, operation. Having driven a cab in Brisbane traffic, and having wrapped the microphone cord around the steering wheel on more than one occasion, I have no desire to repeat the experience for pleasure. Neither do I see any great point in carrying on conversations on air whilst hurtling down the freeway at 100 km/h.

Well, it all began with a simple hand-held two metre unit. The "camping" equipment at the time was a 323 van, the back of which was utilised as rather minimal sleeping quarters for my wife and self. The simplest radio operation was carried out by plugging the hand-held into the cigarette lighter socket of the car and simply projecting a whip antenna out of the window.

This antenna system was quickly superseded by a "Slim Jim" which considerably improved performance and added to the comfort of the operator. In this case (and I have heard of many variations on this theme), the Slim Jim was made from television ribbon taped to a half-inch semi-circular hardwood section, a little longer than the actual antenna at the bottom, and which plugged into an approximately equal length of plastic covered metal tube, as used for curtain hanging, which in turn was clipped to the gutter of the vehicle, thus raising the actual antenna above the car and reasonably clear of car and metal tube. The bottom of the tube was either stuck into the *ground* or lightly tied to some convenient projection under the car.

There was no concern at this point regarding the added load on the car battery — the relatively small power output of this set (five watts at 13.5 volts maximum), and hence small drain, was not expected to drain the battery below that required to start the car, even after a few nights of operation without recharging. (Whether this assumption is correct would obviously depend on the degree of "earbashing" indulged in, but, in fact, the battery never showed any signs of distress with this mode of operation).

All of this was very satisfactory within limits, and most satisfying, particularly when all the locals on some outlying repeater came on to investigate the strange new call, concluding with a marathon "chinwag" to (hopefully) the enjoyment of all concerned.

Unfortunately, we did not always stay overnight on mountain tops, but rather creek banks and valleys, resulting in very severe limitations to operation on this frequency and mode. (As most would know, two metre signals do not propagate well through mountains).

About this time, it was decided to upgrade (?) the camping rig to a 4WD car and a small "pop-up" caravan, containing, amongst other necessities for existence, a small three-way (*gas*, 240 volts, 12 volts) refrigerator. This last item is specifically mentioned as it plays a major role in future events and planning. (Electrically, that is, the major role of keeping the liquid refreshments cold, should be understood! ! !).

The electrical equipment in the van, other than the traffic rear end lights, consisted of one internal light and the refrigerator (either one, but only one at a time), plugged by means of a very small television antenna-type plug and socket, into a 12 volt auxiliary circuit powered, in common with most vans, from the parent car. It was thus possible, with the van plugged in, to run either the internal light or the refrigerator off the car battery. However, and this point was stressed by the manufacturers, the refrigerator should be used on the 12 volt mode only with the car alternator working; ie, the car in motion, when it shouldn't be used on gas, otherwise the car battery would be drained in a very short time. (I have since determined that it takes four to five amps continuous).

No problems were experienced with VHF operations, the hand-held was simply used from the van; the Slim Jim adapted for attachment to the van roof, and a cigarette lighter-type socket was installed in the van on the auxiliary circuit for power. (Taking care to get the polarity correct). A variety of small openings were available for the antenna lead-in.

But, problems were being experienced with the refrigerators operation; the high current on 12 volts was causing definite signs of distress from the small plug connecting to into the auxiliary circuit, like melting and smouldering after lengthy periods of operation on the road. And the necessity of turning the refrigerator off when stopped for any length of time, meant at least partly raising the roof to gain access to the switch or plug in the van — whilst not difficult, a definite nuisance.

Two things happened at about this time which could be called synchronicity (a close interrelationship to those not familiar with Vonnegut and Synchronistic Philosophy of Events).

One — it was decided to include HF in the portable operation
and

Two — the bracket holding the van spare wheel on the frame of the van fell off.

The first event resulted in consideration of increased current drain on the car battery due to higher power used on HF and anticipated longer hours of operation, further resulting in a decision to install a separate battery in the van, exclusively for van and radio use. It could then be drained with impunity, knowing that a fully charged battery was isolated in the car, ready for starting commands next morning.

The second event appeared quite trivial, and the first handy welding shop took little more than a few minutes to weld the bracket back on the box frame. What wasn't so trivial was that it also welded all the van wiring running through the same box section into one solid lump of melted copper and burnt plastic. (I must admit the last sentence is writers licence, I have never actually looked into the box section, all I actually know is that all the wires were a dead short to the frame and blew every fuse whenever power was applied to the van).

As a complete rewire was warranted at this point, it was decided to use the opportunity to modify the circuit, not only to correct some of the earlier shortcomings, like melting plugs, but generally make the set up more convenient and certainly convenient for radio operation. To this end, the wiring was made more easily accessible and frequent use was made of junction boxes and connectors. The final circuit is included in Figure 1 ad shows a socket for the solar panel which, however, was not added until later.

Note also that some modifications were made in the car — a panel switch was installed enabling the auxiliary circuit to be isolated from the car and a heavy duty diode to prevent any back surge from the van battery in case it was left in circuit when the car starter was activated. The wiring would not stand the shock.

Now, either, both or neither battery could be switched into the van circuit as required. As a further protection for the car battery the van could be completely unplugged and still remain electrically functional.

In view of the heavy current, the HF radio power leads were clipped directly to the battery terminals and a 20 amp fuse incorporated.

Of course, it is still possible to leave all switches on and thus flatten both batteries, but how foolproof do you make a system? ? ?

A few points could be made here:

1. The switch on the car panel is not easy to overlook, once its purpose is known, nor is it easy to activate accidentally.
2. Both batteries are the same size and interchangeable.
3. There is a method where a relay, operated from the ignition circuit, switches on the refrigerator, thus ensuring its function only with the motor running. This was considered but, as it would necessitate a separate circuit again for the refrigerator (if the present auxiliary circuit is to retain its multi-purpose function), it was decided to be too complicated to be warranted in the circumstances.

All of this worked and is still functioning satisfactorily after several trips.

It was subsequently found that the van battery would not charge adequately from the car alternator with the refrigerator running. Also, it was found desirable to spend time in one place without having to run the car to charge the batteries, so some other means of charging had to be found.

To cut a long story short, and without getting into lengthy discussions on the relative merits of solar, wind or other means of electrical power generation, I will simply state that a solar panel was selected as the most promising to fulfill requirements. The panel is rated at 14 watts, measures 575 by 480 mm, including frame, incorporates a reverse blocking diode and, because of its relatively low output, is claimed to be completely self- regulating.

In practice, the panel is bolted to plastic angles attached to the ventilator cover on the van roof, plugs into the socket provided, and remains in circuit until we return home.

At home all the equipment is removed from the van, the panel is installed on similar brackets on the house roof, and plugs into a permanent downlead connecting it to the same battery and set, now installed in the shack ready to go on air, courtesy of "Old Sol".

Perhaps I should mention that this emphasis on solar operation at home is not just parsimony (although that is an important point although I do have and operate mains equipment occasionally), but, having acquired the solar equipment, I am curious to discover, in practice, how often I will run out of power. So far, and despite of powering the HF and VHF rigs and a VHF amplifier at home, and the radio gear (HF and VHF), van lights and other odds and ends like shavers, the odd soldering iron, etc, on the road, I have run out of solar power only once, and that was when the refrigerator was accidentally left on the van battery for a couple of hours (the car battery was still okay, of course). The weather was part cloudy at the time and it was several days before I was confident enough in the battery to make but the briefest of OSOs.

It is interesting to note, as the battery declines, the HF transmitter is first to become inoperable, evidenced by poor tone and wild fluctuations in frequency. At this point, the battery still retains sufficient power to operate lights, the set on receive and most other small items of equipment for a considerable period of time.

Now the radio equipment — VHF has remained essentially the same. I see little point in upgrading as my personal experience strongly suggests that

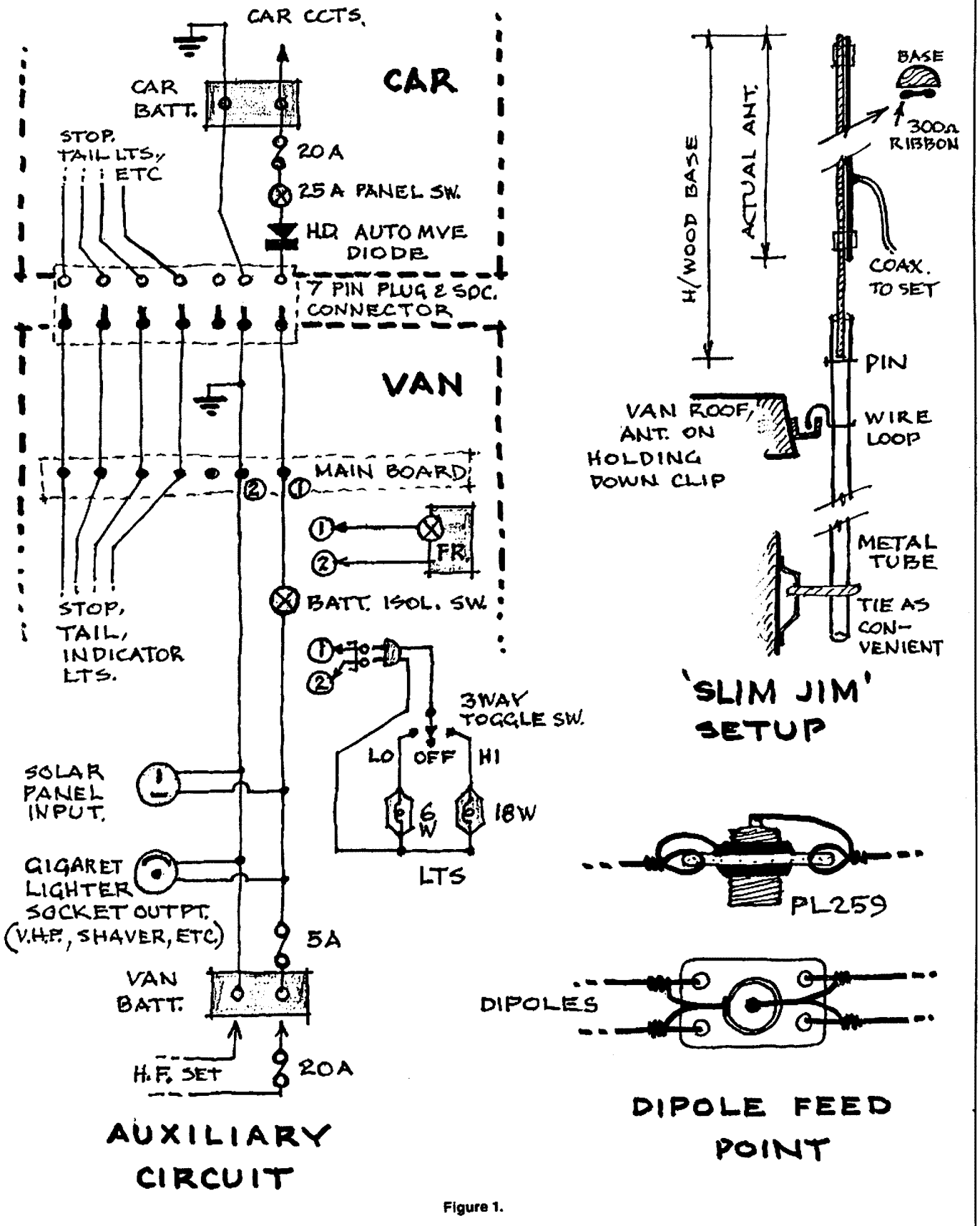

CAR CCTS.
CAR
CAR BATT.
STOP, TAIL LTS, ETC
20A
25A PANEL SW.
HD AUTOMVE DIODE
7 PIN PLUG & SOC. CONNECTOR
VAN
MAIN BOARD
FR.
BATT. ISOL. SW.
STOP, TAIL, INDICATOR LTS.
3WAY TOGGLE SW.
LO OFF HI
6W
18W
LTS
SOLAR PANEL INPUT.
CIGARET LIGHTER SOCKET OUTPT. (V.H.F., SHAVER, ETC.)
5A
VAN BATT.
H.F. SET
20A
AUXILIARY CIRCUIT
H/WOOD BASE
ACTUAL ANT.
BASE
300Ω RIBBON
COAX. TO SET
PIN
VAN ROOF, ANT. ON HOLDING DOWN CLIP
WIRE LOOP
METAL TUBE
TIE AS CONVENIENT
'SLIM JIM' SETUP
PL259
DIPOLES
DIPOLE FEED POINT

Figure 1.

power is of relatively little importance while the location is everything, and I have found on many occasions that even a few metres in the height of the antenna can make all the difference.

The HF rig is a TS130SE with an AT120 antenna tuner. An RF power meter has been used at home to establish an approximate correlation between power output and final IC current (available on the set meter) for reference purposes. This set uses 0.7 amps on receive and a maximum of 19 amps on transmit. The 19 amps sound pretty horrific for battery operation but, in practice, I doubt if I ever come anywhere near it except on very rare occasions.

Firstly, it only occurs at maximum output and then only on the peaks for SSB. On CW (my favourite, and therefore preferred mode), the situation, as far as I am concerned, is much better. I rarely use more than about 20 watts when portable, and have made world-wide contacts on this even with temporary antennas. This takes about five amps out of the battery with key-down. For local QSOs, I make do with 10 watts or less and this requires only three to four amps. This certainly sounds much better than the 19 amps shown on the specifications! (Perhaps I have a strange sense of *humour, but* I get a great kick out of working stations on the other side of the world on 10 watts and a dipole three metres up strung between two trees, whilst they are using 500 watts of power into a multi-element beam 30 metres up, particularly if we exchange the same report!).

On "tour" I use a modified "cheapie" key, purchased for around $2.50, but strengthened and fitted with an improved bearing system. It tends to slide about on the table a little, but I am told my CW is adequate. At home a heavier key is used.

For several trips, a VHF SSB set was carried, an IC202E, but contacts made on this mode did not warrant its continued use — not a single one, in fact!

Last, but not least — the antennas. On VHF the "good old Slim Jim" is still doing good service and needs no further comment. For those interested, the dimensions have been published frequently in AR over the years.

On HF I carry two systems — one very portable but dependent on suitable trees at the site; the other, a little more cumbersome but self-supporting, and dependent on suitable soil.

The first system consists of two dipoles — one for 80 and 20 metres, fed from a common centre point and both cut to favour the CW end of the band. Both give adequate coverage with the ATU. They are made from disposal ex- Army field telephone wire, purchased from a junk-yard — 50 cents for a sugar bag full of tangled mess! This wire, once resurrected, is very light, strong and durable, and handles well in the field.

This system obviously depends on finding suitable and suitably spaced trees for supports, but this is usually not as difficult as it may first appear as there is quite a margin which can be made up with rope, string and a little ingenuity. An ability to climb trees is a definite advantage.

At times, only the 80 metre dipole is used with the 20 metre wires simply being left suspended in neat coils without any apparent ill effects.

I have repeatedly been pleasantly surprised at how effective this system is, even at only some two to three metres above ground and have many 599 reports to verify it!

Perhaps a 40 metre dipole, doubling on 15 metres, would be good value, but so far has not eventuated.

The second system is a five-band commercially-made trapped vertical ground plane antenna. It disassembles into manageable lengths, and although not as portable as a coil of wire, does fit into the van, along with a couple of fishing rods. It does depend, however, on soil soft enough to enable the main mounting peg (approximately one metre of 38 mm pipe) to be hammered into it to provide a good ground plane electrically. (The antenna fails to load on 80 and 40 metres if the last condition is not met).

In practice, beach sand, in the first line of dunes (a camping spot much to our taste) appears to work very well, particularly if a few buckets of sea water is poured around the peg to improve conductivity.

Guys are essential but three minimal supports are all that is required in all but the strongest winds. (In which case we would be packing up anyway). Some small tent pegs and precut lengths of synthetic rope serve very nicely!

It is possible to erect the vertical single-handed in about 10 minutes, but an extra pair of hands at the actual lift are very helpful, though not essential. The performance of this system seems to vary over a wider range, most likely I suspect, due to its dependence on ground plane conditions.

One problem experienced with the vertical — in coastal locations, and with strong on-shore breezes, there is a salt build up on the bottom of the traps. This, coupled with a heavy dew next morning has been known to do very funny things to the SWR. The only solution found so far has been to lower the antenna and clear away the salt.

A separate earth is used wherever possible. This consists of a 12 mm diameter copper rod two-thirds of a metre long, set into the ground as near to the van as possible.

The same length of coaxial cable, fitted with a PL259 plug at each end is used for either system. The dipoles are attached to a perspex plate fitted with a PL259 socket, whilst a similar socket is a standard fitting on the vertical. As any astute reader will notice, if not asleep by now, both systems depend on certain natural conditions being available (trees, suitable soil, etc) so what would happen if we were to camp on a barren rocky outcrop? Well, all I can say so far this hasn't happened and I have managed to get on air somehow from just about anywhere we have stopped for any length of time. Perhaps such inhospitable country for antennas is also unattractive to us, who knows? Anyway, a barren rocky outcrop may well be a marvellous VHF location!

Well, that is the end of the story for now. I feel the system has arrived and we are planning the next trip without considering any further modifications to the equipment — nor were there any repairs to be done at the end of the last trip.

Now the gas bottle and water tanks have been filled and soon we hope to be off again, so hope to see you all on the air — *portable.*

ar

GOING PORTABLE — AGAIN

It is now several months since the original article was written and, a further trip has been undertaken. Consequently, a few additional comments may be in order.

Basically the trip took us west through Longreach and Winton, to the coast at Townsville, north to Atherton, and back down the coast to Nambour with, of course, many detours along the way.

No trouble was experienced with the equipment, and the refrigerator was left on the van battery only once (human error), taking the solar panel three days to bring the battery back to a reasonable state of charge.

The two-metre hand-held was virtually dead-weight, and was useful on only one occasion to listen to the WIA news broadcast via the Rockhampton repeater one Sunday morning, when about 50 kilometres from that centre. In the main, we simply did not get close enough to the major centres to make use of the repeaters, and looking for the odd simplex QSO in the middle of nowhere makes the proverbial needle-in-the-haystack a "cinch."

Inland from the coast the vertical HF antenna was also found to be almost useless. The ground was bone-dry and too rocky for the ground peg. One notable exception was at Lake Victoria, near Biloela, where, once through the dry surface crust, the peg entered soft gooey mud. This apparently provided an excellent ground plane and gave excellent results on-air.

Even though the west is not noted for its timber, sufficient trees or shrubs in some form were usually found to string up the wire dipole in some fashion, usually with adequate to good results. Notwithstanding, in the middle of a vast empty plain north of Winton, two lonely, stunted trees were found, just the right distance apart for the 80-metre dipole!

On the coast the choice became wider, but the dipole still seemed to be favoured for one reason or another.

(Incidentally, I would venture to suggest that the dipole, even under very adverse conditions, would still give better performance than gutter-mounted HF antennas.).

QSOs on 80 metres were never a problem in the evenings but 20 metres seemed in "poor shape" and little new DX was worked on this trip. Some notable QSOs however, were a couple of VK3s, a maritime mobile station in Noumea Harbour, and a couple of stations near Denver, USA, all on a dipole not two metres above ground, at Porcupine Gorge.

I have also been told that using an automotive battery in my circumstance is not advisable, that the relatively slow charge and discharge rates would quickly make it unable to hold any charge at all. However, I have been using it in this manner for a couple of years now without any apparent ill-effects, but would be interested to hear from anyone more knowledgeable about batteries than I!

ar

REMEMBER

When inquiring about products published in AR always mention where you read of the product.

MAINS POWER SUPPLY FOR BATTERY OPERATED RECEIVER

Jack Townsend VK5HT
25 Goose Avenue, Glenelg North, SA. 5045

Built in a wooden leatherette covered case, it produced magnificent sound.

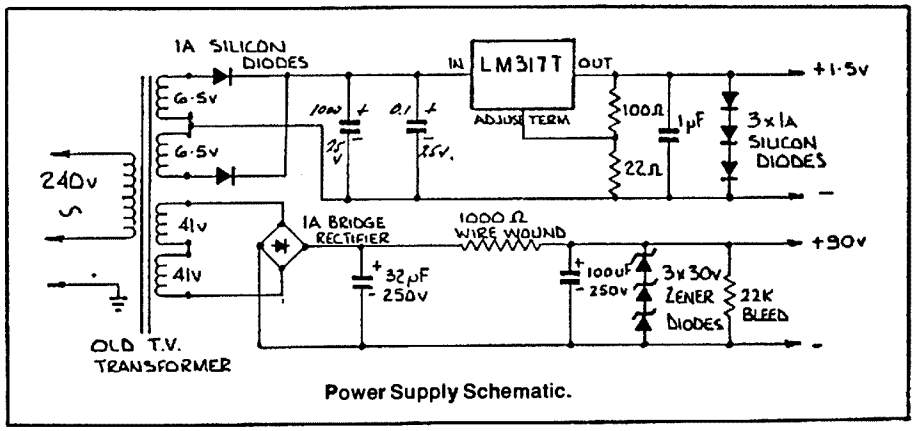
A relation of my wife's had an old HMV Portable model B61B receiver. By todays standards it was colossal namely 390 mm wide, 310 mm high and 135 mm deep. It was built in a wooden leatherette covered case around a Rola 210 mm speaker. It had belonged to his late father. For sentimental reasons he could not part with it. Besides it used to produce magnificent sound.

The tube line-up was a 1T4 RF amplifier, 1R5 converter, 1T4 IF amplifier, 1S5 diode detector, AVC and audio amplifier and a 3V4 power amplifier was used to drive the speaker.

The original power supply was one Eveready No 745 1.5 volt battery and two Eveready No 482 45 volt batteries. It used full sized components. For example, the IF cans were about 90 mm high. All resistors and capacitors were normal size, typical of the post-war era of the late 1940s. There was ample space to install a power supply in the area formerly occupied by the batteries.

A VISIT TO THE JUNK BOX

Most of the components came from my junk box except for the LM317T regulator and the bridge rectifier. The transformer was from an old television set and had four separate secondary windings, two at 6.5 volts and two at 41 volts.



Power Supply Schematic.

The value of the voltage divider resistors connected to the 'adjust' terminal of the LM317T was determined by experiment. As a precaution against over voltage three silicon diodes were connected in series across the 1.5 volt filament output to limit at 1.8 volts. Likewise three 30 volt zener diodes were connected across the 90 volt HT supply to maintain a reasonable steady HT.

The filament drain is only 300 mA and the HT approximately draws 25 mA. Consequently there is very little heat generated and the LM317T is equipped with only a small heatsink. The small components were mounted on a modern resistor strip purchased from a well-known Australian electronics supplier.

The result was well worth the effort and the old Portable is now operating from the AC mains.

ar

Try This!

VERTICAL VEE ANTENNA

Maurie Dewhurst VK5PMD
4 Hawke Street, Linden Park, SA. 5065

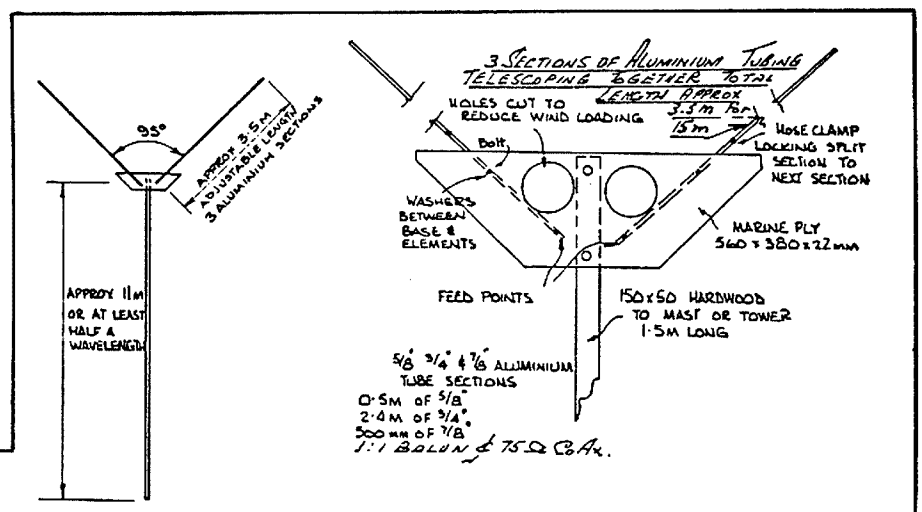
I do not claim to be the 'inventor' of this antenna. I heard Leo VK2NHT, describing it on air and how he obtained the idea from the 'rabbit's ears' on his television set. Being Number One sceptic, I decided to construct such an antenna.

The antenna is a vertical Vee and it is attached to the top of an 11 metre *Silky Oak* tree. On the first test with Eddy VK5ARL, who had previously reported me to be 5x3 on my standard 15 metre dipole, located 11 metres above ground, when connecting the Vee, he surprised me by giving a 5x8 signal report.

On 15 metres the SWR was 1:1 across the Novice segment. I have not climbed the tree to make any adjustments. I was curious regarding 10 metres and with the tuner in line it was found that this antenna could be matched on this band.

The transceiver I am using is a TS120V and the tuner is a FC-700.

ar



Details of the construction of VK5PMD's antenna on information gathered from VK2NHT.

PAPER 3 — THE FUTURE OF AMATEUR RADIO — OPTIONS

by the Future of Amateur Radio Working Party

The Working Party membership includes:
Ron Henderson VK1RH
Gordon Bracewell VK3XX
John Aarsse VK4QA
Stephen Phillips VK3JY

BACKGROUND

The Future of Amateur Radio Working Party was set up by the 1986 Federal Convention and directed by the Executive to, amongst other things, report on "the operating and technical requirements of amateur radio in the near future (next five years) and more distant future (out to say 15 years)".

Following the 1987 Federal Convention where guidance was given to the Executive on the Future of Amateur Radio, the Executive further requested the Working Party "to produce a number of discussion papers coupled with a general review of licencing grades and operating privileges existing in the Amateur Radio Service".

The Working Party to date has produced three discussion papers, namely:

* The Future of Amateur Radio (AR. . .86)
* Frequency Bands and Emissions (AR. . .86)
* A Proposal to Restructure Amateur Radio Licencing (AR. . .86)

These papers have explored many facets of amateur radio and have provided the Working Party with an adequate understanding to now identify the options open to the Amateur Radio Service.

AIM

The aim of this review paper is to identify all feasible options and expose their strong points and weaknesses.

OPTIONS

The Working Party believes the feasible options are limited to the following:

a. Restructure as an 'elitist' service
b. No change
c. Provide more entry points retaining Novice as the lowest grade and unrestricted as the highest licence level
d. Introduce a lower level than Novice using type approved equipment
e. Widen the span with an increased number of entry points ranging from very simple lower grade licences to a more difficult advanced grade (USA or Japanese style)
f. Remove all theory examinations and provide two amateur licences, namely a VHF/UHF licence and an all band licence gained via a Morse test
g. Remove all examinations and provide a single amateur licence

It should be noted this options list begins with the most demanding situation and progresses through a series with lessening requirements to end in an essentially CB situation.

There are variations associated with these options and they include:

a. Elimination of the Morse code test
b. Removal of annual licence fees
c. Seeking more amateur frequency allocations
d. Challenging the Japan/Australia reciprocal agreement on discrimination grounds
e. Level of regulation

Because these variations influence many of the options they will be examined in some detail now before the options are considered.

MORSE TESTS

The earlier paper *A Proposal to Restructure Amateur Radio Licencing* considered the requirement for Morse testing and concluded that, for the present, the Morse test speed should determine the frequency band allocations for each grade of licence. This acknowledges the international requirement for more proficiency to operate below 30 MHz.

Should the ITU at WARC 92 change the applicable Radio Regulations to delete Morse code proficiency, the appropriate adjustments can readily be made to the proposed licence structure.

LICENCE FEES

In these present times of "user pays" for government services, the possibility of removal of amateur licence fees appears a forlorn hope. Even so, it is current WIA policy to press for a licence currency period in excess of one year at pro-rata reduced administrative charges, and this matter has been favourably received in principle by DOTC.

AMATEUR FREQUENCY ALLOCATIONS

Two aspects of amateur frequency allocations are applicable to all options. Firstly, to seek additional spectrum at WARC 92 and, secondly, to exchange some larger shared allocations at UHF for, be it smaller, exclusive allocations.

The first aspect is influenced by much current and some out-of-date WIA policy; all due for review at the 1988 Federal Convention. For the purposes of this paper, it will be assumed the amateur movement, through the IARU and national authorities, will seek additional spectrum at WARC 92 (if only to maintain what we already have!).

The second aspect concerning exclusive allocations, is equally supported by IARU regions and will also be assumed the international amateur position. Again, this matter needs clarification nationally at the 1988 Convention and internationally at the 1988 Region 3 Conference in Seoul.

JAPAN/AUSTRALIAN RECIPROCAL AGREEMENT DISCRIMINATION

It has been suggested the current Japan/Australia reciprocal licence agreement discriminates against the Novice class of Australian licencee. The Japanese licencees, holding national qualifications lower in theory level than the Australian Novice licencees, are accorded access to all Australian VHF/UHF bands and emission modes at Novice power levels.

It will be necessary to establish whether these circumstances constitute a genuine act of discrimination and if the opinion supports that proposal, action will need to be taken to eliminate the discrimination.

LEVEL OF REGULATION

Over the past few years, the Amateur Radio Service has moved from a tightly regulated service under the old and dated Wireless Telegraphy Act to the current reasonably de-regulated situation under the Radiocommunications Act. A number of older amateurs have decried this change, losing as they have the 'warm security of the Regulations". Unfortunately, the natural accumulation of legislation may resurrect a number of constraints, particularly should existing rules not control abuse.

An accompanying feature has been the demise of the Amateur Advisory Committees. However, there are emerging trends to replace them with regional WIA/DOTC joint committees to improve liaison and self-regulation of the service.

Some of the options above rely heavily upon a detailed and strong regulation base covering frequency band segments and permissible emissions and powers. Other options need very little regulation and may lead to frequency anarchy in this present day and age.

The fine balance presently achieved, between constraining over regulation and under regulation with attendant abuses, must be retained. One feature of the Radiocommunications Act is the ability of the Department to gazette specifications as to EMC/EMI for equipment using the electromagnetic spectrum.

EXAMINATION OF OPTIONS

In this part of the paper, the options identified earlier will be examined for their strong points and weaknesses.

RESTRUCTURE AS AN ELITIST SERVICE

The simplest was to create an elitist amateur service is to delete the Novice (and combined) licence grades and to add an Advanced class of licence awarded for additional achievements in theory (more difficult examination), Morse code (faster speed test) or practical operating (practical examination), or any combination of these three.

The Advanced class licencee could be given sole access to the WARC 79 bands plus any new bands gained at WARC 92. The creation of an advanced VHF/UHF licence class is not seen as according with these elitist guidelines.

STRONG POINTS

Satisfies a need perceived by some amateurs, provides an incentive to upgrade and keeps "unskilled black box operators" out of an experimental hobby.

WEAKNESSES

It is not supported by the majority of amateurs. It may place much useful spectrum out of reach of all but the select few and is not moving with the times in acknowledging the near universal use of commercial transceivers. It would be difficult to administer the practical test, also the Morse test due to the decline in number and quality of higher speed

Morse examiners. The option would not be popular with VHF/UHF operators who are equally well skilled as their elitist HF counterparts except for Morse code qualifications.

NO CHANGE OPTION

Retain the existing Novice, Limited, Combined and Unrestricted licences with the current examination requirements.

STRONG POINTS

Retains a scheme which has evolved over many years since World War II; is simple and relatively effortless thus matching the limited Departmental and volunteer effort apparently available to the service at the present time.

WEAKNESSES

Does not satisfy the perceived demands of change arising from the amateur community, in particular, does not offer the range of entry points seen by many to be lacking at present. May lead to a contracting amateur environment in the long term with contracting numbers of licencees leading to contracting frequency allocations. Is vulnerable to criticism of ultra-conservatism and inactivity.

MORE ENTRY POINTS WITHIN EXISTING RANGE

This option, with more entry points within the existing range of Novice to Unrestricted, is essentially the preferred option of the *Proposal to Restructure Amateur Radio Licencing* paper. That is, theory examinations with two levels of difficulty, Morse examinations at two speeds (plus no Morse), combined with a single regulation examination. This combination mixes and matches to yield, in ascending order, the following licence grades:

VHF Novice
Novice
VHF Intermediate
Intermediate
Unrestricted

STRONG POINTS

The desire to make changes, yet retain Novice as the lowest level of theoretical knowledge and Unrestricted as the highest licence grade, are satisfied. This proposal, without introducing any further costly examinations, provides additional entry points and retains the obvious progression and hence incentive to upgrade. Also, a common frequency band is provided for all classes of licencees.

It has a minimum of transition problems being easily "grandfathered" for existing licencees and, at the worst, has only minor impact on examination syllabuses.

It promises stability for years to come, for should WARC 92 make major changes to Morse proficiency requirements, licence grades can be simply merged.

Finally, this option aligns itself well with the recently negotiated Japan/Australia reciprocal agreement.

WEAKNESSES

The obvious weakness is the provision of considerable VHF/UHF spectrum to "Novice" licencees who have only satisfied the basic level of theory, but in all fairness it must be observed this is not as much as that permitted by the Japan/Australia reciprocal agreement.

A secondary, but not insignificant consideration is the possible extension of the basic theory examination (Novice) to include FM and VHF/UHF propagation (beam antennas are used at HF and should already be included!).

ADD A LEVEL BELOW NOVICE USING TYPE APPROVED EQUIPMENT

This options adds to the current situation (option "no change" above) a "student" grade of licence below Novice, permitting voice operation on a portion of a the VHF/UHF band with low power output type approved FM transceivers.

STRONG POINTS

Satisfies a need perceived by some for a student licence grade. Type approved equipment controls frequency bands employed, modulation mode and output power and reduces the likelihood of interference through poor quality signals. Provides the newcomer with immediate access to amateur radio activities and hands-on operating experience, an ideal way to get started using FM voice on VHF/UHF repeater frequencies.

WEAKNESSES

The need for a lower grade than Novice is not supported by the Amateur Radio Service which believes training can be achieved through supervised use of clubs, etc stations. Also, type approval of equipment does not accord with current WIA policy or the experimental nature of amateur radio.

One extra costly examination (or more) is introduced into the system and the student licence tenure (fixed term or renewable?) would be debatable.

There isn't strong support for further operators (holding lower grade licences) on existing VHF repeaters, hence the most popular 144 MHz band is ruled out.

This proposal too closely parallels the UHF CB licence yet amateur radio and citizens band communications have widely differing objectives and very little in common.

EXTENSIVELY WIDEN THE SPAN OF LICENCES

This option proposes a scheme similar to that adopted by a number of other IARU member nations. A wide range of licences extending from well below the current Novice grade (see "student" grade above) to above and beyond Unrestricted, eg an "advanced" class. Associated with each grade is a series of frequency band segment allocations and authorised emission modes (not unlike the USA).

STRONG POINTS

The increased number of entry points would permit those interested in amateur radio to select their desired starting point and upgrade as the need or wish arises. Each licence grade would get a small slice of spectrum in a range of bands permitting their particular interests, be they DX, rag chewing, or contests/awards, to be satisfied yet provide additional spectrum and emission modes/power output for upgrading.

WEAKNESSES

The option has many weaknesses, firstly the licence grades below Novice and above Unrestricted do not accord with expressed amateur service wishes. Secondly, the "bitty" nature of allocating frequency band segments and emissions modes/power output to each licence class is difficult to police and would call for detailed regulations in contradiction to expressed Departmental and amateur views on deregulation.

Many licence grades would require many examination elements to establish the qualification levels. Examinations which, regardless of devolvement by DOTC, are costly to attempt and demanding of man-hours and time to conduct effectively. It has also been claimed the setting up of additional licence grades in the USA a number of years ago detracted from the expansion of amateur radio in that country for a considerable period.

REMOVE ALL THEORY EXAMINATIONS, TWO GRADES OF LICENCE

This option, based on the premise that amateur radio should be available to all, is constrained by current international agreements as to Morse code proficiency. Consequently, a VHF/UHF licence is proposed upon application, convertible to all amateur bands on completion of a basic Morse test. A regulations test may be applied.

STRONG POINTS

Simplicity and ease of administration are key qualities of this option. Coupling a basic Morse test, by say a fellow amateur, with an over-the-counter "Z questions" regular test, it may be possible to issue licences and call signs for life for a single application fee.

WEAKNESSES

The option does little to acknowledge the experimental nature and self-instruction rationale behind amateur radio. Instead it is essentially an authority to allocate a call sign and operate and differs little from CB.

Its principle detraction is its perceived lack of credibility in the international forum. No other nation would enter into a reciprocal licence agreement and the Australian amateur licence would lose all standing world-wide. The WIA would be unable to support this option for reason of its not having the characteristics of testing and certification of qualification vis-a-vis other IARU national licences.

REMOVE ALL EXAMINATIONS, ONE GRADE OF LICENCE

This option is an extension of the one above, deleting the basic Morse test to yield one amateur licence upon application providing access to all amateur frequency allocations and emission modes. A regulations test may be applied.

STRONG POINTS

Like the option above, this one would be even easier to administer by over-the-counter regulations testing, perhaps on the licence application fee.

WEAKNESSES

All the weaknesses of the option above apply here, compounded by non-compliance with ITU Radio Regulations on Morse code proficiency. In fact, the amateur licence would be reduced to an operating permit very like the current CB licence. Again, the WIA would be unable to support this option for it contravenes existing Institute policy.

Finally, it is not the wish of the Amateur Radio Service to reduce its stature to this unqualified level as demonstrated by the continued support for amateur radio vis-a-vis the citizens band service.

COMPARISON OF OPTIONS

The options presented above have ranged from the difficult, that is, more difficult than the existing licence structure to the most simple, obtainable over the counter for a basic test in radio regulations.

When the constraints imposed by the relatively small numbers of operators nation-wide (some 16 000), the Departmental effort available from licence fees to administer and regulate the service and the lack of general support for major upheaval from within the amateur movement are considered, the extreme options can be rejected. Nevertheless, there is a widespread desire for moderate changes to extend the availability of amateur radio to a wider potential audience. This suggests the "more entry points within existing range" option as best meeting the expressed needs of the amateur service, acknowledging that some adjustments may be necessary should WARC 92 significantly change the Morse proficiency requirements.

CONCLUSIONS

In the longer term, the future of Morse code proficiency qualifications will be determined at WARC 92, for the short term no change is proposed to test conditions.

Present WIA policy seeking amateur licence currency for more than one year at pre-rate reduced charges remains a worthwhile negotiating objective.

The WIA must soon decide upon a first negotiating position in regard to frequency allocations and attitudes for WARC 92. This position must be advised to IARU members.

There may be anti-discrimination grounds to seek redress of the imbalance created for Novices by the Japan/Australia reciprocal licence agreement.

A regulatory balance is slowly being achieved under the Radiocommunications Act. This can be aided by formation of Divisional WIA/DOTC joint committees to support self-regulation goals.

The preferred option for the Amateur Radio Service structure is one with no licence grade lower than the existing Novice theory level, no grade more difficult than the existing Unrestricted and having an increased number of entry points.

RECOMMENDATIONS

It is recommended:

a. No change be made to the amateur Morse code proficiency requirements until after WARC 92 when the outcome of that Conference may be implemented.

b. The WIA should press actively for an amateur licence currency in excess of one year with commensurately reduced fees.

c. The WIA agree its position for frequency allocations for WARC 92 at the 1988 Federal Convention and convey that position to IARU members at the Region 3 Conference at Seoul in 1988.

d. The Japan/Australia reciprocal licence agreement be examined for discrimination against Australian novices and, if confirmed, redress be sought.

e. The formation of WIA/DOTC joint committees be encouraged to facilitate communications with the Department and support self-regulation of amateur radio.

f. The option for more entry points within the existing Novice to Unrestricted licence range be represented to DOTC as the WIA's preferred option.

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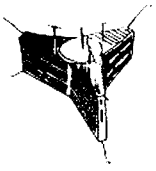


AMSAT Australia

SATELLITE ACTIVITY FOR THE MONTHS OF AUGUST/ SEPTEMBER

1 LAUNCHES

The following launching announcements have been received:

INTL NO 1987	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INC deg
070A	ETS 5	Aug 27	Japan	633.0	35901	199	27.9
071A	Cosmos 1873	Aug 28	USSR	88.8	274	186	64.8
072A	Cosmos 1874	Sep 03	USSR	89.6	333	208	73.0
073A	Ekran 16	Sep 04	USSR	23h43m	35539		0.4
074A	Cosmos 1875	Sep 07	USSR	114.0	1437	1401	82.6
074B	Cosmos 1876	Sep 07	USSR	114.0	1437	1401	82.6
074C	Cosmos 1877	Sep 07	USSR	114.0	1437	1401	82.6
074D	Cosmos 1878	Sep 07	USSR	114.0	1437	1401	82.6
074E	Cosmos 1879	Sep 07	USSR	114.0	1437	1401	82.6
074F	Cosmos 1880	Sep 07	USSR	114.0	1437	1401	82.6
075A	PRC 21	Sep 09	China	89.6	308	204	63.0
076A	Cosmos 1881	Sep 11	USSR	89.5	278	227	64.8
077A	Cosmos 1882	Sep 15	USSR	88.6	253	196	82.3
078A	Aussat K3	Sep 16	ESA/Aust	1429.6	35814	35506	0.2
078B	ECS 4	Sep 16	ESA	1438.0	35989	35690	0.2
079A	Cosmos 1883	Sep 16	USSR	11h15m	19133		64.9
079B	Cosmos 1884	Sep 16	USSR	11h15m	19133		64.9
079C	Cosmos 1885	Sep 16	USSR	11h15m	19133		64.9
080A	Oscar 27	Sep 16	USA	107.3	1183	1018	90.3
080B	Oscar 29	Sep 16	USA	107.3	1183	1017	90.3
081A	Cosmos 1886	Sep 17	USSR	89.8	384	178	67.2
082A	Progress 32	Sep 23	USSR	88.8	267	193	51.6

2 RETURNS

During the period 81 objects decayed including the following satellites:

1986-102A	Cosmos 1810	Sep 11
1987-066A	Progress 31	Sep 23
1987-069A	Cosmos 1872	Aug 30
1987-071A	Cosmos 1873	Sep 14
1987-072A	Cosmos 1874	Sep 17

—Contributed by Bob Arnold VK3ZBB

ar

Novice Notes

SOME PRACTICAL TIPS OF VFO CONSTRUCTION

Drew Diamond VK3XU
'Nar-Meian', Gatters Road, Wonga Park, Vic. 3115

Just about everybody who has attempted a project involving a variable frequency oscillator (VFO) will probably know of the frustrations that can occur in trying to get the thing to perform properly and supply a satisfactory stable output frequency. To the novice, VFO construction may appear to be more of a 'black art' than a science. Traditional radio literature carries a wealth of circuits for just about every amateur application, but the practical aspects are generally given only a few paragraphs. What follows is by no means a full treatment of VFO construction, but is based on actual experience and will, I hope, be some useful tips upon this most interesting subject.

A VFO has many important requirements — good short and long-term frequency stability, constancy of output level, low noise, immunity from mechanically induced frequency changes, spectral purity and preferably, linearity of tuning. To satisfy all these is a lot to ask of any device!

There is a puzzling tendency these days for some builders, especially manufacturers, to make a VFO using sloppy techniques, and then to tack on a phase-locked loop (PLL) to stabilise the thing, so adding unnecessary complexity (and noise), and reducing the overall reliability of the device. If the amateur is prepared to put a little thought, effort and material into the job by following some pretty well established guidelines; the result will be a quality VFO without the need for the PLL panacea.

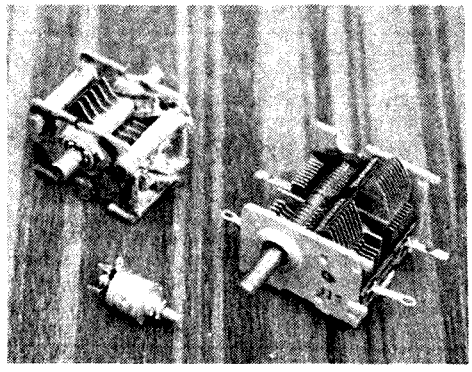
Our first, and most significant enemy is heat, or changes in heat level really. As the components in the frequency determining part of the VFO (oscillator tank) heat up or cool down, their values change, and the frequency will change as a consequence. Obviously, the oscillator circuit itself should be housed in its own enclosure to buffer it from the effects of air draughts, and to slow down any sudden changes in surrounding temperature.

A good plan is to accommodate the entire VFO in a metal box with a tight fitting lid. A die-cast box is ideal, but very good results have been obtained using boxes made from double-sided printed circuit board cut to size and soldered together. The box should, if possible, be thermally insulated from the main equipment chassis. One way of doing this is to attach the box with screws passed through rubber grommets set into the chassis, so providing a useful degree of thermal isolation.

All sources of heat should be distanced from the VFO as far as practicable. These include power resistors, power transformers, power transistors (in fact power anything!), valves, etc. Solid state oscillators therefore offer a stability advantage over one using a valve. Consideration should be given to making the VFO a 'stand-alone' unit if this suits operational requirements. Furthermore, if arrangements can be made for the VFO to run continuously, 24 hours a day, then a considerable improvement in stability will be achieved.

Feedback problems can, and probably will arise if an unshielded VFO runs on the final output frequency of a high power transmitter. So building the VFO into a tight RF proof box not only offers improved frequency stability, but also system stability.

The voltage supply which powers the oscillator must be very well regulated, as small variations in supply voltage can produce changes in oscillator frequency. Even if the main equipment rail (usually 12 volts nominal) is regulated, it is a good plan to drop the voltage to the oscillator and zener it at about 6.8 volts through a 470 ohm resistor from the 12 volt rail. If the loading on the VFO varies, for instance where a keyed stage closely follows the oscillator, then at least one buffer amplifier should be interposed between these stages.



Photograph 1.

CAPACITORS

Variable capacitors of any kind are becoming difficult to obtain, let alone the most desirable type for VFOs — the double bearing, through-shaft, ceramic insulated, split segmented one shown on the left in photograph 1. Note also that a separate spring contact makes the electrical connection to the rotor. These are now highly prized and very difficult to find. I can only suggest that if you see any of these on sale anywhere; buy them, even if you do not have a project in hand at the time. The more commonly available kind is shown to the right — an ordinary BC type made for consumer products. These usually have only one proper ball bearing, aluminium plates (less desirable then silver-plated brass), and ordinary bakelite insulation. Even these are now hard to obtain. I have used this type in many VFO projects, and they have proved satisfactory. * If a choice exists, or when buying, make sure that the shaft rotates smoothly and effortlessly, with no detectable play in the bearing/s. Avoid the kind of capacitor which has only one bearing, as these are notoriously unsuited to VFO applications because of the play which soon develops in this one bearing. Trimming capacitors should ideally have air dielectric. The round Philips 25 pF 'beehive' units are still available from several sources.

* The author was given a number of these, and they are available free to interested experimenters.

Varactor diodes offer an alternative, although their Q cannot be as high as is obtainable with a good mechanical capacitor. Some purists will not use a varactor diode for high stability applications, although, in my own experience, it is possible to build an entirely satisfactory VFO with a varactor as the tuning element. Use of high-stability close tolerance resistors, a good quality potentiometer and a very well regulated and bypassed supply is mandatory when using a varactor however. Reference four has details of a well researched varactor tuned VFO.

Overseas publications often specify silver mica capacitors for the C component of the oscillator tank, although in this country they have become very difficult to buy in small quantities. These capacitors are usually very stable with temperature, although I am not sure myself that their higher cost is justified. A good and easily obtainable substitute is the styroseal or polystyrene capacitors, which generally exhibit a very slight negative temperature coefficient. These are available from about 30 pF to 0.01 uF. For small values of C, less than about 270 pF NPO ceramic types are generally satisfactory, although some experimenters have reported stability problems with these. NPO capacitors are often marked with a black spot.

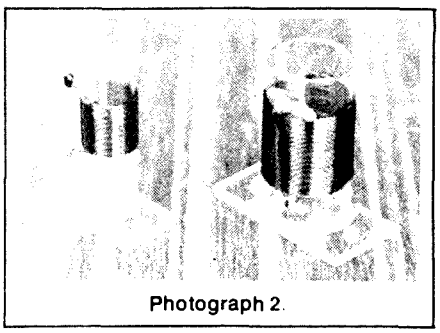
If you find that your nearly finished VFO tends to move lower in frequency as it warms up. it may be possible to substitute some of the tank C with capacitance with a negative coefficient. Only a small amount is generally required. There are no rigid rules applicable to finding the amount required. Start by substituting say 10 pF of tank C with 10 pF worth of N750 C, and observe the results. With cut and try, it should be possible to effect a significant improvement in stability. N750s are often marked with a violet spot. Remember to allow anything up to an hour for your components to stabilise after soldering.

INDUCTORS

The turns of the coil must be held rigid, and the coil solidly mounted to prevent any kind of movement, so some sort of former for the coil will be required. Any material which readily distorts or changes shape with heat must therefore be avoided. PVC, polystyrene and similar materials are not suitable (bang goes the idea of using PVC pipe!). The best material for the amateur is probably Teflon or PTFE tube. This substance is a delight to work, as it cuts and machines beautifully, and is very stable indeed. Electrical insulation wholesalers usually stock Teflon tube

and rod in various sizes. It is rather expensive, but worth the cost. A ceramic former, perhaps salvaged from some military equipment is a good choice also. Glass is a reasonable choice if Teflon or ceramic formers cannot be obtained.

As an example of home-brew, Photograph 2 shows two solenoid coils wound upon glass phials of the kind used by chemists. Two solder tags have been glued with epoxy cement to the former to provide tie points for the winding, and a perspex mounting base attached.



Photograph 2.

Some circuits specify a coil with an adjustable slug of powdered iron to provide a means of varying the inductance of the coil by a small degree. The permeability of any slug will most likely be greatly influences by temperature. Therefore, the slug of such a coil must never be relied upon to provide a significant amount of the total inductance, ie the slug should just influence L by being only slightly engaged into the coil winding.

Generally speaking, toroidal cores should not be used for VFO tank inductors, due to their susceptibility to temperature changes. Curiously enough, one of the most stable VFOs I ever made used a coil wound upon an Amidon T68-2 core (Ref 5), so it would appear that this core is very stable. However, I cannot vouch for any other core type. The great advantage with toroidal cores is their closed magnetic field, so they do not radiate unduly, nor are they as susceptible to external fields as an ordinary coil would be.

For maximum frequency stability, the tuned circuit Q, and hence the inductor Q must be as high as possible. Some empirically derived rules of thumb may be applied to the achievement of a high coil Q:

- Q increases with coil diameter and wire gauge.
- Q increases with coil length, but not significantly beyond the point where the length is 1.5 times the diameter.
- Maximum Q is obtained with a spacing between adjacent turns which is about the same as the wire diameter (selection of the nearest standard wire gauge is satisfactory for practical purposes).
- Metal objects, including the coil can if fitted, should be distanced from the coil by at least one coil diameter.
- The use of 'litz' wire (if available) can only be justified between about 0.5 and 3 MHz.
- Do not leave residual deposits of perspiration or oils on the enamelled wire or the coil former.
- For high L stability, the wire should be wound onto the former under tension.

OTHER CONSIDERATIONS

In addition to using the best variable capacitor available to you, some sort of dial arrangement must be devised. One trap for the unwary is to directly connect the capacitor shaft to a reduction drive. If the alignment between drive and capacitor is poor, the drive will be stressed and become 'back-lashy' with use. In addition, the frequency variation with rotation may not be smooth, but could be rather 'gritty' (frequency scintillation). This is due to the alternative, but inconsistent alternative ground path for the capacitor rotor connection through the balls or gears of the drive. The solution of course is to interpose an insulated flexible coupler between drive and capacitor shaft. As these too have become hard to get, a reasonable substitute can be made at home. A short length of 0.25" insulated rod (eg No 3 knitting needle) may be cut in four places as illustrated in Figure 1.

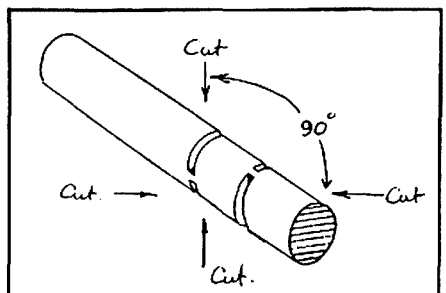


Figure 1.

This is connected via an ordinary solid brass coupler to the capacitor shaft, and would provide adequate coupling flexibility if the drive and capacitor are reasonably well aligned.

There is still some debate going on (Ref 6) as to the advisability of accommodating the VFO tank components on printed wiring board. Some experimenters favour other methods, including good old tag strip. The insulating material in the PWB forms the dielectric of small but significant capacitances, and these may be temperature sensitive. My own experiences have indicated that these effects will *not be a problem if* fibreglass board is used, and double-sided material is avoided. In addition, those little ceramic stand offs are ideal for use as component tags if available (Photograph 3).

Whatever the construction method, all the components in the oscillator circuit must be mounted so that they cannot move. Any necessary wire connections, like that between the PWB and the variable capacitor should be of a heavy gauge, No 18 at least, and kept as short as practicable. Clearly, any long lengths of wire which can flop about will vary the parasitic C and L around the circuit, and affect the frequency.

CHECKING VFO STABILITY

It would be difficult to put an actual figure on any VFO stability requirement, so the particular

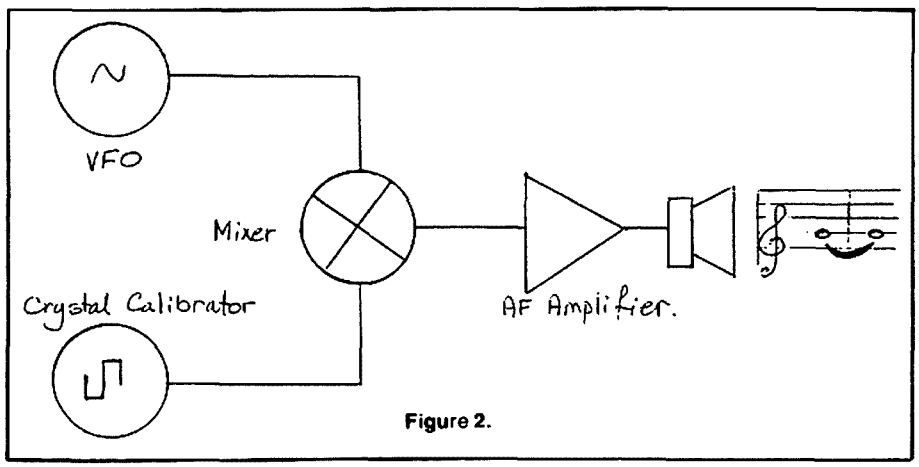
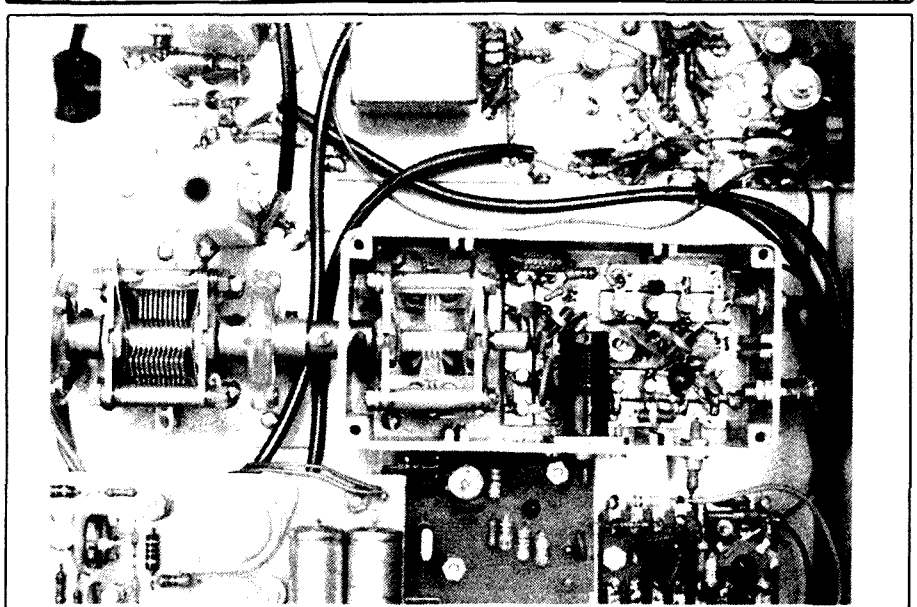
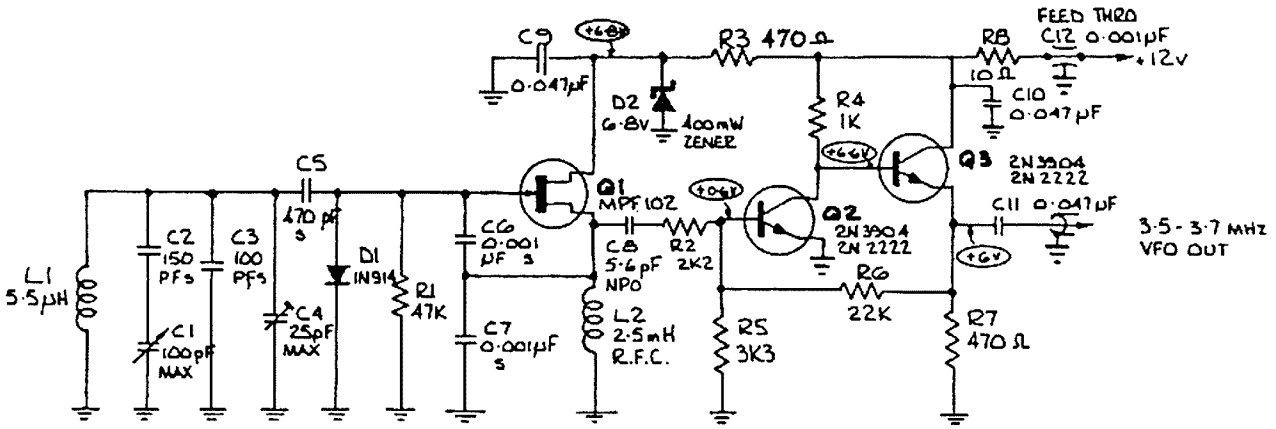


Figure 2.



Photograph 3.



Note:
L1: 32 turns No 22 B & S on Amidon T68-2 Toroidal Core.

All capacitors > 16V.
S = Styroseal (Poly).
Other Disc Ceramic
All Resistors ¼W 5 percent.

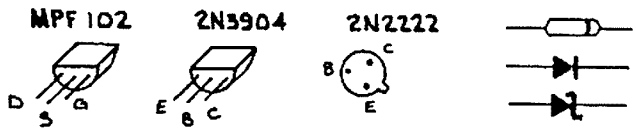


Figure 3.

application must be considered. A figure of five parts per million after warm-up is however, not unreasonable to aim for, and with care, it may even be possible to approach the stability of a crystal oscillator.

There are several methods available to us for checking frequency stability; if not absolute frequency. If you have access to a frequency counter, it is just a matter of observing the frequency trend of the display, and deciding if the stability is adequate for the intended application.

If your receiver covers the VFO frequency; simply check this against the receiver calibrator (on AM).

The 1940s frequency meter BC221 still represents a useful tool even today. The VFO signal is applied to the meter input, and the frequency manually measured off. By listening to the beat note the user gets an immediate idea of the frequency stability of the VFO.

The schematic in Figure 2 shows another method which makes use of a four-diode mixer, a crystal calibrator and an audio amplifier.

The calibrator is set to deliver a harmonic upon the expected VFO frequency. When the VFO is close to the harmonic frequency, say 1 kHz different, a 1 kHz tone will be heard (we have, in fact, a DC receiver). By listening to the constancy of the tone, we soon obtain a 'feel' for the frequency stability With a little careful observation, it will also be possible to do some absolute frequency measurements with this technique. For example; if our VFO is expected to tune from 2.9 to 3.4 MHz, the calibrator would first be set to deliver 2, then 4 MHz pips. Only weak beats should be heard when the VFO is tuned through its range. However, with the calibrator set to 1 MHz pips; a very strong signal will be heard when the VFO is swept across the third harmonic at 3 MHz. This establishes the 3 MHz point. With the calibrator now set to 100 kHz; the 2.9, 3.1 etc points can be found, and the actual tuning range confirmed.

TYPICAL CIRCUIT

The Colpitts circuit shown in Figure 3 is typically the sort of VFO to be found in many applications today, and is a deservedly popular arrangement.

In the example shown in Figure 3, the frequency range is nominally 3.5 to 3.7 MHz, and formed part of a DSB/CW transmitter project (Ref 5). The components in the oscillator tank may be scaled up or down to suit the frequency required. This circuit has been used successfully to cover specific frequency ranges between 1.8 and 29 MHz.

Some examples are given in Figure 4 for tank values to cover other popular frequencies. Other ranges can be found by calculating the values of capacitance and inductance to yield the reactances shown. The nearest preferred component to the calculated value will normally suffice.

References and Further Reading

1 Solid State Design — ARRL
2 Radio Amateurs Handbook — ARRL
3 Radio Communication Handbook — RSGB
4 Building Blocks Revisited — Hepburn VK3AFQ, AR, August 1987
5 DSB/CW Transmitter — Diamond VK3XU, AR, March 1985
6 A Stable VFO on PCB — Keyser G3ROO, CW Mag, May 1986
7 Practical RF Design Manual — DeMaw, ISBN 0-13-693754-3
8 Radiotron Designers Handbook — Langford-Smith

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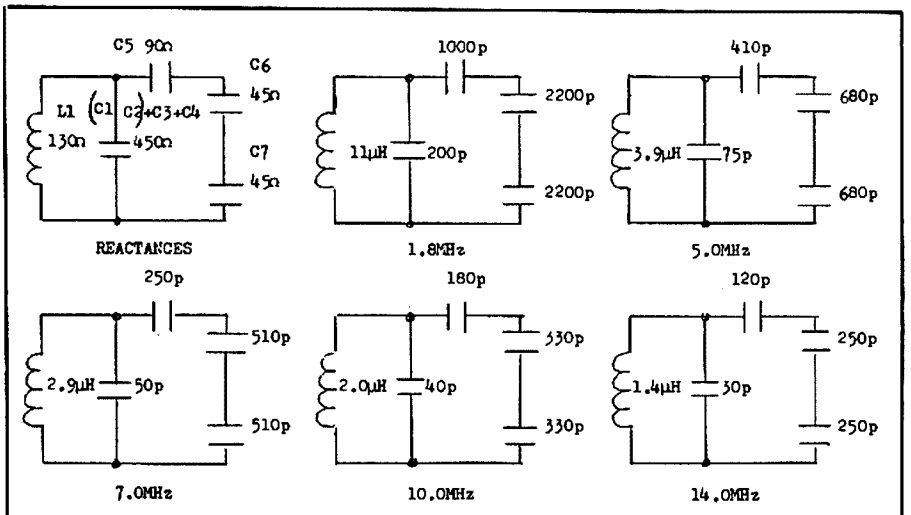


Figure 4.

VHF UHF — an expanding world

Eric Jamieson VK5LP
8 West Terrace, Meningie, SA. 5264

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
*50.005	H44HIR	*Honiara* [1]
50.010	JA2IGY	*Mie*
*50.022	ZS6PW	*Pretoria*
50.075	VS6SIX	*Hong Kong*
50.090	KH6EQI	*Honolulu*
52.013	P29BPL	*Loloata Island*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
*52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
*52.330	VK3RGG	*Geelong*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
*52.418	VK0MA	*Mawson*
*52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
*52.440	VK4RTL	*Townsville*
*52.445	VK4RIK	*Cairns*
*52.450	VK5VF	*Mount Lofty*
*52.460	VK6RPH	*Perth*
*52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
*52.485	VK8RAS	*Alice Springs*
*144.022	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
*144.410	VK1HCC	*Canberra*
*144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
*144.445	VK4RIK	*Cairns*
*144.445	VK4RTL	*Townsville*
*144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
*144.485	VK8RAS	*Alice Springs*
*144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
*144.600	VK6RTT	*Wickham*
*144.800	VK5VF	*Mount Lofty*
*144.950	VK2RCW	*Sydney*
*144.950	VK3RCW	*Melbourne*
*145.000	VK6RPH	*Perth*
*432.066	VK6RBS	*Busselton*
*432.160	VK6RPR	*Nedlands*
*432.410	VK1RBC	*Canberra*
*432.410	VK6RTT	*Wickham*
*432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
*432.445	VK4RIK	*Cairns*
*432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*MacLeod*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
*1296.198	VK6RBS	*Busselton*
*1296.420	VK2RSY	*Sydney*
*1296.445	VK4RIK	*Cairns*
*1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*
*10445.000	VK4RIK	*Cairns*

* Those beacons preceded by an asterisk have been confirmed as operational, either by the custodian or another interested person. A helpful telephone conversation with Bob VK6KRC, confirmed the status of a number of the VK6 beacons and he is trying to establish the position with the remainder of his State.

The VK1 beacons have been confirmed by Dick Elliott VK1ZAH, the VK1 FTAC representative. He said the 51.410 MHz beacon was under development, but had never been tested on air. The two VK1RBC UHF beacons share one identifier controller and use FSK for identification.

Dick said there is a weak sub-harmonic from the 1296 beacon on 432.1367 MHz which, although not radiated by the 1296 antenna, is discernible over much of north-west Canberra. It is currently considered a QRP beacon because the signal has been so hard to effectively remove and probably requires a complete re-build of the system. The 144 MHz beacon is on Mount Majura while the others are at Aranda, a Canberra suburb. Eventually it is hoped to have them all on Mount Majura for an improved coverage.

1 The H44HIR beacon has been relisted in response to a message from Phillip FK1TS, who said he has heard the beacon operating and sending a message "QSX 28R885" (this being the 10-metre liaison frequency for six metre operators). This beacon used to be a regular on the band a few years ago during a better part of the solar cycle.

Phillip has recently returned from a visit to Townsville, where he met other six-metre operators, VK4FXZ, VK4KAA, and confirms the VK4RTL beacon is operating well.

On returning to Noumea, he found many JA signals on 50.110 MHz, October 26. Although only running three watts to a wire antenna, he managed to work three in JA2 and one JA9. More could have been worked except for an emergency arising at his work place so he had to reluctantly leave the band.

Phillip now has 25 watts on two-metres via an IC290H; also dual band mobile antenna and duplexer so will be able to listen on 144.100 MHz, during six metre openings.

CLIMBING MOUNT MINTO

Mount Minto is in the Admiralty Range which lies across the Transarctic Mountains, near the northern tip of the western coast of the Ross Sea. It is 4163 metres ASL and has never been ascended although numerous attempts have been made during the past 20 years, the most recent being an Austrian expedition in 1985/86, and again in 1986/87. Most attempts have been beaten by the weather.

A letter from Don Richards VK2BXM, (which arrived just too late for inclusion in last month's issue), says plans are advanced for another voyage to the south in the *Dick Smith Explorer*, to try to scale Mount Minto. The team will leave in December and Don will be the ship's master and radio operator. It is hoped to land a shore party at Cape Hallett or Cape Adare, about 70 kilometres from Mount Minto. A helicopter can be used to get the party ashore if the shore cannot be approached. The ship will then put to sea where it will continue with a marine studies project. The shore party will be faced by a long slugging trip across the broken and crevassed ice cap before starting the actual climb.

Don VK2BXM, says he will be taking mainly HF equipment and will not be leaving the ship. He hopes to obtain the loan of a suitable two metre transceiver with SSB and FM and would be interested in trying auroral scatter contacts. He would like to take six metres, but the size of a suitable beam is hard to accommodate amongst all the other equipment on board, and it will be difficult enough with a two metre beam! He is not planning to use a VK0 call sign, but his own plus /MM.

The distance is about 2400 nautical miles from Sydney on a course of 171 degrees T, for the Ross Sea, where he and the others in the team should arrive about three weeks later. If Australia was to experience another large auroral period like last February, then a contact on two metres is a distinct possibility. Although not stated in the letter, one would think Don would at least start any calls on the calling frequency of 144.100 MHz. The letter says I am to receive further information.

FROM SOUTH AFRICA

Hal Lund ZS6WB, has sent another copy of *VHF News* and special prominence is given to the Heard Island DXpedition mentioned in these columns last month.

Also mentioned was the first QSO of the Six Metre TEP Tests on 2/10 when Dave A22KZ, in Maun and Costas SZ2DH, in Athens, Greece, for 15 minutes on 50.110 MHz at signal levels around 5x4. At 1527 UTC, Dave reported hearing the 9H1SIX beacon in Malta, and by calling on both 28.885 and 50.110, eventually the two-way contact resulted. The beacon continued to be heard at A22KZ until after 1900 UTC. The beacon appeared again on 4/10, but no one could be raised in the European area.

JAPANESE JOTTINGS

My good friend, Yoshi JA1VOK, has sent me October and November copies of the independent DX magazine, *Five Nine* which also carries the heading *Message for DX Lovers!* It is written in Japanese with English for some of the tables and charts, but Yoshi has added some English translations for me.

The first page of information is headed *World VHF News JA1VQK*, and carries a greeting for the starting of a VHF column in what has probably been an HF magazine, as this page is actually number 26! The top 100 50 MHz DX standings are taken from the *QST* columns by Bill Tynan W3XO, which shows JA4MBM as heading the list with 79 countries confirmed and 81 heard. VE1YX is next with 77/79. Yoshi, together with JH1XWA, visited Bill Tynan in April 1987, and they are shown in a picture together in Bill's shack.

The CT0WW beacon on 50.030 MHz is listed as having 40 watts output, whilst the new South African beacon on 50.0225 is given prominence. European beacons are SZ2DH on 50.015; GB3SIX 50.020; CT0WW 50.030; ZB2VHF 50.035; OX3VHF 50.045; GB3NHQ 50.050 and GB3RMK on 50.060 MHz.

Chinese stations, BY4RB and BY4RN, around August 20 to 24, were working JAs; but on 21/6 at 0530 N5CW heard JE2KCP over a distance of about 9000 kilometres. (This may have been some early F2 assisted by Es. The distance seems rather far for multi-hop Es alone).

It is also worthy of note that G3COJ worked 43 stations in the USA from 10/6 to 21/7. It will be interesting to see how long it takes to achieve a G to JA contact on six metres and for another VK to G contact to eventuate.

This spread of information into the pages of another magazine must surely be of benefit to those operating on VHF; we hope the work of JA1VOK is rewarded.

TWO METRES

Mark VK5ZMK, at Gepps Cross, Adelaide, found the two metre band to be in good condition around 1045 UTC on 27/10, when he worked David VK3AUU at 5/3 and received 5/4 and Les VK3ZBJ, 5/2 and 5/6.

Although the VK5LP establishment is still not operational after the big move, I would think the southern weather patterns would have to be conducive to some good openings on the band, perhaps even across to Albany and Esperence.

David VK3AUU, has sent some news of his exploits on two metres. During the special moon-bounce weekend of October 17 and 18, he again worked W5UN, this being the fifth time using 120 watts output to a single 19 element Yagi. Just before moon-set his signal was peaking at 20 dB above the noise in 50 Hz bandwidth. David also copied N5BLZ, WA1JXN/7, OZ1EME, DL8DAT, EA1LU and SM5FRH.

David said VK3AMZ worked W5UN and N5BLZ, and heard a few more than he did, as he has a pair of 15 element DL6WU antennas.

David also mentioned his contact with Mark VK5ZMK, and that the Adelaide beacon was good again the following night (28/10) but no OSOs resulted.

Some measurements he has done on sun noise with the sun setting at an elevation of +3 degrees, indicates a handy +5 dB of signal should be available due to ground reflection when the moon is rising or setting. This confirms observations at K2US.

EME REPORT

Doug VK3UM, spoke of some excellent conditions for 3/10, but the big EME weekend of October 17 and 18, was something of a disaster due to a large solar flare on the Friday night before resulting in a virtual wipe out of many signals. Signals could be there for two minutes then disappear for 20 minutes to half an hour, due to serious libration fading (although it appeared not to have been so bothersome in New Zealand).

On Saturday 17/10, for the first five degrees after moon-rise there were big echoes. Doug worked about 12 stations altogether, four Europeans and about eight in W-land. Some contacts were good, others a disaster! But he worked all he could hear including W3IWI on 70 cm, but, due to his signal level concluded he must be having some problems. ZL3AAD also worked W3IWI.

I hope I have this part of the message correct, but Doug advised that John ZL2AQE, had established a world record on EME of 2304 MHz to W3IWI. John was using five watts into a 12 foot dish. Good work!

Also reported was a station in the UK which would be coming on in November with a 64 foot dish. If everything works out well that should provide a hefty signal.

Doug VK3UM and Chris VK5MC, worked one another on 70 cm EME with M reports!

ALICE SPRINGS

On Monday, 2/11, Peter VK8ZLZ, during the late afternoon has the pleasure of getting amongst some JAs on six metres whilst mobile, running about three watts to a whip antenna. He worked several stations, but one signal stood out, JA3EGE, with whom reports were exchanged at 5x9 both ways! Mike VK8ZMA, worked many JAs as well, all on 52 MHz. In addition, Mike worked a VS6 in Hong Kong, but there are no details of the call sign.

In my telephone call to Peter he said he had just moved to another house which would place him about one-and-a-half kilometres from VK8ZMA, but a little to one side of a direct line, so was hoping the higher power Mike runs would not keep him off the band too much. Peter will be quickly getting on with the job of getting some antennas up, but this first of all requires a tower to be erected.

Peter also remarked that the Alice Springs beacons would be shifted soon to a new location south of the Alice where they should have a good take-off to VK5; he even suggests we may hear the two metre beacon before we can hear stations in the Alice!

50 MHz STANDINGS

The November issue of *QST* contains the latest list of 50 MHz standings by Bill Tynan W3XO. This has an update of information mentioned earlier in the Japanese magazine. VE1YX heads the list with 81 countries confirmed and 82 claimed; next is JA4MBM with 79/81 and K8WKZ with 73/76.

Looking down the list I see Graham VK8GB, still heads those from Australia with 42/42. Next are VK2BA and VK4ZJB both with 30/30. VK2DDG is given prominence as he features twice, once with 28/29 and then further down with 25/26. I presume the last entry was not removed after the update. I note there are a number of VK stations who have their listings in *QST* but don't bother to include them in my listing in AR!

Bill Tynan's *World Above 50 MHz* reports on a flurry of activity in the US in the microwave regions which is interesting as this area has long been the province of the European stations.

Bill also says there has been little long-distance propagation to report after the large degree of activity during their summer months.

And, whilst talking of reduced activity, I see by the listing for September in the Japanese CQ ham radio magazine (courtesy Graham VK6RO), that their Es season through June and July really did not produce anything of outstanding interest. Many contacts were made to Korea and Hong Kong, plus some to China and Guam, but little else. No contacts were reported having been made with Australia.

CLOSURE

There is not much else to report so there seems no need to prattle on! Hopefully I will have the antennas erected soon and be able to give some first-hand information on band condilions. During the heatwave recently, I took out the IC502 and listened on six metres under the power lines which pass along the front of the house and was pleased to note there was only a very low level of power leak, and what there was could be easily eliminated by the noise blanker, so that looks like one plus already noted.

May I take the opportunity of wishing everyone a happy and prosperous New Year and plenty of DX as we climb up from the trough of the solar cycle.

Thought for the month: "A woman described her father as a road-sweeper. She commented that some people branded his work as lowly, but she rated the person who picked up the rubbish far higher than the one who dropped it!" and "Youth, the more it is wasted the sooner it wears."

73, The Voice by the Lake.

ar

Book Review

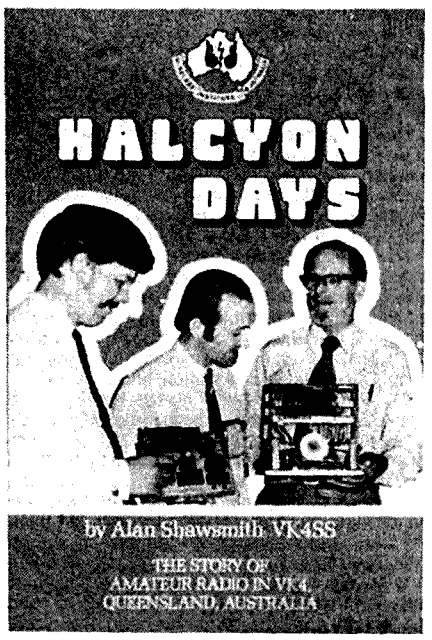
HALCYON DAYS

The Story of Amateur Radio in VK4, Queensland, Australia

by Alan Shawsmith VK4SS
(Official Historian, Queensland Division, WIA)

Published by Boolarong Publications

Bill Rice AX3ABP
54 Maidstone Street, Altona, Vic. 3018



The long awaited history of amateur radio in Queensland has made it into publication. VK4SS deserves the heartiest congratulations on the tremendous effort he has obviously put into this publication, which represents the culmination of years of historical research.

The book has 177 pages, and is divided into 17 chapters, with headings such as "Pathfinders", "QSLing", "Contests and Awards", but by far the largest is entitled "Profiles", and contains 49 pages of Alan's inimitable thumbnail sketches of notable Queensland amateurs, many of whom have now passed on to the ranks of the Silent Keys.

Alan chose the title "Halcyon Days" as best representative of amateur radio during the period between the two World Wars, and this would be true of most of the civilised world. The technology of world-wide communication evolved during this period, with amateurs providing more than their share of innovative effort, but from 1945 onward commercial exploitation of the spectrum began to snowball, alternatives to home-brewed equipment started to appear, and the world was never the same again! Perhaps we may hope that plans for a book on amateur radio post WWII are already developing in Alan's fertile mind!

If one could make any criticism of such a monument to dedicated effort, and I do so with some trepidation, it is that the book is about 99 percent devoted to Queensland, and gives little attention to parallel evolution of the hobby (dare I so belittle it? Way of life, perhaps?) in other States and overseas. But I fully realise that a similar book about Australia as a whole could well be a long life's work. Perhaps Alan should instead be congratulated on having set specific boundaries to his undertaking, and remained so effectively within them.

One ability possessed by a book such as this is to bring home forcibly to the modern radio amateur how great is the debt he owes to the pioneers who made it all possible. It should be compulsory reading for all who value our unique, demanding, but deeply rewarding part-time occupation!

Our copy came (via the author) from the VK4 Division. If not already sold out, the price is $12 from the WIA Queensland Divisional Bookshop, GPO Box 638, Brisbane, Old. 4001.

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Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7251

CONTEST CALENDAR

JANUARY 1988

2 — 3 *73* magazine 10 Metre SSB Championship Contest
9 — 10 *73* magazine 15 and 20 Metre SSB Championship Contest
9 — 10 European YL-OM Contest
— 10 Ross Hull Memorial VHF/UHF Contest concludes (Rules November issue)
16 — 17 *73* magazine 160 Metre World SSB Championship Contest
16 — 17 Hungarian DX Contest
23 — 24 *73* magazine 40 and 80 Metre World SSB Championship Contest
29 — 31 CQ WW 160 metres CW Contest
30 — 31 French DX CW Contest
30 — 31 YL ISSB CW QSO Party

FEBRUARY 1988

13 — 14 Netherlands "PACC" Contest
13 — 15 YLRL YL-OM Phone Contest
20 — 21 ARRL DX CW Contest
26 — 28 CQ WW 160 Metre SSB Contest
27 — 28 REF French DX Phone Contest
27 — 28 YLRL YL-OM CW Contest

MARCH 1988

5 — 6 ARRL DX Phone Contest
12 — 13 QCWA Phone QSO Party
12 — 13 RSGB Commonwealth CW Contest
19 — 20 WIA John Moyle Memorial National Field Day Contest (Rules next month)
19 — 20 YL ISSB Phone QSO Party
26 — 27 CQ WW WPX SSB Contest

May I offer my belated greetings for Christmas and wish you and yours a healthy, happy and prosperous New Year.

The Ross Hull Memorial Contest should be still under-way and providing some interesting new contacts, please send in a log and we may build up the contest again.

The contest season is now in full-swing and, from the list of contests in this issue of AR, there is a contest to suit almost every active amateur who likes a good contest, but I sometimes feel for those who just like to rag-chew on 20 metres over the weekend.

Rules for the John Moyle Memorial Field Day will be published next month, together with the results of the 1987 Remembrance Day Contest. The John Moyle Field Day Contest will coincide with the NZART National Field Day and, with a small change to a rule, will make it easier to run and take part in.

Now is a good time to remind contesters to please read, and read again, the rules before entering a contest, and then read them again before filling in the rest of the paperwork that should accompany your entry. The term "in accordance with the rules and spirit of the contest" means exactly what it says with respect to the rules. In the case of "spirit of the contest" this is a good old fashioned and probably out of style meaning, but I like to think of it as "doing the right thing". Those of you who enter logs under various call signs are not, in my opinion, doing the right thing. One call sign, one station, one contest!

During the period following the Remembrance Day Contest, and the closing date of entries, I found that the earlier entries received "and some claimed some high scores" were mostly handwritten, whereas those very late entries contained a high proportion of computer generated logs and handwriting that was not easy to read. Me thinks the computer is finishing off the job that the ball point pen started!

With the higher HF bands attracting more attention these days it will be interesting to check the activity that the *73* single-band world SSB championships generate. Your scribe will be looking at the other end with the hopes of that elusive opening on 160 metres that will get me one more towards the DXCC on 160 (look out Jim).

Rules for the 73 World SSB Championship Contests are as follows:

73 MAGAZINE WORLD SSB CHAMPIONSHIP CONTESTS

A series of six single band contests organised by *73 magazine* will determine the single band SSB World Champion on each band, 10 through to 160 metres.

Second annual 10 metre test (48 hours) will be held from 0000 UTC, Saturday, to 2400 UTC Sunday, January 2-3.

Fourth annual 15 metre test (24 hours) will be held from 0000-2400 UTC, Saturday, January 9.

Fourth annual 20 metre test (24 hours) will be held from 0000-2400 UTC, Sunday, January 10.

Ninth annual 160 metre test (48 hours) will be held from 0000 UTC Saturday to 2400 UTC Sunday, January 16-17.

Seventh annual 40 metre test (24 hours) will be held from 0000-2400 UTC, Saturday, January 23.

Seventh annual 75 metre test (24 hours) will be held from 0000-2400 UTC, Sunday, January 24.

CLASSES: Both single and multi-operator, single transmitter. Stations may operate the full contest period regardless of their classification.
SPECIAL 10 METRE: Novice single operator, limited to 250 watts PEP. 28.300 to 28.500 MHz, can compete with each other.
EXCHANGE:RS report and state, province, or territory for the 48 US states and 13 Canadian areas. RS and country for DX stations, including Alaska and Hawaii. For 10 metre US Novice, RS and state, and consecutive QSO number.
POINTS — Five QSO points for contacts within your own continent, 10 QSO points for contacts outside your own continent. Five bonus points for each US Novice station contacted in the 10 metre contest. Novice stations are easily identified as they are the only ones giving out contact numbers.
MULTIPLIERS: One multiplier for each US state, Canadian area and DXCC country worked (excluding the US or Canada).
FINAL SCORE — Total OSO points times the Multiplier points.
AWARDS: A plaque to each World Champion winner on each band (minimum of 500 contacts). Certificates in each class in each US state, Canadian area and DXCC country (minimum of 200 contacts).
DISQUALIFICATION: Taking credit for duplicate contacts in excess of three percent of the total made can mean disqualification. There is a stiff penalty of 100 OSO points for each duplicate contact for which credit has been claimed, and failure to comply with the rules and regulations and unsportsmanlike-like conduct.

A summary sheet showing the scoring and other essential information and a dupe sheet for entries with 300 or more contacts is required.

It is suggested that you send a large SAE and return postage to the Contest Chairman, Bill Gosney KE7C, 2665 N Busby Road, Oak Harbour, WA 98277 for official forms.

Mail separate entries to the individual directors listed below postmarked **no later** than February 18, 1988.
10, 15, and 160 metres — Russ Blair KE7KF, 2113 East 10095 South, Sandy, UT 84092.
20 and 75 metres — Ron Johnson WE7H, 68 South 300 West, Brigham City, UT. 84302.
40 metres — Dennis Younker NE6I, 43261 6th Street East, Lancaster, CA. 93535.

COMMONWEALTH CONTEST

Though not mentioned with the rules for the 1988 contest published last month, medallions will again be presented to the VK winner and to the state team of four, as in previous years.

In *Amateur Radio*'s coverage of the results of the 1987 contest, only the scores of the top 10, and all the VK and ZL entrants were shown out of a total entry of 149. Among the remainder were many of those that we would love to pick up for those extra bonus points, ZD8, Z2, ZC4, 5B4, 9J2, ZB2, 8P9, VP2M, 5N, 9M, etc.

Many of these seem to operate only at a time when their signals cannot be heard in this part of the world, and it has been suggested that VKs target some of these areas by letter enclosing a copy of the rules and suggesting that many VKs would like to work them in the contest.

A couple of VK3s have agreed to survey the bands for the next couple of months and note who is active on CW in these areas, and that includes ZL4!

John VK3ZC suggests that those willing to give this scheme a try send him a SASE which he will return with a copy of the rules and the call and QTH of a station who might be persuaded into taking part at a time when signals might make it through to VK.

John's address is John Tutton VK3ZC, 11 Cooloongatta Road, Camberwell, Vic. 3124.

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How's DX?

WORKED ON THE EAST COAST
SEPTEMBER 1987

JW5E, SSB on 14 MHz.
QSL to LA5NM.
Operator Rom says that, beside September, March is the other month when propagation is the best to this country across the North Pole.

BY4AOM, from Shanghai, SSB on 14 MHz.
QSL to PO Box 227, Shanghai.
Operator John, excellent and beautiful English. Aged 68, his mother was an English lady.

T32BE, CW on 3.5 MHz.
QSL to WC5P (prompt reply card received).
Operator Paul was on Christmas Island in the Pacific.

ZC4EE, CW on 14 MHz.
QSL via the bureau to Nick in Nicosia.

HG19HB, CW on 14 MHz.
QSL via bureau.

CR6BWW, special commemorative call sign for 60th anniversary.
QSL to CT1BWW.

OCTOBER 1987

C21XX, SSB on 1.8 MHz.

HX2FV (France), special call sign for the blind. SSB on 14 MHz.
QSL to FF6URA.

IO1IIC, SSB on 14 MHz.
This is a special call sign for the Genova (Italy) International Communication Institute.

YI1BGD, SSB on 14 MHz.
Operator Rajed in Baghdad.

GB2URR, SSB on 14 MHz.
Special event station. Operator Gary, West London, near Uxbridge. Opening day of the Brunel University.

A92EM, SSB on 14 MHz.
QSL via bureau.
John in Bahrain.

KG6SL, SSB on 14 MHz.
QSL via WA6AHF.
Bert is on Saipan.

9M2SXI.
Jamboree on the Air station in Penang.
Operator Mal.

VU4GDG/TS.
QSL via VU2GDG.
This is the DX operation on Andaman Island. Worked Gopal CW on 21 MHz and SSB on 21 MHz.

Some rare call signs during the CQ WW DX Phone Contest were:
HS0A, HC1OT, P40T, HC8DX, HK4R, DX1A, P40V, PY5EG, KH2F/P/KH4 (Midway Island, QSL via N2AU), CW8B (Uruguay), PJ1B, L2D (QSL via LU5EIC). (What do other amateurs think of the International Regulations regarding amateur call signs? L2D? !)
These contests are a must for prefix hunters.

WORKED ON THE EAST COAST OCTOBER 26 — NOVEMBER 8, 1987

14 MHz

KH0AC, Saipan.
Operator Len, QSL to K7ZA.

KL7LF/P/KH3, Johnston Island.
Operator Joe, QSL to KL7VZ.

GB2RNX, CW Special Event Station representing the Royal Naval Auxiliary Service celebrating 25 years Silver Jubilee.
Operator Bill. Special QSL card will be sent.

9K2KW, Kuwait.
Operator Farid, QSL to 9K2DT.

PZ1DC, CW in Panamaribo, Surinam.
Operator John, QSL via the bureau. Interested in Australian awards.

PY1QN, CW in Rio de Janeiro.
Operator Ben, QSL via the bureau.

CX1DM, CW in Uruguay.
Operator Harry.

9Y4JJA, Pala Seco.
Operator Joe, QSL via the bureau.

4S7PVR.
Operator Paul, QSL to F6FNU.

21 MHz

ZK1XE, Raratonga.
Operator Peter OH1RY, on South Seas DXpedition. QSL to OH1RY.

FR5EL, Reunion Island.
Operator Michael from Le Tampon.

There was an excellent opening on 28 MHz to Europe, short path, on November 8, 1987 between 0700 and 1100 UTC.
About 38 CW QSOs were conducted. Most of the European countries were contacted — it was almost a contest-type of operation.

—Contributed by Steve Pall VK2PS

DXAC PRESS RELEASE

DXCC-CW ROLL BACK DATE

The ARRL DX Advisory Committee (DXAC) was to vote last October on whether to recommend rolling back the start date of the DXCC-CW award to 1945 to coincide with other awards. Many DXers feel that the CW award should have preceded, or at least have had the same start date as other more modern forms of communication.

ARUBA

The DXAC were also to vote in October whether to recommend that Aruba be added to the DXCC Countries List. The last vote on this matter was defeated as a result of a tie vote. Usually a petition is not considered again until a lapse of two years, but the chairman may waive this waiting period if he estimates sufficient additional information has been received to reconsider the petition. This discretionary privilege was exercised in reference to Aruba.

ARAB DEMOCRATIC SAHARAU REPUBLIC

The Lynx DX Group of Spain has petitioned the ARRL for recognition of the above Republic as a new DXCC country. The Lynx group have provided excellent supporting documentation and there has not been any adverse comments from within the DXAC on the petition. The vote was scheduled for December 15, 1987 and if the votes were affirmatively, the DXAC would probably recommend that the effective date be made rectroactive.

RESTRUCTURING THE DXCC

The DXAC is listening to the DX community's comments and recommendations on this matter, and assessing the practical application of many suggestions. It appears as if there will be some recommended changes.

The DXAC chairman and sub-committee chairmen for the DXCC study met in Oakland, CA, early in December, to finalise the draft proposals of DXCC rules. The recommended rules were then forwarded to the Board of Directors for consideration. It is unknown how the final product will look, but the DXAC were striving to maintain the integrity and merit of difficulty of the present program, whilst, at the same time, providing fair, impartial and attainable goals.

—Contributed by Ken McLachlan VK3AH from material supplied by John Panott Jnr, W4FRU, Chairman, ARRL DXAC

Beacons & Repeaters

Tim Mills VK2ZTM
F1AC BEACON CO-ORDINATOR

This month you will find a list of the Australian beacons and repeaters on the centre pages of this AR. It was taken from the WIA data base. Should there be any errors in the listing of your system, would you write to the Federal Office, PO Box 300, Caulfield South, Vic. 3162, with any corrections.

There has been considerable discussion in VK2 about the expansion of the paging network which is the two-metre band's neighbour at the high end. Both Telecom and commercial networks are expanding and, in time, there will be systems in any part of the country that can support them. This will place a strain on amateur repeater installations as most will find they are either sharing a hilltop with a network or there is one nearby. To date, only VK2, 3, 4 and 6 have repeaters above 147 MHz with about 40 systems operational. (Read comments in the *VK2 Mini-Bulletin* on changes in that State).

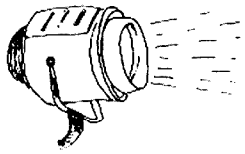
Now is maybe the time to have a hard look at the problem and to determine the best solution. It is not desirable to leave the top Megahertz. The Amateur Service should be making full use of all its spectrum and to show other interests that it is being used. Perhaps it would help the repeater operators of systems above 147 MHz if the input and output frequencies of their repeater were reversed. This would place the input an additional 600 kHz away from the top of the band. Reversal has occurred with two systems in Brisbane. Telecom channels are at the low end of 148 MHz, starting at 148.0125 MHz. The commercial systems start from about 148.500 MHz and the pager band extends to 150 MHz. Typical power (EIRP) are quarter, half or one kilowatts and in major population centres there is likely to be more than one transmitter in operation. Most networks are expanding outside the major cities to provide regional, State or national coverage. As the use increases, so does the on air time.

It is also time to consider the question of tone access. The chief advantage would be to keep the repeater quiet until required. It would not, however, prevent interference from a paging network if the problem was already occurring.

The operating frequencies for repeaters have been determined in the past and the results of various decisions from the present national band plans. Before any major change can occur it requires all interested parties to provide an input. During the holiday period both repeater groups, as well as interested users, should do some thinking on the possible changes to enable the Amateur Radio Service to live with its neighbour — *the Pager.*

I will discuss this subject further in these notes, next issue. A happy New Year to all.

73, Tim VK2ZTM



Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Well, another year has arrived, in fact, our Bicentennial Year! So, it is Happy Birthday Australia on the 26th of this month. This will mean that many of the international stations are likely to schedule special programming beamed to this region. I do know that the BBC World Service are going to be one.

Our own Radio Australia is also going to be having special programming to celebrate out Bicentenary throughout the year. Incidentally, RA came into some flak in November when they decided to drop the Australian 10 minute news bulletins to three minute capsules after the World News every two hours. This naturally is bound to upset Australian expatriates throughout the world, who specifically tune in to get news from home. They certainly do not want news from the South Pacific, but home-news! By the time this is in print, they may have altered their decision. I believe the decision was brought about by budgetary cutbacks.

They have instituted a positive decision in providing a 24-hour Answerline though, which is similar to that of Radio Netherlands. This allows listeners throughout the world to phone Radio Australia and leave a message on the answering machine, speeding communications between the listeners and the program makers.

On September 30, 1987, Time and Frequency station, VNG, at Lyndhurst closed down at 1359.59 UTC for the last time. This left several VNG users in the lurch, including many amateurs and SWLs. But about 10 days later the Royal Australian Navy activated an experimental time station from Belconnen, in the Australian Capital Territory, using two 10 kW senders into monopole antennas. They are on 6.448 MHz USB and 12.982 MHz USB continuously. They are using a Caesium standard, which has been co-ordinated to UTC by this time, but there are no identification announcements or other means to let the listener know. The service, being experimental at this juncture, could become permanent, depending on the numbers using the service, so announcements and identification could come later. You will have noted that the service is within the maritime allocation, but it should be noted that this experiment is being run by the National Standards Council, and the RAN has provided the wherewithal.

Last month, I neglected to nominate the most improved international broadcaster during the past year. In my opinion, the World Service of Radio Moscow should get this honour, particularly towards the last quarter of 1987. Their improvements in reporting domestic news and instituting off-the-cuff discussion programs, has made it more interesting to listen to RM these days. This is primarily because of "Glasnost" or openness. This is also evident in some programming, yet the anti-American bias is still prevalent, especially in the international news and commentaries. It is, to me, the comments on what is happening internally within the USSR, that has been interesting, compared to the old propaganda line that the Soviet Union is "paradise."

RM has also improved their presentation style and their programming is up-to-date, particularly the World Service. The separate North American Service of RM has been operational for many decades, and their presentation has also been more sophisticated and polished to that of the W/S, which has only come on-air in the past 10 years. Unfortunately, I have not been able to judge their style lately, as the North American Service is not audible at this location, compared to the W/S which is easily found.

But I am convinced that the award for the most consistently bad presentation and programming content should go to Radio Pyongyang, in North Korea. I must confess that it is the most boring station I have ever heard. It hasn't changed over the years. The only significant improvement is their signal strength.

Two interesting DX catches I received in September were in different parts of the world. The first one, the Falkland Islands Broadcasting Service came-up on 3.958 USB from 0600 until around 0900, but it is very weak. It carries programming from the British Forces Broadcasting Service (BFBS) in London, via satellite, until local programming begins around 1000 UTC. This rare station is usually heard around the Equinox here in south-eastern Australia. They are also very difficult verifiers as they are sticklers for accuracy. A QSL from this station has to be earned.

The other station is Radio Clarin, in the Dominican Republic. I heard it via the Long Path at 2150 UTC on 11.700 MHz, with typical Latin programming and plenty of identification. The interesting facts is that I first heard it on my Sony ICF 7600D portable. It was at fair to reasonable strength. The station only runs about five kilowatts and can be easily over-powered by adjacent stations running 10 times more power. This was the station that carried both Radio Earth and the "La Voz dell CID" but I don't think it carries either of them now. It is a commercial operation, yet it came under government pressure to terminate the anti-Castro programs after Cuban complaints. Radio Earth simply ran out of money.

Well, that is all for this month. Have a happy Bicentennial weekend at the end of the month!

Good listening — Robin VK7RH.

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Intruder Watch

A very Happy New Year to all! We've heard a lot about our Bicentennial, and now here it is. I hope the ionosphere puts on a good show to mark the occasion.

September 1987 saw a good response from Intruder Watchers around Australia, with a summary of reports that had me working the word processor overtime. Contributions were gratefully received from: VK2s CXX, MUZ and QL; VK3s AMD and XB; VK4s AKX, BG, BHJ, BTW, DA, DFR, KHZ and OD; VK5s GZ and TL; VK6RO, VK7s DQ and RH; VK8s HA and JF

Broadcast intrusions reported totalled 151; CW 163; RTTY 78; other modes accounted for 90 reports, and 31 intruders told us what their call signs were. (But very cryptically!).

The 10-metre signals coming from north-west of us are apparently increasing, with many being heard and reported from observers in the north of Australia. (VK4 and 8). I predict, as I did some months ago, that this will become a serious problem for 28 MHz amateur operators, and I urge those who hear the signals to send in a report of what they hear. It is no good waiting until 10 metres is full of unauthorised stations before complaining.

The CW station sending "V" on 7.002 MHz has been positively located at Vladivostok, USSR, and is apparently (quote) "in the USSR Maritime Service" (unquote). A friend of the notorious "UMS" perhaps? This pest is being heard and reported in all IARU Regions. The ARRL has sent documentation to the United States FCC Treaty Branch regarding both the above CW nuisance and "UMS". We hope that the FCC can have something done about them.

And, on to the mode for the month: A3E. This is the AM mode, of course, and needs no description. When can we label it an intruder when we hear it on amateur frequencies?

On the 80 metre band, it is an intruder over the whole band. On the 40 metre band, it is an intruder only between 7.0 and 7.1 MHz. It is certainly not an intruder over 7.1 MHz, as this segment of the band is shared by amateurs and the broadcasting service. On the 20 metre band, an AM broadcast is always an intruder on the amateur-allocated section; ie 14.000 to 14.350 MHz. Although the segment 14.250 to 14.350 MHz is shared, it is **not** shared with the broadcasting service. On the 15 metre band, an AM broadcast is always an intruder on our segment, that is, between 21.000 and 21.450 MHz. On the 10 metre band, an AM broadcast is always an intruder on our segment, that is, between 28.0 and 29.7 MHz. Note that we refer to *non-amateur* transmissions in the AM (A3E) mode. Next month we will consider the mode R7B.

73 for now and take care.

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MODERN EDUCATION

A document has fallen into our hands which throws new light on an eternal mystery: what teachers really mean by the comments they write on report cards.

REPORTS ON PUPILS

Many teachers have expressed a need for a checklist to appropriately describe pupils in their care for the purpose of reporting to parents. This document may be of some assistance.

COMMENT	INTERPRETATION
Satisfactory progress	I can't think of a single interesting thing about him/her
A born leader	Godfather type
Easy going	Bone idle
Lively nature	Disruptive
A sensitive child	Never stops whining
Helpful	Creep
Reliable	Dobs in his mates
Good at contact sports	Thug
Friendly	Never shuts up
A rather solitary child	Has nits
Works better in a small group	Daren't take my eyes of him/her for a second
Needs encouragement	Thick as a brick
Often appears tired	Stays up all night watching late movies, or is glue sniffing
Good at practical activities	Illiterate
All work is of a high standard	Has ambitious, middle-class parents
Forging his way steadily ahead	Cheats

—Reprinted from the *Sydney Morning Herald* and contributed by Tim Mills VK2ZTM

BICENTENNIAL EXHIBITION, WODONGA, January 1-5, 1988

The Twin-cities Radio Club, Albury-Wodonga, will be establishing a display depicting the history and development of radio and electronics in Australia. The display will be in conjunction with the National Travelling Exhibition, which will start from Wodonga.

There will be an award station on HF and VHF from January 1 to January 31, offering a certificate to stations making one contact with the special event station at the display, or any club member station. A special call sign, either an AX or VI has been applied for.

Amateurs Australia-wide are invited to the border tourist area to see the huge displays and live enactments.

Further details are available via FAX (060) 56 1030, or PO Box 396, Albury, NSW. 2640.

—Contributed by Scotty VK3ZR

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Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED IN OCTOBER

HEARD ALL VK CALL AREAS

133 Sergey N Sherchenko UA3-121-2194
134 Pokhmelnov Alex UA1-169-777
135 Valery N Pureskin UA4-094-516
136 Semin A A UA4-164-286

WORKED ALL VK CALL AREAS

1552 Yoshio Kimura JA7UMN
1553 Peter Marmet HB9DCZ
1554 Victor U Kullit YC0GVT
1555 Alan McLauchlan ZL2AVA
1556 Eisuke Saji JA2NNF
1557 Ron Moorefield W8ILC
1558 Haruki Oue JR3EQA
1559 Tsuneo Okuya JG1PII
1560 Bill Morgan K0DEQ

DXCC

Phone
359 Harry Cox VK4OX
360 Maurie Thompson VK6NGG

WORKED ALL STATES — VHF

173 D R St John VK3AQR (144 MHz)

DXCC UPDATES IN OCTOBER

VK3DYL 259 phone
VK2BCH 225/226 phone
VK3JF 308/323 phone 232/247 CW 311/335 open
VK3CSR 260/263 phone

REQUIEM AWARD

ON4RIP (Rest In Peace — Requiescat In Pace) is a special station in commemoration of the third battle in the Ypres Salient Fields (Salient Ypres — Passchendaele). In remembrance of the 70th anniversary of this struggle in which more than 600 000 casualties were counted. A third of these young soldiers, from all over the world, were denied, by the fortune of war, to have a known grave.

In commemoration of this battle, which lasted for 99 days and nine hours, activities are planned by different nations. Radioclub Ypres will participate, and obtained for that purpose, the special call sign ON4RIP. This station will be operated by radio amateurs from the British Commonwealth, France, Belgium, Germany and the USA.

Attention is drawn to the fact that, during the coming months, the remembrance of the 60th anniversary of the unveiling of the memorials for the unknown soldiers 'Tyne Cot' and 'Menin Gate', will take place in the presence of VIPs and members of the British and Belgian Royal Families.

A special certificate/award "Requiem Award" will be issued in co-operation with the city council of Ypres. The *rules for the* award are to make contact with ON4RIP. The award is also available to shortwave listeners. The fee for this award is 10 IRCs, £5, US$7, 300BF, 15FL, 15DM, 10000 Lira or 15 SFR.

Applications should be sent to: Ieperse Radioclub v.z.w (Radioclub Ypres), PO Box 32, 8900 Ypres (Ieper), Belgium.

INTERNATIONAL AWARDS GUIDE

This huge guide (434 large A4 size pages) describes 1027 amateur radio awards from 74 different countries, with 371 illustrations.

A copy of the guide costs only 1390 Belgian Francs, US$34, or 58 IRCs. Payment in the form of cash or IRCs in a registered letter and International Postal Money Orders will be accepted.

RCY DX BULLETIN

This bulletin is issued 11 times per year (monthly, except in August). A regular issue has 12 pages with up-to-the-minute coverage of DX events. New DX information is included in the bulletin up to two days before mailing!

Rates are as follows:
— Sample copy (air mail) — US$1 or 2 IRCs
— 11 issues by surface mail — US$10 or 17 IRCs
— Trial subscription to five issues (air mail) — US$5 or 8 IRCs.

Contributors can receive free copies of the *RCY DX Bulletin*, but they must have been a subscriber for at least one year.

Send all correspondence to: The Secretary, Ieperse Radioclub v.z.w., PO Box 32, 8900 Ieper, Belgium, Europe.

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Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

Buying an appliance? You may get RFI you didn't bargain for!

THE LINE OSCILLATOR RFI

The line frequency oscillators in television sets drive the horizontal scanning circuits and provide the necessary 25 kV plus high tension. The horizontal output pulses contain very strong harmonics, which may be radiated by the television chassis, the mains lead, the antenna or cables connecting to other equipment. Older television sets had a metal chassis, a three-core cable with earth connection and some shielding of critical circuit sections. RFI from these older sets was usually weak even at only two to three metres distance. Therefore, the standards for low frequency RFI (15.625 kHz fundamental) did not mention this source of RFI particularly, and a fairly high level of radiation at three metres distance was permitted, on the assumption that no problem existed.

Unfortunately, this is no longer so, because these days it is not the engineer, but the sales manager who determines what is to be left out of the design. Several radio amateurs (VK3CQ, VK2CLB, VK3ANJ) tell us that the new television sets cause so much RFI, that it is impossible to listen to a receiver on any band anywhere in the house (perhaps next-door as well). If you write to the Technical Services Manager of the manufacturer (as per the RFI Assistance List) you may be lucky to get an answer at all. If so, it probably states the half-truth, that "all television sets do this, it is a matter of distance (television to radio), where the RFI fades out, and the television set has been designed to meet Australian Standards!" The important fact is, that it depends only on the television design at what distance the RFI fades out sufficiently to be compatible with nearby radio operation.

Going Shopping

Arm yourself with a good medium-wave/shortwave transistor radio when shopping for a television set. Hold the radio close to the television. Tune in about 530 kHz away from any strong radio station so that the AGC does not reduce the sensitivity of the receiver. Move the radio around the television and swing the receiver around to receive the best reception from the directive ferrite antenna of the receiver.

Hold the receiver close to the television antenna cable and also close to the mains cable to ascertain whether these wires radiate a strong signal. Move slowly away from the set, turning the radio for best RFI reception. Observe whether the RFI fades out completely at three to five metres distance. Tune in a strong local AM radio station and hold the radio close to the television. An acceptable television set will show no RFI from line frequency oscillator harmonics at medium wave frequencies at three metres distance, tuned away from the station, and at one metre distance when tuned to local AM stations. We can then recommend this make and model of television to our family, neighbours and friends.

Next, one should repeat the test somewhere near 14-15 MHz, using the shortwave receiver range. The result should be similar. If the sales personnel do not like your test ask the sales manager to state on the invoice that they will replace or take the television back or refund the purchase price in full should the set cause unacceptable RFI to your radios and shortwave receivers/transceivers. If this is unacceptable, go to another shop!

It would be interesting to hear of your experience.

What to do If you are stuck with a RFI Lemon!

A coaxial cable separation transformer should be installed between the television set antenna terminal and feeder. This will be even more effective if the transformer is placed close to the tuner input terminal inside the television set. The German firm, Blaupunkt, found that removal of the 470 pF safety capacitors at the television antenna terminal reduced the radiation of unwanted line frequency harmonics by 20 dB. It is well-known that capacitive coupling has "high-pass features", whilst inductive coupling has "low-pass features". (See AR, March, page 49, for separation transformers).

If possible, use a three-core mains cable, and earth whatever chassis is left. Consult the circuit to see whether earthing is possible, so that a short circuit will blow the mains fuse (if there is any). In addition, all cables which go to the television set may be wound through ferrite rings of high μ and low Q. These rings act, with a few cable turns, as RF chokes.

TESTING THE VCR

The German Post Office (FTZ = DOTC) recommends (pamphlet 8.79/654321) that the sales manger of the shop agrees, in writing, (on the invoice) that he will exchange or take back a VCR should it show too great susceptibility, obviously not meeting the recommendation (now Standard) of immunity, which is three volts per metre field strength in the critical range of 1-10 MHz (especially near 3.500 and 7 MHz). It has been found that appliances carry the type approval number, but too often they do not pass the test and do not deserve the type approval. This is also the reason (stated by DL1BU) that, in RFI collision cases, the radio inspector no longer relies on type approval numbers, but uses his own test television set, radio or VCR, attached to the complainant's antenna, etc, to see who is to blame — the amateur or the appliance manufacturer — and to demonstrate this fact to the customer. Many VCRs have been quietly exchanged by the dealers if, for example, the local broadcast station or other legal transmission could not be handled by the VCR.

DL9AH (CQ-DL 7.1986) recommends taking a hand-held transceiver to the shop. Even two metres and 70 centimetre hand-held transmitters have sometimes been strong enough to sort out the worst cases. A description of a 3.500-3.800 MHz mini-transmitter with up to six watts RF power follows.

A loading coil allows reducing the length of the 3.500 MHz whip antenna. With this test transmitter it is possible to check VCRs and to find if they are compatible with 80 and 40 metre band operation. Building such a transmitter could be a capital city amateur project by a group, making the equipment available to those who intend to purchase a VCR. Any amateur might assist his neighbours this way too.

RFI FROM AND SUSCEPTIBILITY OF MOTOR CARS

If a radio amateur wishes to operate mobile and intends to purchase a motor car, he/she should find out in advance whether radio operation is compatible with the selected car. It is increasingly common that modern cars do not only produce ignition hash which may be difficult to cure, there is also RFI from micro-processors and timing-devices, affecting VHF reception. In some cases, electronically controlled car operations are affected by the VHF transmitter.

QST reported about the W-amateur who had bought a new car which showed malfunction as soon as the VHF transmitter was used. When the amateur complained about the lack of shielding in the car's wires leading to sensitive parts, the dealer recommended that "the amateur should shield his antenna, which would be far simpler!". Learning the lesson again, we should take a hand-held transceiver to the car dealer. Use the transceiver during the demonstration run around the block and find out if anything happens. Five watts output could be effective with a rubber-duck antenna inside the car near the dashboard wiring. When the car is stationary with the bonnet open, one could test whether the transmitter affects the functioning of engine, lights, wiper, etc.

Cars with micro-processor controlled dashboard instruments, anti-locking brake systems, or cruise control, are more likely to be affected by transmitter radiation. It has been reported that some of these devices were found to fail when the car was driven near a high power radio station. It is better to be careful first, than sorry later.

To check the behaviour of the car electronics when shortwave operation (mobile 14 MHz, etc) is intended, one may not have a hand-held transceiver. We can use a one watt input, or more, GDO or oscillator, which is also suitable to check the susceptibility of VCRs. No antenna is required if the coil has a large enough diameter, say two to three centimetres. For VCRs, the frequency of the test-oscillator should be between 5 and 6 MHz. The VCR is switched to replay. The oscillator coil is held close to the slot where the tape is inserted. Picture or sound may be affected.

If the test oscillator has six to seven watts DC input, it will most likely affect the picture and sound when less than 40-50 centimetres away from the VCR. Less sensitive is the VCR-to-television input connection, if the oscillator is held close to the VCR RF input terminal. One can also see the beneficial effect of a shielded high-pass filter inserted between the antenna and the VCR. It should not be much of a problem to build a 5-6 MHz transistor oscillator, having one watt DC input power, to be able to check appliances prior to paying for them, as regards interference and/or susceptibility. Some may be 10-30 times more affected than others.

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Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

Welcome to 1988 — Australia's Bicentennial Year, and hopefully a year of increased YL activity around the amateur bands.

Perhaps a brief look back at some of the achievements of 1987, before we finally dust the old year down and file it carefully away.

Our most memorable activity of the year was, of course, the ALARA-meet in Adelaide, which brought together members from five Australian States, plus New Zealand, and was an outstanding success.

The ALARA Contest, held on November 14, saw finalisation of the Five Year Trophy. (A contest report next month).

Our Birthday Activity Day was held on July 25, a good opportunity to catch up with old friends, and make new ones.

Several ALARA members assisted with JOTA stations in October, and found the activity challenging and stimulating.

There were individual achievements too.

Plaques for outstanding service to ALARA were awarded to:
Marlene VK5QO, Valda VK3DVT, Helene VK7HD and Mavis VK3BIR.

Raedie Fowler received a special certificate for her contribution to ALARA over the years.

Liz W3CDQ, has been an active amateur radio operator for 65 years.

Jan VK3DMH, (now VK3HD), operated the VI3PVA call sign (issued to the amateur radio club Polonia in honour of the Pope's visit to Australia).

Joan VK3BJB, continued her Japanese studies by radio, and assisted with marine-mobile communications for Japanese yachts competing in the Melbourne to Osaka Yacht Race in March.

Mavis VK3KS, received a silver coaster when she gained first place in the VK-YL section of the WARO Contest.

Jenny VK5ANW, was re-elected as VK5 Divisional President, and Christine VK6ZLZ became Vice-President of the VK6 Division, with Gill VK6YL, also being elected to the Council.

Maggi VK3CFI, worked the John Moyle Contest solo from a hill.

Bev and OM Brian (VK6s DE and AI), logged nearly 200 calls when using the Special Event Call Sign, VK6CUP.

June Greenaway L60068, was the first VK6 SWL to qualify for the VK6CUP Award, with her grand-daughter, Leeanne, the youngest SWL to attain it.

Helene VK7HD, was awarded a 75th Anniversary WIA Medallion.

Elizabeth VE7YL, gained first place in the CW section of the YLRL/OM 1987 Contest.

Several ALARA members upgraded their call signs during 1987, and it was a pleasure, also, to see many new YL call signs appearing on the bands.

YL CONTESTS

YL-OM CONTEST sponsored by YLRL

PHONE: starts Saturday, February 13, 1988 at 1400 UTC and ends Monday, February 15, 1988 at 0200 UTC.
CW: starts Saturday, February 27, 1988 at 1400 UTC and ends Monday, March 1, 1988 at 0200 UTC.

All licensed women and men operators throughout the world are invited to join in. OMs call "CQ YL" and YLs call "CQ OM".

All bands, no cross-band. Net contacts and repeater contacts do not count.

A station may be worked and counted once on each band, work only 24 hours of the time, operating breaks must be indicated in log.

Exchange — station worked, QSO number, RS/T, state/province/country.

Score —
a. phone and CW will be scored as separate contests, submit separate logs for each contest.
b. one point is earned for each different station worked on each band, YLs count only OMs and OMs count only YLs. Add the QSO points earned, that is your total number of QSOs.
c. multiply the number of QSOs by the total number of different states/provinces/countries worked.
d. contestants running with a power output of 100 watts or less on CW and 200 watts PEP or less on SSB at all times may multiply the results of c. by 1.50 (low power multiplier). Maximum power output that may be used at any time during the contest is 750 watts on CW and 1500 watts PEP on SSB.

All logs must show your state/province/country to qualify for awards. If you have 200 or more QSOs submit a separate log for each band and submit a dupe-sheet.

Logs must show claimed score and be postmarked by March 15, 1988. Send logs to: YLRL Vice-President, Carol Shrader W14K, 4744 Thoroughgood Drive, Virginia Beach, VA, 23455. USA.

YL-OM MID-WINTER CONTEST

Participating clubs — BYLARA, BYLC, DYLC, YLRC

Weekend — January 9-10, 1988
CW: Saturday, January 9, 0700 to 1900 UTC.
Phone: Sunday, January 10, 1988, 0700 to 1900 UTC.
Bands: 3.5 to 28.700 MHz.
YLs call "CQ Contest" or "CQ Mid-Winter Contest".
OMs Call "CQ YL".
YLs work YLs and OMs, OMs work YLs only.
Exchange: station worked, RS/T, QSO-serial number, OMs start at 001, YLs start at 2001, country. Entry must also show time, Band, date, YL or OM, number of multiplier.
Points: each QSO with a YL, confirmed, count five points, each QSO with OM count three points, one station may be worked only once on each band.
Multiplier: one point for every worked DXCC country, multiplier is counted only once in the contest, it is not counted on each band.
Final Score: multiply the sum of QSO-points by total number of different DXCC countries worked.
SWLs: each different heard YL station counts five points, multiplier as above. Logs must also show the foreign station worked with.
Logs: a score calculation is required, use a multiplier column and insert multiplier, log has to be signed. If you participate in CW and phone send two logs.

Logs to be sent, prior to February 19, 1988, to DYLC, PO Box 262, 3770 AG Barneveld, Netherlands.
Awards: certificates will be awarded to YL and OM winners in each category, and to second and third stations. Certificates also to each country winner in each category.

Wishing you all a happy New Year.
73, Joy VK2EBX

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The ladies at ALARA-meet, which was held in Adelaide on September 26-27, 1987. Back Row (from left): Carol VK5PWA, Pat Stuart, Joan VK3NLO, Christine VK5ZCQ, Muriel May, Nancy VK2NPG, Denise VK5YL, Angela Shaw, Margaret VK3DML. Centre: Valda VK3DVT, Gill Wardrop, Joy VK5YJ, Bev Tamblyn, Joy VK2EBX, Margaret VK4AOE, Marlene VK5QO. Front: Maria VK5BMT, Poppy VK6YF, Meg VK5AOV, Marilyn VK3DMS, Jenny VK5ANW, Vicki ZL1OC.

WICEN News

Dennis Gibson VK1DG
ACT WICEN CO-ORDINATOR
39 Lyall Crescent, Kambah, ACT. 2902

CAN YOU HELP MAKE IT GREAT IN '88?

In the months February and March 1988, ACT WICEN will be seeking your help in providing a nation-wide communications network for the Australian Bicentennial Castrol World Rally for vintage and veteran cars. A veteran car is one of those delicate mechanical contrivances built before 1919, and a vintage car is one of those sturdy stylish vehicles constructed between 1919 and 1930. *Castrol Australia*, the *Veteran Car Club of Australia*, and the *Australian Bicentennial Authority* have teamed together to bring Australia its own history-making event as part of the official celebration of our great country's Bicentenary. The ACT WICEN group has been engaged by the Rally Executive Director in Canberra, Mr Ian Irwin, to provide communications.

The event comprises seven separate rallies, from West Australia, Brisbane, Sydney, Melbourne, Darwin, Adelaide and Hobart, with 56 stopover points on the way to the finish in Canberra. It is hoped that WICEN can provide a network consisting of an HF amateur station at each of the stopover points, to keep the rally headquarters, in Canberra up-to-date with the events of the day, and to allow limited message traffic to be sent to the rally organisers in the field.

ACT WICEN have assumed the responsibility for the net control stations, and the overall organisation of the communications exercise, with the help of each State and Territory WICEN groups, and other interested amateurs. The exercise has the endorsement of the Federal Executive of the Wireless Institute of Australia as part of our 1988 Bicentennial celebrations.

It is the rally organisers responsibility to contact the radio operator and to generate or receive messages, and the radio operator's responsibility is to establish contact with the net control station VK1WI, in Canberra. Stopover stations will only be required to be active on the evening of the required date, and communications will be conducted using USB on the primary WICEN frequencies of 7.075 MHz from 8.30 pm; 14.125 MHz from 9.00 pm and 3.600 MHz from 9.30 pm. (Times are in EAST). Secondary frequencies will be up 25 kHz in cases of severe ORM. Up until the start of the rally contact may be made with the VK1 contingency after the VK1 Sunday Evening Broadcast on 3.570 MHz.

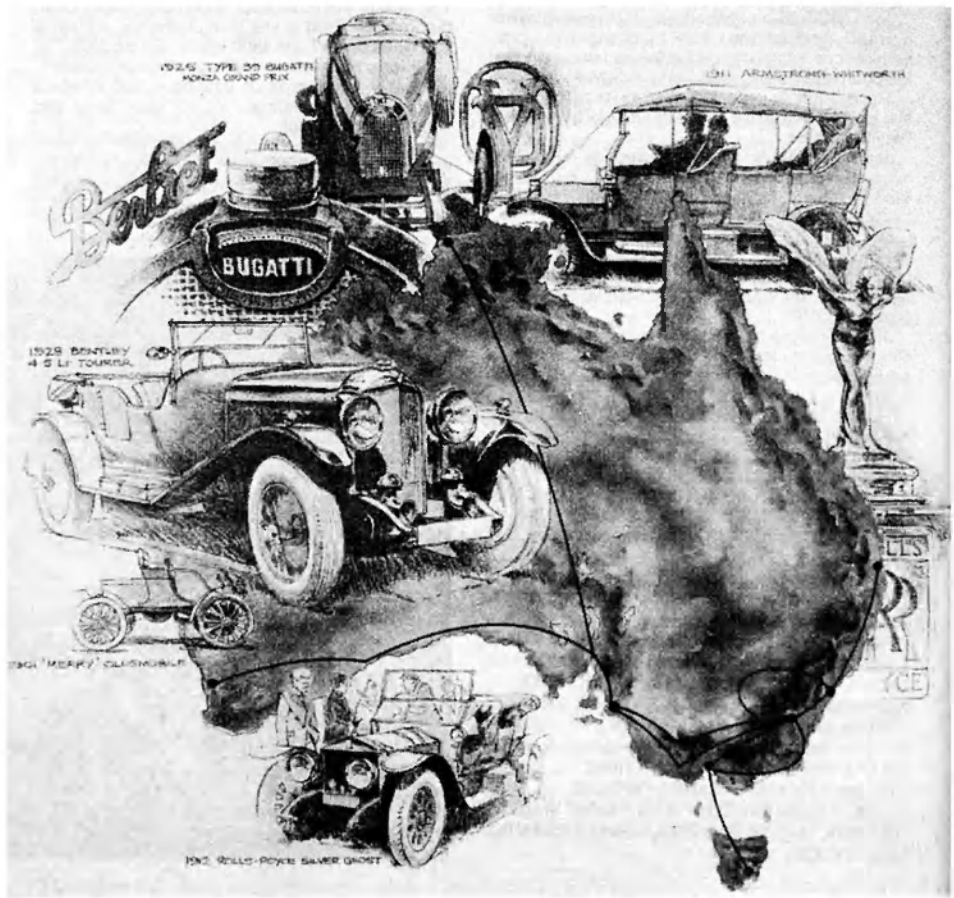
The message traffic is expected to be very light and will mainly comprise information about the status of the vehicles and crew. The worst case traffic density for stopover stations will involve three consecutive evenings, except for Adelaide with four evenings, and the net control station in Canberra, which will be active from February 20 to March 16, inclusive.

Following is a list of the stopover points and dates. If you are able to help with this exercise in any way, please contact your area WICEN co-ordinator, from the following list, or the VK1 Division of the WIA, by writing to GPO Box 600, Canberra, ACT. 2601, indicating which stopover station/s you can maintain, and on what dates. It is essential that this information is received as soon as possible, as the rally organisers in the field need to be advised of who to contact at each stopover, in advance. Even if you are unable to assist with communications for this worthwhile event, take the time to go out and see this most unique collection of ancient vehicles ever to grace our shores, and show your children what 'real' motoring is all about!

COME ON, GIVE US A HAND!

1988 CASTROL RALLY WICEN OPERATOR LOCATIONS AND DATES

AUSTRALIAN CAPITAL TERRITORY — VK1	
Canberra	February 20, 21, 25 February 27 to March 16, inclusive.
NEW SOUTH WALES — VK2	
Ballina	March 7
Bathurst	March 9
Coffs Harbour	March 8
Cooma	March 15
Cootamundra	March 12, 13, 14
Dubbo	March 11, 12
Finley	March 11
Goulburn	March 14
Gundagai	March 15
Holbrook	March 14
Jerilderie	March 11
Maitland	March 11, 12
Merimbula	March 14
Narrandera	March 12, 13
Orange	March 9, 10
Pambula	March 14
Parks	March 10, 11
Parramatta	March 8
Port Macquarie	March 9, 10
Richmond	March 8
Sydney	March 7, 13
Tumut	March 14
Wagga Wagga	March 13, 14, 15
West Wyalong	March 14
Windsor	March 8
Yass	March 15
Young	March 12, 13
VICTORIA — VK3	
Bairnsdale	March 12
Ballarat	March 10, 11
Beechworth	March 13
Cann River	March 13
Caulfield	March 11
Echuca	March 12, 13
Lakes Entrance	March 12, 13
Melbourne	March 10
Mildura	March 10
Moe	March 11
Morwell	March 11
Seymour	March 12
Swan Hill	March 11
Traralgon	March 11
Wangaratta	March 9, 10



QUEENSLAND — VK4

Brisbane	March 6, 7

SOUTH AUSTRALIA — VK5

Adelaide	March 6, 7, 8, 9
Bordertown	March 9
Ceduna	March 3, 4
Port Augusta	March 5
Renmark	March 9

WEST AUSTRALIA — VK6

Balladona	March 1
Eucla Motel	March 2
Kalgoorlie	February 29
Merredin	February 28
Perth	February 27, 28

TASMANIA — VK7

Devonport	March 8

NORTHERN TERRITORY — VK8

Alice Springs	February 25
Darwin	February 20, 21

STATE AND TERRITORY WICEN CO-ORDINATORS

VK2 Steve Boyd VK2DNN
4 Wisdom Street,
Arnandale, NSW. 2038
Ph: (02) 660 4783 home

VK3 Leigh Baker VK3CDP
552 Canterbury Road
Vermont, Vic. 3133
Ph: (03) 873 3417 home
Ph: (03) 609 1365 work

VK4 Ken Ayres VK4KD
142 Castle Hill Drive,
Nerang, Old. 4211
Ph: (075) 58 2293 home

VK5 Bill Wardrop VK5AWM
Box 303,
St Agnes, SA. 5097
Ph: (08) 251 2154

VK6 Jack Shurmer VK6QS
15 Blackford Street,
Mt Hawthorn, WA. 6016
Ph: (09) 444 3427 home

VK7 Alan Ruthven VK7ZAR
Box 94
Lindisfarne, Tas. 7015

VK8 Trevor Connell VK8CO
Box 40114
Casuarina, NT. 5192
Ph: (089) 27 9256 home
Ph: (089) 20 4431 work

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Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

Recently, I came across some old examination papers of the essay type. In view of the continuing controversy over multi-choice questions, I thought it might be of interest to some of the newer members to publish a sample. I would be interested in comments, especially from those who attempted both types of exam.

Remember —

a) it is AOCP level

b) 2½ hours is allowed — approximately 20 minutes per question

c) each question is worth 15 marks approximately.

I also found a couple from about 1920, I will publish these later in the hope that some old timer might be inspired to contribute an article on some of the now defunct equipment and techniques.

See how well you would do with this one, and the amount of ground it covers in comparison with the current ones!

73, Brenda VK3KT

POSTAL AND TELECOMMUNICATIONS DEPARTMENT

(C)

AMATEUR OPERATOR'S CERTIFICATE OF PROFICIENCY

SECTION M (THEORY) AUGUST 1975

(time allowed — 2½ hours)

NOTE: SEVEN questions only to be attempted. Credit will not be given for more than SEVEN answers. All questions carry equal marks.

1. (a) Draw a circuit diagram of the plate-modulated radio frequency amplifier and modulator stages of a 150 watt DC input amateur band transmitter.
   (b) Describe fully how 100 percent modulation is obtained.
2. Assisted by a circuit diagram, describe the operation of a mains operated power supply which uses silicon diodes. The power supply is required to provide a regulated output of six volts to supply a crystal oscillator and an unregulated output of nine volts for the buffer stage of a transistor type transmitter.
3. With the assistance of a circuit diagram, describe the operation of a device suitable tor measuring the ratio of forward to reverse power present in a transmission line feeding radio-frequency energy to an antenna.
4. (a) Discuss factors you consider desirable in a microphone used in mobile operation.
   (b) With the aid of a sketch, describe the construction and theory of operation of a microphone which you consider meets these requirements.
5. With the assistance of a sketch showing approximate dimensions explain the theory of operation of an antenna which uses "traps" to enable it to be used for multiband operation within the amateur bands. Show resonant frequency of traps.
6. (a) With the aid of a circuit diagram, describe the operation of a circuit which uses a cavity resonator.
   (b) Over what order of frequencies would a typical cavity resonator be used?
7. (a) Describe the manner by which high-frequency radio waves may be propagated over long distances. Explain why communication between countries such as America and Australia is restricted to certain times in the HF bands.
   (b) Explain why communication over long distances as described in (a) is not possible using the VHF and UHF amateur bands.
8. In relation to a communications receiver, define the following terms:
   (i) signal to noise ratio;
   (ii) cross modulation;
   (iii) selectivity;
   (iv) image rejection;
   (v) automatic gain control.
9. (a) Find the total capacity when three capacitors of 2, 5 and 10 microfarads respectively are connected:
   (i) in parallel; and
   (ii) in series.

   (b) Calculate the capacitive-reactance of the series combination in (a) when connected across a 50 Hertz supply.

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MORSEWORD 11

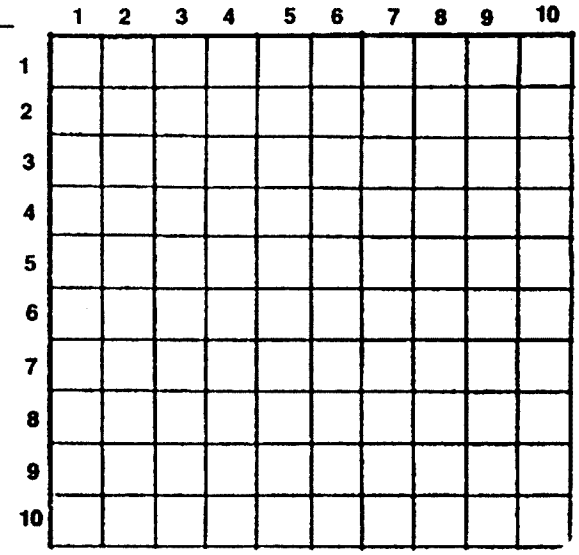
Compiled by Audrey Ryan
30 Starling Street, Montmorency, Vic. 3094

ACROSS

1 Regulates food intake
2 Type of gun
3 Meadows
4 Does
5 Silent actor
6 Desserts
7 Gives medicine to
8 Sound of a horn
9 Labels
10 Short sibling?

DOWN

1 Animal park
2 Exclamation of disgust
3 Futile
4 Listen
5 To cry
6 Emanation
7 Seizes
8 Heave
9 Floating slab
10 Bed linen



Club Corner

CENTRAL COAST AMATEUR RADIO CLUB FIELD DAY

— Preview

All amateur radio operators, their families, friends and those interested in amateur radio are invited to attend the 1988 Central Coast Amateur Radio Club Field Day. It will be held on Sunday, February 21, 1988, at the Gosford Showground. Gates will open at 8 am, wet or dry, as all displays are under cover.

REGISTRATIONS: Gents — $4. Ladies — $2. Children — $1. Pensioner concession of 50 percent on production of pensioner card will apply. A special group concession will also be available on application.

PROPOSED PROGRAM

Sunday, February 21, 1988

	0800 to 1300	Registration
	0800 to 1700	Tea and coffee available in Dining Room (no charge)
1	0800 to 0900	Open Mobile Scramble
	0930	Disposals Booking-in closes
2	1000	Pedestrian Talk-in Fox Hunt — two metres FM (146.500 MHz)
	1000	Disposals open (Entry northern end of Dwyer Pavilion)
	1000	Children's Events (races, etc) on grass near covered area
3	1045	Long Pedestrian Fox Hunt — two metres FM (146.550 MHz)
	1030	Quiz sheets available at Name-tags. Return to Name-tags before 1330
	1100	Entries close for Home-brew contest
4	1130	Mobile Talk-in Fox Hunt (a) — two metres FM (146.550 MHz) and (b) — 10 metres USB (28.360 MHz)
	1200	Lucky Registration Number drawing
5	1215	Open Pedestrian Fox Hunt — two metres AM (144.300 MHz)
	1215	Home-brew Antennas evaluation
	1230	Bus Tour departs
6	1300	Pedestrian Talk-in Fox Hunt — two metres FM (146.500 MHz)
	1530	Prize Presentation. Advise Information if leaving early to arrange delivery of prizes

Field Day attractions include:

Home-brew contest, Home-brew antennas evaluation (70 cm), Ladies and Gents quizzes, Ladies events, Children's events, Lucky door prizes, Disposals, QSL Bureau, Trade displays, Amateur television display, Packet radio display, Ladies stall, Complimentary tickets for bus tour and Reptile Park.

TRAINS: Sydney and Newcastle trains will be met by a courtesy bus which will run between Gosford Railway Station and the Showground between 8.30 am and 10.30 am.

PARKING: Plenty of off-street parking is available at the Showground.

ACCOMMODATION: Accommodation is usually scarce on the Central Coast at Field Day-time, and early booking is advised.

CATERING: Tea, coffee and biscuits available from 8 am to 5 pm at no charge in the Dining Room. Take-away food can also be purchased in the Showground.

DISPLAYS: Companies, persons, groups or clubs wishing to set-up a table or display at the Field Day should contact the Central Coast Amateur Radio Club at PO Box 238, Gosford, NSW. 2250. before January 31, 1988.

CALLS PRESENT: Bring your QSL cards for the "Calls Present" Board.

SCRAMBLE: The Open Scramble will be held between 8 am and 9 am. Rules as follows — no operation in Showground or one kilometre radius. No operation on Gosford repeaters. Log extract to the Event Recorder before 10 am showing time of contact, station worked, mode, band, and full serial numbers. Scoring one point per station per band regardless of mode. You may rework the same station on several bands.

HOME BREW CONTEST: Entries for the Home Brew Contest to be submitted by 11 am. Judging will take into account:

1. Innovativeness; 2. General Construction; 3. Overall Appearance and 4. Performance.

HOME BREW ANTENNA CONTEST: Bring along your 70 cm antenna for the Antenna Evaluation Contest. Antennas can be any 70 cm design.

1. Occupying no more than one-cubic metre; 2. With at least three metres of coaxial cable; 3. Fitted with a BNC connector and 4. A clamp for mounting onto a 45 mm mast.

DISPOSALS: Disposals forms and lot-numbers can be obtained in advance from Reg Brook VK2AI, PO Box 148, Gosford, NSW. 2250, or phone (043) 25 2191. Forms and lot-numbers are also available at the Showground on Saturday afternoon, February 20, 1988. All items for disposals must be booked in before 9.30 am, February 21, 1988. Late arrivals or equipment improperly tagged or catalogued may be refused.

Information on the Group Concessions, Trade Displays, Programs, and any other Field Day information can be obtained by writing to: Central Coast Amateur Radio Club, PO Box 238, Gosford, NSW. 2250.

—Contributed by Bren Connolly VK2BJC for the CCARC Field Day Committee

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16th WORLD JAMBOREE MONDIAL

DECEMBER 30, 1987 – JANUARY 10, 1988

"Bringing the World Together"

AMATEUR RADIO STATION AX2SWJ 16th WORLD JAMBOREE CATARACT SCOUT PARK, NSW

Australia is the host country to the 16th World Jamboree to be held at Cataract Scout Park, south of Sydney, from December 30 to the January 10, 1988. This is the first time a World Jamboree has been held in the Southern Hemisphere and it will be the first official function of the Bicentenary Year, the opening ceremony taking place at 0001 on January 1, 1988.

Over 80 countries will be represented by their contingents at the Jamboree with a total attendance of more than 15 000 in a tent city, the Australian Contingent numbers 4 500.

One of the many activities at the Jamboree site is a fully equipped modern amateur radio station, courtesy of Dick Smith Electronics, manned by licensed operators within the scout movement and assisted by other amateurs who have freely volunteered their time for the duration of the Jamboree.

A very comprehensive static display of electronic and communication equipment together with a small lecture theatre will serve to introduce the hobby of amateur radio to those attending and visiting the Jamboree.

Contingents from overseas have been invited to arrange scheds with local amateurs prior to their departure to Australia and, conditions permitting, the Cataract Park station will endeavour to give our visitors a practical demonstration of amateur radio in action. A very attractive QSL card featuring the Jamboree Badge has been designed especially for the station.

—Contributed by E A Brian, Deputy Base Manager

BALLARAT HAMVENTION

The 1987 Annual Ballarat Hamvention, sponsored by the Ballarat Amateur Radio Club, was held in beautiful, but unusually warm weather for the period, which brought amateurs and their families from near and far.

The exhibitions, events and social gathering was complimented by the excellent food that was provided. All present, had an excellent time and have made it a 'must attend' weekend in their diaries for 1988. Meanwhile the committee has commenced planning a super Hamvention for Australia's Bicentennial year. If you missed out on the 1987 event, make it a must for this year.

—Photographs courtesy of Barry Wilton

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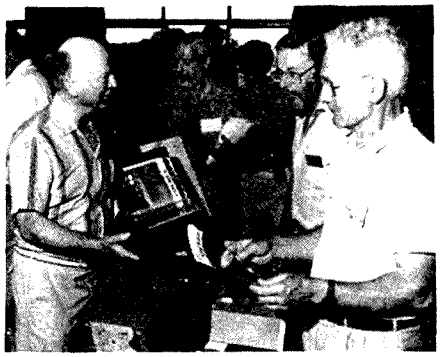
Brian VK3KQB, owner of WECAM, the well stocked local Icom Australia outlet, points out the salient points of a hand-held transceiver to Kevin VK3BPH.

Kenwood Retailer, Murray VK3CEI shows some of the extensive range available to Jim VK3KJH and Tom VK3TCE (extreme right).



Would the discussion be about Pounding Brass or WICEN? Popular AR columnist Gil VK3CQ, President of the North East Zone of the Victorian WIA Division captured on film, during a discussion with Andy VK3WH.

JANUARY CLEARANCE SALE!

ALINCO POWER SUPPLIES

EP-570 10V-15V DC Regulated 5.5A DC cont. 6.5A max. Was ~~$220~~ Now $159
EP-1510 10V-15V DC Reg 25A DC cont. 30A DC max 50% duty cycle Was ~~$399~~ Now $269
EP-2510 10V-15V DC Reg 25A DC cont. 30A DC max 50% duty cycle. Was ~~$469~~ Now $299
EP-3030 10V-15V DC Reg 25A DC cont. 30A OC max 50% duty cycle. Was ~~$549~~ Now $399

BLACK JAGUAR

BJ-200 HAND HELD SCANNER 26 MHz to 520 MHz Was ~~$479~~ now $299

REGENCY

HX-1000 HAND HELD SCANNER 30 MHz to 512 MHz Was ~~$449~~ Now $329

DAIWA PRODUCTS

CN-650 SWR METER 1.2-2.5 GHz. 2/20W FWD. 0.4/4W REF. N-type Was ~~$220~~ Now $150
CN-630M SWR METER 140-450 MHz. 50 ohm. 20/200W FWD. 4/40W REF. was ~~$290~~ Now $190
CNW-419 TUNER 1.8-30 MHz Continuous. 17 Bands. 200W CW (3.5-30 MHz) 100W CW (1.8-3.4 MHz). Was ~~$469~~ Now $299
CNW-518 TUNER 3.5-30 MHz. 8 Bands. 1kW CW. 50% duty cycle 20/200/1kW. Was ~~$790~~ Now $499
PS-120 POWER SUPPLY 3-15V DC. 8A max. 12A max. Was ~~$299~~ now $270
LA-2155H 2m LINEAR (144-148 MHz). Preamp gain 15 dB. Power Low 1.5W. High 25W. (In 25W -- Out 150W) 13.8V Was ~~$559~~ Now $459
LA-4090 (430-450 MHz) Gain: 15 dB. In 10W — Out 85W. (In 25W — Out 90W) 13.8 V DC/25. Was ~~$669~~ Now $529
VS-3 SCRAMBLER — Last One. Was ~~$169~~ Now $99
LA-2035R (144-148 MHz) (In 1.5W Out 30W) Was ~~$189~~ Now $129

PEARCE SIMPSON

TG-133 40ch UHF CB MOBILE 5W Compact. Was ~~$429~~ EXCELLENT VALUE! Now $250

TOKYO HY-POWER

HL-30U UHF 30W 430 MHz LINEAR AMP with GaAsFET receive preamp. FM, SSB, CW mode Was ~~$289~~ Now $199

HL-120U UHF 100W 430 MHz same specs as above. Was ~~$829~~ Now $599
HL-65V 144 MHz ALL MODE LINEAR AMP — same specs as above (10-80W) Was ~~$469~~ Now $390
HL-88V 50 MHz ALL MODE LINEAR AMP — same specs (10-85W) Was ~~$469~~ Now $390
HL-160V25 144 MHz ALL MODE (25W-150W) Was ~~$559~~ Now $480
HL-725D 144 MHz/430 MHz COMBINED UNIT — same specs as above Was ~~$699~~ Now $499
HL-20U 430 MHz FM/SSB (2W-20W out) Was ~~$109~~ Now $90

HAL

CT2200 TERMINAL. Receives & Transmits Baudot, ASCII, RTTY & Morse etc. Professional features Was ~~$2000~~ Now $499
KB2100 KEYBOARD enable Split Screen Transmit & Receive. An excellent partner for CT2200. Was ~~$599~~ Now $299

SANSEI

D-5000 SCRAMBLER. Digital, used for all mode Transceivers. Excell voice quality, high stability, etc. Was ~~$4500~~ Now $3500

TAIYO

TD-L1626 DIRECTION FINDER, highly professional system complete with flat ant etc. Was ~~$25,000~~ Now $17 000

GOODWILL

GDM-8035 DIGITAL MULTIMETER bench type. Reduced below cost $99 only.

TELEREADER

CD-670E DIGITAL DECODER — for CW (Morse code), Baudot, ASCII & TOR/AMTOR, RTTY, etc. Was ~~$629~~ Now $399

TONO

THETA-777 DECODER for AMTOR, RTTY & CW and has complete software for Communication Rx/Tx etc. Was ~~$729~~ Now $499

TASCO

FX550 COMPUTER CONTROLLED VIDEO FACSIMILE PROCESSING SYSTEM — Latest Technology Was ~~$899~~ Now $799

DRESSLER

RPA-70 GaAsFET Rx PREAMP. 70cm Was ~~$109~~ Now $49
VV INTERFACE REMOTE UNIT for power supply & switching of M/Mounted preamps via Coax Feeder Was ~~$69~~ Now $20
EVV700 M/Mounted PREAMPS 70cm Low Noise Was ~~$299~~ now $279
EVV2000 M/Mounted PREAMPS 144 MHz Low Noise Was ~~$289~~ now $279

OATONC

SRB-2 AUTO NOISE BLANKER — Blanks noise from any Receiver or Transceiver Was ~~$299~~ Now $95
DF + DFAI DIRECTION FINDING SYSTEM for existing narrow band FM Receivers & Transc. Was ~~$599~~ Now $350
ANF AUTO NOTCH FILTER. 3 Filters in one incl CW. Var Low Pass. Var High Pass & Notch. Was ~~$239~~ Now $139
VLF Adds Low Frequency coverage to exist. Communication Receivers Was ~~$129~~ Now $99
RFA Improves sensitivity & Signal to Noise Ratio of Receivers & Transceivers 5-200 MHz. Was ~~$149~~ Now $129

WELZ

SP-600 SWR & P/METER 1.6 to 500 MHz. Has 3 built-in sensors. 20W/200W/2000W Range Was ~~$389~~ Now $349
SP-225 SWR & P/METER 1.8 to 200 MHz. Has 1 built-in sensor. Range 1W/3W/30W Was ~~$249~~ Now $229
SP-425 SWR & P/METER 140-525 MHz. Has 1 built-in sensor. Range 1W/3W/30W Was ~~$259~~ Now $240
RS-3000 POWER SUPPLY 13.8V dual outputs 30A/10A. 50% duty cycle. Ripple 0.2 mV Was ~~$480~~ Now $340
RS-3050 POWER SUPPLY 3V to 15V dual outputs 30A/10A. 50% duty cycle,etc. Was ~~$569~~ Now $450

ANTENNAE

CREATE 2X713 (430 MHz) 2 x 13 element Yagis compl. W/Phasing Harness Was ~~$349~~ Now $199
CREATE X211 (144 MHz) 11 element Yagi Was ~~$289~~
CREATE 2X211 (144 MHz) 2 x 11 elem Yagis compl with Phasing Harness. Was ~~$425~~ Now $359

TET

TE-11F3J 3 el. 27 MHz Base Beam Antenna Was ~~$159~~ Now $129
HB 23M 2 el. 3 band (20, 15, 10) Beam Was ~~$369~~ Now $299

CHIRNSIDE

CA-33 3 el. Tri-band Beam (20, 15, 10) Was $429 Now $359
CA-35DX 5 el. Tri-band Beam (20, 15, 10) Was ~~$529~~ Now $459
CONNECTORS GALORE . . . 2 pin, 3 pin, & 4 pin @ $1 each

CUSTOMERS NOTE:

We are now taking bookings for buses from Melbourne & Brisbane for the Gosford Hamvention. Ring now & book.

CORRESPONDENCE:
BOX K21,
HAYMARKET, NSW.
2000

EMTRONICS

MAIL ORDERS WELCOME

NSW & HEAD OFFICE:

92-94 Wentworth Ave, Sydney
NSW. 2000. TLX:AA73990
P.O. Box K21 Haymarket, NSW. 2000.
Ph: (02) 211 0988
FAX: (02) 281 1508

VICTORIA:

288-294 Queen St, Melbourne
Vic. 3000.
Entrance from Lt. Lonsdale St.)
Ph: (03) 670 8551 or 670 0330
FAX: (03) 670 0671

QUEENSLAND:

416 Logan Road, Stones Corner
Qld. 4120. TLX:144696
Ph: (07) 394 2555
FAX: (07) 39 4316

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

A happy New Year to all members from the Council and Office Bearers of the NSW Division. Hopefully it will be a year of good DX and other amateur radio activities.

Within VK2 there will be a range of activities in association with the Bicentenary. The most important for VK2 is the introduction from the start of the year (one minute past midnight on January 1), of the previously advised *Awards*. Full details and requirements of the awards will be in the next issue of *Amateur Radio*.

The major award will be the VK2 Division's *Bicentenary of Australia Award 1788-1988*. To achieve this award you need to work 200 different stations within the VK2 call area. Overseas amateurs will be seeking this award, as well, so try and be active whenever band conditions permit. Other awards being introduced at the same time include the VK2 Award, National Parks and Historic Places Award, and a Worked VK2 Shires Award. Log entries must be kept for all contacts used to claim these awards. Any contact from the start of 1988 is valid. If you require further details, listen to the broadcasts or a sheet is available from the Divisional Office for collection, or send a SASE to PO Box 1066, Parramatta, NSW. 2150. The Awards Manager is Col VK2CS.

For the duration of January 26, 1988, the Division will be mounting a special event station on all available bands, most likely under the call of VI88NSW. A special QSL will be available on bureau exchange.

Another change in 1988 will be with the VK2WI Sunday Morning and Evening Broadcast transmissions. From the re-commencement of the sessions for the new year, on January 10, there will be a slight change to the starting times. The news content will remain with a start at 10.45 am and 7.15 pm, for a trial period with a technical and educational segment. A reminder that if you are unable to catch either of the broadcast sessions that the highlights for the week may be obtained from the answering machine on (02) 651 1489.

Members are reminded that it is approaching that time to start thinking about Annual General Meetings and Council elections. The nominations for council will become due during February and the AGM will be in April. Nomination forms for council are available from the office.

The Two-Metre Simplex Contest, held over September 25, 1987, was a big success. Over 100 stations took part with a return of 43 logs. The major places were:
First Overall — VK2BIT with 2714 points
Second — VK2DLE with 2193
Third — VK2KAA with 2132.

In the country section, the highest score was VK2XGM at Byron Bay with 90. Next was VK2AMV at Forbes with 72, followed by VK2GJ at Brunswick Heads with 20.

There were many comments included with the logs and it looks like it will be practical to conduct a series of short duration contests at regular intervals. A two-metre SSB one was held on November 27.

About the time this issue of AR reaches you the Ross Hull Contest will be in progress. It needs your support and a returned log.

The Divisional Office will close during the holiday period and re-open early in January.

The office has a few 1988 calendars available. The cost was unknown as these notes were being prepared, but a phone call on (02) 689 2417 (11 am to 2 pm) or via the broadcasts will get it to you.

There have been several changes recently to repeater channels in an attempt to overcome some of the associated pager problems. The Mittagong VK2RHR 7350 and Goulburn VK2RGN 7325 have, by this time, received several Telecom channels on their respective sites as part of the expansion of paging facilities.

Goulburn will be changing to Channel 6825. Changes for Mittagong are still to be determined as the region is also in a television Channel 5A service area. It will also be difficult to obtain alternative channels for this site as there is a heavy concentration of services at the site. It is an intermodulation nightmare.

VK2ROT 7075 Paddington will change to 7025 to get away from an intermodulation problem on the 7075 input. VK2RTZ 7100 Newcastle went to 6775. VK2RLD 7375 Liverpool went to 6625. 7100 is to become VK2RZL in the Upper Hunter. VK2RPI ex-6625 Newcastle RTTY has been cancelled. VK2RTD 6800 is now operational from Tumut. VK2RWM 7100 Grenfell is to have a UHF service added.

The problems that come from the adjacent pager band is making life difficult for some repeaters. In VK2 there has been plenty of use made of channels above 147 MHz. Most of these are within, or adjacent to, the Sydney region. While some systems have moved to channels below 147, it is not possible in the majority of cases as there are neither the channels available, nor should the Amateur Service leave the top Megahertz.

Perhaps it would benefit the majority of repeater operators to alter the existing policy and reverse the input — output frequencies above 147 MHz. This would place each repeater input an extra 600 kHz from the pager band. It is a matter for all amateurs to consider. By now, all VK2 repeater groups should have received a report on this approach. If you have any thoughts on the matter you may obtain a copy of the report from the Divisional Office as we would like to hear your opinion.

The Central Coast ARC Field Day will be held at the Gosford Showground on Sunday, February 21, 1988.

NEW MEMBERS

A warm welcome is extended to the following who were in the November intake.

D Downie VK2EZD	Sylvania
R N Fullerton Assoc	Mount Victoria
K Goodwin (Mrs) Assoc	Auburn
D M Hughes VK2DML	Turramurra
D S Mackie VK2XGX	Cromer
R J Paxley Assoc	Armidale
J Ronk VK2FIX	Lane Cove
P A Smith VK2FJB	Singleton
G J Stephenson VK2VGS	Cronulla
S D G Tucker VK2ZET	Elanora Heights
A P Wilson Assoc	Yagoona

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VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

STORMNET

The south-east corner of Queensland is subjected to many violent storms every summer. The stormy season begins in October and can stretch right through until May. Many are accompanied by high winds and hail.

For several years a somewhat informal net has been activated on the Brisbane two metre repeater, VK4RBN. The net controller was usually Fred Saunders VK4FJ (until recently, VK4AFJ). Reports were received from amateurs as to the progress of the storm. This enabled those listening to take such precautions as were needed at the time.

This year more organisation has gone into the net. It has come under the umbrella of the Brisbane-area WICEN Group. Fred VK4FJ, was appointed net controller, and Manfred VK4KHW, as his deputy.

Publicity has been given to this service by the Sunday morning Divisional Broadcast which has detailed simple operation procedures. Already the storm watch has been activated and amateurs have conducted themselves very well. It is not confined to members of WICEN, of course, any amateurs with storm information are invited to report in.

It is very pleasing to the WICEN group that the Brisbane headquarters of the State Emergency Service monitor the Brisbane repeater and take note of the reports to the net controller.

The Brisbane Stormnet is tangible evidence of how amateur radio can be of service to the community.

THE SOUTH-EAST QUEENSLAND TELETYPE GROUP WORLD-WIDE NEWS SERVICE

The VK4TTY news printed each Monday evening on two metres and 3.630 and 7.045 MHz, has been reaching much further afield than the Group's news editor, Rob Green VK4KUG, ever envisaged.

Thanks to packet radio, the Monday night newscast now goes to many bulletin boards, not just in Australia, but to New Zealand, the United States, Canada and the Far East. The Group have already had messages of appreciation and recommendations on the quality of the news.

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QRM from VK7!

John Rogers VK7JK
VK7 BROADCAST OFFICER
1 Darville Court, Blackman's Bay, Hobart, Tas. 7052

The WICEN groups in several areas of the State seem to be having quite regular commitments to provide communications support for such activities as car rallies, orienteering expeditions and ocean yacht racing (like the Westcoaster). The experience gained from these activities, according to their various co-ordinators, will stand them in good stead if they are called upon to act in the case of an actual disaster.

Due to a long lead time, this has had to be written before the Westcoaster (the Melbourne to Hobart Yacht Race) takes place, and a more complete report on the outcome of the efforts of amateur operators will be given in the February AR.

A regular "training talk" has been transmitted each week on the VK7WI Divisional Broadcast. WIA Broadcasts are becoming slightly more complex in the State as further relay frequencies come into play, and the broadcast roster now includes a total of 28 participants. This means that each involved amateur is concerned with originating, relaying on 80 or 40 metres only two or three times in the three-monthly period.

The 80 metre antenna at the Southern Activity Centre is now "up and running" and this means that the Centre can accept its share of 80 metre relays as well as originating two metres. The broadcast is being recorded and repeated now on Tuesday evenings, 1930 hours local, on 80 metres only (3.590 MHz) taking up the half hour before the Devil Net. We hope that those who listen to this report will stay on air and join in the Devil Net under the benevolent guidance of Bob VK7NBF, who is in his fifth year as Devil Net Co-ordinator.

The two metre repeater on Mount Wellington, which has been the object of a great deal of "repair and maintenance" work during the past two months, is now working very well. Reports of access to the repeater have been received from many areas of the State which would earlier have seemed impossible, or at least very difficult and spasmodic. The linking of repeaters for broadcast purposes has been faultless and has made re-broadcasting and relaying very reliable. The meteorological conditions at the 4000 feet-plus level play havoc with alt external fittings, especially cables, and the group who spend time working under such conditions to keep the repeater working deserve the thanks of all repeater users.

WIA MEETINGS

WIA meetings are held at:

Penguin High School on the second Tuesday in the month at 8 pm.

Launceston Maritime College on the second Friday, at 7.30 pm.

Hobart Activities Centre, Newtown Road on the first Wednesday at 8.15 pm.

Visitors to Tasmania are very welcome to any of these meetings and can always be "talked in" on one of the repeaters. As well as the general business agenda, there is often a guest speaker or a debate at these meetings which would be of interest to inter-state visitors. Recently, there have been, for instance, talks on Satellite Communications, Cellular Telephone Systems, Safety in the Shack and Patching Units for Broadcast Relays. Debates have been on Morse and the Amateur Examinations and the Use of Repeaters.

The discussion on "Morse and the Amateur Examinations" brought out several interesting points:

1. That if the use of Morse code became extinct in the amateur fraternity (as seemed likely to many of the speakers if the proposed changes are made), we could no longer call ourselves a truly international body. We would have cut ourselves off from communication with amateurs in many (third world?) countries who were forced to home-brew their own gear and be restricted to low power.
2. Otherwise, do we expect all other participants in radio communication also to allow Morse to disappear? Many will not, and how do we then communicate with them?
3. Many of the QRP groups in the amateur world would shrink onto small "islands" of communicators quite apart, distinct from the rest of the fraternity — QRP is the mode of entry for many, especially young people, into the hobby.

The ATV Group is continuing to meet regularly in the north-west of the island under the guidance of Peter VK7AX, and to give encouragement to other prospective ATVers, there is a transmitter kit available from Peter.

A definite move to support would be novice amateur operators has been set in train by Noel VK7EG, and the branches are distributing information packages to colleges and schools to attempt to increase the number of candidates for the courses and to provide personal help when required.

The Tasmania Day Award proved to be a going concern and, already discussions are taking place about the possibility of a repeat in 1988.

Talking of awards, the 400th Tasmanian Devil Award was reached a short time ago. VK3CWJ was the lucky recipient, not only of the award certificate itself, but also a signed photograph of the Tasmanian Devil Net Organiser himself!

HELP NEEDED

The Max Loveless Pioneer Memorial Collection needs some help to get a 1960s vintage home-brew CW transmitter back on the air. Required is a valve or valves, type QV08 — 100 used to be used in a DCA transmitter type T49, and also in superior public address equipment.

If you can help with either a donation of same or a sale, please contact VK7RS, or anyone connected with the Tasmanian Division of the WIA. We would like to get this particular transmitter on the air again in 1988.

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VK3 WIA Notes

FEDERAL CONVENTION

The VK3 Divisional Council is most interested to hear from individuals, groups and clubs who have matters which they feel should be discussed at the next Federal Convention.

VICTORIAN DIVISION BOOK OFFICER

At the October meeting of the Victorian Divisional Council, Fred Swainston VK3DAC, was appointed to the position of Book Officer. Fred, who used to work as an electronics technician, is a full-time TAFE instructor and has been a successful and hard-working AOCP Instructor for many years. Council is confident that Fred will, through the bookshop, be able to supply a range of valuable reference works appropriate to the needs of operators of all levels.

HIGH ALTITUDE PIRACY

The Victorian Divisional Council has written to the DOTC expressing concern re the illegal use of frequencies in the 144 MHz band during the World Hang Gliding Championships to be contested in central Victoria this month.

Illegal use of frequencies by competitors at previous events, especially during bushfire season, could have interfered with WICEN emergency service operations. Whilst the illegal operation of two metres equipment mainly concerns hand-held units, the fact that these units are operated at altitudes up to 3000 metres, or so, provides extremely long range interference.

A letter was written to the President of the Australian Hang Gliding Federation requesting their co-operation, however, this body appears to be very reticent to co-operate and has adopted the attitude that communications on illegal frequencies are a matter for DOTC. They have indicated that they are not prepared to modify their rules and penalise contestants who operate in the 144 MHz band.

The World Hang Gliding Championships are being sponsored by a large brewing company.

NEW SERVICES AVAILABLE

The VK3 Division has high quality RG213 Belden cable available to members at $2.50 per metre.

The Division also has negotiated with a printer for the printing of quality two-colour QSL cards at a reasonable price to members.

Inquiries regarding the cable should be directed to the Divisional Office, 412 Brunswick Street, Fitzroy.

For further information on the QSL cards, please contact the State President, VK3XV, QTHR.

This is a membership service operated by the VK3 Division on a non-profit basis.

—Bill Trigg VK3PTW, VK3 Council.

NEW MEMBERS

A warm welcome is extended to the following new members.

R D Fincher VK3BRF, Red Hill
Steven Jackson VK3KRG, West Footscray
J A Maker, Dandenong
D B Milne, Airey's Inlet
A J C Randall VK3MAT, Ringwood
A W Rowe VK3PMF, Mill Park
A J Williams VK3MAW, Forest Hill
A S Meynderts, Wendouree
Donald Peters VK3DVE, Tallangatta
Geoffery Rees, Lara
P J Shufflebotham VK3XJI, Romsey
Peter Styles VK3EBP, East Kew
N Webster VK3KAL, Alexandra
Michael Weinstock VK3EMJ, Ripponlea
Colin Dyason, Drouin

ar

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

WIND-DOWN JUBILEE 150 — SA

Almost 12 months to the day, the Grand Old Lady, VK5JSA, went skywards from South Australia, signalling the commencement of South Australia's amateurs involvement in the State's 150 birthday celebrations. In the months that followed, the call sign literally "popped up" from the length and breadth of the State. It travelled by air, sea and rail many times over, as well as from the United States and within Japan. It lit up many transceivers around Australia and overseas in a year of poor propagation and, with it, brought friendships and the good things of amateur radio.

A LETTER OF THANKS TO ALL

The success of the program can be measured in its overall results, its goodwill to the hobby, its promotional aspects towards the State and, very importantly, its reliance on firm financial backing and resources to achieve a noble end and come out in front — and have some fun doing it.

All aims and objectives were fulfilled and, thanks to our sponsors and you out there, the many thousands of contacts and award chasers, all creditors were appeased and the blue ink surpassed. The SA Division and the amateurs who worked for this very successful outcome would like to share the following letter of thanks forwarded recently to the Premier of South Australia, the Honorable John Bannon, with the amateurs of Australian and beyond.

Dear Sir,

On behalf of the WIA (SA Division) I would like to thank you, Sir, for your support of our major Jubilee 150 program of amateur radio activities and in particular the addition of your personal signature to in excess of 1500 SA Jubilee Certificate Awards.

The SA Division believes its program to make world contacts and to promote SA was an outstanding success. Amateur radio contacts communicated SA's birthday celebrations and reached into all parts of the world by many different modes including satellite, Morse code, RTTY and AMTOR with by far being SSB (voice) on HF bands.

Sir, I feel you would be interested in a brief of the results achieved and the scoreboard would read as follows:

There were

- 90 000 radio contacts, 90 000 special J150 QSL cards forwarded to in excess of 150 countries.
- 1450 special "Premier" signed SA Awards (to achieve the award several contacts were required with SA stations and activities to qualify for the award).
- a total of 80 different countries plus SWLs received the J150 award (a list of these countries have been enclosed).

During 1985-6 from a total of 25 listed activities, five additional awards complimented the J150 Award and were included under the umbrella of the J150 program. Activities were followed up with award applications for:

- Kangaroo Island, Cape Willoughby Lighthouse (400 awards).
- Jubilee Industry Trade Train (state-wide) SA (530 awards).
- Paddle-steamer Industry, Renmark SA (250 awards).
- Marion Council Centenary J150 (250 awards).
- Australian Formula 1 Grand Prix, Adelaide (400 awards).

It should be noted that the awards forwarded represents about 20 percent of the total contacts made for each activity.

A feature of our program was to experiment with antennas and therefore celebrate with the use of the special call sign VK5JSA or VI5JSA from as many locations as possible.

In addition to working from a lighthouse on Kangaroo Island, the Paddle-steamer at Renmark, the Trade Train (state-wide), the Marion Council Library and the metropolitan and near-country for the Grand Prix, the call sign travelled rail mobile on the Trans-Australian to Perth and return, on the Failie (marine mobile) and by air (aeronautical mobile). It was located as far north as the Moomba Gas Fields (courtesy of Santos Ltd) and overseas in Japan and the USA (Texas and California) with 1250 logged contacts within the States. Unfortunately, hot air balloons and submarine operations alluded our theme of *Have J150 Call Sign, Will Travel.*

Feature articles appeared in Australian and overseas radio magazines, namely *Amateur Radio* (the official WIA monthly magazine), *Amateur Radio Action, CQ Ham Radio* and *73 magazine*, American and Japanese periodicals.

The WIA (SA Division) would ask me to acknowledge, Sir, the formal acceptance of our program by Mr Gavin Keneally then the Honorable Minister for Tourism, and the sponsorship afforded our undertaking by the SA Tourist Bureau through the work of Mr Chris Crayford, Marketing Manager, and Mr Bob Bullfield.

Again, Sir, on behalf of the SA Division of the WIA, the President, Mrs Jennifer Warrington, the Council and the amateurs of SA, we thank you. It was a pleasure to help put SA on the world map, we enjoyed doing it by promoting VK (Australia), 5 (SA), JSA (Jubilee SA) via the hobby of amateur radio.

The SA Division also extends acknowledgments of supportive sponsorship for SA's major awards program to:

- Hills Industries SA Ltd, (Mr R W Dodman and Mr R D H Ling)
- The District Council of Kingscote (Mr Neville Cordes) and the Jubilee 150 Committee of Kangaroo Island (Mr George Murphy)
- AN Rail, (SA) and Westrail (WA)
- ANZ Bank (Mr Bruce Dent)
- AXIS Travel of Tranmere, SA (Mr Max Najar and staff)
- Coco Cola SA (Mr Vince Monerola)
- Jubilee 150 Committee (Mr John Chapman)

Your generous support has been well received throughout Australia and overseas, thank you.

Yours sincerely,
(Signed:) Graham Horlin-Smith VK5AQZ
Co-ordinator, WIA (SA Division) —J150

COUNTRIES AND CALL SIGN OF FIRST CONTACT

1	Australia (VK5SJ)	42	Nepal (9N1MC)
2	New Zealand (ZL1AQQ)	43	Austria (OE1PCC)
3	Papua New Guinea (P29JW)	44	Sweden (HB9AIB/SM)
4	Japan (JQ1EBK)	45	India (VU2VVC)
5	USA (K7KSA)	46	China (BY1QH)
6	Malaysia (9M2DF)	47	East Germany (Y36TG)
7	Fiji (3D2DW)	48	Sri Lanka (4S7EA)
8	SWL — Australia (VK3XKG)	49	Costa Rica (TI2JJP)
9	South Africa (ZS1FW)	50	Saudi Arabia (HZ16260)
10	Brunei (V85WS)	51	Hong Kong (V560A)
11	Mexico (XE1JIX)	52	Kuwait (9K2YA)
12	Indonesia (YB3CKY)	53	Heard Island (VK0DA)
13	Bolivia (CP5LE)	54	Cyprus (ZC4NL)
14	Brazil (PY2ZJ)	55	Antarctica (VK0TW/S)
15	Chile (CE1FGT)	56	Gabon (TR8CA)
16	Canada (VE4ANA)	57	Togo (5V7SA)
17	Argentina (LU1CIZ)	58	Guam (AH2F)
18	Trinidad (9Y4MJK)	59	Oman (A4XKJ)
19	Alaska (KB6GOZ/MM/KL7)	60	Sicily (IT9TOH)
20	St Kitts, WI (V44KQ)	61	Azores (CU3AA)
21	Wake Island (NH6FU/KH9)	62	Canary Islands (EA8ALY)
22	England (G4VOE)	63	Solomon Island (H44JL)
23	Switzerland (HB9VQ)	64	Hungary (HA6NF)
24	Germany (OL2RBK)	65	East Malaysia (9M6MO)
25	Wales (6W4VBV)	66	Ecuador (HC1RF)
26	Scotland (GM0FQV)	67	USSR (SWL — UA1.169738)
27	Czechoslovakia (OK2BBI)	68	Gambia (Africa) (C53BU)
28	Western Samoa (5W1FT)	69	Marshall Islands (KX6BF)
29	Malta (9H4E)	70	Poland (SP8AJK)
30	Denmark (OZ1LDN)	71	Kenya (5Z4BP)
31	Israel (4Z4OX)	72	Singapore (9V1WR)
32	Netherlands (PA3CWJ)	73	Ukraine (RB5DX)
33	Noumea (FK8AH)	74	Korea (HL2ADV)
34	Spain (EA2TSA)	75	Grand Cayman (ZF1RC)
35	Pakistan (AP2SQ)	76	Nauru (C21RK)
36	Ireland (EI6EW)	77	Yugoslavia (YU3HR)
37	Italy (IK5FCD)	78	Philippines (W3WYP/DU2)
38	France (F6IFE)	79	European USSR (UW3IN)
39	Peru (OA6DA)	80	Estonia (UR2DL)
40	Rumania (YO4JQ)		
41	Belgium (ON6HR)		

WIND UP? ? ?

Well, that's it for 1986 and a curtain call and close for VI5JSA and here we are on the doorstep of the 1988 Bicentenary with a few activities on the drawing board for VK5-land, or should we say, VI88SA? Keep an eye out for us on the Murray Princess (marine mobile), the Grand Prix later in the year with a couple of activities in between hopefully! Thanks to the SA gang and Seasons Greetings to all.

—Correspondent for the month:
Graham Horlin-Smith VK5AQZ
2 Athol Drive,
Tranmere, SA. 5073.

Ionospheric Summary

The monthly average of the 10 cm flux for September was 86.5, for sunspots the number is 33.5, the A index 16.4, I index 21.1, solar activity was low and there was one M class flare observed on September 21.

Between September 5 and 10, there appeared to be a good chance of energetic flares and associated shortwave fade-outs, but none eventuated. Solar activity also appeared likely to increase during the period around September 21, but only the one energetic flare was observed.

The high monthly sunspot number for September continues the trend of recent months and brings the yearly smoothed value for March 1987 up to 21.9.

Geomagnetic disturbances were recorded on September 1, 2, 10-16, 22-26, and 28-30. September was a very disturbed month with two extended periods of disturbance. The most disturbed days were September 11 and 25, when the A index exceeded 30 — 40 on the 11th and 35 on the 25th. The monthly averaged A index was the highest recorded since February 1986. Aside from that month, September was the most disturbed month since November 1984.

IPS have now produced a Frequency Prediction Calculator for mobile communicators. It provides an economical and easy to use method to instantly select a frequency for HF communication needs. The path covered can be up to 1000 kilometres. The price for a quantity of 1 to 9 is $14.50 each and includes four insert cards, one for each season. The calculator is a four page folder with a multi-page sliding insert card, updated every three months.

Those interested should contact IPS Calculator, IPS Radio and Space Services, PO Box 702, Darlinghurst, NSW. 2010, or telephone (02) 269 8616.

This calculator could be helpful to those who have a daily sched with other VKs or possibly Pacific areas.

Should clubs require some, there is a reduction in price to $13.00 for 10 to 49 copies. Postage is included for all purchases.

Contributed by VK2QL

Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

G — General
C — Constructional
P — Practical without detailed constructional information
T — Theoretical
N — Of particular interest to the Novice
X — Computer program

BREAK IN, October 1987. Hawles Bay VHF Group issue (G). Spectrum Deregulation (G & N).

CQ-TV No 139, August 1987. Information and circuits for ATV. (British Amateur Television Club) (G).

73 MAGAZINE, September 1987. Special Antenna issue. (G & N).

QST, September 1987. Alternative Energy (G). Precise Tuning Frequency Indicator (P). Tuning Diodes (C & N). Fibre Optics (G & N).

RADIO COMMUNICATION, October 1987. Invisible Antenna for 14 MHz (P).

CQ, September 1987. 1986 CQ WW DX Phone Contest results (G).

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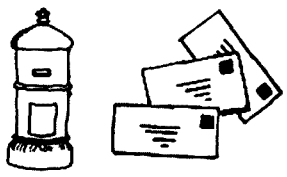
Over to You!



Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

JOTA RELAY

I feel it would be most remiss if all amateurs in this State did not write to the magazine and express their grateful thanks to whoever arranged the "hook-up" between here and the east on two metres for the JOTA exercise weekend.

If little else, these amateurs should be publicised in AR so that all will know to whom we can say "Well Done".

An article on how it was done will no doubt appear in due course and will be appreciated by all who made use of the facility.

Apart from the astounding event, mention must be made of the extreme courtesy shown by the *many* gentlemen during the resulting "dog pile" *on* some occasions, and their patience in waiting for those by nature a little slow with their overs. As well, it was noticeable that amateurs were quick to ask others to take a turn so that there was little "hogging" of the facility.

I am of course reporting from this side of the continent and maybe it was different elsewhere. May the spirit of amateur radio as such long continue in our hobby making us better for it. Also "Well Done" to the net operators, whose excellent supervision kept things functioning smoothly.

73 to all

R A Davey VK6ARD
12 Lillian Street,
Cottesloe, WA 6011

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TECHNICAL CORRESPONDENCE

I read with interest the letter of Allan Doble VK3AMD, in the August 1987 edition of the magazine's regular feature *Over to You!*

Allan indicated that there was very critical tuning of Emtronic's antenna tuning unit. The problem is not unique to this brand of tuner, but also affected my new Kenwood AT230 tuner.

I improved adjustability by installing a 6:1 reduction drive to the "R-TUNE" control. The other control "X-TUNE" did not require similar modification.

Actually, this modification was not difficult, but took me several hours to experiment with, and finally install the reduction drive. Conveniently, the existing parts of the knob were used and the external appearance of the unit is not changed.

Internally the insulating shaft of the capacitor of the "R-TUNE" control was shortened by about 1.5 cm. The hole in the front panel was enlarged and two holes drilled for use with 1.5 cm spacers and long screws to rigidly mount the reduction drive mechanism. Two small screws (metric thread) were used to fix the metal part of the original knob to the drive to act as an indicator, while the plastic part is used as the hand control. It appears that the use of a reduction drive may have been in the original design but was not in the final product.

I have found that on the 80 metre band of the Hy-Gain 18AVT vertical aerial the tuner is now much easier to use. The 6:1 ratio is an ideal reduction, and is readily available.

I find that the tuner degrades the SWR of reasonably resonant aerials irrespective of any settings of the controls. Also, I find it impossible to obtain SWR better than 3:1 on 80 metres with the 18AVT. Is this a normal feature or unique to the design of the Kenwood unit? I would appreciate comments from other users.

Yours sincerely,

Richard Penalurick VK1KAB
HMAS *Nirimba*
Quakers Hill, NSW. 2764

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TOPICAL TECHNICALITIES

Topical Technicalities has started badly. No 1 was intended to show that the most important purpose of impedance matching is to obtain maximum conversion efficiency and not the maximum possible transfer from source to load. The errors in the text will add to the confusion about this subject. They are in order of appearance:

Replace

$$R_s \pm jX_s = R_l \pm X_l$$

with

$$Z_{source} = R + jX$$

and

$$Z_{load} = R - jX$$

Note: Steve VK3HK, has pointed to possible confusion caused by the word 'conjugate'. Conjugate is used in mathematics when expressions are joined by a reciprocal relationship. +j is the reciprocal of -j; (their product is unity) therefore R + jX is the conjugate of R — jX.

The DC resistance should be 12/9.7 = 1.24 ohms.

The RF resistance is E_p^2 /PEP = 0.79 ohms.

My typewriter doesn't have a symbol for Pi and I used ¶ which was also used by the typesetter. I hope readers guessed correctly.

Yours sincerely,

Lindsay Lawless VK3ANJ
Box 112,
Lakes Entrance, Vic. 3909.

ar

MORSEWORD 11 SOLUTION

Across: 1 diets 2 bren 3 leas 4 acts 5 mimer 6 tarts 7 dose 8 beep 9 tabs 10 bro
Down: 1 zoo 2 ugh 3 vain 4 hear 5 sob 6 aura 7 takes 8 heft 9 raft 10 sheet

	1	2	3	4	5	6	7	8	9	10
1	—	•	•	•	•	•	—	•	•	•
2	—	•	•	•	•	—	•	•	—	•
3	•	—	•	•	•	•	—	•	•	•
4	•	—	—	•	—	•	—	•	•	•
5	—	—	•	•	—	—	•	•	—	•
6	—	•	—	•	—	•	—	•	•	•
7	—	•	•	—	—	—	•	•	•	•
8	—	•	•	•	•	•	•	—	—	•
9	—	•	—	—	•	•	•	•	•	•
10	—	•	•	•	•	—	•	—	—	—

Obituary

HAROLD DICKS VK6QD

When a capable and determined person is convinced early in life that his career should include specialist training and skills, nothing can prevent him from achieving his goal. Add to this the mental attitude that performance of a standard less than excellent is not acceptable and you have a fair understanding of the character and ability of the late Harold Dicks, who died suddenly at his home in Perth on October 10, 1987.

In the 1930s, when Harold was a medical student in Sydney, the other facet of his magnificent obsession became a reality, he learned to fly. At that time there were not very many pilots in Australia and the country was trying to recover from the great financial depression. This did not deter him, and it was typical of his outlook that he also studied for, and obtained, his aircraft Ground Engineers Certificate.

His first medical appointment in Cairns did not hold him for long, after he saw an advertisement for a Government Medical Officer at Marble Bar. It stated that the applicant must be prepared to fly.

It became a natural progression for him to the Australian Aerial Medical Service. Wonderful things happened during those years when the AAMS became known as the Royal Flying Doctor Service and John Flynn's vision of a 'mantle of safety' for the people of the outback became reality.

Many stories have been told, but there was so much in the life of Harold that it is doubtful whether it will all become known. It is certain that there are many thousands of men, women and children who will mourn the loss, and be grateful for the inspiration and work of this truly remarkable man.

Harold was well-known in the Port Fairy district of Victoria, as he frequently called at Warrnambool on the many occasions when he ferried new aircraft from overseas en route to Perth for service with the RFDS.

In addition to the kindred spirits in aviation, he was also in regular contact with his amateur radio friends. He will be sadly missed. We honour his memory and join with his widow, Patricia VK6QL, and his children, Robin and David, to mourn his loss.

Vale VK6QD.

—Printed courtesy of the *Port Fairy Gazatta*, written by George Bills-Thompson VK3AHN, and contributed by

DEADLINE

All copy for inclusion in the March 1988 issue of *Amateur Radio*, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, January 19, 1988.

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS**, Box 157, Mortdale, NSW. 2223. (*No inquiries at office* . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — NSW

GENERAL COVERAGE COMMUNICATIONS RECEIVER: DX160 or similar. Any model or condition considered. Peter VK2APJ, QTHR. Ph:(047) 59 1651.

WANTED — VIC

INSTRUCTORS: To teach AOCP or AOCP Novice Course in 1988. Attractive pay rates apply. Course duration is 3 hours per night for 16 weeks. For further details contact Peter or Ian VK3COE. Outer Eastern College of TAFE. Ph:(03) 220 8826.

WANTED — QLD

HD ROTATOR: Prefer Diawa 7600R. Also 4 el monoband Yagi, for 20m. Both must be as new and in excell cond. Albert VK4CL, QTHR. Ph:(070) 55 1036.

FOR SALE — NSW

COE ARR22 ROTATOR: with control. Suit small HF beam viz TH3jr/TH3mk3. Fair condx. $200 ONO. Simplex semi-auto key made by Leo Cullen. Good condx. Also, Autronic (USA) key to suit electronic keyer. New. What offers? Art VK2AS. Ph:(02) 467 1784.

FT-290R 2m FM/SSB TRANSCEIVER: Unused condition. $500. NEC CQ-110E HF transceiver. 160-10m, 12 and 240 volt operation, CW filter. Handbook, with full service information, excellent operating order, digital frequency readout. $425. VK2AYO, QTHR. Ph:(02) 489 2417, 7 pm on weekdays, or anytime weekends.

OSCILLOSCOPE: H/P CRO Dual Trc. Model 170A 30 MHz — op & service manual, working order. $200. VK2SU, QTHR. Ph:(069) 68 1556.

SHACK SELLOUT: 20 MHz dual trace CRO. $750 inc probes. Digital function generator — sine, square, triangle waves to 2 MHz. Use as frequency meter to 10 MHz. TTL/CMOS pulse outputs, etc. $400. Digital benchtop multimeter. $250. Kenwood R-5000 communications receiver. $950. All gear less than 6 months old, still under warranty, excellent condition. Any reasonable offers, Must sell, going overseas soon. VK2XRG. Ph:(02) 625 4490.

SWAN 350: with power supply, handbook, and spare set of valves except finals. As is $100. Charles Aston VK2YH, 61 Mitchells Pass, Blaxland, NSW. 2774. Ph:(047) 39 2484.

WIND-UP TOWER: Deceased estate. 22.5m, Hills. Very good condition, 3 section. Offers to David. Ph:(02) 29 1768 BH or (02) 498 2259 AH.

FOR SALE — VIC

POWER SUPPLY: Lambda LMF15V, 9-20V DC adjustable, 28 amp, regulated with overload protection, excellent condition. $250 ONO. VK3KOA, QTHR. Ph:(03) 45 1731 AH.

YAESU FT-290R TWO-METRE ALL-MODE TRANSCEIVER: excellent condition. Complete with carry case, nicad rechargable batteries, instruction manual, carton. Also, 2m side-mount aerial, J-pole, coax and connectors. $400 the lot. Alan VK3KRP, QTHR. Ph:(03) 743 4385.

FOR SALE — QLD

DRAKE MN2000: 2kW antenna tuner. $350. Speech processor, Japan, works well, but no longer needed. $30. UA78HG voltage regulator desperately needed. Can anyone help? Please advise cost, including post to John VK4SZ, QTHR. Ph:(070) 61 3286.

KENWOOD TS-130 TRANSCEIVER: as new. $750. Also Kenwood antenna tuner, AT-130. New $150. Albert VK4CL, QTHR. Ph:(070) 55 1036.

FOR SALE — WA

KENWOOD TS-430S HF TRANSCEIVER: New condition. $975 ONO. Lance VK6MD. Ph:(09) 293 4331. Licenced amateurs only.

FOR SALE — TAS

KENWOOD TS-520S. Excellent cond, unmarked, CW filter, svce man, Mic. $525. DG5 digital readout suit TS520S. $225. As new. All with books, leads, etc. Pair $700. VK7AN. Ph:(003) 31 7914.

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Advertiser's Index

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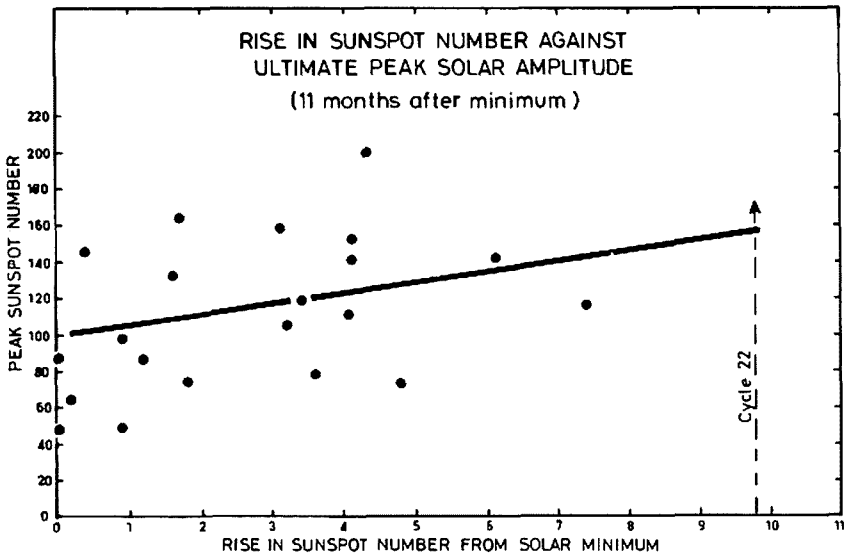
JANUARY ISSUE



THE NEXT SOLAR PEAK – HOW BIG WILL IT BE?

Last January we said "Kiss Your Last Big Sunspot Maximum Goodbye". Well, you might not have to! Richard Thompson of IPS Radio & Space Services details what looks like good news!

Roger Harrison's
Australian
ELECTRONICS
Incorporating
Elektor Electronics

DON'T MISS IT!

$4.75 AT YOUR NEWSAGENT

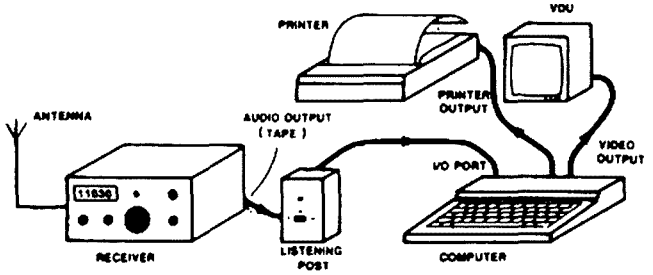
BUILD A STAND-ALONE RTTY/MORSE DECODER

No computer required! Just hook it up to the audio output of your receiver and any dot matrix printer. If you don't have a computer – here's how to get into electronic RTTY. If you do have a computer, free it up for other uses!

More electronics you can use. Every month.

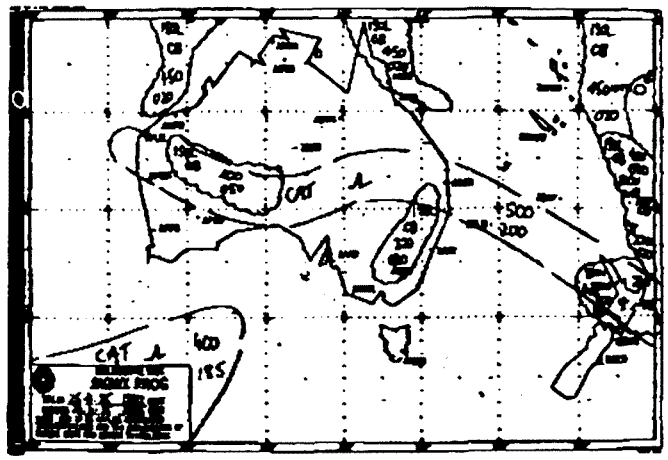
Wholly independently produced by Editor/Publisher Roger Harrison VK2ZTB through Kedhorn Holdings P/L, PO Box 507, Wahroonga 2076 NSW.

RECEIVE WEATHER FAX, RADIOTELETYPE AND MORSE CODE TRANSMISSIONS USING YOUR COMPUTER



Build the Australian Electronics Monthly "Listening Post" (AEM3500), a simple add-on decoder project – it goes between the audio output of a HF (shortwave) communications receiver and the I/O of your Commodore 64 or Microbee computer; software then decodes the transmissions for you. Print weather maps, foreign news service broadcasts, amateur and commercial radioteletype or Morse transmissions. *

Fascinating! Useful, too.



FAX picture

SOFTWARE ONLY: $25.00
– includes all instructions on the decoder & s/ware.

LISTENING POST "PACKAGE": $35.00
– you get software, quality fibreglass pc board with component overlay and full how-to-build instructions plus software operating details. (Components are widely sourced by electronics retailers).

*C64 software does not provide Morse decoding.

Send coupon to: AEM Software Service, PO Box 507 WAHROONGA 2076 NSW.

Send us a blank C10 cassette or a formatted disk for us to transfer the software onto.

SEND ME THE LISTENING POST:
☐ SOFTWARE ONLY
☐ FULL PACKAGE

My computer & printer are:
☐ Microbee/C.Itoh 8510-type
☐ Microbee/"Epson" FX80-type
☐ C64 or C128/(most printers)

I am paying by ☐ Cheque ☐ Money Order ☐ Bcard ☐ Mcard ☐ Visa
(Make out cheques or money orders to: Aust. Electronics Monthly)

Card No ..... Expiry .....
Signed .....
Name .....
Address .....
..... P/code .....

Or phone and pledge your plastic: (02)487 1207.

BAD NEWS FOR ANYONE WHO EXPECTED BIG THINGS FROM ICOM.

The biggest news in hand held transceivers is actually very, very small.

It's the new generation ICOM IC-μ4AT and its midget twin, the IC-μ2A.

Both pack all the performance and reliability you expect from ICOM into a tiny package. And although they weigh next to nothing, they're not light-on for features, as you'll see.

The IC-μ4AT has built-in power saver circuitry that uses as little as 8 mA of current flow during standby. So it will last up to four times longer than some older equipment. Yet it measures only 58mm wide by 140mm high by 29mm deep with optional BP-22 battery pack.

It also has a DTMF pad, 10 memory channels with convenient digit up/down switches, subaudible tone encoder, and a comprehensive LCD display with special backlighting that turns off when not being used.

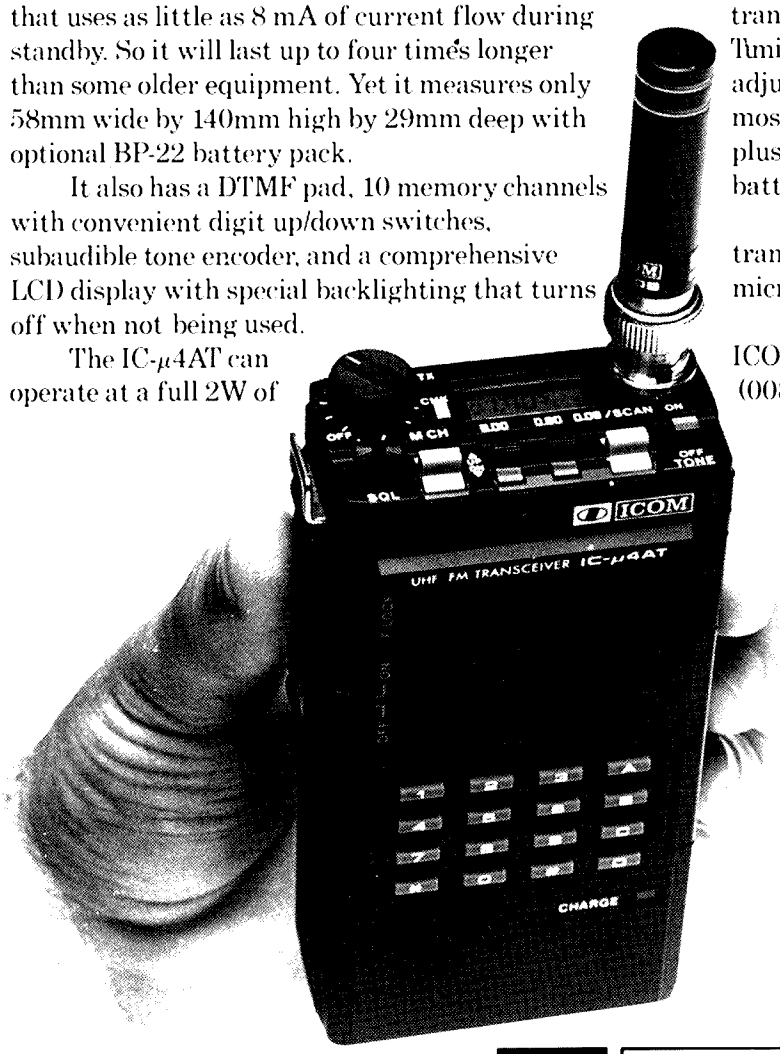
The IC-μ4AT can operate at a full 2W of output power from the optional BP-24 or optional converter with 12V battery. And its durability makes it ideal for operating in rugged outdoor environments.

The IC-μ2A also has 10 memory channels and the top panel LCD for easy readability and puts out up to 2.6W of output power from the BP-24 battery pack.

Like its counterpart, this 2 metre transceiver features Digital Touchstep Tuning for fast shirt-pocket frequency adjustments. And of course, both can use most existing ICOM hand held accessories plus a new line of long life nicad battery packs.

So if you want big things from a small transceiver, get your hands on the ICOM micros soon.

For details of your local dealer phone ICOM on Melbourne (03) 529 7582 or (008) 33 8915 from elsewhere in Australia.



ICOM

Amateur Radio

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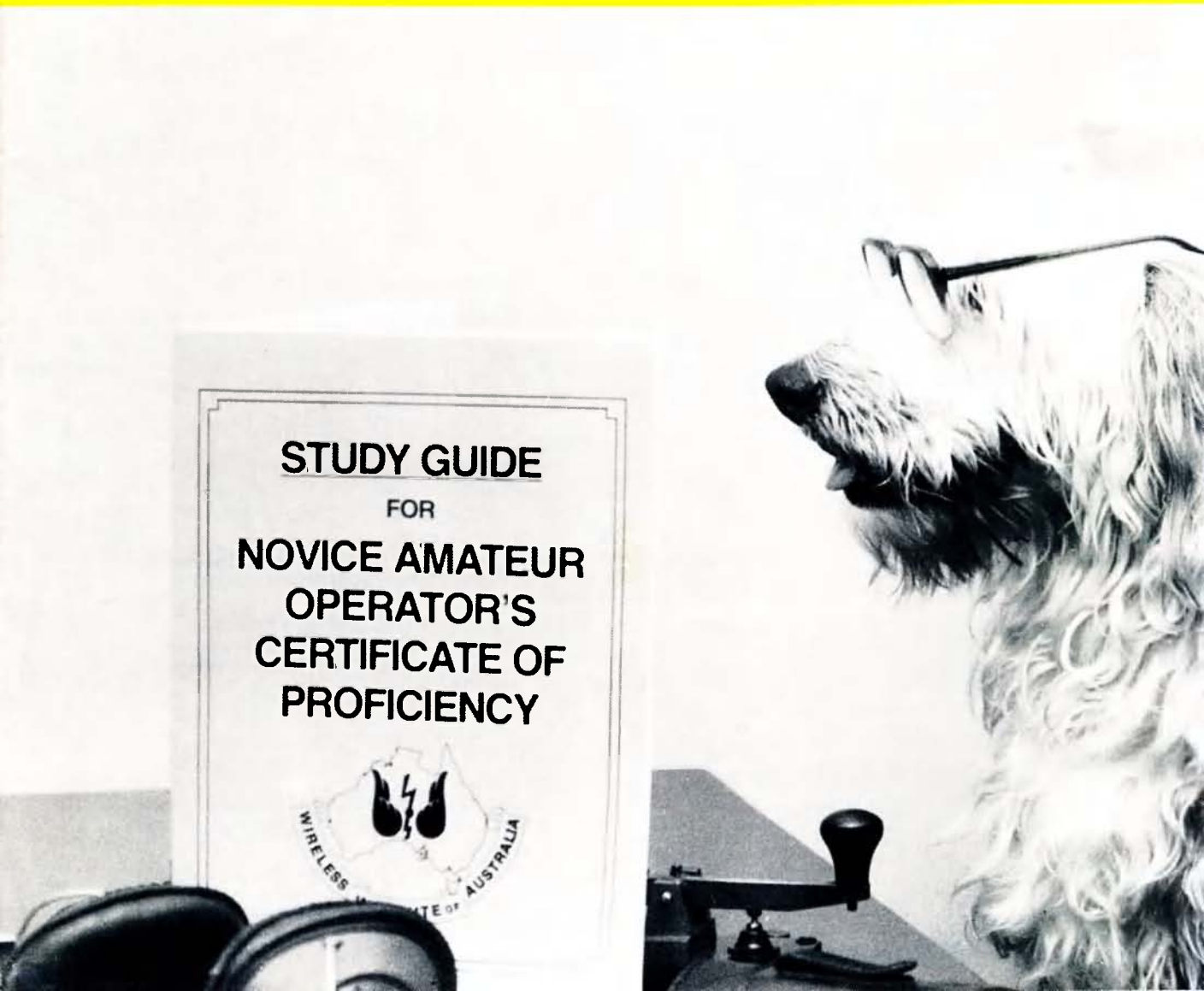

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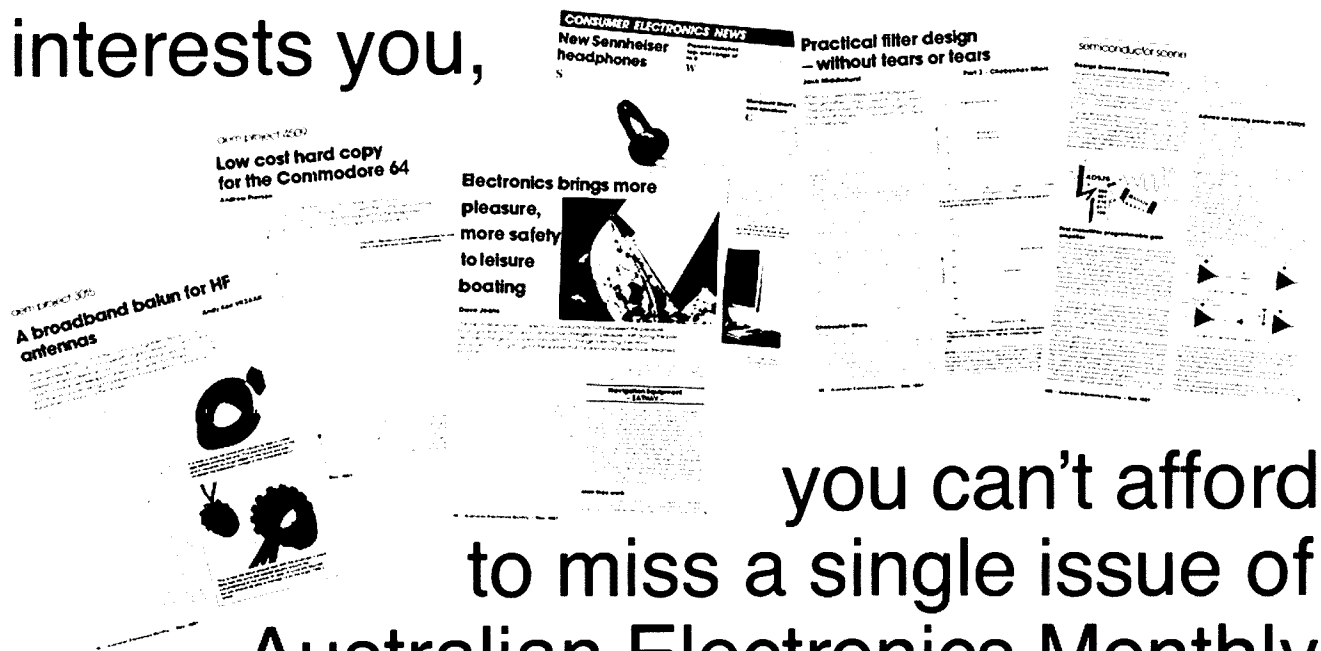

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Amateur Radio

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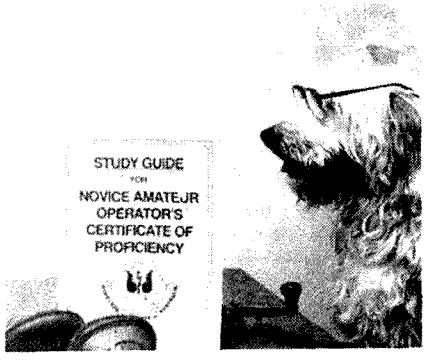

Even Zoe is interested in the new NAOCP Study Guide which is now available for $2.50 plus postage.
—Photograph courtesy Vanessa McLachlan

Technical Features

Regular Features

DEADLINE

All copy for inclusion in the April 1988 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, February 22, 1988.

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HAMADS should be sent direct to the same address, by the same date

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Editor's Comment

THE NEXT TWO HUNDRED YEARS

It is two hundred years since Australia's first European settlers began to carve out of the Port Jackson bush a place to be known as Sydney. We are reminded everywhere that this is our Bicentennial Year. How has civilisation evolved since 1788, and what might life be like in another 200 years?

When the First Fleet arrived, there were only four widely-used sources of energy; and only one of those, wind, was capable of propelling ships for great distances. The others were human muscle power, animals (horses, donkeys, oxen) and water-wheels. Electricity was a vaguely-appreciated natural phenomenon, violently present in lightning, and otherwise only good for twitching the legs of Galvani's frogs! The first steam engine had come into use some years before, and was able to pump water, but slowly and inefficiently until James Watt devised the condenser and later the centrifugal governor, barely 10 years before Phillip and his fleet set sail. Even gas lighting had yet to appear.

The first men to fly had left the Earth's surface, beneath Montgolfier's hot air balloon, just over four years before the Fleet arrived. As for signalling over a distance, even the semaphore had yet to be invented, and ships could only communicate over visual distances using flags.

But the pace of invention quickened. By 1888, steam-powered ships were well developed, railways ran great distances in most civilised countries, the petrol engine was making the first motor cars possible, electricity was being generated in central power stations and beginning to challenge gas for municipal and private lighting. The telegraph system spanned the world, and the advent of powered flight was not far away. Even the possibility of "wireless telegraphy" was being demonstrated by Hertz.

It was at about this time that a man whose name (or even existence) I am unable to establish, is alleged to have resigned his job with the British Patents Office, on the grounds that he could see no future in it, that everything that could be invented already had been!

Since then, of course, we have had aircraft and automobiles, turbines and terawatts, transistors, ICs, computers and space exploration, teleprinters, television, nuclear energy and nuclear weapons, two World Wars, hundreds of minor wars, and now a glimmer of hope that mankind is not quite as near to nuclear suicide as most of us had dreaded. Perhaps our species will survive. What will our descendants see in 2188?

Some things are very likely. It seems that the "greenhouse effect", of our own making, will have warmed the planet and altered climate everywhere. But the general use of nuclear energy will reduce the rate at which we load the atmosphere with carbon dioxide, so perhaps the ice-caps will not have melted and drowned all sea-level cities. In Australia, only Canberra would remain, of our present capitals, if this should happen.

Liquid hydrocarbon fuels may still be in use, but the world's oil will long since have been drained dry. Synthetics, from coal or wood (or sea-weed?) will have been created instead. Solar energy and incredibly compact storage batteries will probably be the main means of vehicle propulsion. Our present primitive space travel will in 200 years have developed beyond recognition. It may be that in 2188 the First Fleet (of Homo Sapiens from Terra) will be approaching the third planet of Alpha Centauri!

And amateur radio? Perhaps; but the communications engineer's aim, to place every person in contact with every other as and when desired, should by then have been long achieved. Will there be a place for the amateur in 2188? I am not game to guess; are you?

Bill Rice AX3ABP
Editor

Recipients of the 1987 Publications Committee Awards announced.

See page 26.

FEDERAL NEWS

At the time of writing this office is busy processing membership subscriptions for 1988 — obviously Bankcard, Mastercard and Visa have made life easier for many members.

Whilst we have been officially closed, we have been unofficially open working on your subscriptions. For some members it is the only time they can choose books from the Magpubs section, etc, so we have had a steady stream of members paying their subs and purchasing books, T-shirts, etc. As we are so busy we are not able to give members as much personalised attention as we would like at this time.

Thanks to the many members who have advised us of change of call sign and address or grade. If you know any non-members who have not notified us of any changes, please give them a gentle reminder.

There has been a slight problem for members with several lines in their address. There is one line needed for internal office code, and three lines available for name, and address.

Thanks also to the many members who have written letters, or notes and enclosed these with their subscription. We are always grateful for constructive advice, and need to be constantly aware of how our members think. All letters are read, noted and appreciated.

Whilst thanking people, now is a perfect time to thank all those volunteers who work so hard for the Institute. Each Division has a band of hard working volunteers, and the Federal Executive has many volunteer workers, too. Year in and year out the same faces appear again to do the hard work needed to keep the Institute going. From the Federal Office to you all — our grateful appreciation.

There will be shipments of books arriving in the new year, so please ask your Division if you require assistance with a selection of technical books.

INTERNATIONAL TRAVEL HOST EXCHANGE

Remember this worthwhile program. If you have ever enjoyed hospitality from friends overseas, you know what it is like to be in a foreign country and not know where to start looking for a fellow amateur, or club. Even if you do not have a spare room or speak a foreign language — register as a friendly Australian amateur just to meet our overseas visitors and have a chat. We have many letters from overseas visitors or intending migrants requesting advice, etc. Can you help? Send your name and address to the Federal Office and we will forward a form to be filled in and we can add your name to the register.

Compiled by Ann McCurdy
Federal Office Secretary

THE WIA MANAGEMENT IS DEMOCRATIC!

by Ron Henderson VK1RH

&

Peter Gamble VK3YRP
Members of the Federal Executive

Yes, we mean it — management of the WIA is democratic! However, it is structured very like our Federal Government and has many similar inherited problems.

Like our Federal Government, the WIA State Divisions came first, except for the Australian Capital Territory Division, who are relative newcomers. At a much later date the Divisions agreed to hand over a number of common responsibilities to a Federal body, retaining only those activities which needed to be conducted by the Divisions. Appendix 1 lists the objectives of the Federal body.

FORMAL STRUCTURES OF THE WIA

We are, each one of us, members of a Division of the WIA. Generally, as a result of inter-divisional agreements, we belong to the Division in which we reside. Years ago we paid our subscriptions to our Division and they remitted a per capita amount to the federal body to finance Federal services such as *Amateur Radio* magazine, membership of the International Amateur Radio Union (IARU), and administrative costs. Of recent years, with the introduction of a computer system, the Federal Office has maintained the membership register, collected subscriptions and returned the Divisional component (which varies from Division to Division).

Each of the seven Divisions is a member of the Federal body and are represented by their Federal Councillor. In company law the Divisions are share-holders of the Federal Company registered in Victoria. Just like any other company the shareholders meet annually at the Federal Convention to determine policy and instruct the directors on the future direction of their company. Those directors are more commonly known as the Federal Executive. Thus you see that it is not an adversary or we-and-they situation, Division and Federal, but rather one of determination of policy by the Federal Councillors and implementation of that policy by the Federal Executive.

Furthermore, that implementation is not carried out in isolation, for Federal Councillors receive minutes of all Executive meetings as progress reports of actions taken. Reports are also made in AR magazine and one Federal tapes for the benefit of members.

EXISTING POLICY

A "Quick Guide to Extant WIA Policies", essentially an index to Federal Convention motions passed by the Federal Council, is maintained by the Federal Office and a copy held by each Federal Councillor. Of recent times, a series of Policy Statements on major issues have been agreed. These include all the major aspects of amateur radio and provide useful background as to the reasoning adopted by the Federal Council.

This existing policy forms the guidelines for all Executive actions and matters diverging from agreed existing policy are invariably referred back to Federal Councillors throughout the year.

PROPOSING POLICY

The correct forum for proposing policy is by means of an agenda item at the Federal Convention. There is also a mechanism for postal voting by the Federal Councillors throughout the year. However, this should be reserved for essential matters.

Agenda items may be raised by Divisional Councils, Divisional meetings, conferences of clubs or individual members of Divisions. However, it must be remembered that such items can only become agenda items if they are proposed by a Division. In every case they must be researched carefully, checked against existing policy (from the Quick Guide) and discussed at Divisional Council level. It is useful to air them at Divisional business meetings and on broadcasts to gauge membership response. If the Federal Executive receives agenda items sufficiently early, they are published in AR. Unfortunately, in recent years, many agenda items have been received less than a fortnight before the Convention, thus preventing effective prior consideration by the Federal Councillors and thus the members.

Before being forwarded to the Executive, proposed motions must be carefully drafted, having any relevant references listed and researched, and the supporting arguments assembled. The Divisional Council must filter motions, determining that they are indeed the wish of members and then supporting them. Caution must be exercised in forwarding motions "because a group of members want it", though it may be politic to do so under exceptional circumstances.

THE FEDERAL CONVENTION

The Federal Convention is normally held for three days over the Anzac Day weekend and is usually held in Melbourne. The seven Divisions

send their Federal Councillor and the "deputy" (or Alternate) Federal Councillor. Some Divisions also send observers, who are either members of the Divisional Council or a specialist in some important policy area that is coming up for discussion. The members of the Federal Executive are also in attendance and visitors are welcome.

Initial business centres around the receiving of reports from the various Federal Office-bearers, such as the President, Treasurer, Editor of *Amateur Radio*, Chairman of the Federal Technical Advisory Committee (FTAC), Contest Manager, Education Co-ordinator and so on — a total of 18 reports were presented to the last Convention! Some of the reports give rise to policy recommendations which are then debated. At the conclusion of the debate the motions are voted on by the seven Divisional Councillors and if carried, become policy. Note that the members of the Federal Executive do not have a vote on these or other agenda items.

Following consideration of the reports, the agenda items are then debated. There were 28 items discussed at the 1987 Convention, ranging from the organisation of the WIA,. through band planning items, to the on air behaviour in the amateur bands. Usually, the more information that is available, the better the quality of the debate. This information can come from a variety of sources — from the background provided by the mover of the motion, from previous policy decisions, from the results of debate by Divisions, clubs and members prior to the Convention and from the specialised knowledge of those gathered around the Convention table.

Difficulties can arise when the motion is framed in terms of "That the such-and-such be discussed". Such a motion is usually readily agreed to and the matter raised is then discussed. However, if there are no firm ideas or directions put forward by the mover as part of the background material, then other Councillors find that they are not well briefed on the issue and the discussion can often drift aimlessly.

SHORTFALLS IN THE CURRENT SYSTEM

Most of the shortfalls in the current system can be attributed to lack of awareness of the following matters:

- The Federal Executive manages WIA Federal matters throughout the year according to directions from the Divisions given through their Federal Councillors at the Annual Federal Convention.
- Members do not belong directly to the Federal body, yet that organisation, by agreement, manages the membership register, collects subscriptions, publishes AR and provides some member services.
- Members a venue for many member services, including voicing their views, is through their Divisions and thence through their Federal Councillor to the Federal body.
- The capacity of the Federal Office to carry out major activities above and beyond routine administration is limited. We employ a Secretary/General Manager and two staff, all on part-time conditions and the Executive are all unpaid volunteer amateurs, principally from Melbourne, giving their time to our Institute.
- The Federal component of subscriptions is set by the Federal Councillors at each Federal Convention, some eight months before it applies. Three elements make up that component:
  - the IARU Region 3 subscription as set every three years at the Regional Conference,
  - the Federal administrative element, and
  - the *Amateur Radio* magazine element (currently running at about 50-55 percent of the total Federal component).

  To this each Division has to add its own component.
- Presently changes can only be made by altering policy through the tortuous route of member/club to Division to Divisional Council to Divisional Federal Councillor to a Federal Council meetings once a year at the Federal Convention.
  This raises the question "have we too many levels of management, predominantly volunteer, in the WIA?

The Federal Executive is currently reviewing these and other related issues.

Appendix 1
Objective of the Wireless Institute of Australia

The following points are extracts from the Articles of Association of the WIA, a company incorporated in Victoria under the Companies Act and limited by guarantee. Your Federal Councillor has a copy of the full list of 16 objectives of the Company.

1. To represent generally the views of persons connected with amateur radio in Australia and its territories.

2. To promote co-operation between the Divisions and similar institutions interested in the encouragement and development of amateur radio in Australia and to promote mutual interchange of ideas.

3. To safeguard the interests of the Divisions and the members thereof and obtain for them such frequency allocations and rights and privileges by representations to Federal, State or any other appropriate body.

4. To promote the development, progress and advancement of amateur radio.

5. To acquire and disseminate information and advice on amateur radio.

6. To undertake the control of competitions, contests, tests and records in connection with amateur radio.

7. To consider, originate, promote and procure reforms and improvements in laws affecting radio communication, frequency allocations and amateur radio.

8. To buy, sell and deal in radio parts and components and other requirements of the Divisions and the members thereof.

9. To impart training and instruction in radio and allied subjects.

10. To affiliate with the international organisation known as the IARU.

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GETTING ON AIR — Part 1
16A Power Supply

Peter Parker VK6NNN
C/- Witchcliffe Post Office, WA. 6286

This short series of articles is intended for the new amateur with little money and a desire to build some equipment for an amateur station. A few old televisions are useful for parts. A trip to the local rubbish tip may yield some suitable sets, if you are lucky.

Every experimenter with valves needs a good power supply providing 6.3 volts AC and about 250 volts DC. A transformer as large as possible should be chosen to provide enough power for the transmitter which will be described later.

The transformer should be free of smell or leaky chemicals. The thick winding of the transformer is usually the 6.3 volt LT winding. Other checks should be made, such as with an ohm meter.

The secondary winding for the HT may be tapped.

The filter capacitor should be in good condition or purchased new. Dick Smith Electronics sell 100 uF filter capacitors. The supply should be enclosed in a wooden or earthed metal box. Do not take any chances with high voltage.

PARTS LIST

QTY	DESCRIPTION
2	Silicon Diodes (EM401, etc)
2	Fuse Holders
1	250-500 mA fuse
1	1-1.5 A fuse
1	Power Transformer 240V → 150V, 8.3V
1	Electrolytic Capacitor 100 uF 350-400V
1	100 kohm resistor
1	3-pin plug and lead
1	DPDT switch
	Box, wire, screws, bolts

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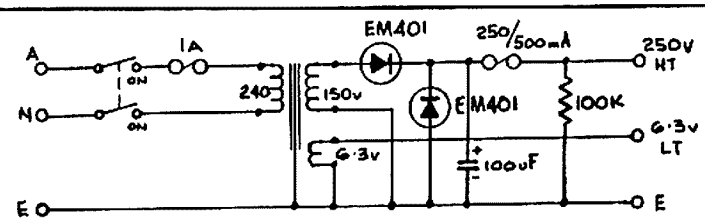

Figure 1: A Power Supply for Valve Equipment.

A modified version of the Dick Smith 2 metre Folded J Antenna, this antenna is actually another version of the *Slim Jim*.

Errol Chick VK3GG
15 Vida Street, Essendon, Vic. 3040

A TRIM SLIM JIM

It is a very satisfactory antenna — the design is of a boomless masthead antenna which rises to a maximum height above the feedpoint. A metal mast may be used.

The antenna has been tailored to two 2.5 inch centre spacing exhaust pipe U-bolts. These are readily obtainable from automotive muffler retailers. The following explanation and specification will facilitate home-brewing.

Three aluminium tubes are required. The first is of 9.5 mm diameter and is 2060 mm long. Some extra length may be desirable to allow for bending and trimming. The other two tubes are 12 mm diameter and 1020 mm long.

One of the 12 mm diameter tubes will need to be cut into two lengths. One length is of 155 mm and the other is 840 mm long.

The two cut lengths must then be fitted with the 75 mm long, 13 mm internal diameter plastic tube insulator. They are then fixed by pop rivets or self tapping screws. Holes must be drilled for the fasteners. It is important that both the uncut 1020 mm tube and the tube split by the insulator are of the same length.

The top bracket has to be drilled in line 13 mm diameter top and bottom. The U-bolt holes must be in line, too. Then the bottom bracket must be drilled 13 mm diameter but on the top only.

Feed the two 12 mm diameter tubes through the holes drilled in the brackets. Allow for the selected spacing between the brackets. Then drill the tubes through the U-bolt 8 mm (5/16") mounting holes. Next mount the assembly tightly on the mast in the desired position.

Fit the bottom bracket level and flush against the tube ends. Attach so that the tubes are parallel to the mast.

Drill the tubes through the U-bolt holes in line with the U-bolt and bolt- up the bottom bracket and tubes. Cut off any excess ends of the U-bolts. The tube mast can be weather-proofed with a rubber plug.

Starting from the top, the U-bend is made by tightly packing the 9.5 mm tube full of sand. Firmly seal the ends. Bend the middle 100 mm around a piece of circular pipe with a diameter equal to the internal diameter of the tube loop.

If heat from a blow torch is necessary, rub soap on the part to be bent and bend the tube when the heat turns the soap brown. After bending, cut off and trim any distorted end to make the required length of 2060 mm, end-to-end.

The bent tube has to fit neatly into the two tubes of 12 mm diameter.

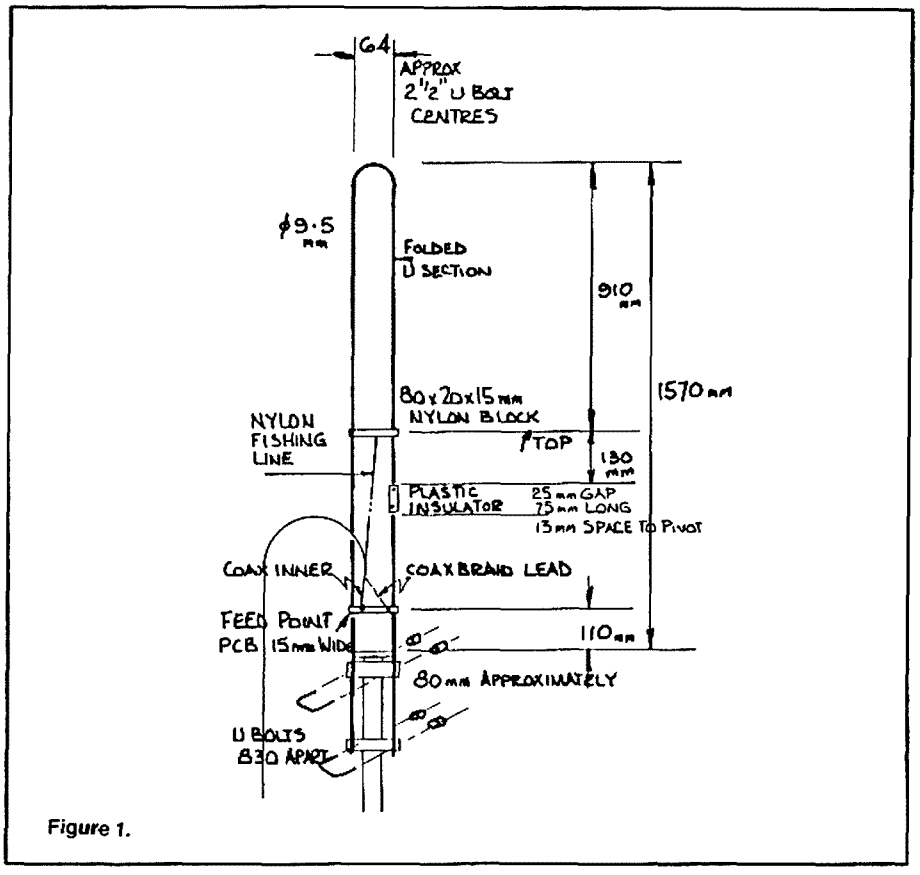

Figure 1.

The nylon block is a necessary spacer and anchor. If positioned flush with the top of the thick tubes it is both a ledge for sealing compound and a measuring base.

Alternatively, printed circuit board 20 mm wide may be used instead.

Both tubes should be used as an anchor for the strained fishing line.

The ends of the bent tube need to be cleaned externally with steel wool. Similarly, the internal ends of the 12 mm tubes should be cleaned with a rat tail file. Then coat the cleaned surfaces with conducting paste. Insert the bent tube into the 12 mm tubes.

Before locking the tubes in position with self-tapping screws or pop rivets, use a small hose clamp to anchor the loop while adjusting the length which controls the frequency of operation and the minimum SWR.

Because the loop tube section of the Dick Smith tubing is long it will probably have to be shortened with a hacksaw or tubing cutter on the insulator side. This will probably be necessary to clear the pop rivet near the top of the insulator.

The feedpoint bolts, etc, as supplied are quite flimsy, particularly if thick coaxial cable is used. Change over to 3/16 inch bolts and nuts and more solid solder lugs.

The feedpoint uses wrap-around aluminium strips. The strips and the tubes, where they make contact, need to be treated for conduction in the same manner as the bent tube ends. Clean them with a file and steel wool as appropriate and use conduction paste. The Printed Circuit Board is placed in the middle for support.

The bolts go through the board first, both aluminium flaps and then the lugs. The mounting holes are spaced to lock the strip very tightly against each tube with very little gap.

The Dick Smith version relies on the top U-bolt as an earthing bar. It is unsatisfactory to use dissimilar metals for earthing. Use a semi-wrap-around earth bar above the top of the mast to get over this problem.

Clean the strip and tubes where it is to be clamped to enable good conduction. Use steel wool, etc, as before. Fix it in position with self tapping screws or pop rivets.

The next adjustments are vital for minimum SWR. The coaxial cable must join the feedpoint 180 degrees from the bottom matching section. A low loss cable is desirable. I used RG213. If heavy cable is used it is necessary to cut and strip off about 70 mm of braid and solder a strong lead to the braid end. That is longer than normal, but it is necessary to provide the leverage needed by the fishing line to hold the coax in the right position.

Terminating both the lead and inner cable to a solid circular lug is recommended, particularly if it is necessary to remove the cable for the frequency and matching adjustments.

Temporarily use string for support instead of the nylon fishing line and be sure to reset the coaxial position exactly the same every time a matching adjustment is made due to its critical effect on the SWR.

Finally, slot the nylon block or PCB strips so the line angle will not change. The fishing line or weatherproofed cord needs a lot of tension to properly anchor the heavy cable. Fortunately the use of a locked G-knot (AR October 1985, p49) is ideal for that purpose.

If thin coax is used some means of keeping the cable away from the bottom matching section may be necessary.

With adjustments finalised and tested a suitable waterproofing compound should be used on all junctions.

As a guide, my Trim Jim is mounted 800 mm from the antenna earth point to the top of an angled metal workshop roof with a 1:1 SWR at 147 MHz, 1.1:1 at 148 MHz and 1.35:1 at 144 MHz using the specifications given.

ar

BUILDING BLOCKS REVISITED — Part 8

Harold Hepburn VK3AFQ
4 Elizabeth Street, Brighton, Vic. 3186

The final module to be covered in this series describes a six digit frequency readout which can also be used as a stand-alone DFM having a resolution of 100 Hz.

DISCUSSION

The modules so far described have many uses and can be put together to perform many functions. However, the most widely perceived grouping is that which finishes as a single band receiver or transmitter.

Whilst the 10 turn multidial used to tune the VFO (see Part 4 of this series) is reasonably linear, and can quite easily be calibrated to indicate operating frequency, there can be little doubt that some sort of direct readout of operating frequency is a decided advantage.

The requirements of a direct readout system compatible with the other modules in this series can be defined thus:

1. Ability to handle two input frequencies and display their difference.
2. Have a resolution of not worse than 100 Hz.
3. Have a quick reaction to movements of the VFO knob.
4. Have crystal locked stability.

The first requirement is dictated by the frequency plan used. Reference to Part 5 will show that:

$$F(inj) = F(sig) + F(IF)$$

or

$$F(sig) = F(inj) - F(IF)$$

Given that the F (IF) is, in fact, that of the BFO and that F (inj) is the feed to the Receiver/ Transmitter mixer, the counting system must display the difference between these two inputs.

The need to do some "calculation" rules out the possibility of using "single chip" counters or simple "UP" decade counters so that this display is designed around discrete "Up/Down" devices — specifically the TTL 74192 series.

If the minimum number of displays is taken as six — then the resolution — that is the value of the most rightmost digit — is set at 100 Hz.

To minimise the cycle time — that is the time taken between any changes in the VFO tuning knob and a display of the new frequency — the time taken to count the two inputs, determine their difference and put up a steady reading, must be kept low. In practice, the cycle time must be kept below 0.15 of a second if the display is to appear to change instantaneously. In this design the cycle time is 0.1 seconds.

The need for stable and reliable operation dictates that the timing system is derived from a crystal source.

There is one other problem that must be taken into account. That is to ensure that the system will handle all the frequencies involved. Reference to Table 2 of Part 5 of this series shows that the maximum frequency encountered is the 38 MHz injection in the top 500 kHz section of 10 metres.

38 MHz is a bit beyond the specified limit of standard or LS TTL devices so that either the S or F series of TTL devices have been used where required. To further assist in the handling of this maximum frequency problem, the inputs have been divided by two after the necessary squaring up process, and the sampling times doubled to compensate.

Figure 34 is a functional block diagram of the complete counting system.

The (sine wave) inputs from the BFO (Module 6, Part 2), and the injection generator (Module 7, Part 5), are buffered, amplified and brought to TTL levels and then divided by two in identical signal conditioning sections.

Two single gates control the passage of the conditioned inputs into the counter and display section.

Four single pulse signals are required to control the operation of the system. They are — in given order:

1. A pulse to open the injection gate for 20 mS.

Then

2. A pulse to open the BFO gate for 20 mS.

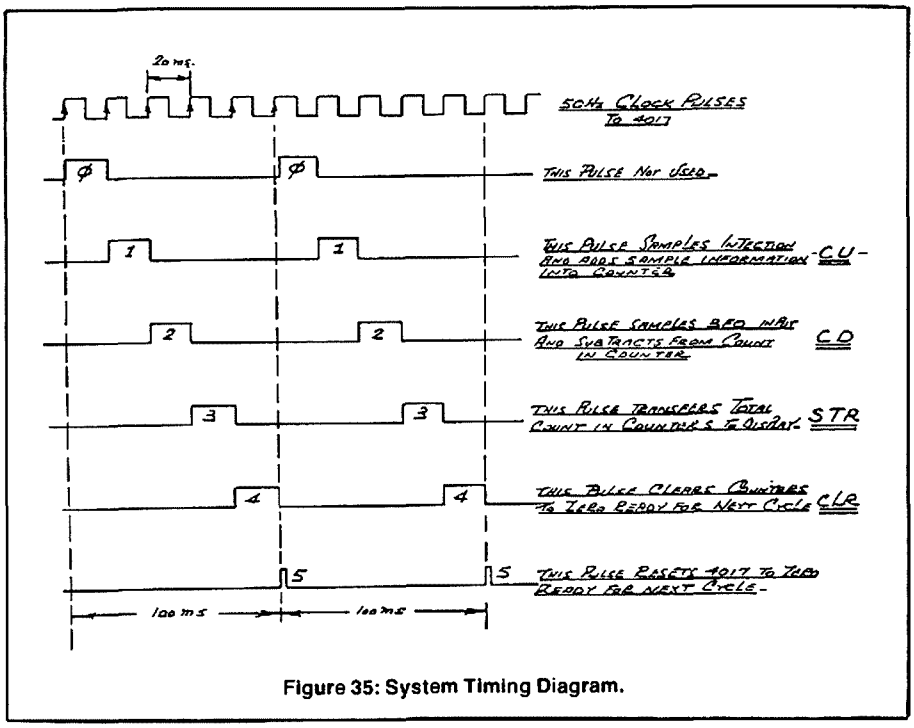

Figure 35: System Timing Diagram.

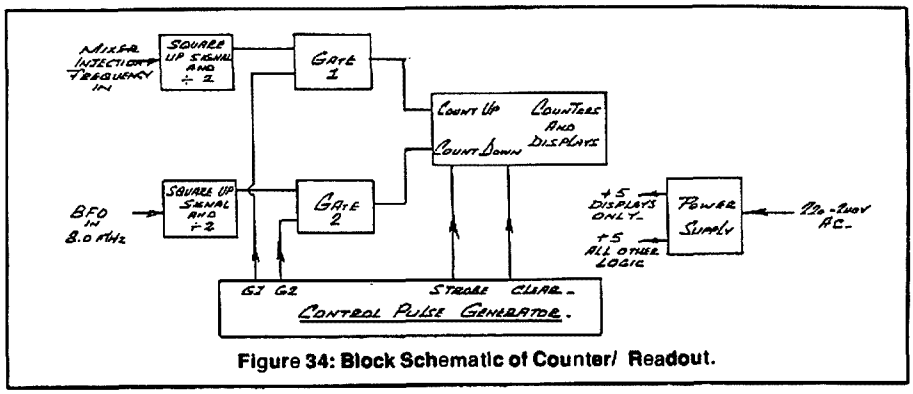

Figure 34: Block Schematic of Counter/ Readout.

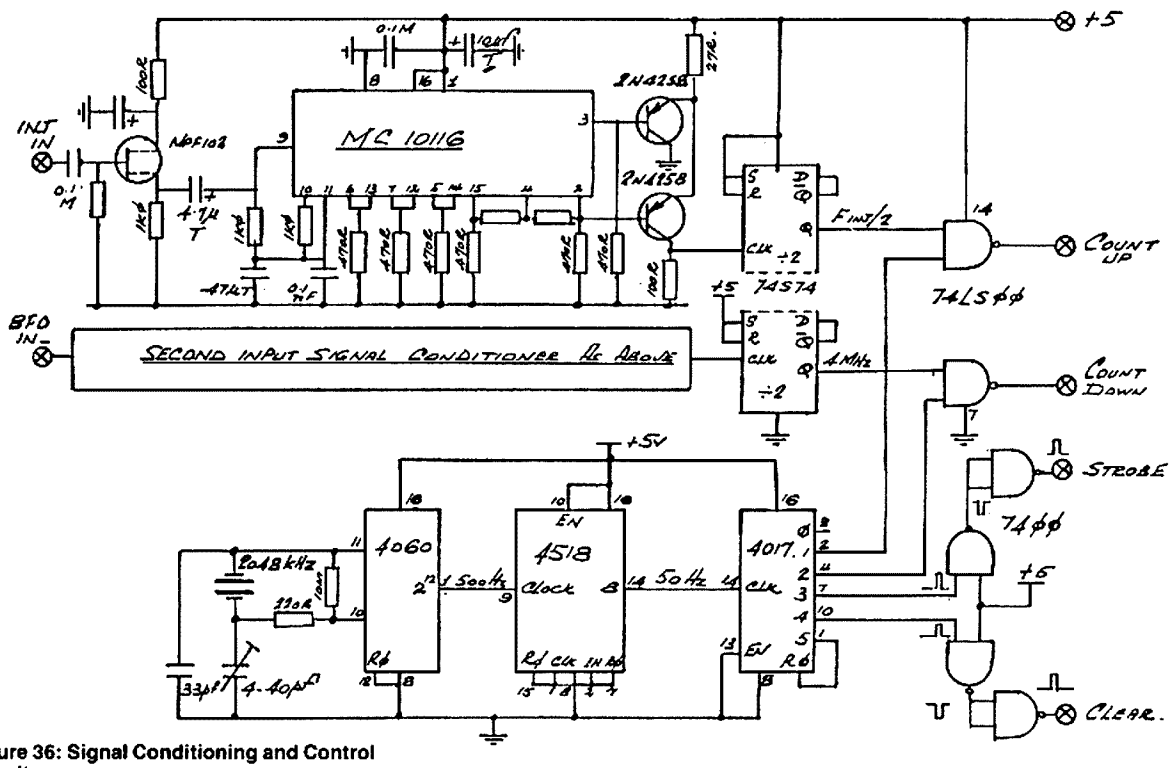

Figure 36: Signal Conditioning and Control Circuitry.

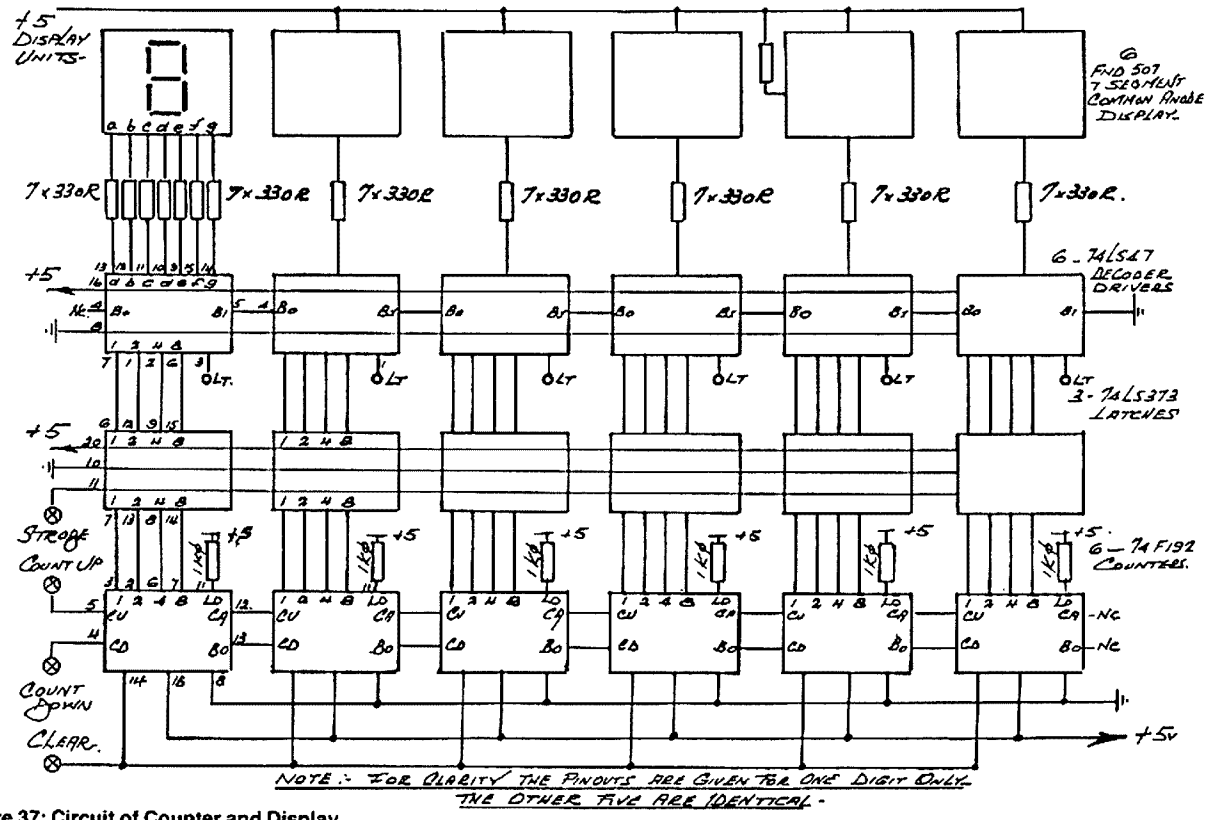

Figure 37: Circuit of Counter and Display. NOTE: For clarity, the pinouts are given for one digit only. The other five are the same.

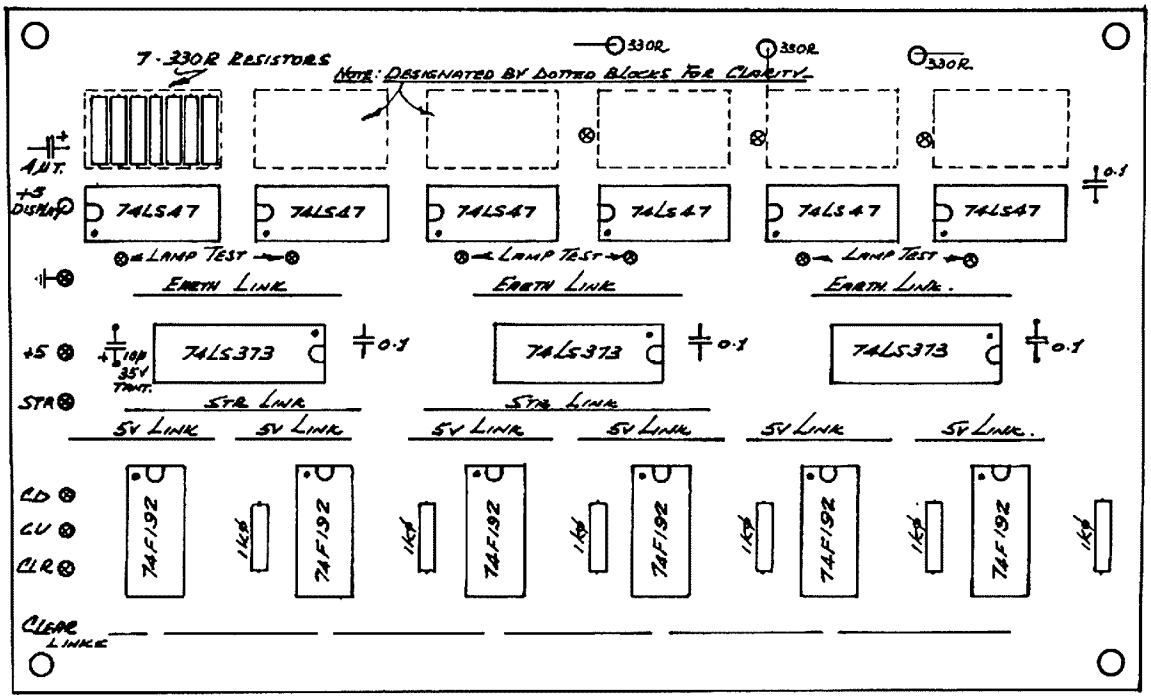

Figure 38: Layout of Counter Board.

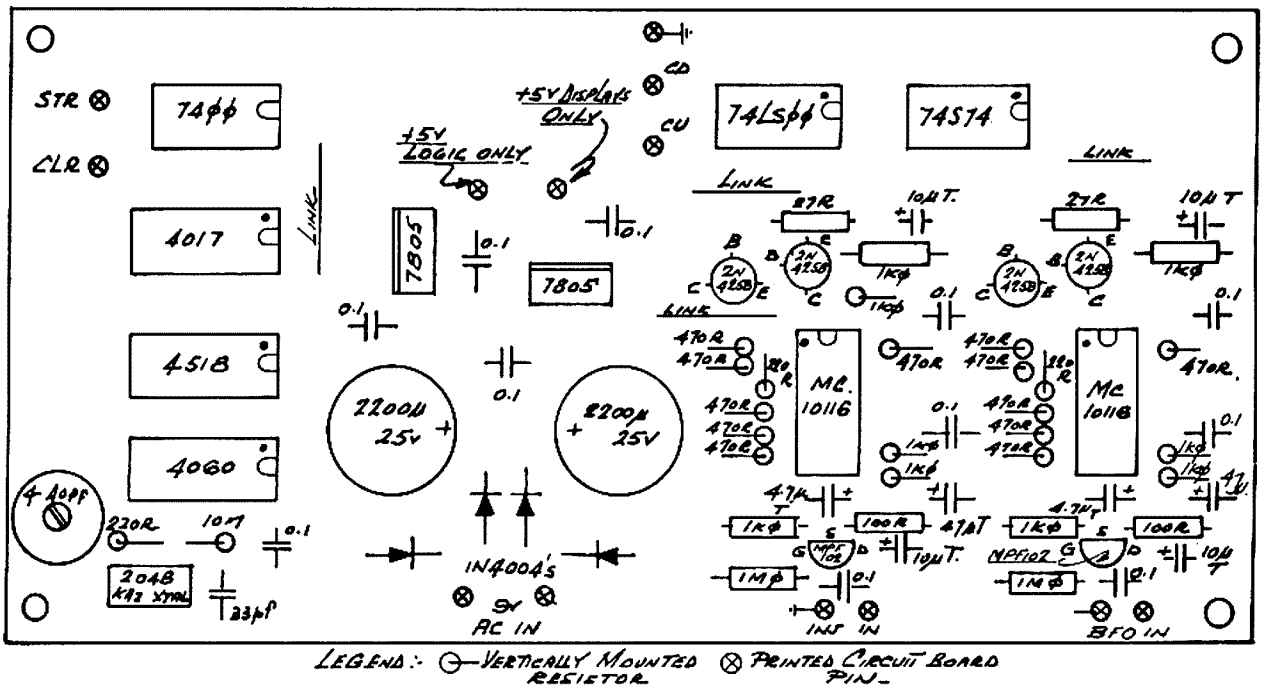

Figure 39: Layout of Counter/Control Board.

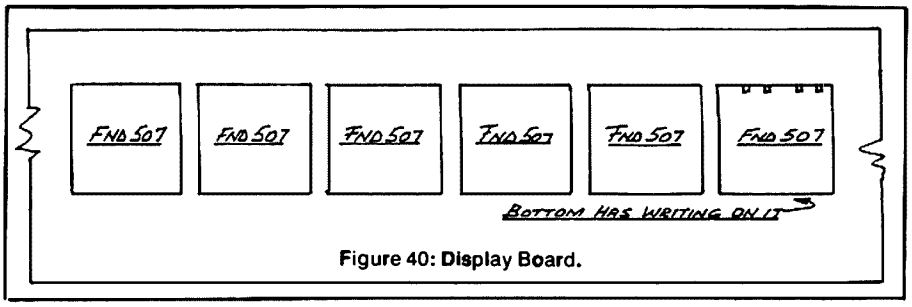

Figure 40: Display Board.

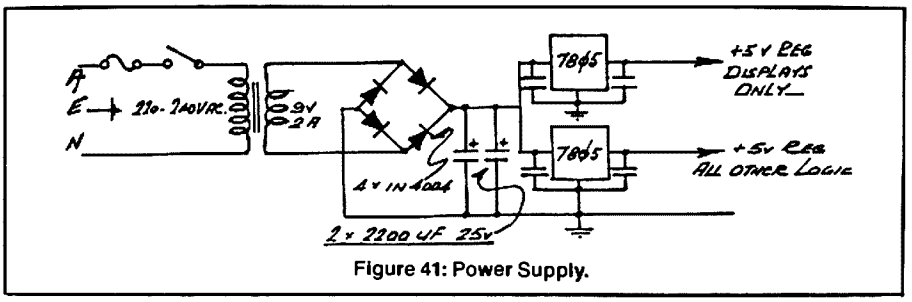

Figure 41: Power Supply.

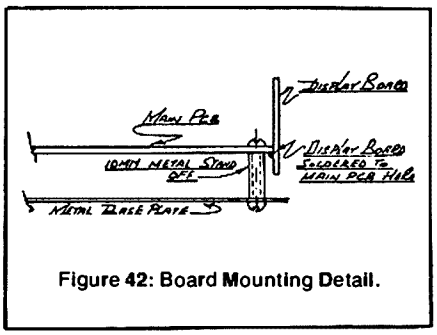

Figure 42: Board Mounting Detail.

Then

3. A pulse to transfer the count into the displays.

Then

4. A pulse to clear the counters ready for the next cycle.

The system timing diagram is shown in Figure 35. It will be noted that the total cycle time for the four control pulses is 100 mS so that the count is updated 10 times per second to give the desired "quick follow" action as the VFO tuning is changed.

CIRCUIT DESCRIPTION

(i) Signal Shaping and Control

The detailed circuit of the signal conditioning and control pulse generator is given by Figure 36.

Two identical signal shaping circuits are provided, one for the injection input and one for the BFO input.

An MPF 102 is used as an input buffer to present a high input impedance and a low output impedance. Input to the buffers will be via small (22 pF) capacitors from pin 8 of the transmitter/ receiver mixer and from pin 8 of the product detector. The signal level will probably be around 100 mV RMS in both cases. This is more than sufficient for reliable operation of the signal conditioners.

The buffer is followed by a Motorola MC10116 quad line driver. In this application, three of the four sections are used as amplifiers and the fourth as a Schmitt trigger. The resultant square wave output at ECL level is not capable of directly driving the subsequent divider and is raised to TTL level by the two 2N4258 PNP transistors.

The (now TTL compatible) signal is divided by two in a 74S74 D type flip flop before entering the signal gate formed by one section of a 74LS00. Output from the two signal gates are taken to the counter section. Note that the highest frequency the flip flop has to handle is 38 MHz and substitution of the specified 74S device by normal or LS devices is not recommended.

A crystal on 2048 kHz is used in conjunction with a CMOS 4060 oscillator/divider to give an output at 500 Hz. This is further divided down to 50 Hz in one section of a 4518 dual decade divider.

A CMOS 4017 device is used to produce the required four successive control pulses (Gate 1, Gate 2, strobe and clear).

The 4017 has 10 output pins numbered 0 to 9. With no input, output pin 0 (OP0) is high and the other nine (OP1 - OP9) are low. The first rising side of an incoming pulse train causes OP0 to go low and OP1 to go high. The second rising side takes OP1 low and OP2 high, and so on up to OP9.

In this design, the high on OP0 is not used. The high on OP1 is used to open the injection or "Count Up" gate while the subsequent high on OP2 is used to open the BFO or "Count Down" gate. The next high — on OP3 — is used to strobe the count onto the displays and the next high — on OP4 — is used to clear the counters back to zero.

In order to reduce cycle time, OP5 is connected to the reset pin on the 4017. As soon as OP5 goes high it resets the device back to zero, OP0 goes high and the cycle repeats.

Whilst a CMOS output will drive a single TTL or LSTTL input, the Strobe and Clear outputs will — in this design — be called on to drive six TTL inputs. The Strobe and Clear CMOS outputs from the 4017 are each buffered with two sections of a 7400 quad Nand gate to oversome this drive problem.

(ii) Count and Display Section

Figure 37 gives the circuit of this part of the system and it will be seen that it consists of six electrically identical "digit" sections. Each section consists of a 74F192 up/down counter, half of a 74LS373 octal latch, a 74LS47 decoder driver and a FND507 seven segment, common anode, LED display.

The six 74F192 counters are effectively in series. Signals fed into the "Up" input cause the counters to increment from 1 upwards, Any signal then fed into the "Down input will then decrement whatever count was in the counters on a "one for one" basis.

In this design the injection frequency is always higher than that of the BFO. By first "adding" in the injection frequency via the "Up" input and than "subtracting" the BFO frequency via the "Down" input, the residual count represents the frequency to which the Transmitter/ Receiver is tuned.

At the end of the two sampling periods (the "up" and "down" counting periods) the "signal frequency" is on the six counter BCD outputs and on the six latch BCD inputs. As soon as the strobe pulse is applied to the latches, the count on their inputs is transferred to the latch outputs, and from there through the 74LS47 driver/ decoders to the displays. Note that this reading stays on the displays, irrespective of what may happen on the counters, until the next strobe pulse arrives.

Finally, the clear pulse is applied to the string of 74F192 counters and they are reset to a zero count ready for the next cycle.

The use of the 74F series of counters may be queried since a simple 74192 or 74LS192 on its own is capable of handling the highest frequency of 19 MHz (38 divided by two), that the system calls for. However, the six counters used introduce finite in/out transfer delays. These transfer delays are cumulative and, in the case of the slower, devices have the effect of restricting the top frequency response to around 12/15 MHz. The 74F series should not be placed with the cheaper 74 or 74LS series if operation over an injection frequency of 12/15 MHz is anticipated.

The 74LS47 decoder/drivers have a couple of features which are of interest.

Firstly, they have the facility to blank out leftmost leading zeros. If used, as it is in this design, a signal on 80 metres reads:

3.4567

and not

03.4567

which makes for an improvement in readability.

Secondly, the 74LS47 has a control pin, marked "LT" on the circuit diagram, which, if earthed, lights up all seven segments irrespective of whatever the rest of the logic says. This facility is useful if it is suspected that any of the segments of the display has "blown". On the circuit layout each of the six "LT" pins is made available on top of the board to allow this "Lamp Test" to be carried out.

Since the design has set both the number of the displays and the resolution, it follows that the position of the decimal point in the display is also fixed. It is brought into use on the second most significant digit by taking the appropriate pin high through a 330R resistor.

It should be noted that a separate five volt supply is provided to power the displays. There are two reasons for this. Firstly, the current changes, with changes in the display readings, are quite high so that, if possible, the supplies to the rest of the logic should be protected from these current surges. Secondly, the power supply itself (to be described in the next installment) has to provide at least a two amp capability and it is simpler to use two separate 7805 on board regulators to do this than to use a single two amp regulator.

This series will conclude in the a future with descriptions of the board layouts, constructional hints and commissioning notes.

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RADIATION RESISTANCE, LOSS RESISTANCE AND ANTENNA EFFICIENCY —A METHOD OF MEASUREMENT

Lloyd Butler VK5BR
18 Ottawa Avenue, Panorama, SA. 5041

Antenna resistance is the sum of radiation resistance and loss resistance. A method of measurement is described to separate those components so that antenna efficiency can be calculated.

It is an easy matter to measure antenna resistance using a noise bridge or other impedance measuring device but more difficult to resolve what part of this is radiation resistance and what part is loss resistance. A knowledge of the value of these components is particularly important in antenna systems using the earth or a counterpoise as part of the antenna resonant circuit and where the earth loss resistance causing significant reduction in antenna efficiency.

Use of the well-known three earth stake method of measuring earth resistance is satisfactory for DC or power frequencies but would give a misleading result if used to estimate earth loss in a grounded antenna operating at radio frequencies. The fact that the upper layers of the earth form a lossy part of the dielectric between the earth and the antenna wire is sufficient in itself to add losses not evident by this method of measurement. Furthermore, if radials are used as a common counterpoise, resistance to general earth is of little relevance.

METHOD OF MEASUREMENT

The writer has experimented on antennas at 1.8 MHz with a measurement method based on the following:

(1) Radiation resistance falls sharply as the ratio of antenna length to wavelength is decreased, that is, it falls sharply as frequency is decreased.

(2) Whilst loss resistance might vary to some degree with frequency, over a restricted frequency range its value could be expected to be reasonably constant.

The procedure is to plot antenna resistance as a function of frequency starting at the operating frequency (or a little higher) and going downwards. Figure 1 shows that such a plot on an antenna derived by measuring resistance at spot frequencies using a noise bridge coupled to a tunable receiver. It can be seen that the resistance falls sharply with a decrease in frequency to a point where the radiation resistance is comparable with loss resistance and the curve turns to form a straight line.

The straight line represents loss resistance (R1) and antenna resistance (Ra) is read directly from the curve at the operating frequency. Radiation resistance (Rr is calculated from (Ra-R1) and antenna efficiency is the ratio (Rr/Ra). From the curves, the antenna has a loss resistance of 9 ohms. At 1.8 MHz, he antenna resistance is 16.5 ohms giving a radiation resistance of 7.5 ohms and an antenna efficiency of 45 percent. At the other end of the band, 1.875 MHz, the antenna resistance is increased to 27.5 ohms, giving a radiation resistance of 18.5 ohms and an antenna efficiency of 67 percent.

The measurement method has been repeated on a number of other antenna wires at 1.8 MHz with usable results. The method seems practical providing the antenna is not too short, giving a radiation resistance much smaller than the loss resistance. In this case, it would be difficult to resolve the radiation resistance component.

DIFFICULTIES IN MEASUREMENT

Noise level on the band below 1.8 MHz is inherently high, not to mention the numerous carriers from broadcast stations, their harmonics and other sources. The carriers can be avoided but because of the high noise level, the writer had some difficulty in resolving the null at balance of the bridge.

Improved measurement resolution was obtained by coupling a signal generator into the last noise amplifier stage of the noise bridge (refer Figure 2) and setting the frequency to that of the receiver for each measurement. With tone modulation on the signal generator, the bridge was adjusted for a 'null' in received tone. The receiver S-meter was also used for fine adjustment.

One point concerns the accuracy of the bridge. It is important that the resistance balance control is accurately calibrated and this can be done by checking its calibration using known values of non-inductive resistance connected at the bridge input. Calibration of reactance balance control is not required as this is only used to phase out antenna reactance which is not being measured.

Before concluding this article, some discussion took place with the Editor, who raised a question concerning the curve plotted for the antenna under test in Figure 1.

In this curve, resistance appears to rise with frequency at a much greater rate than might be expected from theoretical considerations. The reason for this is made apparent by extending the measurement to 2.4 MHz as shown in Figure 3.

Series resonance was measured at 1.73 MHz, where reactance was zero, but there is a sharp hump in the value of resistance at 1.95 MHz, possibly caused by interaction with other antenna wires or other objects in the writer's backyard. The hump is not another resonant point as the antenna is highly inductive over the whole frequency range shown above 1.73 MHz. Unless the antenna is out in the clear, away from other antenna wires and metal structures, bumps and kinks in the plotted curve seem to be difficult to avoid.

A FEW MORE DETAILS

The best antenna is a sloping wire terminated in a 'T' section at its end. The highest portion at the 'T', is only house gable height and hence radiation resistance at the resonant frequency is quite low. By pure chance, the effect of the hump is to raise this resistance in the 1.8 MHz band to advantage.

SUMMARY

Assuming validity of the assumptions made, the method described to separate the components of radiation resistance and loss resistance appears satisfactory within certain limits. If anyone has any comments on this method, or can suggest some other method, these comments or suggestions would be welcomed. We would certainly be interested to see the experiment performed on a more ideal antenna such as a quarter wave vertical.

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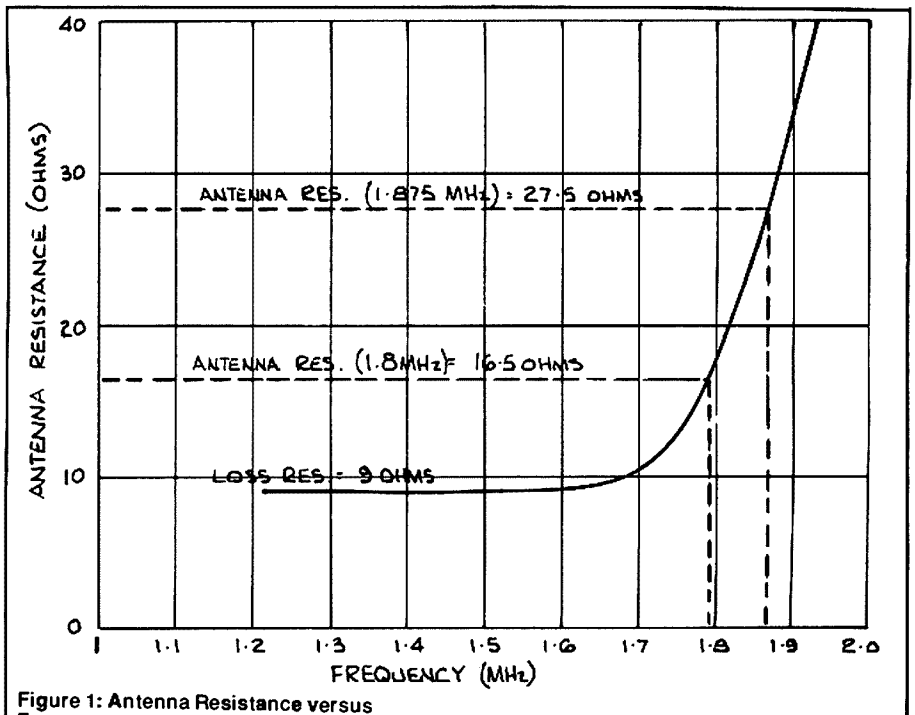

Figure 1: Antenna Resistance versus Frequency.

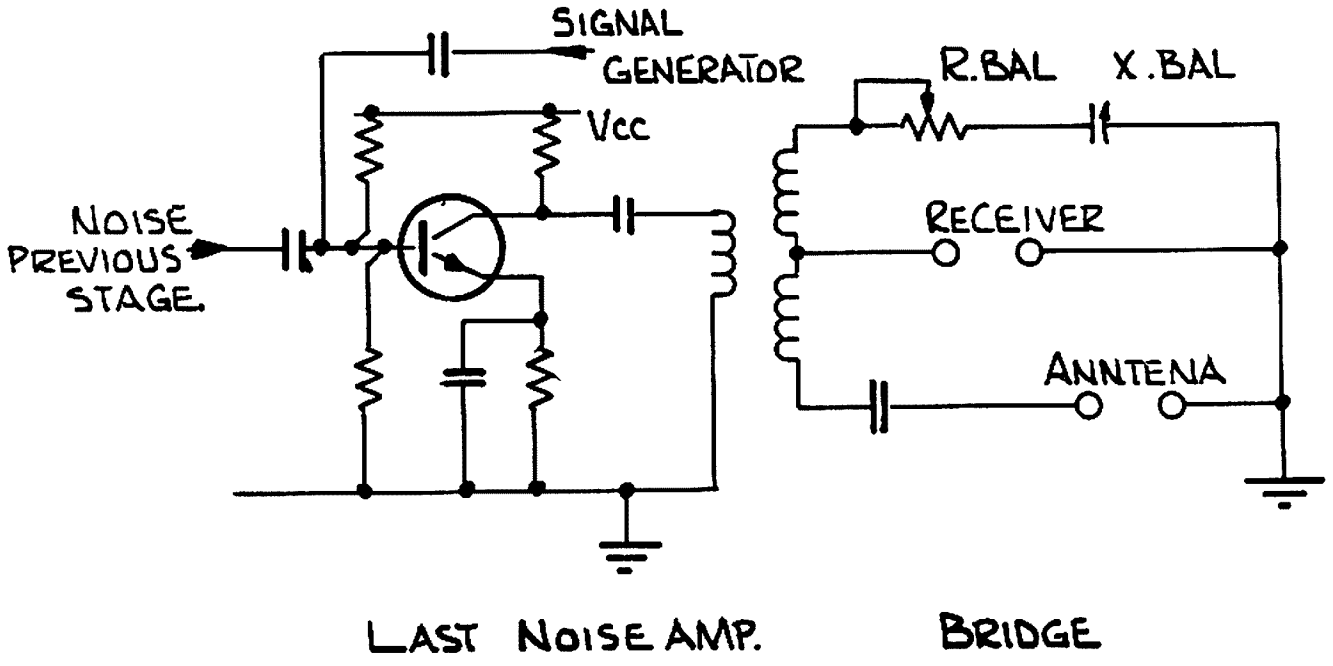

Figure 2: Injection of signal generator into the noise bridge.

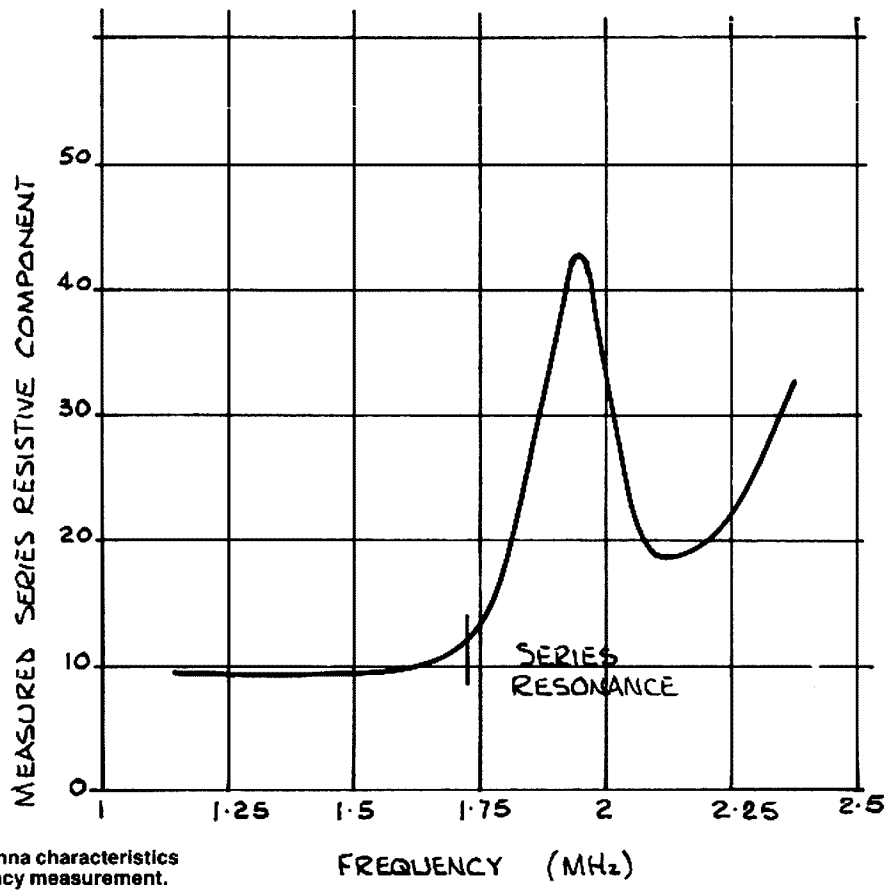

Figure 3: Sample antenna characteristics with extended frequency measurement.

Jacket Maker for the Commodore C64

Any computer owner or operator spends endless hours in seeking files from an accumulated mass of discs. This is how one amateur faced with the dilemma, ingeniously converted a printed program in a magazine to meet the parameters, he personally required.

* See printout of this computer program on page 13.

Bob Richards VK7NRR
PO Box 168, Launceston, Tas. 7270

After obtaining a disk drive for my Vic-20, the only way to display the directory on a disk cover was to list the directory to Print, cut it out and paste it onto the front of the disc cover.

That was alright if the disc was full, but if you had to reprint the directory after adding files to the disc, what did you do with the new one? Remove, or try to remove, the old one and paste the new one on! Give up in frustration!

Once I bought my C-64, things moved too fast for any of these methods, so I started hunting around for a program which would suit my requirements.

After many abortive attempts, VK5NEW told me of a program that appeared in the September 1986 edition of the magazine *COMPUTE*. Eric had already typed the program into his unit and gave me a copy whilst visiting Tasmania In November last year.

After using the program called *Jacket Lister*, it still did not suit my requirements fully.

Firstly it did not print the BLOCKS FREE on the jacket.

Secondly, what if I had programs on side two of the disc?

Thirdly, it was limited in size to 88 files per disc. (As we know, you can have up to 144 files per disc).

Fourthly, what if I wanted the disc jacket brightened up with something other than a listing. (I have both PRINTMASTER and PRINTSHOP).

After some thought I realised that the basic program could be altered to suit most, if not all, of my requirements. Then a friend suggested that I make provision for an MPS803 or an MPS1000, both capable of printing six or eight lines per inch.

With experimentation I concluded with five variations of the original program.

(1) Front cover — six lines per inch.
(2) Front cover — eight lines per inch.
(3) Back cover — six lines per inch.
(4) Back cover — eight lines per inch.
(5) Blank cover - for use with either PRINTSHOP or PRINTMASTER.

This arrangement was very cumbersome in operation because, if you were making a cover for both sides, it involved loading a second program.

After further thoughts on the matter, a program was developed which met all my requirements.

So, with due acknowledgment to the original author and the magazine for giving me the idea to develop the following program.

THE PRACTICAL SIDE

To make up the double-sided jacket, make the cover for side two first. Slip the original disc-cover inside and paste the two flaps of side one jacket over the side two jacket. If you desire, the flaps can be cut off and the front cover, with the listing, pasted over the back of the back cover. Some trimming may be necessary.

It is also advisable to have only enough files on side two to list on the top half of the cover. If you have programs listed on the bottom of side one, leave the bottom half loose and in storage it folds up behind the disc, out of the way.

The number of files listable are:

Printed six lines/inch —
Top half side one — 16 Total 80
Top half side two — 20 Total 80
Printed eight lines/inch —
Top half side one — 24 Total 110
Top half side two — 30 Total 110

Good luck.

(Bob, has kindly volunteered that if you don't feel like typing the program into your computer, send him a blank disc and enough stamps to cover return postage and he will copy and return it to you. Tech Ed.)

ar

Amateur Log Program for the Amstrad CPC612

Jim Oliver VK7JO
2 Luxmore Place, South Launceston, Tas. 7249

* See printout of this computer program on page 14.

A very useful program to check for a name, call sign or when and if you have had a previous contact.

This program is in fact a station log, controlled by a menu. The menu consists of:

(1) Enter call sign and information.
(2) List call sign and information. (This option displays the calls and information in successive pages of 15 calls.)
(3) Retrieve data from disc.
(4) Save data to disc.
(5) Search for a call. (This option displays multiple listings of a call sign which has been entered more than once.)
(6) Amend or delete information.

(Jim, has kindly offered to copy the program to a tape or disc. If you require a copy please send Jim a disc or cassette and stamps to pay return postage. Tech Ed.)

ar

Jacket Maker — Computer Program Printout

```
10 REM ** JACKET MAKER BY BOB RICHARDS, MARCH '87 **
20 DIMTB$(144),AB$(144)
30 POKE53280,13:POKE53281,9:PRINTCHR$(147)CHR$(150)
40 PRINTTAB(12)CHR$(17)"JACKET  LISTER"
50 FORI=1TO1000:NEXT
55 PRINTCHR$(17)"  DO YOU WANT A BLANK JACKET? (Y/N):"
60 PRINTCHR$(17)"  ";:INPUTY$
65 IFY$="Y"THEN590
70 PRINTCHR$(147)
75 PRINTCHR$(17)"  ENTER TODAY'S DATE (DD/MM/YY):"
80 PRINTCHR$(17)"  ";:INPUTDT$
90 PRINTCHR$(17)"  UPPER OR LOWER CASE? (U/L):"
100 PRINTCHR$(17)"  ";:INPUTCA$
110 IFCA$="U"THENSA=0
120 IFCA$="L"THENSA=7
130 PRINTCHR$(17)"  WHICH DISK DRIVE? (NO.):"
140 PRINTCHR$(17)"  ";:INPUTDN
150 PRINTCHR$(17)"  WHAT IS THE DISK NUMBER?:"
160 PRINTCHR$(17)"  ";:INPUTDS$
170 PRINTCHR$(17)"  WHICH SIDE? (A/B):"
180 PRINTCHR$(17)"  ";:INPUTS$
190 PRINTCHR$(147)CHR$(17)"  SOME COMMODORE PRINTERS CAN PRINT 8"
200 PRINT"  LINES PER INCH OF PAPER INSTEAD OF"
210 PRINT"  THE NORMAL 6 LINES PER INCH."
220 PRINTCHR$(17)"  WHICH WILL YOURS PRINT?:"
230 PRINTCHR$(17)"  ";:INPUTCH
240 PRINTCHR$(147)"■■■■■■■■■■"
250 PRINTTAB(4)CHR$(18)" READING DATA : PLEASE STAND BY "CHR$(146)
260 GOSUB1950:GOSUB2010
270 REM ** READ DIRECTORY **
280 OPEN8,DN,0,"#0":FORC=1TO8:GET#8,A$:NEXT:C=1:DN$="":FORC=1TO16
290 GET#8,A$:DN$=DN$+A$:NEXT:GET#8,A$:GET#8,A$:DN$=DN$+"  ":GET#8,A$
300 DN$=DN$+A$:GET#8,A$:DN$=DN$+A$:GET#8,A$:GET#8,A$
310 GET#8,A$:OET#8,A$:C=1
320 FORA=1TO4:OET#8,A$:NEXT:PH$="":TY$=""
330 OET#8,A$:IFST<>0THEN400
340 IFA$=""THEN400
350 IFASC(A$)<>34THEN330
360 OET#8,A$:IFASC(A$)<>34THENPH$=PH$+A$:GOTO360
370 OET#8,A$:IFASC(A$)=32THEN370
380 TY$=TY$+A$:OET#8,A$:IFA$<>""THEN380
390 TB$(C)=PH$:C=C+1:IFST=0THEN320
400 CLOSE8
410 IFCH=6ANDC>00ANDS$="A"THENOOSUB1700
420 IFCH=6ANDC>00ANDS$="B"THENOOSUB 1700
430 IFCH=8ANDC>110ANDS$="A"THENOOSUB1700
440 IFCH=8ANDC>110ANDS$="B"THENOOSUB1700
450 REM ** SORT LISTING **
460 PRINTCHR$(147)"■■■■■■■■■■"
470 PRINTTAB(4)CHR$(18)" SORTING DATA : PLEASE STAND BY "CHR$(146)
480 GOSUB1950
490 Z$="◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆":E=1:REM ** SHIFTED Z **
500 FORA=1TOC-1:C$=Z$:FORB=1TOC-1:IFC$<TB$(B)THEN520
510 C$=TB$(B):O=B
520 NEXT:AB$(E)=C$:E=E+1:TB$(O)=Z$:NEXT
530 REM ** JACKET NAME = JN$ **
540 JN$=" ** REFERENCE   "
550 REM ** PRINT JACKET **
560 PRINTCHR$(147)"■■■■■■■■■■"
570 PRINTTAB(2)CHR$(18)" PRINTING JACKET : PLEASE STAND BY "
580 GOSUB1950
590 DD=0:CD=INT(C/2):OPEN4,4,SA
600 FORCR=1TO2:PRINT#4,CHR$(10):NEXT:REM ** LINE FEEDS **
610 TL$="-":REM ** LOOO O **
620 IFS$="B"THEN750
630 PRINT#4,TAB(2);:FORTL=1TO72:PRINT#4,TL$;:NEXT:PRINT#4," CUT"
640 GOSUB1600:GOSUB1620
650 GOSUB1600:IFY$="Y"THEN670
660 PRINT#4,CHR$(14)JN#DS$" **"CHR$(15);
670 GOSUB1620
680 FORLF=1TO2
690 GOSUB1600:GOSUB1630
700 NEXT
710 OOSUB1600:IFY$="Y"THEN725
720 PRINT#4,CHP$(16)"18"DN$SPC(1)8F"FREE"TAB(2)DT$CHR$(16)"64";
725 GOSUB1620:IFY$="Y"THEN905
730 IFCH=8ANDS$="B"THEN2170
740 GOTO2130
750 PRINT#4,TAB(10),:FORTL=1TO56:PRINT#4,TL$;:NEXT:PRINT#4," CUT"
760 OOSUB1600:GOSUB1620:OOSUB1600
770 PRINT#4,CHR$(14)JN#DS$" #4"CHR$(15);:OOSUB1620
780 IFCH=8THEN2210
790 GOSUB1600:GOSUB1620
800 OOSUB2110
810 OOSUB1600
820 OOTO720
830 IFCH=6ANDS$="A"THEN870
840 IFCH=6ANDS$="B"THEN880
850 IFCH=8ANDS$="A"THEN890
860 IFCH=8ANDS$="B"THEN900
870 IFC>32THEN1160
880 IFC>40THEN1170
890 IFC>48THEN1180
900 IFC>50THEN1190
905 IFY$="Y"THEIICD=17
910 FORDD=1TOCD:OOSUB1600
920 PRINT#4,CHR$(16)"20"AB$(DD);
930 PPINT#4,CHR$(16)"40"AB$(CD+DD);:OOSUB1620
940 NEXT
950 OOSUB1600:GOSUB1620:DD=D0+1
960 IFCH=6ANDS$="A"THEN1000
970 IFCH=6ANDS$="B"THEN1010
980 IFCH=8ANDS$="A"THEN1020
990 IFCH=8ANDS$="B"THEN1030
1000 IFDD>17THEN1050
1010 IFDD>21THEN1050
1020 IFDD>25THEN1050
1030 IFDD>30THEN1050
1040 OOTO950
1050 OOSUB1600
1060 IFCH=6ANDS$="A"THEN1100
1070 IFCH=6ANDS$="B"THEN1110
1080 IFCH=8ANDS$="A"THEN1120
1090 IFCH=8ANDS$="B"THEN1130
1100 FOPSL=1TO27:GOSUB1640:GOSUB1660:NEXT:GOTO1140
1110 FORSL=1TO23:GOSUB1640:GOSUB1660:NEXT:GOTO1140
1120 FORSL=1TO36:GOSUB1640:GOSUB1660:NEXT:GOTO1140
1130 FORSL=1TO31:GOSUB1640:GOSUB1660:NEXT:GOTO1140
1140 GOSUB1710
1150 GOSUB1740
1160 J=16:GOTO1200
1170 J=20:GOTO1200
1180 J=24:GOTO1200
1190 J=29
1200 FORDD=1TOJ:GOSUB1600
1210 PRINT#4,CHR$(16)"20"AB$(DD);
1220 PPINT#4,CHR$(16)"40"AB$(OO+J);:OOSUB1620
1230 NEXT
1240 GOSUB1600:PRINT#4,SPC(21)"$$$ MORE $$$";:OOSUB1620
1250 GOSUB1680
1260 GOSUB1640:GOSUB1660
1270 IFCH=6ANDS$="A"THENO=33:GOTO1310
1280 IFCH=6ANDS$="B"THENO=41:OOTO1320
1290 IFCH=8ANDS$="A"THENO=49:OOTO1330
1300 IFCH=8ANDS$="B"THENO=59:OOTO1340
1310 H=32:OOTO1350
1320 H=40:GOTO1350
1330 H=48:GOTO1350
1340 H=58
1350 CX=(C-O)/2:CZ=CX+H
1360 FOPDE=0TOCZ GOSUB1640
1370 PRINT#4,CHR$(16)"20"AB$(DE);
1380 PRINT#4,CHR$(16)"40"AB$(DE+CX);:OOSUB1660:DD=DD+I
1390 NEXT
1400 GOSUB1640:GOSUB1660:DD=OD+1
1410 IFCH=6ANODD=43THEN1430
1420 IFCH=8ANODO=59THEN1430
1425 OOTO1400
1430 GOSUB1710:GOSUB1740
1440 PEM ** CLOSING REMARKS **
1450 PPINTCHR$(147)"■■■■■■■■■■"
1460 PRINTTAB(9)CHR$(18)" DISK COVER COMPLETE "CHR$(146)
1470 GOSUB1950
1480 PRINTCHP$(17)"  DO YOU WANT ANOTHER JACKET (Y/N):"
1490 PPINTCHR$(17)"  ";:INPUTAG$
1500 FOPDD=0TO144:AB$(OD)="":NEXT
1510 IFAG$<>"Y"THEN1530
1520 GOTO30
1530 PPINTCHR$(I47):POKE53280,2:POKE53281,2
1540 PRINTCHR$(147)"■■■■■■■■■■"
1550 PRINTTAB(8)CHR$(18)" PROGRAM TERMINATED ! "CHR$(146)
1560 GOSUB1900
1570 FORWT=1TO1000:NEXT
1580 PRINTCHR$(147)CHR$(154):POKE53280,14:POKE53281,6:END
1590 PEM ** SUBROUTINES**
1600 PEM ** LEFT TOP MARGIN **
1610 PPINT#4," |       |#";:RETURN:REM LOOO J LOOO O
1620 REM ** RIGHT TOP MARGIN **
1630 FPINT#4,CHR$(16)"64# |       |":RETURN:REM LOOO M LOOO L
1640 REM ** LEFT BOTTOM MARGIN **
1650 PPINT#4,"       |":RETURN:REM LOOO J
1660 REM ** RIGHT BOTTOM MARGIN **
1670 PRINT#4,CHR$(16)"65 |":RETURN:REM LOOO L
1680 REM ** FOLD LINE **
1690 FL$="-":REM SHIFTED O
1700 FPINT#4,TAB(2);:FORFL=1TO72:PRINT#4,FL$;:NEXT:PRINT#4," FOLD":RETURN
1710 REM ** BOTTOM LINE **
1720 BL$="-":REM ** LOOO Y
1730 PPINT#4,TAB(10);:FORBL=1TO56:PRINT#4,BL$;:NEXT:PRINT#4," CUT":RETURN
1740 REM ** PAGE FEED **
1750 PRINT#4:FORPF=1TO3
1760 PRINT#4,CHP$(10)
1770 NEXT CLOSE4:OOTO1440
1780 REM ** TOO MANY PROGRAMS **
1790 PPINTCHP$(147):POKE53280,2:POKE53281,2
1800 PRINTCHR$(147)"■■■■■■■■■■"
1810 PRINTTAB(9)CHR$(18)" TOO MANY PROGRAMS "CHR$(146)
1820 PPINTTAB(9)CHR$(18)" TO LIST ON JACKET "CHR$(146)
1830 GOSUB1900
1840 FOPI=1TO1000:NEXT:POKE53280,13:POKE53281,9
1850 PRINTCHP$(17)" PRINT THOSE THAT FIT? (Y/N):"
1860 PPINTCHR$(17)"  ";:INPUTLS$
1870 IFLS$<>"Y"THEN1530
1880 IFCH=6THENC=88:RETURN
1890 C=110:RETURN
1900 PEN ** BUZZER **
1910 FOPES,240
1920 H=54273:S=54278:W=54276:V=54296
1930 POKEV,15:POKEH,5:POKEW,33:FOPT=0TO500:NEXT
1940 FOPT=H-1TOV:POKET,0:NEXT:RETURN
1950 PEM ** BELL **
1960 H=54273:S=54278:W=54276:V=54296
1970 FOPAA=1TO3
1980 POKEV,15:POKEH,40:POKES-1,9:POKEW,17:FORT=1TO500:NEXT
1990 FOPT=H-1TOV:POKET,0:NEXT
2000 NEXT:RETURN
2010 PEM ** READ BLOCKS FREE **
2020 OPEN15,8,15,"I0":OPEN2,8,2,"$"
2030 PRINT#15,"B-R";2;0;18;0
2040 BF=0
2050 FORI=4TO140STEP4
2060 IF1=72THEN2100
2070 PPINT#15,"B-P";2;I
2080 GET#2,X$:IFX$=""THENX$=CHR$(0)
2090 BF=BF+ASC(X$+CHR$(0))+BF
2100 NEXT:CLOSE2:CLOSE15:RETURN
2110 PEM ** SHOULDERS FOP SIBE B/6 **
2120 PRINT#4,CHR$(16)"02_____#";CHR$(16)"64# |_____ CUT":RETURN:REM LOOO B
2130 PEM ** UNDERLINE **
2140 PRINT#4," |       |#";
2150 PRINT#4,CHR$(16)"18"_____";
2160 PRINT#4,CHR$(16)"64# |       |":GOTO530
2170 PEM ** SHOULDERS FOR SIDE B/8 **
2180 PPINT#4,"  _____  |#"
2190 PPINT#4,CHP$(16)"18"_____";
2200 PRINT#4,CHR$(16)"64# |_____ CUT":OOTO630
2210 PEM ** LINE FEED **
2220 FORLF=1TO2:GOSUB1600:GOSUB1620:NEXT
2230 IFCH=8THEN810
2240 GOTO710
```

Amstrad CPC612 — Computer Program Printout

```
10 REM SET UP MENU
20 MODE 2:INK 0,13:INK 1,0
30 c=0:r=0
40  DIM cs$(500), info$(500)
50 c$="Callsign":i$="Information"
60 WINDOW 1,80,1,25:CLS
70 LOCATE 18,2
80 PRINT "*** AMATEUR RADIO STATION IMFORMATION ***"
90 LOCATE 27,4:PRINT "- Jim Oliver  VK7JO -"
100 LOCATE 33,6:PRINT "-- MENU --"
110 LOCATE 24,9:PRINT"1. Enter callsign and info."
120 LOCATE 24,11:PRINT "2. List callsigns and info."
130 LOCATE 24,13:PRINT "3. Retrieve from disc"
140 LOCATE 24,15:PRINT "4. Save to disc"
150 LOCATE 24,17:PRINT "5. Search for a call "
160 LOCATE 24,19:PRINT "6. Amend or delete"
170 LOCATE 24,25:INPUT"Enter menu selection";ms
180 CLS
190 ON ms GOSUB 230,540,750,840,940,1080
200 GOTO 50
210 IF INKEY$="" THEN 210
220 REM ENTER CALLS AND INFO
230 WINDOW 1,80,1,25:CLS
240 PRINT SPC(25)"-- Imformation entry --"
250 PRINT c$,i$
260 WHILE c<500
270 r=c+1
280 WINDOW 1,80,11,14
290 k$=""
300 PRINT "Record number ";r:PRINT SPC(22)"Use
    UPPER CASE for CALLSIGN"
310 PRINT SPC(22)"Limit imformation to one line"
320 WINDOW 1,80,5,9
330 PRINT SPACE$(160)
340 LOCATE 1,2
350 LINE INPUT:cs$(c)
360 LOCATE 14,2
370 LINE INPUT;info$(c)
380 WINDOW 1,80,17,25
390 PRINT SPC(22) "Press <ENTER> if data is correct"
400 PRINT:PRINT SPC(22) "If not press <SPACE> bar"
410 PRINT:PRINT SPC(22) "If END of LIST press <E> key"
420 WHILE k$<>CHR$(13) AND k$<>CHR$(69) AND k$<>CHR$(32)
430 k$=INKEY$:k$=UPPER$(k$)
440 WEND
450 CLS
460 IF k$=CHR$(13) GOTO 500
470 IF k$=CHR$(69) GOTO 490
480 IF k$=CHR$(32) GOTO 260
490 c=499
500 c=c+1
510 WEND
520 RETURN
530 REM LIST CALLS AND INFO
540 CLS
550 PRINT c$,i$
560 WINDOW 1,80,3,18
570 c=0
580 WHILE c<r
590 PRINT cs$(c),info$(c)
600 page=c MOD 14
610 IF page = 0  AND c>0 THEN GOSUB 1300
620 IF page = 0  AND c>0 THEN WINDOW 1,80,3,18:CLS
630 c=c+1
640 WEND
650 WINDOW 8,80,20,23
660 PRINT TAB(23)"End of list"
670 GOSUB 1300
680 RETURN
690 WINDOW 1,80,25,25
700 CLS
710 PRINT TAB(8)"Press any key to continue"
720 k$=INKEY$:IF k$="" THEN 720
730 RETURN
740 REM RETRIEVE INFO FROM DISC
750 OPENIN "data"
760 WHILE EOF = 0
770 INPUT#9,cs$(c),info$(c)
780 c=c+1
790 WEND
800 CLOSEIN
810 r=c
820 RETURN
830 REM SAVE INFO ON DISC
840 OPENOUT "data"
850 c=0
860 WHILE c<r
870 PRINT#9,cs$(c)
880 PRINT#9,info$(c)
890 c=c+1
900 WEND
910 CLOSEOUT
920 RETURN
930 REM SEARCH FOR A CALLSIGN
940 cs$="zz":f=0
950 LOCATE 20,3
960 INPUT "Enter callsign to search for";cs$
970 cs$=UPPER$(cs$)
980 LOCATE 1,8:PRINT c$,i$
990 WINDOW 1,80,10,21
1000 c=0
1010 WHILE c<r
1020 IF cs$=cs$(c) THEN f=1:PRINT cs$,info$(c)
1030 c=c+1
1040 WEND
1050 IF f<>1 THEN LOCATE 25,8:PRINT"Callsign not found"
1060 GOSUB 1350
1070 REM AMEND CALLSIGN AND IMFO
1080 CLS
1090 cs$="zz":f=0
1100 LOCATE 20,3
1110 INPUT "Enter callsign to amend";cs$
1120 cs$=UPPER$(cs$)
1130 LOCATE 1,9
1140 PRINT "    "c$,i$
1150 WINDOW 1,80,10,21
1160 c=0
1170 WHILE c<r
1180 IF cs$=cs$(c) THEN f=1 :PRINT: PRINT c;cs$,info$(c)
1190 c=c+1
1200 WEND
1210 IF f <> 1 THEN LOCATE 25,8:PRINT "Callsign
     not found":GOTO 1350
1220 WINDOW 1,80,22,24
1230 INPUT"Input number of callsign you want to amend";n
1240 CLS:PRINT "Retype the whole record"
1250 WINDOW 1,80,10,21 :CLS
1260 PRINT n;cs$(n),info$(n)
1270 LOCATE 2,4:INPUT cs$(n)
1280 LOCATE 12,4:INPUT;info$(n)
1290 GOTO 50
1300 WINDOW 1,40,25,25
1310 CLS
1320 PRINT TAB(8)"Press any key to continue"
1330 k$=INKEY$:IF k$="" THEN 1330
1340 RETURN
1350 WINDOW 1,80,25,25
1360 CLS
1370 PRINT TAB(8) "Press any key to continue"
1380 k$=INKEY$:IF k$="" THEN 1380
1390 GOTO 50
```

HOW WOULD YOU FARE ? ? ?

COMMONWEALTH OF AUSTRALIA
POSTMASTER-GENERAL'S DEPARTMENT
FIRST AND SECOND CLASS AMATEUR OPERATOR'S CERTIFICATES OF PROFICIENCY

SECTION K (Regulations) **APRIL 1947**

Time allowed — 30 minutes
NOTE — Three questions only to be attempted.

1 What are the regulation requirements regarding the sending of test signals from an Experimental station?

2 What steps must be taken by an experimental station licensee to ensure that his transmitter operates within the frequency bands allotted for experimental use?

3 When desiring to establish communication with another station what requirements must be met in regard to:
(a) adjustments to receiver and transmitter before commencing to call,
(b) duration of time between calls.
(c) manner of making a call in (i) CW and (ii) Telephony.

4 What comprises the distress signal in Telegraphy and Telephony?

5 For what purposes is an experimental licence issued?

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A Free-Standing Tilt-Over Mast

Allan Carman VK3AQH
PO Box 287, Warrnambool, Vic. 3280

An antenna with no guy wires and a small amount of concrete.

This mast was recommended to me by Peter VK3FX, who helped construct and erect it. It requires no guy wires, a small amount of concrete and will be 35 feet or 36 feet tall (about 11 metres).

PARTS LIST

Galvanised Bolts (Hexagonal Head)
1 only — 6" x ½" w/nut (150 x 12 mm)
2 only — 1½" x ½" w/nut and washer (40 x 12 mm)

Galvanised Pipe, unthreaded, medium grade
2 only — 3" diam 21'6" long (80 NB 6.6 m)
1 only — 2½" diam 7'0" long (65 NB 2.1 m)
1 only — 2½" diam 4'6" long (50 NB 1.4 m)
1 only — 1½" diam 3'6" long (40 NB 1.1 m)
1 only — 1½" diam 1'6" long (40 NB 0.5 m)

Mild Steel Plate (⅜" or 10 mm thick)
2 only — 2" x 1½" (50 x 40) (Part "A")
2 only — 7" x 1½" (50 x 40) (Part "A")
2 only — 4" x 1½" (100 x 40) (Part "C")
2 only — 5" x 1½" (130 x 40) (Part "D")
2 only — 6½" x 3" (170 x 35) (Part "E") (¼" or 6 mm)

Sundries
1 bag — Cement
Small quantity — Crushed Stone (not coarse)
Welding Rods (gor galvanised steel)
1 only — Turned Wooden Reel
Small tin — Metal Primer
About 60 feet — Manila Rope, (¾" diam)

First prepare the pieces of steel plate. Pieces "B" have both ends cut at 45 degree angles, and pieces "C", "D" and "E" all have a half inch hole drilled at one end, with these corners rounded and the ends lightly dressed.

Next take one length of three inch diameter pipe called "F" in Figure 1. It must be a good straight piece. At one end weld piece "A" flush with the end, with the other "A" piece welded directly opposite. Chip clean, double weld and chip again — this procedure applies to all welded areas.

Next, weld piece "C" in place to project 2" followed by a second piece "C" opposite, using the six inch bolt to help align this piece. Paint primer on all these welded pieces and joints.

Take the second piece of straight three inch pipe and insert the piece of two and a half inch diameter pipe for about 10 inches. Using shim metal, even three or four inch nails, carefully align with the main piece, tack weld, and check the alignment before completing the double welding. Repeat this procedure to insert the two inch diameter pipe about eight inches down into the two and a half inch pipe, and the longer piece of one and a half inch diameter pipe about six inches into the two inch pipe. Chip and prime all joints. This is part "T" in the diagram — it must be perfectly straight.

Lay the two lengths of mast on a flat surface, parallel to each other and touching, but with one length protruding six and a half feet beyond the other as in Figure 2. Using a one and a half inch by half inch bolt, place piece "D" in position as indicated in Figures 2 and 3. Tack and weld in place. With the help of an assistant, turn the two mast sections 90 degrees so that part "T" now lies on top of part "F" enabling the second piece "D" to be placed into position with a bolt and tacked into place.

Ensure that the long pieces of the mast, "F" and "T" are truly aligned, then double weld the two "D" pieces, followed by bracing them with parts "B" which must be above "D" to allow for free-tilting of the mast later. (See Figure 3).

With "F" and "T" now correctly aligned, pieces "E" are welded at the bottom end of "T" using the six by half inch bolt to help position them. (See Figure 3).

Remove all bolts and double check that all mild steel and welded joints are chipped and primed. Other paint can now be applied if desired.

Excavate a hole at the proposed site, remembering that both ends of the mast must have room to travel, including rotator and antenna. Begin with a hole two feet three inches in diameter, nine inches deep and at its centre use a long-handled post-hole shovel to dig a hole as narrow as possible with a total depth of four feet six inches below ground level — this is not easy. Finally, undercut the bottom as much as possible using a hoe, cultivator, etc. Now mix enough concrete, three-to-one mix, to fill this undercut only. Stand the base pipe "F" upright in the middle of the small diameter hole, ensuring Plates "C" are correctly aligned for future tilting. Prop in position with temporary wooden stays, ensuring that it is vertical by using a long spirit level. Wait four days and fill the small diameter hole with sand only; do not use soil or concrete, and ram the sand as you fill. Now the nine inch hole at the top is filled with concrete which can be given a slight fall-away from the mast for drainage. Allow at least a week for the concrete to cure and remove the stays.

Tie a temporary rope to piece "T" at the junction of the two and two and a half inch pipes so that the mast can be tilted later until its antenna is fitted, when it becomes top-heavy and is then able to be lowered by just using the 60 feet piece of manila rope as a brake.

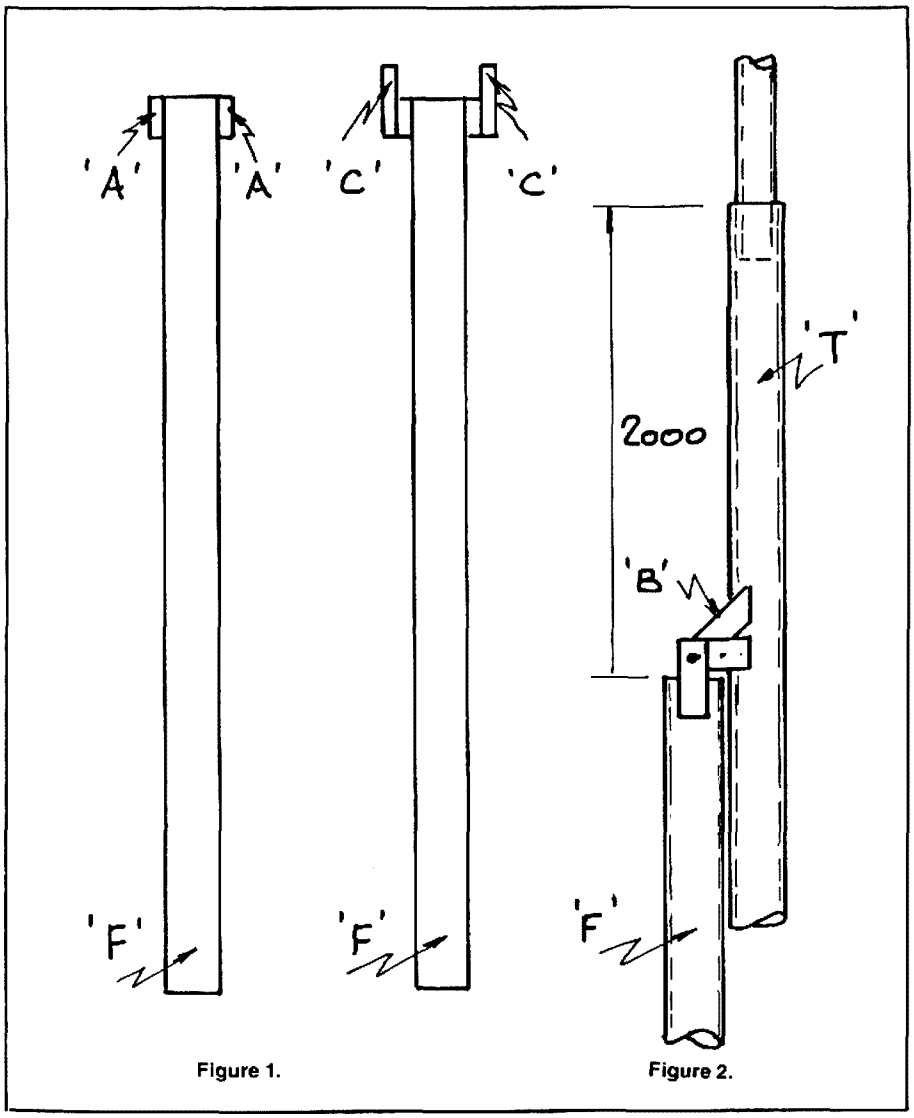
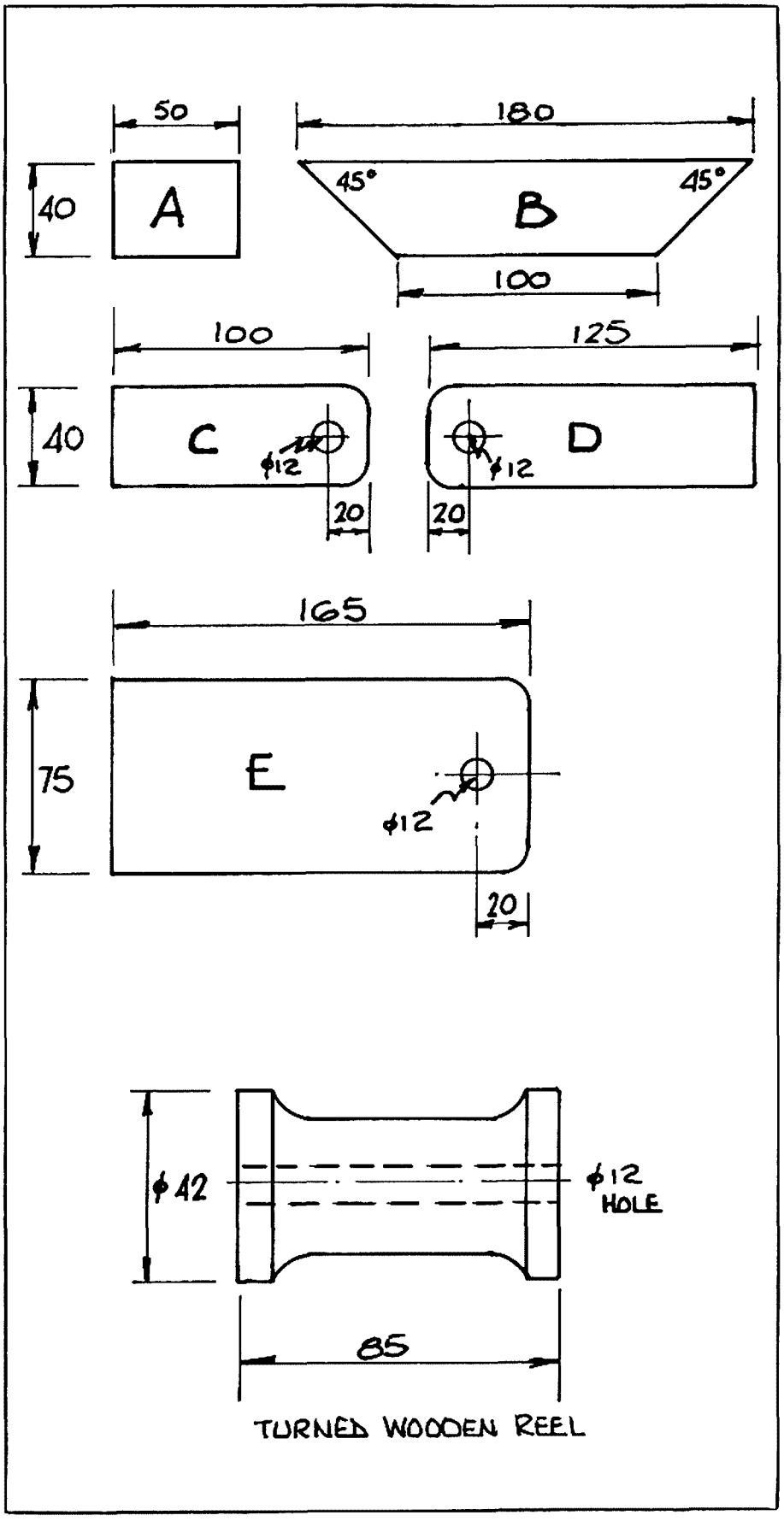


Figure 1.

Figure 2.



One person now climbs a ladder leaning against the fixed part of the mast, taking the one and a half inch bolts with them whilst another person or two stand the long section upright near the fixed base pipe until it is standing against this fixed pipe. It is now lifted vertically and the bolts are inserted by the ladder-person and washers and nuts applied. During this procedure the ground-people hold the long pipe against the fixed base. They next slip the six inch bolt into place through the "E" pieces.

To tilt the mast, the sixty foot piece of manila rope is first wrapped seven times around the fixed base, as in Figure 4, and tied. Place a shoulder against the mast, remove the six inch bolt, tilt the mast slightly towards you so you may pass a U-shaped rope loop over the wooden pulley, which is fixed between the "E" pieces by the six inch bolt and nut. An assistant pulls on the other temporary rope tilting the mast while the operator feeds the manila rope over the pulley and around the mast, as in Figure 4. Tie the temporary rope down firmly when the thin end of the mast is at the desired level, for clamping the rotator and the short piece of one and a half inch pipe into place. Next attach the control cable and coaxial cable to the side of the mast — you can wrap PVC cable around at each point of attachment, then use half inch metal straps over the tape.

Clamp the antenna in place, making sure it points as shown on the rotator indicator, then complete rotator and antenna connections. The temporary rope is removed — you should always attach it when loosening or removing the antenna. The antenna may be tuned quite close to the ground.

To raise the antenna and mast, haul the manila rope around the mast — it is better for the rope to travel on the pad of seven turns of rope which are already around the base, especially when lowering the mast. When the tilting piece is hard against the base piece, lean against it while you remove the six inch bolt, allowing the pulley and rope to drop clear. Push with the shoulder until the "E" pieces embrace the fixed base and re-insert the six inch bolt and nut.

When you wish to lower your antenna, one person prepares the manila rope as in Figure 1, leans against the mast, removes the six inch bolt, tilts the mast slightly towards them, put the rope, pulley and six inch bolt back into position as in Figure 4. Pass the rest of the rope around the "friction pad" of rope on the base pipe and hold it firmly while tilting commences, feeding the rope slowly until the antenna is at the desired position when the rope is tied off around the base of the mast. You can use a single X- shaped wooden support near the rotator to take the strain off your rope — it will help steady the antenna.

Other tips are:

1 Raise or lower the antenna as steadily as possible — avoid jerking to lesson strain on the antenna and rotator parts.
2 Check the nuts on the one and a half inch bolts frequently — they tend to loosen with tilting. Do not substitute a single long bolt.
3 Tie-down the tilted mast with temporary rope when loosening the rotators or antenna clamps.
4 Neither Peter VK3FX, or I have guy-wires on our masts — if you must use them, attach to the fixed base pipe, below the pivots.

(NOTE: The design of this mast has been assessed for strength by a technical editor. It should be able to withstand winds of over 100 km/h without an antenna, but this reduces to under 90 km/h with a typical 20 metre beam fitted. No responsibility is taken for the accuracy of these calculations. Check with your local council as to their requirements.)

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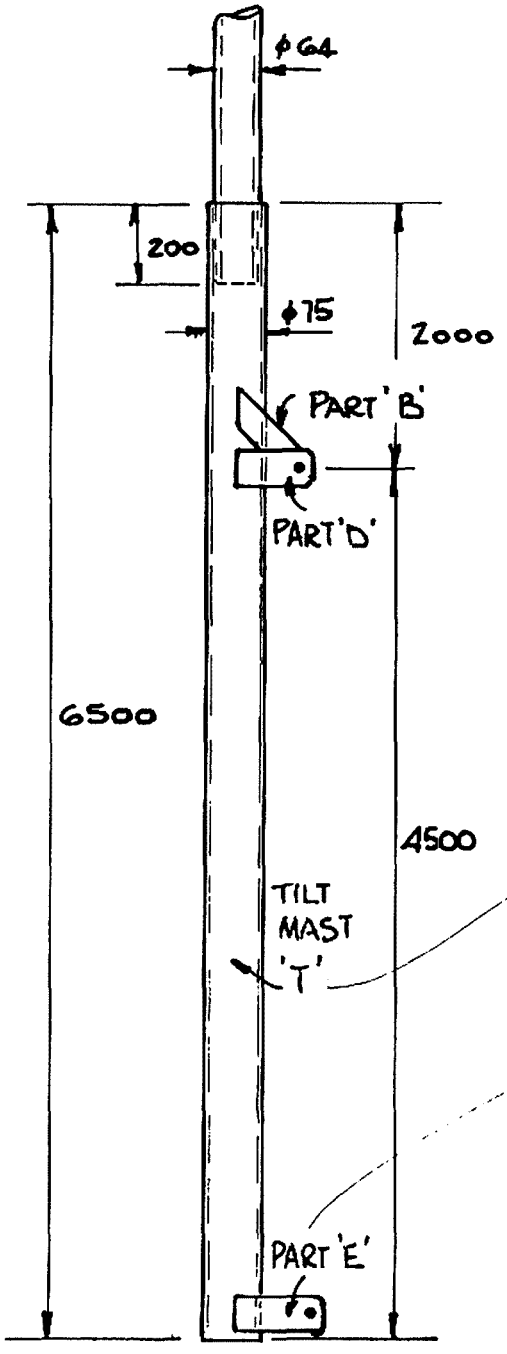

Figure 3.

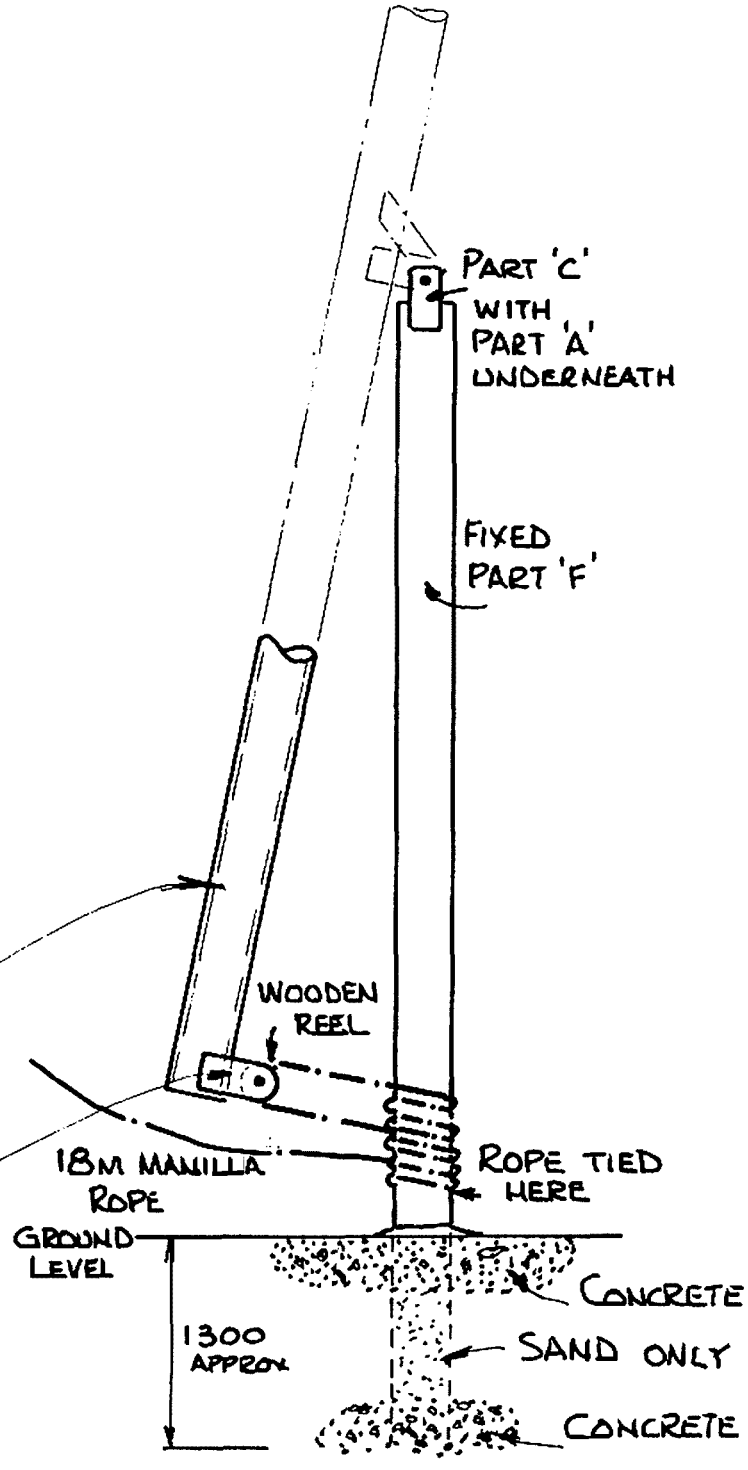

Figure 4.

THE VK3AUU YAGI DESIGN

David Tanner VK3AUU
Korumburra Road, Drouin South, Vic. 3818






A developing interest in Moonbounce has kindled a fresh desire to search for the ultimate in antenna design.

For many years the author has had a need for high gain antennas for VHF and UHF, having often lived in out of the way places where the nearest station was hundreds of kilometres away. In more recent years a developing interest in moonbounce has kindled a fresh desire to search for the ultimate in antenna design. An article by Gunther Hoch DL6WU, seemed to be the very sort of thing needed. The design currently produces the highest known gain for a given boom length, increasing about 2.35 dB each time the boom length is doubled and it seems to work for boom lengths from about one wavelength up. At that length, the gain is about 9.2 dBd. In addition to that, the impedance of the driven element is 50 ohms so that a 4:1 balun and a folded dipole gives a very good impedance match without any adjustment and, according to DL6WU, the bandwidth is four percent at the -1 dB point.

The prospect of reading figures from a graph seemed to be a messy way of going about the job of determining the lengths of all the directors. However, about a year ago I received a computer program, written by VK4ZF, with modifications by various others, which seemed to have something to offer with regard to the DL6WU design. Instead of a graph, it used a look-up table for elements of various diameters. The drawback with this was that, if you wanted to use elements of different diameters than those in the table, there was some error in the computed lengths. I now had a table to work from so I set about determining what I hoped would be a simple equation which would enable me to plot director number against director length, assuming a constant element diameter. A suggestion was made to me by my mathematics lecturer from GIAE that it looked like an equation of the form

$$y = a + be^{-kt}$$

would fit the curve. This did turn out to be the case. In addition to that, it was also possible to determine the length of a given director as its diameter was varied. As a result of much trial and error, an algorithm was finally arrived at which gave the length of any director of the DL6WU design as a function of element diameter with quite small errors over the range of diameters from .003 to .2000 wavelengths and out to at least 40 directors. The fit is very good at .003 which is about 6.25 mm on two metres. The final algorithm is as follows, with all dimensions in wavelengths:

$$L = .5179 - .4328\,d^{.2078} + (.007344 + .1794\,d^{.1998})\,e^{-.07586\,N}$$

where

L = Length of Director N
d = Director Diameter
e = 2.718285

Reflector Length =
1.12 x Director 1

Driven Element =
1.066 x Director 1

The original article by DL6WU also included a table which gave a correction for the length of elements which pass through a metal boom. This reduces to quite a simple formula with dimensions also in wavelengths.

$$C = 12\,D^2 + .15\,D$$

where
C = Length to be added
D = Boom Diameter

If C is greater than two-thirds of the boom length, then use a correction of

$$C = 2\,D/3$$

I would suggest that a folded dipole driven element is used, in which case the total length should be twice that shown, plus one boom correction. Feed impedance will be 200 ohms.

Now all that remained was for me to build an antenna for two metres and see how it performed. The final result is a 19 element Yagi with a total boom length of 11.73 metres. The boom is 40 mm diameter with 1.6 mm wall thickness made from two six-metre lengths spliced in the middle. The elements are 6.35 mm diameter. The boom was drilled slightly undersize and the holes reamed to a good fit. After marking the elements 20 mm each side of the mid-point, the elements were given a slight squeeze with a pair of adjustable pliers where they go through the boom. The elements were then tapped through past the first squeeze, twisted 90 degrees and then tapped the rest of the way. This made then a very tight fit in the boom. Care should be taken with this operation not to put nicks in the elements as subsequent vibration caused by the wind will fatigue at any such nicks. The mast is continued up about a metre above the boom and a wire stay is run to each part of the boom about two-thirds of the way out. The boom to mast clamp is made using four muffler clamps and a 150 mm square plate of six millimetre steel. A commercial masthead preamplifier was installed at the top of the mast 12 metres from the ground and connected to the transmitter through 25 metres of 10 DFB coaxial cable.

The design was as follows:

Frequency MHz	144.100
Wavelength mm	2082
Boom Diameter mm	40
Element Diameter mm	6.3
Elements through Boom	Yes
Boom Correction mm	15
Reflector Length mm	1057
Reflector Spacing mm	500
Driven Element mm	1008

Director Number	Length mm	Spacing λ mm	Boom Length mm	Gain dBd
1	946	.075 156		
2	937	.180 375		
3	929	.215 448		
4	921	.250 520		
5	914	.280 583		
6	907	.300 625		
7	901	.315 656		
8	896	.330 896		
9	890	.345 718	5267	12.6
10	885	.360 749	6017	13.1
11	881	.375 781	6797	13.5
12	877	.385 802	7599	13.9
13	873	.390 812	8411	14.2
14	869	.395 822	9233	14.5
15	866	.400 833	10066	14.8
16	863	.400 833	10899	15.1
17	860	.400 833	11731	15.4

The length can be cut off anywhere from director nine onwards. Subsequent directors from 15 onwards are all spaced 0.40 wavelengths. The gain figures may seem low compared to some commercially designed antenna claims, but, believe me, they are the best you can get for the boom length and are in genuine dBd.

Stacking two antennas should yield another 2 dB.

The results with this antenna have been quite outstanding with the most successful contact to date being on CW with W5UN on 144.008 MHz off the rising moon in late October 1986. The strength of the signals shows that the predicted gain of 15.5 dBd is easily being met. It is now possible to hear the Mount Gambier beacon on 144.550 MHz, 90 percent of the time while the Canberra beacon on 144.410 fades in and out of the noise most of the time. Early morning scheds with VK5BVT, in the Adelaide Hills on 144.100 SSB are successful quite often, and scatter signals from VK2ZAB in Sydney are generally readable on peaks. Another array consisting of four or these Yagis is currently under construction at this QTH, with horizontal spacing of 4.58 metres and vertical spacing of 4.12 metres.

The author has also built a 70 cm Yagi of this design with 33 elements on a tapered boom approximately eight metres long. This single Yagi with a GaAsFET preamplifier mounted on the boom near the driven element has been used to copy CW from K2UYH, off the moon and enables SSB QSOs with VK5NC, in Mount Gambier to be made any time. Four of these Yagis and a pair of 4CX250Bs should make a usable EME station.

References:

1HOCH G, DL6WU. *More Gain with Yagi Antennas.* VHF Communications 4/1977
2HOCH G, DL6WU. *Extremely Long Yagi Antennas.* VHF Communications 3/1982
3POWLISHEN S, K1FO. *Stacking Yagis is a Science.* Ham Radio, May 1985

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Overhauling the TH3 Tri-Band Beam

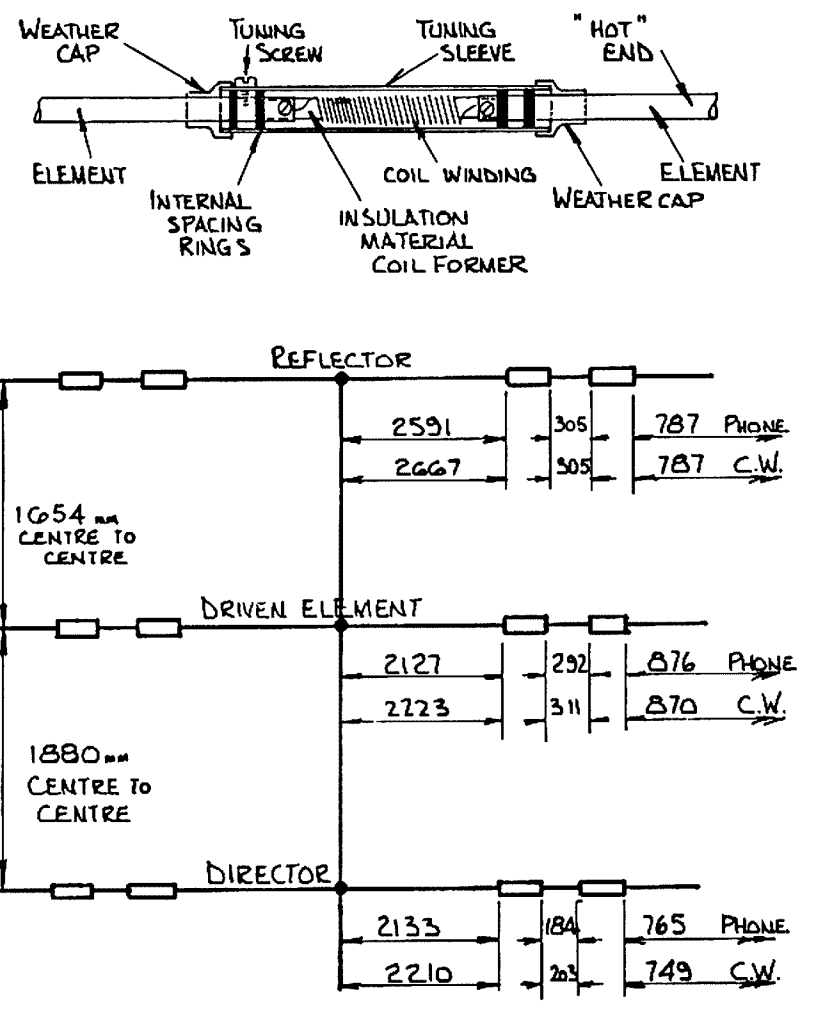
Desmond Greenham VK3CO
16 Clydesdale Court, Mooroopna, Vic. 3629

The traps were open at each end allowing water to enter.

Perhaps one of the most popular beams in recent years has been the famous TH3-Junior, made by Hi-Gain, USA. This beam is designed to operate on 10, 15 and 20 metres with a reasonable gain and yet is not too big for the average suburban backyard. Its gain is claimed to be around 8 dB and this, combined with a good front-to-back ratio, makes the beam most attractive. Many were purchased over the last 12 years including one that has done sterling service at this location. But in recent times it has been noticed that after a shower of rain the SWR along with the performance changes dramatically. The SWR goes up and the performance goes down! ! !

Figure 1: TH3-JR Dimensions in millimetres. (Measurements to end of tuning sleeve of trap).

From HI-Gain Pamphlet



Peering at the beam through binoculars showed that the trap ends were, in some cases, not on the traps at all and were, in fact, quite removed from the trap and hanging loose on the elements. The beam was dropped.

An inspection revealed that the plastic ends were perished and split — no doubt due to the Australian sun. This left the traps open at each end allowing water to enter, thus ruining the tuning etc. Replacement caps are available but their life span is doubtful and they are very costly. So, some other alternative was necessary.

The ends of the traps could be sealed with silicone sealer but this idea was not attractive because of possible detuning effects and the difficulty of opening the traps at a later time. The idea of using electricians shrink- tubing was tried and proved to be most effective. Several sizes and various colours are available.

The size chosen was 33 mm. This will shrink to half its original size when heated over a flame. Prior to fitting the ends each trap was dismantled and the collection of dust, spiders, bugs, etc removed. The coil was inspected and cleaned. Connections were tightened. The tuning shield was replaced and prior to fitting the ends, the resonant frequency was checked with an accurate Dip Oscillator. Coupling was made to the GDO with a short piece of wire from the hot-end of the trap around the coil of the GDO. This enabled enough coupling to establish a dip and the frequency was checked. The 10 metre traps resonated at 28 MHz and the 15 metre traps at 21 MHz. There was no detuning due to the fitting of the new ends.

To fit the ends the procedure went like this.

Firstly, clean the trap surface with steel wool to remove corrosion. Cut the 30 mm tubing into 40 mm lengths and fit over the end allowing about five millimetres overlap on the sleeve. To shrink the tubing it must be placed over a flame. The family gas barbeque is ideal for the job! If your wife will permit the operation it can be done over the normal gas stove. The main point is to constantly rotate the trap and not allow the flame to burn the tubing.

Begin applying heat to the larger diameter, rotating all the time, and then move along to the smaller diameter as the shrinking occurs. **Do not** overheat as the shrinking process will be too great and the sleeve will split and it will be necessary to begin again. There is a knack to this and it will soon be acquired.

After all traps have been treated in this manner the beam should be cleaned with steel wool and reassembled again. The dimension chart should be carefully followed and the beam set up to suit your particular requirement, CW or Phone operation. Check all clamps, connections, etc, to ensure nothing is loose. When all these procedures have been carried out the beam can be put back to work. The life of the shrink-tube is unknown at this stage but, if it only last five years, that will be enough. I can repeat the entire operation again, only next time I may change the colour!

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THREE AMATEURS GO TO THE TOP

Well, to the top of the Northern Territory!

Keith Scott VK3SS
34 Henry Street, Maffra, Vic. 3860

For seven-and-a half weeks, from July to September, Sue VK3KDK, husband Michael VK3ZQV and Keith VK3SS, together with several others, drove from Gippsland in south-east Victoria, to the most distant points of the Northern Territory. Transport was three four-wheel drive vehicles.

In their vehicle, Sue and Mike took their two boys, one about eight-years, the other just crawling and 10-months old. The author was fortunate to be accompanied by Vic, an expert automotive engineer, who shared the driving and kept a close eye on the mechanics of the vehicle. The other vehicle was driven by John, a retired Senior Sergeant Policeman, his 83-year-old father and Harry, a machinery mechanic.

With a Royal Flying Doctor (RFDS) radio and plenty of amateur equipment, the group were well prepared.

The entourage travelled the complete Stuart Highway to Alice Springs, a town which continues to grow and is quite attractive — no longer resembling the outback!

A sad note enters here — Jock VK3DOJ, was waiting to join the party at Alice, but he was feeling far from well and, after receiving medical attention, decided to return home. Jock and the author had traversed many roads together and had many enjoyable times, but this was his last as he is now a Silent Key. (See Obituaries, December AR).

Next stop for the day was Mataranka. This is a lovely place with a famous warm fresh water spring running into a pool where it is possible to swim and splash all day. The scenic Waterhouse River meanders through here with canoeing a popular pastime.

The group were joined here by another couple, then all proceeded to Maranboy where permits to travel into Aboriginal lands were received from the Police Station. Destination from here was Nhulunbuy, at the far north-east tip of Gove Peninsula.

This took three days along a narrow, twisty track, crossing creeks and the metre deep Goyder River. The township of Nhulunbuy exists as a mining town to service and house workers at an open-cut-type bauxite mine from which aluminium is extracted in a lengthy and costly process. The deposit is huge and enormous earth-moving machines feed the worlds second largest plant 24-hours a day. Alumina, a light brown powdery substance is extracted, then shipped overseas for smelting and processing. A good deal of processing is also done in Australia.

Nhulunbuy has a local tourist committee to assist visitors, most of whom fly in from Darwin on packaged-tours. The track into town is such that it is often only open for five months each year, Summer and Autumn wet-seasons inundate the area with constant rain and large parts of the track disappear at these times.

Michael VK3ZQV, crossing the Goyder River in the Northern Territory.

Some of the committee guided us around the area on their free days, and pointed out places of interest on other days. We toured the mine, visited lovely beaches and swam in warm sea water.

Being surrounded on three sides by the sea, the area although hot, is quite comfortable due to sea breezes.

The scenery is tropical, with plenty of fresh water creeks and a river of two amid the tropical vegetation and was quite a change from the interior through which we had travelled previously. The locals were very friendly, as were the Aboriginals, and an enjoyable evening was spent with Darryl Heffernan VK8DH, an electronics technician at the mine.

After a fully-occupied five days stay it was time to turn around and traverse the same track which had brought us to Nhulunbuy.

Giant termite mounds, some over five metres high, are numerous along the track. Very little animal life was obvious — possibly the fauna has learned to keep away from the tracks, plus being hunted by the local inhabitants. Bird-life is plentiful around the lagoons right through Arnhem Land. Jabiru, Broglas, Magpie Geese, various Parrots and Cockatoos, Egrets, Herons, Pelicans, Hawks, Eagles, Ducks — you name it, they are there. In fact, it is estimated 25 percent of all our native birds reside in the area. Buffalo are plentiful, observing us along the track, although they are being slaughtered for pet meat and small goods.

We met, and chatted to, many friendly Aborigines along the track. Housing in their villages was satisfactory, tidy and reasonably well cared for. Our permits were endorsed with strict no alcohol restrictions, and warning signs near villages stated that breaches of these rules could lead to fines of $1000, plus confiscation of vehicles for anyone caught peddling alcohol. These rules are made by the Aboriginal councils and are legally supported.

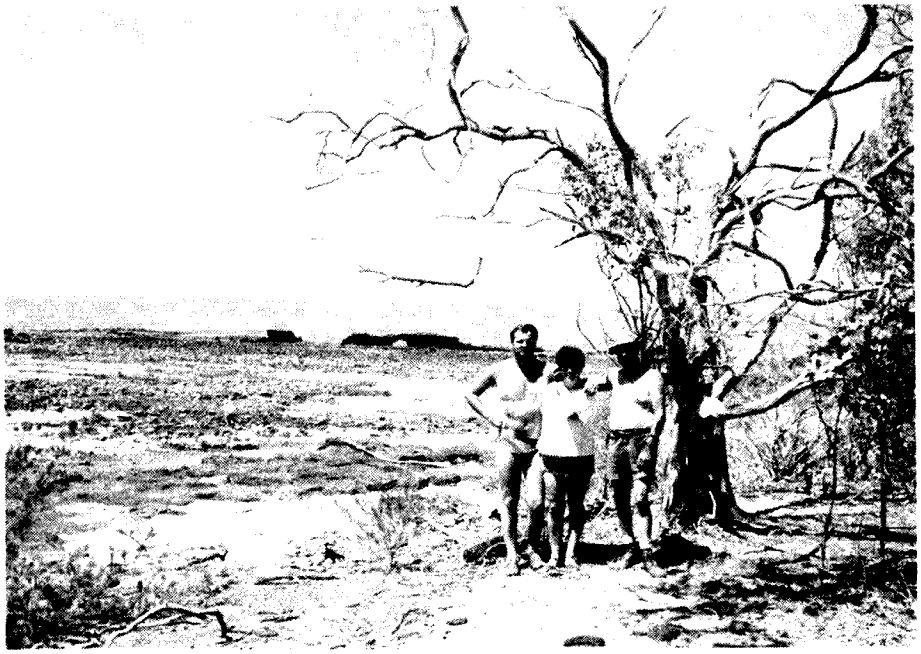
The last couple to join the group went their own way at Katharine, and after a boat trip up the beautiful gorge at Katherine, we continued north to Darwin, visiting interesting areas en route.

A week or so was spent in Darwin, visiting friends and roving around the nearer parts of Kakadu National Park, a most interesting and scenic area.

Contact was kept at all times with amateurs via repeaters and two metres. Every day we reported in on the 14.104 MHz Travellers' Net, and spoke with the author's son, David VK3DY, and others in the Latrobe Valley. There was only one day when contact with VK6ART, the principal operator, on the Travellers' Net was impossible. Mobile antennas were used at all times!

Full marks go to Sue VK3KDK, who did an excellent job of cooking, washing and caring for two young boys and Michael, under trying conditions. Baby Nigel insisted on waking at first light each morning, wanting food, play and crawling over sleepy parents. She had little time for amateur radio, took everything, including some driving, in her stride, all with no complaints.

We proceeded up the Adelaide River on a large launch — very scenic but somewhat unsuitable for swimming due to large crocodiles laying on the oozing mud banks and swimming alongside the launch. We were warned to keep arms and legs well inside the boat!



From left: Michael VK3ZQV, Sue VK3KDK and Keith VK3SS.

The intrepid travellers in the "outback" examining a termite mound.

A light plane was hired for a 60-minute flight from Jabiru. This was most worthwhile to see and appreciate areas which it was impossible to see from the tracks. This particular area is mostly vast wet-lands, rivers, creeks, lagoons and swamps, which inundate vast areas during the wet season from about December to April.

Next was a tour over the Ranger uranium mine. It appeared that little damage was being caused to the environment with this mine and we were assured that the quarry and all-else had to be completely re-habitated when mining ceased. Safety precautions are thoroughly observed here.

Then on to the second permit journey through Aborigine land which took us to the most northerly tip of the Northern Territory, Smith Point, on the Cobourg Peninsula which juts out some 200 miles into the Arafura Sea. This was similar to the Gove Peninsula trip — beautiful seas, lagoons, bird-life, plus an all-day launch trip along Port Essington to a place which the British attempted to establish as a settlement in 1838, and called Victoria. It was to be the capital of all Northern Australia, but after much hard work in a most hostile environment, had to be abandoned in 1849. Interesting ruined remains of the settlement remain, showing the results of extreme hardship and labour in vain. This was an interesting insight into our early history.

The sea was like a mirror and photographs showed clouds clearly reflected on the surface. Dolphins and Manta-Rays swam near the launch.

The permits only allowed a seven-day visit, so after catching a few fish, plus plenty of large luscious oysters which abound on the rocks, it was time to turn for home, back into Kakadu, another launch trip on the Yellow Lagoons on Jim Jim Creek, and back to the highway at Pine Creek.

Leaving the main road near Katherine, we turned east along the Roper Highway, which follows the big Roper River. The highway soon deteriorated to a 4WD track following the Gulf into Queensland. Our choice of three tracks proved to be roughest yet encountered! It was necessary to cross many rivers and creeks (no bridges), but it was all very scenic and very hot. Stops were frequent to make quick plunges into the waters to cool off and erase the copious bull-dust — a fine dust on the outback roads which I estimate is the world's reserves of talcum powder!

Once into Queensland, we headed for Mount Isa, then due south near the Northern Territory border, into Birdsville, then across the Stony Desert to Innamincka. From there we passed through the extensive Moomba oil and gas fields, which supply gas to Adelaide and Sydney, visiting areas along Coopers Creek where Burke and Wills perished, then through Camerons Corner, the place where Queensland, New South Wales and South Australia meet! Onward over the undulating area into Milparinka, Tibooburra and along the Silver City Highway to Broken Hill. Michael and his elder son went down a mine to view the underground workings then we visited an old friend, Frank Bridgewater VK2ZI, who is a white cane operator. Frank is surrounded by many clever electronic aids which produce audible answers. With such assistance he can align his beams to the satellites and receive excellent results. We were pleasantly surprised to learn that most of these aids had been made by Roy VK3BTL, one of our Eastern Zone members from Gippsland.

The remainder of the safari was routine — back via Mildura and home after 52 days which covered 13 198 interesting kilometres and used 982 litres of petrol.

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SECONDHAND EQUIPMENT GUIDE

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

THERE APPEARS TO have been an decrease in the amount and range of secondhand amateur and communications radio equipment advertised.

Theory put forward for this include the high cost of new equipment (imports under pressure of foreign exchange currency rates) resulting in people keeping their equipment longer.

Whatever the reason, there is always someone wanting to buy secondhand equipment and a shortage of this equipment can affect the hobby. In some shacks, and elsewhere, there is surplus equipment which could be recycled to help someone get-on-air, or to assist an upgraded licensee to develop their station.

Those just starting out face the prospect of either finding the money to buy a new transceiver, antenna rotator, SWR bridge or whatever. Their alternative is to locate a suitable secondhand item.

Some surplus equipment is not in working order, or has a fault, and the present owner could be reluctant to sell it in such a condition.

Perhaps a challenge for the WIA, clubs and groups is to refurbish "faulty" equipment so it may be recycled?

If it is real "junk", parts may still be useful as replacements to repair other pieces or could come in handy for a home-brew project.

Selling unwanted or surplus equipment can also mean cash to spend on a new piece of equipment — or the funds can go towards one of the many kits now available.

Accompanying this article is a survey of advertised or otherwise available equipment, wares at radio club "white elephants", and industry source secondhand valuations. It must be stressed that this is only a guide to the prices currently being asked. Prices will vary according to the condition and age of equipment — for example, some linear amplifiers and early model HF transceivers have a wide price variation.

BUYER BEWARE AND PREPARED

Knowing something about the equipment and what the model numbers mean is essential. Like any electronic consumer purchase, the advice is to learn as much about the types of equipment available as you can. Things such as when it was made, its operation, features, differing models, popularity, or any known problems.

Recommended reading is the on-going series of articles *Know Your Secondhand Equipment* by Ron Fisher VK3OM, and check the annual indexes of AR magazine for a list of *Equipment Reviews*.

Unless you are experienced in fixing electronic equipment, avoid an item which seems cheap and the seller claims "needs only a little attention". If the equipment needs a major refurbish the cost of parts, particularly if import replacements are involved, can be very expensive.

TEST DRIVE BEFORE YOU BUY

When buying a major item such as a transceiver, check its history and, if possible, give it a try. Depending on circumstances you may be able to put the item on air for a test.

If you can get the help of a friend who has a similar piece of equipment a comparison can be made for performance on the various bands. Obviously, if you compare a late model transceiver (for instance) with something much older there may be some difference in favour of the modern unit on receiver performance.

Testing a transmitter to determine if its rated power output is okay can be done simply by tuning it up via a watt meter into a dummy load. Take the time to run it on all of the bands to ensure it works on each. Should you consider such a test is necessary, and the seller is co-operative, let the owner tune-up the transmitter as you are unfamiliar with the equipment.

Audio quality can be checked on a separate receiver or on-air reports could be a sufficient test.

With other items, such as receivers or VHF/UHF scanners, the test should include using all of its functions. With programmable receivers push the buttons to program in a channel, and check out the scan rate, search, delay, lock-out, priority or whatever the test has according to the owner's manual.

LIFT THE LID

Outside appearance can be deceiving and, while a major item costing hundreds of dollars may look alright, only lifting the lid will determine if it has signs of aging or abuse. Has it been given a "tweak" with a screwdriver in every slot, such as tuning slugs and trimmer capacitors?

Some modifications will improve performance but the trap is to have such modifications documented because, should something go wrong, the modification can make repairs following a standard circuit diagram difficult.

Smoking is a health hazard, not only to humans, but also electronic equipment. Amateur radio transceivers and linear amplifiers — particularly those with a cooler fan — can certainly suffer from inhaling tobacco smoke. The sticky amber coloured substance gets baked on components and combines with dust and dirt to damage moving parts, including relays, switches and dial mechanisms.

HAMADS THE MEDIUM

One of the oldest and most known services to WIA members is the regular monthly Hamads.

This listing of For Sale, Wanted, Give-away, and Exchange advertisements has been keenly read by generations of radio amateurs and shortwave listeners.

You can use your free entitlement to advertise surplus equipment and components, books, magazines and collectibles.

Is there something or help you need? Want to swap? Sell? Donate? Offer? Borrow? Try Hamads — read by the majority of active radio amateurs and SWLs.

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FINE TUNING FOR THE EARLY FRG-7

Alistair Elrick VK4FTL
C/- Base Radio Station, RAAF, Amberley, Qld. 4305

Early models of the FRG-7 lacked the fine-tune control fitted to later versions which made the resolving of SSB signals an easier task than with the high-geared main VFO dial.

This upgrade proved to be a successful alternative to the use of a variable capacitor as in the later versions and improves the operation of the budget priced older models of this popular receiver.

Perusal of the circuit diagrams of several transceivers revealed the use of a varicap diode as the tuning element controlled by a bias voltage applied by a linear taper pot.

Working with these circuits as a guide, the circuit in Figure 1 was derived from readily available parts and built on older style Veroboard which enabled the tracks of the board (mounted vertically) to be soldered directly to TP-401 and TP-402, with additional support from a small bracket between the board and the chassis.

Supply voltage can be taken from TP-406 (+9V) on the IF/AF board and fed to the 50k pot (VR-1) on the front panel via a 1k resistor (R1) with another 1k resistor (R2) completing the circuit to earth from the other side of the pot. The voltage available at the wiper should vary between +3 volts and +6 volts. This variation was sufficient to shift the VFO frequency by approximately 1.2 kHz measured at TP-401, enabling adequate fine tuning of SSB signals. If greater frequency shift is required reduction of R1 and R2 will provide more voltage change and hence more frequency shift.

Following installation it will be necessary to re-calibrate the main VFO dial in accordance with the fine tune pot in the mid-position (half voltage at wiper). Select LSB, set MHz dial to zero and hair-line centre. Rotate main VFO past 1000 to be within five millimetres of the ▲ mark, for correct position of main VFO scale. Set dial to 1000, and a beat note will be heard. Adjust T-403 for zero-beat. Set the dial to zero and adjust TC-403 for zero-beat. Repeat these steps until tracking is completed.

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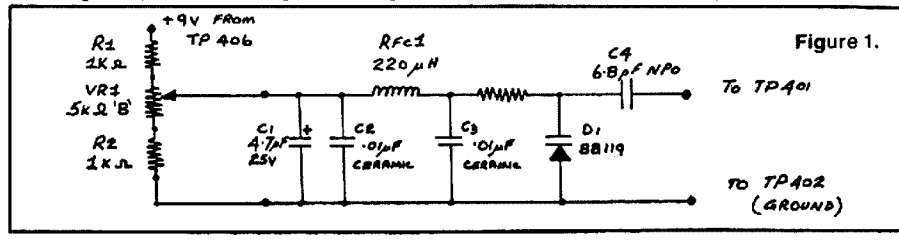

Figure 1.

HF TRANSCEIVERS & TRANSMITTERS

Collins KWM-2	$270
Collins 32S	$200
Drake TR4C	$300
FL200B (Tx)	$120
FLDX400 (Tx)	$235
FTDX100	$170
FTDX400	$310
FTDX401	$300
FT7	$240
FT7B	$300
FT758	$300
FT ONE	$200
FT101B	$250
FT101E	$350 — $420
FT101ZD	$600 +
FT107DM	$550
FT102	$1130
FT200	$200
FT310	$240
FT301D	$300
FT301S	$270
FT501	$500
FT77S	$530
FT77	$620
FT707	$600
FT757GX	$1100
FT902D	$595
FT902DM	$300
FT980	$1400
TS120S	$450
TS120V	$350
TS130S	$600
TS180S	$600
TS430S	$900
TS440S	$1250
TS500	$175
TS510	$275
TS520	$375
TS520S	$400
TS530S	$570
TS820S	$500
TS830S	$850
TS930S	$1400 — $1650
IC701	$600
IC720A	$600
IC730	$600
IC735	$1300
IC740	$800
IC745	$930
IC751	$1400
Atlax 210X	$250
Swan 240	$150
Swan 350C	$195
Swan Astro 150	$150
Ten-Tec Argonaut 515	$250
Ten-Tec 580 Delta	$
Uniden 2020	$150
Viceroy (200W)	$75
Galaxy 5	$50
NEC CQ110E	$300

TRANSVERTERS

FTV250B (2m)	$100
FTV650B (6m)	$95
FTV901 (2m & 6m)	$300
OSE 10/11m to 80m	$45

TWO METRE TRANSCEIVERS

Kenwood TH21 HT	$250
Kenwood TR7400	$250
Kenwood TR7600	$230
Kenwood TR7800	$300
Kenwood TR2400 HT	$300
Kenwood TR7850	$550
Kenwood TS700SP	$500
Kenwood TS7850	$550
Kenwood 2500	$300
Kenwood TWA000A 2m/70cm	$590
Kyokuto 144-105XR	$145
FT2FB	$150
FT227RA	$200
FT208R HT	$210
FT209R HT	$350
FT209RH HT	$500
FT290R	$425
FT270RH	$600
FT230R	$300
FT480R	$425
FT2700R 2m/70cm	$820
IC202 (SSB)	$100
IC3200A 2m/70cm	$500
IC21A	$135
IC25A	$300
IC25E	$400
IC27A	$480
IC211	$400
IC22A	$90
IC22S	$150
IC2A HT	$175
IC02A HT	$270
IC202	$100
IC25E	$400
IC255	$250 — $400
IC260A	$200
IC271A	$760
IC271H	$1200
IC280	$150 — $250
IC290A	$500
Ken KP202 HT	$50
Multi Palm 2 HT	$100
Multi 750A	$290
DSE Commander	$100

SEVENTY CENTIMETRE TRANSCEIVERS

IC370	$400
IC45A	$250 — $300
IC4E HT	$230
IC04A HT	$400
IC37D	$430
IC471A	$750
IC471H	$1070
IC490A	$600
Kenwood TR8400	$350
Kenwood TR9500	$500
FT709R	$405
FT780R	$550
Philips FM320/321	$250
DSE Explorer	$130

SIX METRE TRANSCEIVERS

IC502A	$110
IC505	$500
IC551	$480
FT680R	$400
FT690R	$340

LINEAR AMPLIFIERS

Collins 30L-1	$800
Dentron Clipperton-L	$550
Heath SB230	$650
FL110	$150
FL2100B	$400
FL2100Z	$495 — $1200
FL2050 2m	$200
Kenwood TL120	$100
Kenwood TL922	$850
Swan 1500Z	$550

EXTERNAL VFO

FV101B	$60
FV101B	$60
FV101DM	$165
FV901DM	$80

MICROPHONES & SPEAKERS

Diawa c/less infrared	$85
D104	$35
DX344	$60
Icom IC-SM5	$40
Icom IC-SM6 desk	$40
Kenwood MC35C noise cancel	$34
Kenwood desk MC50	$35
Kenwood spkr SP180	$35
Kenwood spkr SP520	$30
Leson Power desk	$40
Shure 401A hand mic	$38
Shure 444 desk	$65
SMC25 spkr/mic	$25
Turner base	$30
Yaesu MD1 desk	$100
Yaesu YD148 desk	$35
Yaesu UD844A desk	$55
Yaesu YD846 hand mic	$20
Yaesu YH2 headset	$45
Yaesu SP901 spkr	$50

RECEIVERS

Barlow Wadley XCR30	$66
Bearcat DX1000	$480
Collins 75A4	$125
Collins 75S	$200
Drake 2B	$120
Drake SSR-1	$130
Eddystone 830	$300
Eddystone EC10	$90
Geloso G4/216 Amateur Band	$100
Hallicrafters 27-145 MHz	$120
Hallicrafters SX100	$190
Icom R70	$540
Icom ICR71A	$650
Kenwood R1000	$350
Kenwood R2000	$550
Kenwood R5990	$275
Lafayette HA800 Amateur Band	$170
Lafayette P100 VHF Tunable	$50
National OR28	$210
National OR Q63	$360
Realistic DX150	$70
Realistic DX190	$100
Realistic DX200	$100
Realistic DX300	$230
Realistic DX302	$200
Realistic DX360	$115
Realistic DX400	$250
Skycom VHF Aircraft	$50
Sony ICF201	$220
Sony ICF2001D	$490
Sony ICF7600D	$235
Tandy Patrolman	$80
Trio 9R59DS	$35
Yaesu FRG9600 VHF/UHF	$650
Yaesu FRG7	$120
Yaesu FRG7700	$300 — $500

RECEIVER CONVERTERS

FRV7700 VHF	$75
FRV7700(B)	$150

POWER SUPPLIES

FP700 (20 amp)	$195
ICPS20 (20 amp)	$250
Kenwood PS30 (30 amp)	$350
VK Powermaster (20 amp)	$140

MONITORSCOPES

Heathkit SB610	$90
Kenwood SM220	$250
Yaesu YO-100	$100
Yaesu YO-901	$200

SCANNER RECEIVERS

AR2001	$400
AR2002	$590
Bearcat 20/20	$300
Bearcat 150FB	$275
Bearcat 200FB	$250
Bearcat 210	$110
Bearcat 250	$190
Bearcat DX1000	$480
Firelert	$120
Handic 20	$190
JIL SX100	$100
JIL SX200	$325
Micromm SX150	$250
Micromm SX155	$310
Realistic PRO2002	$330
Realistic PRO2003	$375
Realistic PRO2009	$180
Realistic PRO20-20	$280
Realistic PRO-30	$250
Regency HX2000	$250
Saiko SX150	$300
Saiko SC7000	$280 — $420
Realistic PRO30	$265
Yaesu FRG9600	$650
Uniden 100XL	$300

HF BEAMS

ATN 8el Log Periodic	$400
Chirnside CE35LX Triband	$300
Chirnside CE42 10/15m	$90
Hidaka 3el Triband	$200
Hy-Gain TH3jr	$250
Hy-Gain TK3Mk3	$250 — $300
Hy-Gain TH6DXX	$500
Hy-Gain 204BA	$195
Hy-Gain 10/15	$100
Mosley TA33	$130
TET HB33M	$200
TET HB-35C 5el Triband	$300
TET HB443 4el Quadband	$480
Wilson 4el 10/15	$75
Wulf 3el 14 MHz	$160
Wulf 3el 10/15m	$100

ROTATORS

Archer	$80
COE Ham 2	$150
Commander 400	$160
Diawa DR750DX	$250
Diawa 7600X HD	$300
Emotator 502CXX	$110
Emotator 502SAX	$100
Ken KR400 MD	$115
Kenpro Elevation	$250

TELEPRINTERS

Creed 7	$15
Model 15	$30
Siemens M100	$65 — $90
Siemens M100 Rx only	$35

VHF & UHF ANTENNAS

AOR DA300 Discone	$110
ATN 2m 13el	$75
Hoxin 9dB 2m Vertical	$75
Ringo 2m	$45
Wulf 2m 11el	$60
Wulf 6m 6el	$90
Scan-X Discone	$40

ANTENNA TUNERS

Diawa CNW217	$140
Diawa CNW418	$150
Emtron EAT300	$165
IC-AT130	$130
IC-AT500	$1150
Kenwood AT200	$150
Kenwood AT230	$150
Kenwood AT250	$300
Yaesu FC700	$150
Yaesu FC757AT	$375
Yaesu FC707	$170
Yaesu FRT7700	$60

MISCELLANEOUS

DSE VHF/UHF OF Unit	$105
Clipsal Key	$35
Hi-Mound Key	$10
Katsumi EK-150 Keyer	$75
Bencher Paddle	$120
Bandit Spider Quad Hub	$25
Hustler Whips 6 bands & mount	$20
Yaesu RMS-2 Gutter Mount	$20
Yaesu RML series Whips	$25
Butternut HF5V Vertical	$190
Hy-Gain 18AVT Vertical	$80
Nagarara 5 band Vertical	$80
V5JR 5 band Vertical	$60
Yaesu FRA7700 Active Antenna	$60
RAIC BL70A Balun	$25
RAK Balun	$20
W2AU Balun	$20
Coaxial 3-pos Switch	$24
ETI 755 RTTY Modem	$60
VZ200/300 RTTY Decoder	$55
MFJ1224 RTTY Modem	$200
Tono Theta 5000E	$850
Tono 7000	$600
Tono 7000DE	$700
Nichols W/Pecker Blanker	$32
Yaesu QTR-24 World Clock	$30
Yaesu YC7B Digital R/O	$30
Yaesu Fan	$5
Oskerblock SWR200	$60
Robot 400 SSTV Converter	$200
Emtron EP200 SWR/PWR Meter	$75
Welz SP350 SWR/PWR Meter	$75
Welz SP-15M SWR/PWR Meter	$50
Welz DL600 Dummy Load	$95
YP150 Dummy Load Watt Meter	$100
Drake 200Y2K Watt Meter	$50
Helray Peak Power Meter	$40
CRO Leader Ham 310	$150
CRO Serviscope 513	$100
Roller Inductor	$25
Tech TE20D Signal Generator	$40
Trio DMB1 GDO	$120
MFJ202 RF Noise Bridge	$65

CLANDESTINE SWLing — from the other side of the fence

Reg Glanville VK2ELG
63 Buffalo Crescent, Thurgoona, NSW. 2640

Inoperative radios were legion.

Even now, after a considerable time lapse, I receive the occasional on-air comment suggesting the possibility of another *Clandestine* article. This, of course, refers to the three articles in AR publications of March 1984, and February/December 1985, relative to the construction of a shortwave receiver, a magnetic compass, and a water boiler in the Prisoner of War camp in south-east Germany. I stated in December 1985, that it would be my final article — perhaps "force majeure" could be the excuse for this return to the theme?

Referral to the above publications is recommended to refresh the background details relative to this camp, a sugar factory, 15 kilometres south of Wroclaw (then the German city of Breslau).

By mid-1943, a specific routine had been established — the working week seven days, 84 hours — the duties heavy, cold and wet. Each POW, with one or more German civilian workers, was allocated to a definite job. Yours truly to the electrical workshop, plus acting as camp interpreter. By this time, goods and services available to the public were minimal, but the basic necessities of life were rationed and distributed with typical German efficiency, which applied until the closing days of the war.

The intense war effort had recruited all German males in the 18 to 50 years bracket, and this void was filled by foreign forced labour and prisoners of war. Skilled tradesman services to civilians were non-existent; repairs to vehicles, houses, domestic appliances, came to a halt. Inoperative radios were legion. I had surreptitiously hinted in the right quarters of my radio knowledge, and this information, propagated by factory workers, had infiltrated the locality.

This area of Germany was primarily agricultural, with sugar beet the predominant crop. Most of the affluent landowners were sugar factory shareholders, and exerted a certain influence over factory management. Thus, their calls for tradesman service were complied with by the factory, despite this being forbidden by the bureaucracy.

These landowners lived in an opulent Manor House-type of society, the absolute antithesis of the German farm labourers' lifestyle. Food, clothing and drink rationing had bypassed them, and two or more house servants were a permanent feature of their households.

The norm for their residence was 15 rooms, three storey — a pretentiously portalled front entrance, stepped to the first floor, and one rear entrance, strictly servants and tradesmen. The 'Lord' of the mansion was invariably ensconced in Berlin, with a post that carried Officer ranking. His spouse remained 'el supremo' at home, to qualify as an occupied residence, and retain its extravagant fringe benefits.

One fine autumn day, as yet another recurring malaria attack was descending upon me, an SOS re an electrical fault was received by the factory, from one of these properties, four kilometres distant (not the place from which I obtained headphones for my shortwave receiver, AR, March 1984).

If the job happened to be of a minor electrical nature, yours truly was usually allotted the task, accompanied by an armed guard, even though they were not responsible for duty beyond the factory precinct. But the fine food and female staff at these kitchens of the wealthy, ensured that off-duty guards volunteered with alacrity.

By the time the manor house was reached, my temperature had reached a debilitating level, but the axiom was — "If you can walk, you can work."

With the guard settled in a chair near the door, a kitchen maid explained that, although their handyman had checked wall fuses, three hot plates on the large range were not operating. I soon ascertained there were separate in-built fuses for the three phases — one was blown, and soon replaced. She then stated that her "Madam" upstairs wished to see me, and escorted me to her. The maid was dismissed, and after a few awkward minutes of rather irrelevant conversation, she asked in perfect English "Are you the prisoner that understands radio?"

She then explained, in short, that her receiver had an intermittent fault. But I said that I was in no condition to delve into the intricate innards of her radio, and that malaria was positively non-contagious. She introduced herself as Frau von Konig, of Linden Manor — middle-aged, and obviously well educated. With the ice thus broken, she expressed her concern re my health, and suggested she would call me again, that radio would not be mentioned, but that I bring appropriate tools.

Visit number two, with the guard and two maids heavily involved on the ground floor, (literally), Frau K showed me the skittish radio. A fine six-valve Blaupunkt, with Long, Medium and Short Wave capability. Low and medium wave were common on most European sets of that period, but shortwave was only on the more expensive units. The latter was severely frowned upon by Goebbels, Himmler and Associates.

With no possibility of eavesdropping on this first floor, Frau K intimated that the fault was primarily on the shortwave band, which she wanted corrected if possible. I then immediately knew where I stood — she wished to receive allied (or enemy, depending on which side of the fence ones/sympathies lay) news services. She requested the set be moved into a small inconspicuous study, adjacent to the spacious lounge room in which it stood. She was acutely aware of the risk to her, if it were decreed there was an ulterior motive in repairing such a sensitive shortwave receiver.

This situation was, of course, a totally unexpected turn of events — one read of such happenings in paper back novels. As this was the period when I was experiencing difficulty in producing a shortwave tuning coil for the receiver hidden in our barracks, and the blonde lass had not yet located a set of headphones for me, I decided to foster this opportunity at all costs. At least it could mean a tenuous iron in the fire towards hearing some news from our side of the fence. The persistent propaganda machine, combined with the onerous work load, was adversely affecting our work party's morale. Also, I must admit to a smug satisfaction in assisting a German national to 'do the wrong thing.'

I removed the chassis and speaker from the cabinet. The speaker was a heavy dynamic type, with the large diaphragm field coil also serving as a power supply filter choke, which was in series with the rectifier valve output, of about 400 volts. Electrolytic filter capacitors of about 10 mfd, 500 volts working, 800 volts peak, were connected at each end of this coil. If the set was switched on with the speaker disconnected, voltage across the first capacitor could rise to peak. As it was, voltage rose to over 500 for a short period, while valve cathodes were warming. The forgoing was common circuitry of the time.

A brief under chassis exploration revealed the fault — some sealant wax from a paper capacitor had infiltrated the wave change switch. A tedious 15 minutes probing with madam's slim nail file corrected this. Touching the antenna terminal with a screwdriver indicated the set was now sensitive on all bands and it was quickly re-assembled.

At this point, Frau K advised the kitchen by house phone that the power point job was not yet completes, that the 'Englander' (the common designation for all Western POWs), would be coming down to eat with the guard. The girls were goggle-eyed at sharing their table with an armed soldier and an enemy alien, but, nonetheless, they proceeded to ply the alien with the best meal he had faced in three years!

Radio reception of enemy transmissions was strictly forbidden, and effective antennas, especially external, were non-existent. This set had the usual short piece of wire hanging from the rear, which was adequate for the local State controlled stations. It responded fairly well to two MW and one LW German station, but of shortwave there was nothing readable, at which Frau K showed disappointment. Obviously a much higher RF pick-up was essential, without an antenna being noticeable. She ruled out a long internal one, no matter how well concealed, owing to visits by military brass and her husband.

While pondering the matter, I noticed a heavy vertical copper wire, secured by stand off insulators to the outside wall, just to one side of the window. Frau K said that it was a lightning conductor, from a small copper-roofed attic window. This was the answer! — a ready-made, disguised, vertical antenna. I explained that, if possible, I wished to disconnect it top and bottom — she was quite happy for me to render it inoperative as a lightning conductor.

I went up to the second floor (bedrooms only), leaned out of the corresponding window, and was just able to reach an insulator. Pulling upward on the wire slack enabled me to cut the wire at the point equivalent to the centre of the cylindrical insulator. Both ends were then turned back and forced back into the insulator, leaving a gap — the wire held satisfactorily. This was to obviate noise emanating from possible poor joints in the sheet copper roof. I wished to achieve the same at the bottom end, and disconnect the wire from actual earth. Madam and I conferred on this in English. By now she was addressing me as Rex, the preferred name, as the Germans had trouble in pronouncing the soft 'g', as in Reg. We decided to go down to the kitchen, where, after mentioning that I was continuing a safety check on earth circuits, she would engage the girls in a domestic discussion.

The guard, having dined and wined beyond his austere norm, was obviously seeing the world with a rosy aura. I explained that the earth stake, partially concealed by shrubbery, six metres from the door, needed checking. He remained at the door, clearly fantasising on other matters, as I repeated the earth wire modifications.

Back on the first floor, we found the existing short antenna on the set would just reach the outside wire by moving it closer to the window. I had previously noticed a paper clamp in the study,

and this made an effective, quick connection. Hey Presto! In two hours an efficient, centre fed, vertical antenna had been produced, visually still a paragon of innocence. An added bonus — that wall was oriented westward, towards England.

The 20 second warm-up period seemed eternity — then the shortwave band came alive. Tuning around 25 metres, a good signal was received, and within minutes I identified this as England!

Elation was disturbed by the strident phone — the guard announcing "knock-off" time. It was just after 5 pm — an hours' walk back to the factory and my shift was 6 am to 6 pm. I quickly shepherded madam through a dummy run, emphasising the importance of returning the paper clamp to her study — she proved safe and efficient. I reminded her that local time was one hour ahead of Greenwich, and that from memory, BBC News was on the hour, several times a day. As I departed, in a 'partners-in-crime" tone, she said that in a few weeks she would engineer a hoax, to call the factory again for my services, to give a report on the success or otherwise of our exercise.

In due course, accompanied by the same enthusiastic guard, Josef, I returned to Linden Manor, to meet a completely changed lady. In the security of her private first floor residence, she literally bubbled of her success with BBC shortwave broadcasts, and also confessed she had distant relatives in England. Meantime, to preserve the hoax in case of intrusion, I was kneeling on the carpet near a dismantled power point, tool kit at the ready.

For security reasons, she restricted her listening to one news service every other day, and was now aghast at the subtle manner in which the Goebbels Propaganda Ministry was hoodwinking the majority of the German nation. She had felt for over a year that the persistently optimistic German news could not be correct. Now, with news from the other side of the fence as a modifying comparison, she realised the situation was hopeless, and for the sake of humanity, wished for war's end.

By this time I was receiving BBC news in our barracks, and knew as much as she did, but could not even hint of this. She was openly grateful for my assistance — I felt recompensed in the knowledge that I had made a minuscule exposure of propaganda inaccuracies to a German national. Also, the short breaks away from the endless work routine and frugal meals, in the humid, noisy factory, were a sorely needed boost to morale. I did not meet this fine lady again.

When I was leaving, Frau K furtively mentioned that possibility of a job at a neighbouring property, where a similar situation existed.

Eventually, as predicted, accompanied by Josef, yours truly found himself in the other Manor House, similar in design, but a higher level of affluence. It even boasted a small first-floor swimming pool, for which coal was available! How the upper social strata lived, world-wide!

The lady in charge was elderly, tall, dominant, with a stiff Prussian demeanour, and spoke only stilted German to me, although I knew she was fluent in English. She was playing a role, hoping that from Frau K I knew the real reason for the visit. I played also, and asked her why I had been summoned, to which she lamely replied, "Could you check the power points?"

The hoax proceeded with — I left one uncovered and asked was there anything further. She glanced toward a compact radio on a book case. Upon examination, it proved to be five valve, older that the Linden Manor set, barely one metre of antenna, but included a shortwave band. I felt, despite its lower sensitivity, it should have possibilities.

Madam maintained her haughty mien, so I embarked on a solo exploration of concealed antenna possibilities. No lightning conductor bonus here, and other alternatives in the lounge room appeared lean.

I then passed through to the swimming pool area, and initially it appeared to offer nothing. Rather austere, with two bland and two window walls, and an L-shaped security rail near the pool. Just as I was leaving, it dawned on me that the rail was plated metal, eight metres long, supported on carved wooden posts. It was such a blatantly obvious antenna, that it had escaped my notice (and also that of others). One of the window walls had an aspect favouring England, and I presumed glass presented much lower RF attenuation than double masonry.

During warmer months, because of excellent natural light, Madam was wont to read in there, so it would be nothing markedly new if she occasionally had the radio with her.

I carried the set to the pool, stripped the short antenna wire end, wrapped it once around the rail, switched on, and tuned it to shortwave. Finally, England was identified, only about R3 S2, but adequate for the purpose.

The lady agreed that a practice run was desirable. The set was transferred to a disused, castered coffee table, which she trundled into the swimming area, attached antenna to rail, sat back in her customary reading chair, and switched on. From her dexterity in tuning shortwave, it was apparent she had often tried, albeit without success, because of an inadequate antenna. She picked up a signal in garbled German, very likely a Russian station, jammed by Germany. Soon an English transmitter was heard, and she switched off, commenting that her only interest was to check on the "quatsch" (twaddle), that was being fed to the English! By now I was adamant to do all that I could, to expose this person to the truth.

While still seated, she swung the table in an arc away from the rail, the antenna single turn freed easily, and she switched to mediumwave. This disengagement manoeuvre took about five seconds.

Much to Josef's chagrin, the 'power point' job finished at 3 pm — we had been well fed, but it was the first and last visit to that properly.

The following is an example of life and conditions under totally different circumstances, but despite the risk, the desire to listen over the fence was paramount.

A call came from a dairy farm — the symptoms, no lights in the barn. An hours' walk later, in the gloomy dairy, surrounded by cobblestones and munching cows, I was unable to locate the short in the antiquated wiring. A temporary direct cable, bypassing switches, was suggested. Josef objected to the additional hike to the factory for new cable, so a Ukrainian, with a note, was despatched on a bicycle.

With possibly one-and-a-half-hours to kill (the Ukrainian was not noted as a speedster), I took stock of the surroundings. About 30 Friesian cows, housed most of the time in the barn, with hay loft above, maintained the temperature year round at about 27 degrees Celsius. Two German males, a working manager and a foreman, exempt from war because of their livestock expertise, ran the place, assisted by Polish and Ukrainians.

The foreman and his wife were sweeping cobblestones, when he approached the guard and asked could the Englander come to his quarters (immediately above the diary), to repair his electric hot plate.

With time to spare, Josef agreed to this (he was occupied watching a hay-carrying Polish lass). So, up the stairs with the foreman, followed a little later by his wife. Named Rosel and Hans, they wore wooden clogs and were austerely dressed. The abode was stark, unheated, and without running water. Their working week was seven days, 70 hours, the pay reasonable, but very little could be purchased beyond the ration card allotments. Because their work was not categorised as "heavy" they did not receive a full food ration. They were good, honest, simple people — the type on which any nation is built.

The hot plate problem was soon diagnosed and repaired — aged, a spiral heater wire had broken. Hans then departed to his job. Rosel, somewhat awkwardly, then confided that her next request should not involve her husband. His punishment could be action on the Russian front — hers, at most, hard labour imprisonment.

In fearful undertones, she asked could their radio be capable of receiving England — they had tried, without success. There was no glimmer of light in their lives, the risk was worth it. The non-resident owner had given them the set, second-hand, in 1938, when they accepted the job. I lifted it from the dresser shelf, their only furniture, and ascertained it was a Dutch Philips — LW, MW and shortwave; the screwdriver test showed sensitivity on the shortwave band. Once again, the antenna was under a metre long. How to safely conceal an antenna in this stark room? I was not prepared to put this couple at risk.

Some time passed before I made a decision. Immediately above the radio shelf, but still part of the dresser, was an enclosed cupboard, with a perforated zinc sheet ventilator, 100 x 100 millimetres, top and bottom. The shelves has recently been covered with wallpaper, glued with flour paste. Was there any wire? Rosel quickly presented a discarded, perished ironing cord.

My line of thought was interrupted by Hans calling up the stairs — the Ukraine Parcels Express had returned with the cable.

I hurriedly detailed to Rosel what must be done. Strip the iron cord, remove insulation and separate the conductors into wires of only four strands each. These were to be cleaned thoroughly, especially the 50 millimetres of each end, which were to be twisted together to produce a continuous wire about eight metres long. This wire to be placed on the bottom shelf of the cupboard, zig-zag fashion, with one end firmly attached to the ventilator.

Scraps of matching paper were then to be glued over the wire, taking care to cover the wire connection at the edge of the ventilator. For shortwave reception, simply hook the short antenna wire into the vent grill immediately above. I bade her goodbye and assured her the subterfuge would work.

Some weeks later, Hans came to the factory for a load of stock-feed, and called to me as he waited in the queue. Hoping to meet me, he had appointed himself to this pick-up. Rosel sent her greetings, the radio was great. Unbiased news reports had resurrected new life within them; they no longer felt led down a blinkered path by local media. Two ordinary people, two Germans, on the bottom end of the socio-economic scale, now somewhat enlightened. It was Hans' turn to load — he hastily passed me a tiny package and bid me farewell; it contained a small piece of smoked sausage, their week's ration.

The foregoing is one more revelation of the way that radio, almost unnoticed, causes widely diversified paths to cross. These paths can be made by people of totally unrelated social, national, political or religious persuasions. The common bond of radio is capable of unification.

ADDENDUM — harmonics from the past

Two years after the war, I received a brief communique, through Australia Army Headquarters and the Victorian Police, from a Mrs Konig (no address), then resident in England. It simply inquired, had I survived. I replied briefly, through the same channel. There has been no further contact.

In March 1987, with the help of Polish friends, I wrote to the Postmaster of Wroclaw (Breslau), seeking information on the sugar factory. His reply stated the place had been renovated, and was now producing jam and other fruit products — the factory is now 70 years old.

In the same month I obtained a New Zealand address, and inquired about old Kiwi friends. The one that had been primarily responsible for getting the radio back to me (March 1984, AR), had died two months prior to my letter.

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Examination Devolution Update

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

The Department of Transport and Communication (DOTC) has announced it will go ahead with its proposal to devolve examinations for amateur operator certificates of proficiency to outside bodies and individuals.

DOTC has been heading towards such a move over the last few years in an atmosphere of government deregulation and a user-pays policy.

The Department's prime justification for handing over the conduct of examinations to outside bodies is an escalating cost of exams. DOTC estimates the annual cost to administer the examinations is $285 000 while revenue from the activity is $35 000 — a deficit of $250 000.

Under the user pays principle, DOTC says it would have to charge the 1600 candidates sitting 3000 examinations a year much higher fees on a full cost recovery basis.

The present fees and what they would cost under user-pays (in brackets) according to DOTC are:

Regulations $5 ($32)
Theory $10 ($64)
Morse Code — sending $5 ($32)
Morse Code — receiving $10 ($64)

But the DOTC says benefits will be gained from devolution by both the Department and the amateur radio community (see earlier article, February 1987, page 22).

In November 1986, DOTC circulated a package of information called a draft accreditation package to the State Technical and Further Education (TAFE) directors, amateur radio clubs, individuals and the Wireless Institute of Australia. It invited comments on the package and received a total of 71 submissions.

DOTC says the vast majority (84 percent) were in favour of the proposal, but nearly all of the submissions expressed concern with one or another aspect of it.

The Department, in a recently issued report titled "Devolution of Amateur Examinations" seeks to highlight and answer the concerns. The main points are listed here:

- The responsibility of examinations will be devolved.
- DOTC to supply papers on request to examiners up to March 1, 1989.
- The Department to verify and ensure examination standards.
- Examination papers to be DOTC approved.
- DOTC makes available its Morse code examination generating program.
- Examiners must retain all candidates papers for at least a year.
- Market forces will set examination fees.
- Complaints of impropriety or examination misconduct will be investigated.
- Verification of candidates identification is required.
- Both DOTC and examiners to conduct examinations for handicapped candidates.
- Remote candidates to be examined by a local person acting as an examination supervisor.
- Examiners required to give DOTC an advance schedule of their examinations.
- Candidates cannot be required to have undergone a prerequisite course.
- Examiners need not hold amateur operator certificates of proficiency.

A key issue of concern about devolvement contained in the submissions DOTC received was the "Standard and Integrity" of examinations. DOTC, in the report, say legislation requires examinations to be approved by the Department. The legislation requires the Department to verify and ensure examination standards.

The report says in addition to approving examinations papers, the Department will visit the examination centres and conduct other checks to verify that the standards are being maintained.

DOTC Manager of the Regulatory Operations Branch, Radio Frequency Division, David Hunt says a series of public forums will be held this month in all State Capitals to explain the devolution process to interested radio amateurs. The forums are particularly designed to explain the requirements and administrative procedures necessary to become an examiner.

Mr Hunt says anyone interested in becoming an examiner should plan to attend these forums to obtain first hand information and to resolve any problems or concerns they may have with the action. He says the Department aims to have examiners accredited from March 1, 1988, and a 12 month phasing-in period before full devolvement is in place.

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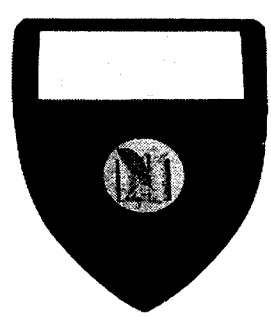
PUBLICATIONS COMMITTEE AWARDS

In December each year the Publications Committee selects those contributors to *Amateur Radio* during the year whose contributions or services are judged of sufficient merit to win one of the three Magazine Awards.

For 1987, the awards went to the following contributors, with the Committee's congratulations.

Bill Rice VK3ABP



AL SHAWSMITH JOURNALISTIC AWARD (For the article on a radio theme considered best to display literary merit — $100 plus engraved plaque)

To Bert Trupp VK5BVN, for his article "Antarctic Communications".

TECHNICAL AWARD (For the best Technical Article/s of the year — $100)

This was awarded jointly to Harold Hepburn VK3AFQ and John Day VK3ZJF, for their continuing series on "Building Blocks".

HIGGINBOTHAM AWARD (For meritorious service to amateur radio generally, not necessarily only to AR magazine — $100)

To Roger Harrison VK2ZTB, for his article (jointly with Leo McNamara) on the solar cycle, and for his continuing support of amateur radio, both the hobby and the magazine.

1988 FEDERAL CONVENTION AGENDA MOTIONS proposed by VK4 and VK1

MOTION: That the Federal Council be seen to be a dynamic member-responsive body actively planning for the future.

PROPOSER'S COMMENTS: It is the duty of the Federal Council to establish policies that serve the long term interests of the Australian Amateur Radio Service. To this aim the Institute should encourage amateurs to utilise new modes, techniques and bands without neglecting the gains and expertise of the past.

Communicating such an image to members should be through the Federal News segment of the weekly Divisional News Broadcasts together with use of the Institute's monthly journal *Amateur Radio* and news releases to other amateur oriented publications. However, members have shown us recently that, on issues of concern, they have no hesitation in writing directly to the DOTC or politicians, thus indicating that they have no confidence in the Federal Council or that they do not appreciate its functions or even know of its existence.

These members have been allowed to believe the Institute is ineffectual, non-dynamic and remote. This poor perception of the WIA should be altered by more efficient public relations, not only to the important non-amateur population, but right down to the "grass-roots" level of membership.

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MOTION: That all Federal Office Bearers Reports for the year ending December 31, with the exception of the Treasurer's Report, be published by the April issue of the Institute's journal. The audited Treasurer's Report is to be published by the July issue, together with the comprehensive report of the proceedings of the Annual Federal Convention.

PROPOSER'S COMMENTS: It is a requirement of most organisations that their members be fully informed. In this way all Institute members will be able to appreciate the vast amount of volunteer effort that is expended on their behalf.

The proceedings of the Federal Convention will be expedited as interested members throughout Australia will have had an opportunity to instruct their Federal Councillor as to their wishes and aspirations. Four hours Convention discussion time on the achievements of the past year should then be ample.

Because of auditing requirements, the Annual Treasurer's Report is not often available until after the printing deadline for the April edition of our journal. However, the July edition should also contain the Budget projections for the ensuing year.

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MOTION: That the Wireless Institute of Australia Federal Executive establish a more effective presence in the Canberra region prior to WARC 1992.

PROPOSER'S COMMENTS: The cornerstone of the Institute's reason for existence is the continuing need to have a strong and close relationship with the Regulatory Authority (DOTC). In the years since the DOTC has moved to Canberra, DOTC personnel and conditions have altered and our strategy needs to be adjusted. Under no circumstances should we lose the close rapport built up over the years by our IARU representatives but, on a more mundane level, much time-consuming liaison work is required between Regulatory authorities and Federal Executive members who represent Australian amateurs.

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MOTION: That the size, structure and location of the Federal Executive of the Wireless Institute of Australia be reviewed.

PROPOSER'S COMMENTS: It is quite apparent from the poor attendance that there may be too many Federal Executive members. Motion 83.07 increased the number of Federal Executive members from five to nine and the reasons applicable then may no longer be valid. A smaller number of members may increase their effectiveness and/or efficiency. Naturally, there is no intent to restrict volunteer Institute officials from attending any Federal Executive meeting.

The duties applicable to members of Federal Executive naturally vary according to the individual talents available. The administrative needs of the Australian amateur radio service has been a burden on the VK3 Division and this burden should be shared by other Divisions. With a restructuring of the Federal Executive, the practice of monthly meetings should be reviewed. Quarterly meetings held on weekends would, on a cost effective basis, allow members from other parts of Australia to contribute their skills.

It is desirable, but not essential for the Federal Executive to meet at the Federal Office. The Federal Secretary should attend all Federal Executive meetings at Institute expense.

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MOTION: That the Wireless Institute of Australia seek an exclusive amateur allocation within our existing bands 420-450 MHz and 1240-1300 MHz as a matter of urgency.

PROPOSER'S COMMENTS: It is becoming more apparent that our UHF bands are under threat, in some countries. There is no reason to believe that similar threats will not occur in Australia. An example is the way in which the amateur service was treated recently in regard to the 2300-2450 MHz band.

The AR article, *Frequency Bands and Emissions*, page 12, November 1987, states that there are no current policies in relation to these bands.

The appropriate Government authorities must be advised as quickly as possible that exclusive allocations are sought in these bands. The request must be regularly and actively followed up, and DOTC left in no doubt that the amateur service does require such allocations.

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MOTION: That the Wireless Institute of Australia develops band-plans for the amateur microwave bands and seeks exclusive allocations within those bands.

PROPOSER'S COMMENTS: No WIA policy exists for these bands according to page 12 of the November 1987 issue of *Amateur Radio*.

DOTC has indicated in the past that WIA band-plans will be taken into account when looking at the usage of various frequencies and bands.

DOTC's intentions to establish the Multi-Point Distribution Service in the 2300-2450 MHz band

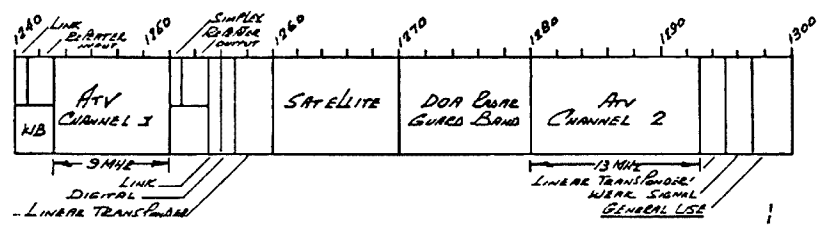

Figure 2 — Proposed 23 centimetre Band- Plan (to suit available commercial equipment which covers only 1260-1300 MHz). **See over page...**

seems to indicate that DOTC takes notice on the basis that if we do not have a band-plan we are not using that band.

DOTC must be advised that we are developing band-plans for these bands and will be seeking exclusive allocations within the bands.

* * *

MOTION: That the Wireless Institute of Australia once again review the 1240-1300 MHz amateur band-plan.

PROPOSER'S COMMENTS: For the past six years the Institute has grappled with the 23 centimetre band-plan to satisfy the needs of the existing amateur users and to ensure that no interference is caused to the primary user, the DOTC airport radar on approximately 1275 MHz.

This band has suffered from lack of use by Australian amateurs since it is considered to be mainly an experimental band and a high degree of skill is required to build transceivers for it. However, a significant number of world-wide manufacturers now supply transceivers for use on the segment 1260-1300 MHz.

There is much interest in repeater usage in this band which the present interim band-plan inhibits. This VK4 23 centimetre band-plan will assist the ATV enthusiasts, who construct their own equipment, to mainly utilise the spectrum as far as possible away from any interference caused by the DOTC radar.

* * *

MOTION: That the Wireless Institute of Australia obtain a public relations consultant to plan and implement a campaign to increase membership.

PROPOSER'S COMMENTS: The Institute does not do enough to advertise its existence. The sporadic appearance of unimaginative minuscule advertisements in electronic publications other that *Amateur Radio* could hardly be called advertising. Not enough emphasis is placed on the positive things the Institute does for amateurs (representation to DOTC, running QSL Bureaus, Repeater Co-ordination, organising Contests to list only a few). Even a discrete reference to how non-members accept benefits provided by the WIA without paying anything thus becoming parasites on those amateurs who are members might be appropriate.

Public relations exercises are expensive, however a three or six month campaign should be within the reach of the WIA and could dramatically boost membership. If we don't try we will never know!

* * *

MOTION: That the Institute continue to press the DOTC to allow holders of the NAOCP qualification to operate on the 144.000 to 148.000 MHz band.

PROPOSER'S COMMENTS: There has been much discussion amongst the amateur fraternity over the past two years and it is now time for a decision.

* * *

MOTION: That the reports of the Future of Amateur Radio Working Party Committee *be an agenda item and to be allocated at least four hours discussion time.*

PROPOSER'S COMMENTS: The future of the Amateur Radio Service is of fundamental importance to the Institute and consideration of the results of this committee should not be inhibited by any lack of Convention time. All members are urged to consider the various papers published and, after thorough consideration of the issues raised, contact their Federal Councillor.

This is also a machinery motion that ensures that adequate time is provided for discussion on our future. At last year's Federal Convention, the topic *Future of Amateur Radio* was formally raised only after the Federal Convention had been convened for nearly 72 hours. This motion is to ensure that "prime time" will be allocated to this topic not "twilight time".

* * *

MOTION: That the Band Plan for 20 metres be amended so that the narrow band mode segment be extended to cover frequencies between 14.000 MHz to 14.120 MHz.

PROPOSER'S COMMENTS: The above motion is offered as a means of resolving the interference between packet beacon stations and the Travellers' Net run by VK6ART. Packet is a new mode of narrow band transmission, and the spread of narrow band usage above 14.100 demonstrates a need for more spectrum space for that mode. Both services are deserving and should be accommodated. Internal band-planning is up to us, but we can do nothing to enforce our plans overseas. The packet frequencies were initially imposed on Australian amateurs by overseas usage — quite indifferent to our band plans. It is logically unattractive to seek removal of the packet BBS as that will involve probably futile attempts to seek support from other organisations, and maybe the intervention of sovereign governments. There is no way of enforcing compliance with any WIA resolution by foreign nationals. On the other hand, it would be easy to QSY phone nets to say 14.125 MHz. This is not a case of this Division taking sides, but only one of recognising the frailty of international law.

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Shorting Stick from an old Flyspray Dispenser

Peter Parker VK6NNN
C/- Witchcliffe Post Office, WA. 6286

A shorting stick can be useful for discharging capacitors.

This shorting stick is constructed from an old flyspray dispenser. The tube is removed and the rubber piston replaced with two nuts to hold the stiff wire.

The shaft should be cleaned and stranded insulated wire attached to the part of the shaft near the handle. A crocodile clip is joined to the other end of the wire.

In use the clip is attached to earth and the positive terminal of the capacitor is touched with the thick wire.

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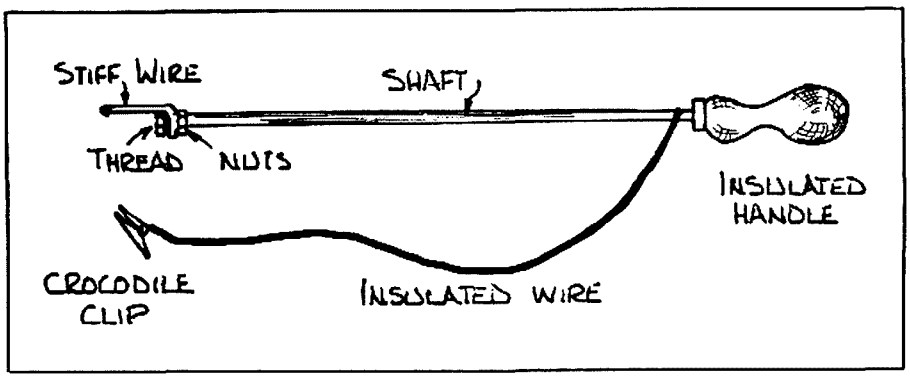

SUMMARY OF "NOVICES ON TWO METRES" SURVEYS CONDUCTED BY DIVISIONS

The 1987 Federal Convention motion 87.09.13/1 has created considerable interest throughout the Institute. Both support for and opposition to the motion have been registered by amateurs communicating with their Divisions, the Federal Office, Amateur Radio *magazine, ARA magazine and to DOTC (formerly DOC).*

CONSULTATION

The background to novices on two-metres was included in *Amateur Radio* magazine as an insert and Divisions have consulted their membership in a number of ways to seek guidance on the issue. The following actions were taken within Divisions:

ACT — A questionnaire was supplied to those attending the August 1987 Divisional General Meeting, however, no provision was made for those not present at the meeting to record their opinions. Data was combined from several questions to provide responses corresponding to questions asked elsewhere. Some questions are not reported here as they have no bearing on the novice issue. The response is from 17 percent of members.

NSW — Two sets of statistics were supplied, the first from their May 1987 forum, the second from a VK2WI Broadcast item authorised by VK2AAR. The first set appears the more reliable. Again attendance at the forum was a pre-requisite to providing an opinion, although several clubs have submitted results from membership polls. The response was from about 2.5 percent of membership.

VIC — A comprehensive questionnaire (but perhaps biased in structure towards existing council policy), was included in AR and responses invited from members and non-members alike. The response was 23 percent of membership.

QLD — This Division used both their broadcast and newsletter, *QTC*, to inform members of the motion and solicit comment. Responses received, both in writing and over the air, totalled over five percent of Divisional strength. However, as many of these were club responses, the true membership return could be several times that figure.

SA — This Division, like Victoria, placed a questionnaire insert in AR. The range of questions was limited, seeking only responses to major issues and the poll achieved replies from 16 percent of members.

WA — The Federal Councillor reported a near unanimous agreement with the 1987 Convention motion following extensive discussion at the August 1987 Divisional General Meeting. As a consequence, no detailed questionnaire poll of members was considered necessary.

TAS — The Federal Councillor toured the island visiting all three branch meetings to obtain the views of the members, which was near unanimous support for the 1987 Convention motion. No detailed poll was considered necessary. The views expressed represent 33 percent of members.

SUMMARY OF FINDINGS

The 1987 Federal Convention Motion
The findings are:

Clearly for	3	(VK4, 6 & 7)
Marginally against	1	(VK5)
Clearly against	1	(VK3)
Implied against	2	(VK1 & 2)

The proposition could be considered marginally lost.

Need for a Common Band
The findings are:

For	6	(VK1, 2, 3, 6, & 7)
Implied (through rejection of "no change")	1	(VK5)

The responses indicate overwhelming support for the proposition.

For All of Two-Metres to Novices

For	2	(VK6 & 7)
Implied for	1	(VK4)
Marginally against	1	(VK1)
Clearly against	2	(VK2 & 3)

The proposition appears undecided, however, since it is the implementation of motion 87.09.13/1 it must be considered marginally lost.

For Part of Two-Metres to Novices

For	1	(VK3)
Implied for	3	(VK4, 6, & 7)
Marginally against	3	(VK1, 2, & 5)

The proposition is supported.

For Part of Six-Metres to Novices

For	1	(VK3)
Marginally against	2	(VK1, & 5)
Clearly against	2	(VK2, & 4)

The proposition is not supported.

For Part of 70 cm to Novices

For	3	(VK1, 2, & 3)
Clearly against	2	(VK4, & 5)

The proposition is supported.

Other Proposals
From responses from only a few Divisions there is:

- Strong support for restructuring the licence system (VK1 & 3).
- Strong support for VHF/UHF for novices (VK1, 2 & 3).
- No support for a licence grade below novice (VK1, 2 & 3).
- No support for data modes for novices (VK1 & 3).
- Ambivalence towards HF (28 MHz) for AOLCP (this contravenes the ITU Radio Regulations).

Consistency of Data

Near similar questions (or those repeated in a negative sense) yield reasonably consistent responses except the burning issue expressed in the positively supported theme; "Strongly support a common band for all licence classes on VHF/UHF provided it is 'not my' band".

CONCLUSIONS

There is not a majority of Divisions supporting motion 87.09.13/1.

The requirement for a common band is near unanimously supported.

Whilst there is not majority support for all of two-metres to be the common band, there is majority support for part of that band.

There is also majority support for part of the 70 cm band but not part of six-metres.

There is not support for a licence grade below novice, nor for data modes for novice licensees.

RECOMMENDATIONS

The President's draft letter to DOTC be recast to reflect and include the findings above and a request be made for part of the two-metre band and part of the 70 cm band for novice licensees. The FM portions of each band are recommended.

This summary report be circulated to Federal Councillors and published in edited form in AR.

The Future of the Amateur Radio Working Party be directed to include the findings of this summary report in their deliberations.

Edited from the Working Party's report of October 6, 1987, by Ron Henderson, December 12, 1987.

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Novice Notes

A HANDY QUARTZ CRYSTAL CHECKER

Drew Diamond VK3XU
'Nar-Meian', Gatters Road, Wonga Park, Vic. 3115

From time to time, we find it necessary to check a crystal for activity and/or frequency. For instance, in trouble-shooting an oscillator circuit, it would be helpful to know if the crystal was good before checking elsewhere in the circuit. By making the checker pocket-size and battery powered, we may take it along to 'white elephant' sales or parts shops so that a crystal may be given at least a functional check before buying. If a frequency measuring device is available in the shack or workshop, such as a counter or calibrated receiver, it is possible to make a reasonably accurate measurement of the crystal frequency. With an appropriate crystal; the device may also be used as a simple signal source for receiver work, or as a marker generator to identify a specific frequency where no other accurate calibration method is available.

The great difficulty with a device of this kind is in finding a circuit which will properly excite as wide a range of crystals as possible. After much delving and experimenting, I was not able to produce a simple "universal" circuit which would drive crystals marked in the 100 kHz to 24 MHz range. Upon reflection it will probably be agreed that most fundamental crystals for radio, electronics and computer work lie in the range of perhaps 1.8 to 24 MHz; so a circuit providing at least this range was aimed for. With the addition of a switch to connect an extra capacitor, crystals down to 455 kHz (the lowest in my collection) may be checked. Overtone crystals; eg 27 MHz or 36 MHz, etc, will be excited on their fundamental frequency; ie 9 and 12 MHz respectively. So, the final circuit arrangement should prove useful in checking the majority of crystals used by amateurs, experimenters and computer buffs.

CIRCUIT DESCRIPTION

The final circuit was empirically designed, and is based on the Colpitts configuration. For fundamental crystals in the HF range; from about 2 MHz to 24 MHz, the capacitive voltage divider consists of C1 in series with C2. For crystals in the MF range, from about 0.5 MHz to 2 MHz, C3 is switched in parallel with C2 to optimise the divider ratio for lower frequency crystals. When the crystal is oscillating, the AC voltage developed across R2 — L1 in series is applied to the voltage doubler C5, D1, D2, C6. The positive voltage thus established across C6 injects a current through R3 into the base of Q2, whose collector current flows as a direct result. The LED in series with Q2 and R4 will illuminate in rough proportion to base current, and by implication indicates crystal activity — the more active the crystal, the brighter the LED.

CONSTRUCTION

A small printed wiring board accommodates most of the components, although any desired form of construction may be employed to suit individual resources. The crystal connection method may also be left to individual taste. To accommodate all crystal types would require up to five different kinds of connector. It is hard enough these days buying a style K connector, let alone the more exotic types. The photograph shows my own suggested approach; two ordinary banana sockets, spaced 0.75 inch (traditional spacing going back to the early days of radio, and still in use). Only some of the very old style crystals may be directly inserted. However, it is a simple matter of plugging paper clips or similar into the rather large holes to make a 'universal' connection to the crystal being tested.

The checker may be housed in a plastic or metal box measuring about 120 x 55 x 30 mm. The banana sockets also serve to attach the circuit board to the lid of the box as shown. If the nuts are used, make sure that the nut securing the 'hot' banana socket (marked Y on the PWB) clears the nearby earthy track. The LED has been placed at the approximate geographic centre of the PWB, so the lid needs a small corresponding hole for the LED to protrude through. The two switches and the output connector may be mounted on the lower part of the lid. Polarities of the FET, transistor, diodes and battery must be strictly observed. With the box shown, it will be found that the nine volt battery will fit snugly in the lower part of the box. Other boxes may require the battery to be fixed in position be some method, perhaps with a blob of 'blutak'.

If the suggested construction method is adopted; the components on the circuit board may only project to a height of about seven millimetres in order to clear the lid. If any of your components are higher than this, it should only be necessary to lay them over to one side (eg some makes of disc capacitors and the RFC may need this treatment).

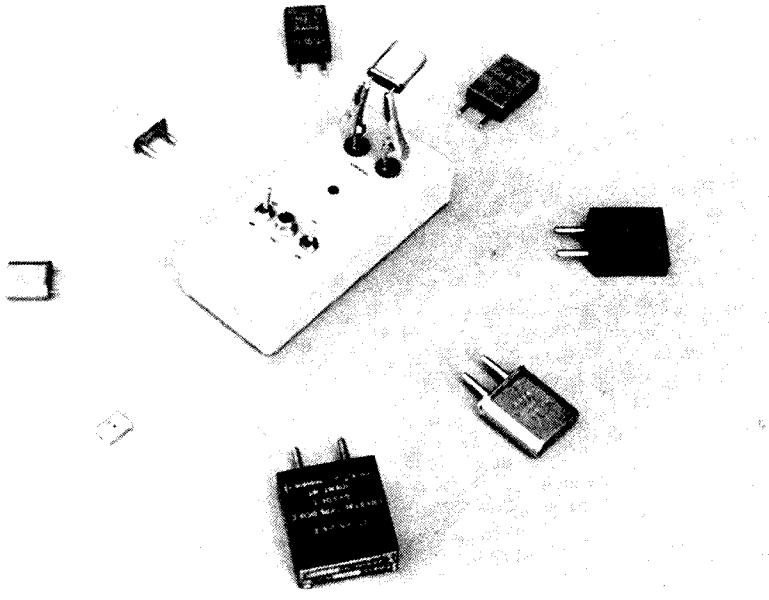
For the visually handicapped user, there is room to include a piezo buzzer to provide an audible indication. The piezo is connected in parallel with the LED as shown on the circuit.

The method of labelling the checker must be left to individual resources. Mine has been done with Letraset® — available from newsagencies and stationers. A light coat of clear lacquer should be applied to prevent the letters from rubbing off in use (remember to test your lacquer by applying a small amount to the inside of a plastic box to make sure that there is no 'reaction').

* Registered trade name.

OPERATION

The two leads of the crystal are connected and the checker switched on. A good crystal will oscillate and cause the LED to glow (and the piezo will 'beep' if fitted). As already mentioned; the brightness of the LED gives some indication of crystal activity. The division between 'MF' and 'HF' crystals is not sharp, so if a particular



A suggested approach for connectors.

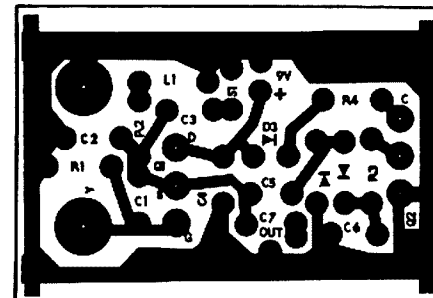
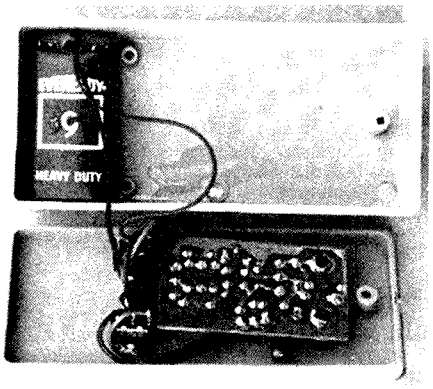
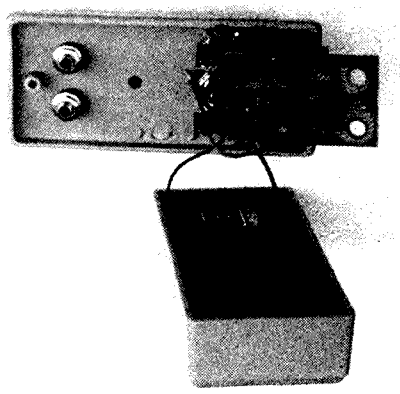


Figure 1: Printed Circuit Board.





crystal at say 1.8 MHz will not oscillate in the MF position, then try the HF position. It may be noted that some really active crystals will oscillate with only the 'hot' lead connected. Stray capacitance to the metal parts of the checker and hand capacitance are supplying the return path for the crystal under these circumstances.

To use the checker as a signal source; connect your crystal of appropriate frequency, and place the checker near the receiver input connector. It should not be necessary to make a direct connection to the receiver input. A small radiator, such as a piece of stiff wire may be inserted into the output connector to radiate a signal into a nearby receiver. The experimenter will soon devise ways of exploiting the possibilities offered.

PROBLEMS

If your checker will not work, even after fruitless attempts to find the trouble; please write to me about it and I will extend any reasonable amount of help necessary. One problem that did occur with mine was difficulties with a certain brand of radio frequency choke (RFC) used for L1. The ones that look like a one watt resistor have a bad habit of going open, even after careful soldering. A small 2.5 mH 'dog bone' RFC is available from some electronics shops. A single pie scramble wound choke, although larger, will also suit. The circuit will work without this choke by connecting R2 to signal ground. However, the range of frequencies and ability to excite sluggish crystals will not be as good.

PARTS

All the parts used in this project are readily available. If you wish to buy it in kit form, Ian J Truscott's Electronic World, 30 Lacey Street, Croydon, Vic. 3136, have agreed to put some kits together. Contact them direct for further information re price etc.

REFERENCES AND FURTHER READING

1 FRANSEN. Universal Oscillator Circuit. *Ham Radio* magazine (USA), April 1986.

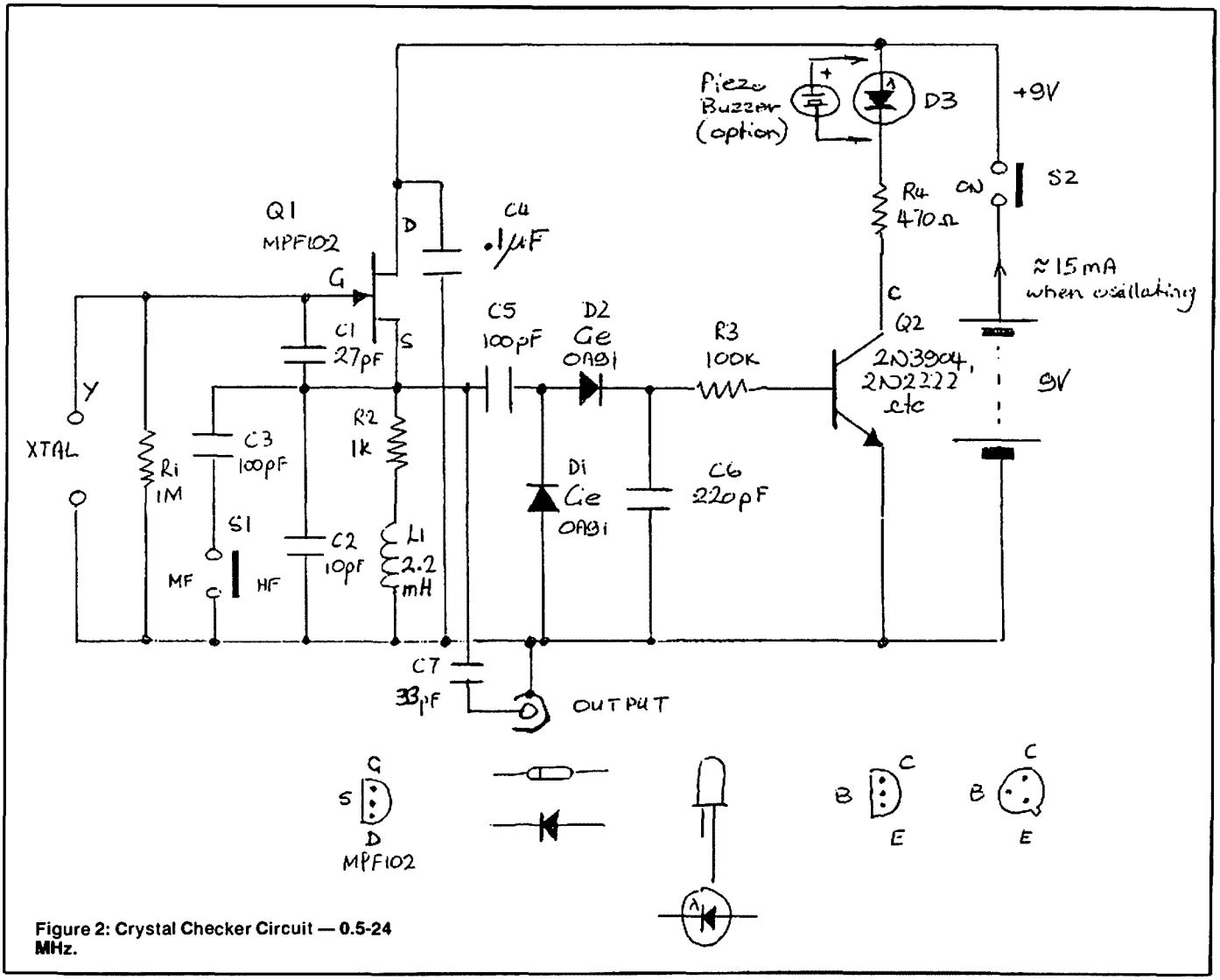


Figure 2: Crystal Checker Circuit — 0.5-24 MHz.

2 MATTHEYS. Crystal Oscillator Circuits. ISBN 0-47-87401-9.
3 DOBBS. Kitchen Table Technology (Crystal Checker). *Short Wave Magazine*, September 1983.

PARTS LIST

Capacitors
C1 27 pF NPO Ceramic
C2 10 pF NPO Ceramic
C3, C5 100 pF Ceramic
C4 0.1 uF Monolithic
C6 220 pF Ceramic
C7 33 pF Ceramic

Resistors
R1 1 Mohm, 1/8W, 5 percent
R2 1 kohm, 1/8W, 5 percent
R3 100 kohm, 1/8W, 5 percent
R4 470 ohm, 1/8W, 5 percent

Semi-conductors
D1, D2 Germanium Diode, OA91, etc
D3 LED, PC mount, any colour
Q1 FET, MPF102
Q2 Transistor, 2N3904, 2N2222, etc

Inductors
L1 2.2 or 2.5 mH RFC (avoid resistor shaped choke)

Hardware
PWB, box to suit (Supertronic PP-4), banana sockets (2), output connector (RCA), 9V battery and connector, miniature single pole switches (2), alligator clips (2), hook-up wire, lettering materials, *piezo* buzzer (optional).

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REMEMBER

When inquiring about products published in AR, always mention where you read of the product!

Australia-wide Appeal for QSL Cards

The WIA (Victorian Division) QSL card collection has been established, and having regard to the interest shown by amateurs outside Victoria, the appeal for cards is now extended to include amateurs throughout Australia.

Not all radio enthusiasts are interested in DX and QSL cards. Radio entails a broad spectrum of knowledge and techniques and many amateurs tend to concentrate on their own particular field of interest, and that is how it should be! For many however, a major interest lies in the collection of QSL cards from all over the world.

Many, particularly pre-WWII QSLs, are fast becoming historic items. It is a long time since we have seen a PK from Java or a K6 from Hawaii, let alone an AU from Siberia or an XU from China.

Ninety percent of QSLs are kept for a short period and then consigned to the rubbish heap. They are enjoyed by the amateur himself (or herself) but by few others. The establishment of a QSL collection enables not only one person to view such history, but for hundreds to do so, both now and well into the future.

In October 1987, over 800 QSLs were exhibited at the Ballarat Amateur Convention and created considerable interest. A selection of cards received are displayed on poster boards. Other cards are indexed and filed.

In the near future it is hoped to have over 2000 selected QSLs mounted for display. These mounted displays may be borrowed by school radio clubs and exhibition organisers.

Displays depict ARRL DXCC countries, together with those of a thematic nature; ships, space exploration, amateurs and their equipment, sport, etc. The aim is to engender interest in the hobby and maximise the use of cards people are good enough to donate. The collection is not confined to early QSLs and contains many of attractive design as well as modern DXpedition cards and rare (usually commemorative) prefixes.

Notwithstanding the generous donation of thousands of QSLs from amateurs from both Victoria and interstate, there are many gaps in the WIA collection.

We appeal to any DXer to donate as many QSLs to the appeal as possible.

A number of people have donated whole collections (after rummaging through dusty old boxes in the garage), whilst others have kept their DXCC and given the remainder, *but any donation, however small, is indeed welcome.* All donations are acknowledged through the Sunday Broadcasts and generally appear in AR too.

If you know of old timers, in particular, who have QSLs they may be able to donate, the WIA would be grateful if you would advise us so that a formal request may be made.

A minor difficulty is delivery of the cards. These can be collected in the Melbourne metropolitan area, or if small quantities only are involved, they may be posted direct to the Honorary Curator, Ken Matchett VK3TL, PO Box 1, Seville, Vic. 3139, Telephone (059) 64 3721. For large numbers of cards, other arrangements can be made directly with Ken. Alternatively, if you let the curator know your address he may be able to arrange transport by a WIA member who is passing through your area en route to Melbourne. This applies to Victorian country and interstate readers.

Please do not destroy your QSLs, modern or ancient, for however commonplace they may appear to you, there is sure to be several the WIA collection needs. Not all QSLs can find a place in a mounted collection; however after recording, each is boxed according to country of origin. If, in the future appeals for QSLs be other interested groups are made, use can be made of such cards.

What can you do to help?

News about the progress of the collection, together with the story of some of the more interesting QSLs will appear in future issues of AR.

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DARWIN RADIO CLUB's 21st BIRTHDAY CELEBRATION

Doug McArthur VK3UM (ex-VK8KK)
30 Rollaway Rise, Chirnside Park, Vic. 3116

Dedicated to all those who "went through it" and have never had a chance to return and to those who returned to rebuild their future.

It has been over 12 years since I was last in Darwin and, even now, I can vividly recall the events of *Cyclone Tracey*. The devastation and despair that followed one of Australia's most traumatic events will never escape my memory. The sheer extent of the tragedy was impossible to convey to others who were not part of the happening. Even today, many of the things that followed the Cyclone still cannot be told.

When the opportunity presented itself to combine business with the pleasure in joining the Darwin Radio Club's (DARC) 21st Birthday celebrations I immediately made the necessary preparations to partake of the occasion.

On the way, via Sydney, Brisbane, Townsville and Cairns, I was not able to find the time to purchase a couple of pairs of shorts for the occasion (all previous pairs had long since *shrunk in the wash!*) so it was with some fear and trepidation that, when the aircraft door opened, the now "Southerner" would fast expire in the heat. Approaching from the east the familiar meandering outline of the Adelaide River was etched in the visibly sodden surrounds which, even if one was unaware of the aircraft pitching through the storm laden sky, indicated that the "Wet Season" had arrived a little earlier than normal. What was an immediate surprise was the extent of the farms now established so far from town. That was all crocodile country as I recalled.

Finally, when the aircraft landed and the doors slid open, one could taste that familiar Darwin air! The Darwin Airport had indeed changed! Yes, they had removed the Cessna 310 off the top of the terminal building and they had also replaced the galvanised iron cladding! Everything else appeared exactly the same! This was later proved incorrect as Barry VK8DI, who kindly met me, proudly pointed to their latest addition in modern technology — the baggage carousel.

Ah. . .it was great to be back and to know things are not all as would first appear to our front door tourists.

The drive to Rapid Creek was indeed an eye-opener. Trees were now standing vertical and they even had leaves! (After the cyclone, there was hardly a tree left standing an the extent of regrowth is truly amazing). Past the familiar land mark of the missiles guarding the RAAF base entrance. They had obviously been stood up again so it was heartening to know our northern defence had been restored to normality.

Approaching Kamikaze Corner (alias Bagot Road and the Stuart Highway) things had indeed changed. Here, in all its glory, was a magnificant overpass circumnavigated all of the past traffic jams. Not only that, further down was a connecting road between Fanny Bay, behind the racecourse and Ludmilla, that ran all the way to Nightcliffe!

It did not take long for the first scheduled event of the Darwin Radio Club to begin. First was an official dinner held at a prestigeous restaurant in Parap. This was obviously a high-class affair as thongs and T shirts were not permitted! (Incidentally, Parap was previously known as Parap Parap and is adjacent to Ross-Smith Avenue, which was the original Darwin Air Strip). The committee had obviously thought of everything and warned mine hosts for we had the place to ourselves. The attendance was indeed fantastic with over 39 amateurs and their wives and friends enjoying themselves.

The following call signs were present:
Terry VKs 8TA, Judy and Barry 8DI, Doug 3UM (ex 8KK), Juliet and Barry 8ZCF, Dianne and Larry 8LM, Heather and Henry 8NHN, Bill 6AOD (ex 8OD), Maureen and Bob 8ZRJ, Robin and Ray 8RB, Anne and Bill (Spud) 8ZWM, Gloria and Jim 8JJ, Ruth and Henry 8HA, Lorraine and Trevor 8CO, Wendy 8YL and OM Garry 8BN, Graham 1BGG (ex 8GB), Frank 8FT, Janice and Garry 8ZGT and Ron 8RW.

Apologies were received from Bev (my wife), Col 2JC (ex 8CM), David 3AUU (ex 8AU), Terry 3ZTW (ex 8ZTW).

Barry VK8DI, was Master of Ceremonies for the evening, thus taking some of the pressure off the President, Bill (Spud) VK8ZWM, who is always short of a word! In fact, as it transpired later, someone else had prepared an outline for his speech!

The evening was a resounding success where each of the visitors were invited to recall the serious and lighter moments of the Club's past history. Original foundation members of the DARC, Harry VKs 8HA, Barry 8DI and Terry 8TA, also related some stories which caused many to choke on their oysters. As one speaker said, "everybody is still the same, only our children are older!". The evening terminated in the very early hours of the morning when our hosts slowly extinguished the lighting and ushered the revelers to the footpath.

The following day (Saturday) Terry VK8TA, insisted that I witness him playing the E Flat Tuba in the Darwin Brass Band, so dutiful I borrowed some earplugs guaranteed to provide 100 dB of attenuation and proceeded to the Darwin RSL Club. It is true to report that Terry can certainly handle the tuba better than he does the Morse key and the earplugs were not required. I would however, have liked to watch him march the streets during a typical Darwin downpour! At least he could walk inside the instrument!

Saturday evening heralded the DARC barbeque at the Club rooms. Things have certainly changed here and the new venue is magnificent. It consists of a very large, fully air-conditioned room of a size suitable for holding classes or functions, with enough space remaining for the transmitting station. The site is part of a multi-functional sporting complex near the Waratah Sports Oval. DARC has exclusive use of the room and it appears, at long last, the club has a permanent home. Outside a fully retractable 60 foot tower supports a TH3JR and other HF antennas, whilst on the roof a series of beacon antennas and other VHF/UHF "word perches" grace the skyline.

Spud VK8ZWM and Terry VK8TA, were chefs for the evening in charge of the barbeque and turned out steaks in true Territory style. The ladies of the club augmented the feast with salads and sweets.

There were around 60 members and guests attending, and judging by the number of harmonics present, the club must be assured of a healthy future. The feature of the night was the cutting of a very large birthday cake following the "tall tales" and speeches. Unfortunately, due to a slight technical problem the magnificant Honour Board, detailing the foundation members, past presidents and Life Member was not unveiled at this time and had to be left until the following day.

Following the barbeque many accepted the kind invitation from Larry and Dianne VK8LM, of Nightcliffe, whose magnificent abode boasts an in-ground swimming pool situated in a setting which we would all relate to a tropical paradise. The harmonics, who prior to this were under threat of not getting their swim if they did not behave at the barbeque, set about emptying the pool with their splashing, whilst the adults pursued the more serious endeavours of socialising. Larry revealed that he had a problem with his six metre linear and his shack was quickly filled with expertise offering to locate the problem. Talk about brave, even with the District Radio Inspector being present, Larry unveiled a monster capable of producing receiver front end overload in Japan! It is unfortunate to report that a string of electrolytics had expired and he is faced with a considerable problem of obtaining replacements. It was again a great night and the tall stories continued until the very early hours of the morning.

Sunday dawned (seemingly just after we closed our eyes) and the celebrations continued. This time it was a mystery bus tour. Mystery because even Terry VK8TA, was unsure where we were going. The object was to visit all the haunts where the DARC previously held their meetings, established beacons and held memorable field days.

The tour began at the present club room and went to the old incinerator site adjacent to Bishop Street. This has now been transformed into a training centre for the Northern Territory Volunteer Emergency Services. A tour was kindly arranged by Kerrie Adams and Peter Teece, who proudly displayed their latest set-up. Groans were uttered by many who recalled the sufferings of first establishing an amateur station in far from ideal surroundings.

Next it was to East Point Reserve via the old Civil Defence Headquarters (devastated by the cyclone and never restored), and then to what was the old high school. Approaching East Point I was dismayed to see that the infamous Fanny Bay Hotel and the old Fanny Bay Goal (now a museum), had not been restored (the latter, in hindsight, was a blessing).

East Point Reserve, a few metres above the shore of Darwin Harbour, has a history of its own. It was here during World War II that large gun emplacements were established. These are currently being restored to their former "glory", The mammoth concrete structures are in as good a condition now as they where when first constructed. Not even Cyclone Tracey was able to inflict damage to these edifices. One of the concrete support buildings was originally used as a meeting and beacon site for the DARC. Members were asked to take their own chairs to the club meetings (along with insect repellent). Getting mains power to this site was a battle with incredible bureaucratic red tape which took almost two years to come to completion. It was here that the first

intelligent six metre beacon operated until that infamous Christmas night.

This was also the site of numerous field days as the dream QTH is surrounded on three sides by sea. Members scurried about pointing out the old concrete slabs painfully laid in bygone-years, still containing the bolt holes that supported some of the most magnificent antennas imaginable? In later years the club restored yet another (larger?) building which provided shelter for its members. The whole area has now been turned into a historical museum frequented by the many tourists visiting the area and is surely worthy of a diversion for anyone visiting Darwin.

This tour was virtually the end of the official functions arrange by the club. Readers who worked VK8DA, the official Club Station, during the celebration period are entitled to a commemoration certificate, see details in October 1987 AR. The certificate is a worthy addition to any shack wall.

The Darwin Amateur Radio Club is certainly a most radio and socially active club. They maintain both six metre (52.200 MHz) and two metre (144.480 MHz beacons and by this time they will probably have the 10 metre beacon (28.268 MHz) operational. All beacons transmit under the call sign of VK8VF In addition, they also operate two VHF (VK8RTE 146.400/147.00 MHz and VK8RDA 146.100/146.700 MHz) repeaters situated at Palmerston and McMillan Road. Coverage is extensive and VK8RTE can be worked as far away as the Adelaide River. Not satisfied with the VHF repeaters, a UHF system is ready for installation on the Maraki Flats (in the city) operating on 433.275/438.275 MHz.

The current committee members are President Spud VK8ZWM, Vice-President Ray VK8RB, Secretary Larry VK8LM, Treasurer Henry VK8HA, Club Station Manager Frank VK8FT, Magazine Editor (*Ground Wave*) Henry VK8NHN, and Committee Members Terry VK8TA and Barry VK8DI. The club postal address if PO Box 37317m Winnellie, NT. 5789. Should you visit Darwin they will certainly make you most welcome.

For those readers who have not been back since the cyclone, you will be pleased to learn that, although the character of the place has certainly changed, the basic social philosophy is much the same. If ever there was a place where a successful integration of a multi-cultural society exists, Darwin is that place.

The city is fully restored, the suburbs expanded and the population returned to well over 60 000. Prices seem reasonable when compared with the southern States although vegetables are still expensive. Petrol prices were certainly no more expensive than in Melbourne.

Housing is much improved with the new building codes. Gone are the rows of stereo look-a-likes which are now replaced with a mix of ground and elevated ascetically pleasing homes surrounded by tropical gardens. Even the insects have been tamed for it could once be said that you could sit outside and swat insects all night and never hit two the same! Not so now!

It is not just any city that could recover after such devastation, to emerge and expand the way Darwin has in such a relatively short time.

Amateur radio is thriving at Australia's front door and they, although they would not wish to talk about it, are prepared for any eventuality (as they were in the past), should such an occassion occur. We all hope it will not be necessary.

The DARC, flushed with their 21st celebration success, are already planning an even bigger and better 25th Silver Anniversary celebration. Mark November 1991 down in your calendar!

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● ● See next month's AR for a Pictorial Spread of the 21st Celebrations ● ●

WIA DIVISIONAL BROADCASTS

Following are the times and frequencies of the Divisional Weekly News Broadcasts.

AUSTRALIAN CAPITAL TERRITORY

Broadcasts are held on Sundays at 8 pm local time on the following frequencies:

3.570 MHz	LSB
28.485 MHz	USB
52.075 MHz	USB
52.525 MHz	FM Secondary
146.900 MHz	FM Channel 6, Secondary, VK1RAC
146.950 MHz	FM Channel 7, VK1RGI, Ginini
438.375 MHz	FM Secondary, VK1RIR
438.525 MHz	FM Primary, VK1RGI

On Mondays, there is a re-broadcast at 8 pm local time, on 146.950 MHz, via VK1RGI, provided no meeting is held on such Mondays. If there is a meeting on a Monday night the re-broadcast takes place on Tuesday at 8 pm.

NEW SOUTH WALES

These are conducted from the Divisional Station, VK2WI, at Dural on Sundays at 1100 and 1930 hours local time. Both sessions — 1.845, 3.595, 28.320, 52.120, 52.525, 144.120 MHz are via repeater channels 6650 Western Blue Mountains, 6725 Gosford, 6850 Wollongong, 7000 Sydney, 7100 Lake Macquarie, and 8525 Sydney.

For the 1100 hours transmission there are additional sessions on 7.146 MHz from Dural, and 3.585 MHz from Newcastle.

There may be relays through the following repeaters — 6700 Orange, 6800 Lismore, 6800 Western Plains, and some ATV repeater systems.

For those unable to listen at these times there is a telephone news highlights recording of about two minutes duration on (02) 651 1489, Monday to Saturday.

VICTORIA

The Victorian Division's broadcast is held every Sunday morning at 1030 hours local time on the following frequencies:

1.840 MHz	SSB
3.615 MHz	SSB
7.085 MHz	SSB (courtesy of Ric VK3RC)
52.525 MHz	FM
144.200 MHz	SSB
146.850 MHz	FM (via the Mount Macedon repeater, VK3RMM)

A call-back is conducted shortly after the broadcast on 80 metres (3.615 MHz), 40 metres (7.085 MHz) and on the two metre repeater, VK3RMM, (146.850 MHz).

All inclusions for the broadcast should be addressed to: Broadcast News, PO Box 260, Cranbourne, Vic. 3877.

Members may advertise items wanted or for sale on the broadcast. The name and address of the advertiser is withheld and all inquiries are directed to the Victorian Divisional Office, 412 Brunswick Street, Fitzroy, telephone (03) 417 3535 between the hours of 10 am and 3 pm Monday to Thursday. All advertisements should also be directed, in writing, to the above office.

Further inquiries regarding the broadcast should be directed to: Rob Hailey VK3XLZ, PO Box 477, Croydon, Vic. 3136.

QUEENSLAND

This broadcast is transmitted on VK4WIA, frequencies being:
1.825, 3.605, 7.118, 10.135, 14.142, 18.120, 21.175, and 28.400 MHz. The broadcast is also transmitted on two metre repeaters VK4RBN, VK4RGC, VK4RSC and many regional repeaters. Also UHF repeater VK4RBC.

Broadcasts are held on Sundays at 2300 UTC (tuning tape commences at 2255 UTC on HF outlets).

A repeat broadcast is conducted on Monday at 0930 UTC on 3.605 MHz and two metre repeater VK4RAG, Brisbane City. The call sign is VK4WIA.

There is no broadcast on the Remembrance Day Contest weekend and over the Christmas/New Year period.

SOUTH AUSTRALIA

The broadcast commences at 9.00 am local time on Sundays and can be heard on the following frequencies:

1.820 MHz	AM
3.550 MHz	
7.095 MHz	AM
14.175 MHz	
28.470 MHz	
53.100 MHz	AM
145.000 MHz	AM
147.000 MHz	Repeater
579.000 MHz	ATV Repeater

REGIONAL RELAYS

3.555 MHz	Darwin
146.500 MHz	Darwin
146.650 MHz	Naracoorte Repeater
146.700 MHz	Port Pirie Repeater
146.900 MHz	Mount Gambier Repeater
438.425 MHz	Barossa Valley Repeater
444.250 MHz	Mid-north Repeater

WESTERN AUSTRALIA

These broadcasts are held on VK6WIA at 0130 UTC, Sundays on the following frequencies:
Via the Perth repeater VK6RAP, Channel 6700 linked to VK6RUF Channel 8525, VK6RBY (6900), VK6RBN (6750), to HF relays 3.560, 3.582, 7.075, 10.147, 14.110 (N), 14.175 (E), 21.185, 28.485 and VHF 52.080 MHz.

A repeat broadcast is held at 1100 UTC on VK6WIA, via 144 and 432 MHz repeaters as at 0130 UTC, but with only 3.560 MHz relayed on HF.

TASMANIA

The broadcasts are originated from Hobart on two metres FM via the Mount Wellington Repeater (6700) and there are links to the northern repeater on Mount Barrow (7000) and the north-western repeater at Ulverstone (6750). Relays are carried on 3.570 MHz and 7.090 MHz at the instruction of the Divisional Council. Three additional relays are carried voluntarily on 144.100 MHz SSB, 52.100 MHz and 14.140 MHz.

Broadcast times are 0930 hours local on Sunday mornings. There is a possibility of a repeat broadcast at 1930 hours local time on Tuesday evenings on 80 metres only (listen to the Sunday morning broadcast for further details).

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OLD EXAMINATION PAPERS

The following papers are published courtesy of DOC. They are some of a series of yesteryear papers which are published so readers may test themselves. Would the OTs still be able to pass with flying colours? How would the newcomers go with this type of exam?

COMMONWEALTH OF AUSTRALIA
POSTMASTER-GENERAL'S DEPARTMENT
AMATEUR OPERATOR'S CERTIFICATE OF PROFICIENCY
THEORY AND REGULATIONS

JANUARY 1937

THEORY

1 (a) Calculate the length of a "Hertz" antenna that would be suitable for operation on all three bands of 80, 40 and 20 metres. Give your answer in feet and show full working.
(b) Indicate by the use of simple diagrams the standing waves that would exist for each of the three bands.

2 Show a full schematic diagram, without power supply, of a super- heterodyne receiver, suitable for the reception of unmodulated CW telegraphy signals and explain the function of each stage.

3 Given a power supply of 500 volts DC, what wattage would be dissipated in a "bleeder" resistance placed across the output if the current flowing through it is 20 milliamperes, and what would be the value of the resistance?

4 (a) Draw a circuit of a two-stage transmitter, crystal controlled, including power supply.
(b) Describe briefly the "piezo-electric" effect of the crystal.

5 Give a brief outline of the process of tuning a MOPA transmitter and state what apparatus you would use. How would you determine that the power amplifier was properly neutralised?

6 Quote three of the major causes of frequency instability in a transmitter and explain the method or methods which should be adopted for their prevention.

7 What is the difference in construction between a voltmeter and a milliammeter of the moving-coil type? Explain the reason for the difference.

REGULATIONS

1 What are *the* Regulation *requirements* regarding secrecy of correspondence?

2 When it becomes necessary to transmit test signals, explain the procedure to be followed.

3 What class of messages or communications are amateurs allowed to exchange?

Time allowed — 3 hours
POSTMASTER-GENERAL'S DEPARTMENT
EXAMINATION FOR AMATEUR OPERATOR'S CERTIFICATE OF PROFICIENCY
THEORY — MAY 1927

(Answers need only be given to seven questions — the first five must be attempted).

1 Draw a diagram of a receiver capable of being used on the various amateur wavebands, setting out the values of the respective components.

2 Give a diagram of a Telephone Transmitter utilising one valve as Oscillator and one as Modulator. State the amount of current necessary to work the installation at 7 watts measured in the anode circuit of the Oscillator.

3 Explain briefly the function each piece of apparatus performs in the circuit drawn by you in answer to Question No 2.

4 What are the faults common in an ordinary lead accumulator and what action may be taken to remedy same.

5 State what you know of the advantages and disadvantages of crystal control in Valve transmitters.

6 State what you know of the means adopted to eliminate the use of batteries in Wireless receivers employing valves, giving circuit.

7 Define the following terms:

Absorption
Dielectric Constant
Impedance
Space Charge
Decrement
A periodic Aerial

8 How may the overall efficiency of an installation be proved. Give example.

9 Explain the function of a Grid Condenser.

10 What is meant by Choke or Anode control in a radiophone set and how is it obtained.

COMMONWEALTH OF AUSTRALIA
POSTMASTER-GENERAL'S DEPARTMENT
AMATEUR OPERATOR'S CERTIFICATE OF PROFICIENCY

SECTION M (i) Theory

SEPTEMBER 1944

Time allowed — 2½ hours
NOTE — Seven questions only to be attempted

1 What is meant by "tracking" as applied to a radio receiver? In the case of tuned radio-frequency amplifier stages, what requirements must be met for correct tracking?

2 Describe the construction of an intermediate-frequency transformer. How are the gain and stability of the transformer affected by the types of coils and condensers used?

3 Compare high-vacuum rectifiers and mercury-vapour rectifiers in respect of voltage drop. What precautions must be taken when mercury-vapor rectifiers are to be operated in parallel?

4 What is meant by a vertically polarised wave? Describe in general terms the relationship of the range of the ground wave to the frequency of the transmission.

5 What is the general effect of increasing the length of an antenna, in terms of half wavelengths, on its directive pattern? What is the effect on the radiation resistance?

6 Draw a circuit diagram showing anode modulation of a neutralised triode Class-C amplifier, using a Class-B modulator. If a Class-C amplifier is to have a linear modulation characteristic, what general operating conditions are necessary?

7 An inductance of 0.5 henry and a capacity of 0.05 microfarad are connected in series. What is the total reactance of the circuit at a frequency of 1000 cycles per second?

8 Give the meanings of the following terms as applied to thermionic valves:
(a) Characteristic curves; (b) Interelectrode capacity; (c) anode-current cut-off point; (d) Grid bias.

9 Describe the operation of the moving-coil and moving-iron meters, and compare their suitability for small direct current measurements.

VHF UHF — an expanding world

Eric Jamieson VK5LP
8 West Terrace, Meningie, SA. 5264

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.005	H44HIR	*Honiara*
50.010	JA2IGY	*Mie*
50.022	ZS6PW	*Pretoria*
50.075	VS6SIX	*Hong Kong*
50.100	KG6DX	*Guam* [1]
52.013	P29BPL	*Port Moresby* [2]
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.418	VK0MA	*Mawson* [3]
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton* [4]
52.440	VK4RTL	*Townsville*
52.445	VK4RIK	*Cairns*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.022	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.445	VK4RIK	*Cairns*
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
144.950	VK3RCW	*Melbourne*
145.000	VK6RPH	*Perth*
432.066	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK1RBC	*Canberra*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*MacLeod*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton* [5]
1296.198	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*
10445.000	VK4RIK	*Cairns*

1 A message from Hatsuo Yoshida JA1VOK, confirms the KH6EQI beacon is off the air. Also, Joe KG6DX, at Guam, runs a beacon each day from 2100 to 1400 UTC with 40 watts output and a three element Yagi at 18 feet. His grid location is QK23KL. Joe changes his beam direction as follows: 2100 to 0100 North East (USA); 0100 to 0430 South (VK etc); 0430 to 1400 North West (JA etc). His transmission is . . . VVV DE KG6DX GUAM QK23KL. He also transmits on 50.110 which presumably is his own station and calls CQ CQ DE KG6DX.

2 A letter from Stephen Mills VK2BQY, firstly confirms the operation of the VK2RHV Newcastle beacon; he also says that a contact with his friend, Paul P29PL, brought news that the P29BPL beacon was restored to operation some months ago after a year off air and has been relocated from the island off-shore to a hill in the Port Moresby area. It runs 30 watts to a dipole.

3 Mark VK0AQ, reports the Mawson beacon has been in almost continuous operation during the past year and has slowly crept higher in frequency and is now around 52.432 MHz. I have left it shown as 52.418 because Mark intended trying to get it down. He had hoped the change in ambient temperature to the Antarctic summer would help to lower its frequency, but this has not been the case.

4 Steve VK3OT, told me personally a few days ago that the VK3RMV beacon on 52.435 MHz is back on the air and I can confirm this as it is audible here at Meningie.

5 VK4JPE, Secretary of the Central Queensland Branch of the WIA writes to say VK4RAR is operating from Mount Archer in Rockhampton and is on 432 540 MHz in lieu of 432.545 until a new crystal is obtained. The site is shared with a data repeater on 144.900 MHz.

While on the subject of beacons, Phill FK1TS tells me there is a Japanese beacon on 50.020 which signs JE6ZIS in CW. It is often quite strong in Noumea and if so Phill says he is able to work over most of JA. He said he had only once heard JA2IGY during an extremely good opening. He also copies the ZL1UHF beacon on 51.020 with FSK.

NOUMEA WRITES

Phill FK1TS, sends a copy of his log from 26/10 to 12/11 which lists quite a few good openings to Japan with JA1 to 7 being listed. Most of the contacts have been around 50.100 MHz with signals from S3 to S9. Some stations can be found around 50.110 and 50.120 MHz.

He also reports having worked nearly all JA call areas using three watts to a wire aerial! Mention is also made of a forthcoming Cook Islands operation during January and February, so it may pay the six metre gang to keep their ears open for this one.

The local amateur radio club in Noumea was been allocated a special prefix for the Pacific Games — TO8KPG. There were to be 26 stations using this prefix between TO8KPA and TO8KPZ, during December, with the possibility of a few on six metres. (I wonder if any VK stations actually had contact with these stations?. . .VK5LP).

FK1TK is very active on six metres with an IC551 and a delta loop antenna. With the early arrival of AR in Noumea for November, the Noumea boys were alerted to the changes to the Ross Hull Contest rules. Thanks for the news, Phill.

PORT MORESBY

Further information in the letter re P29BPL beacon, from Stephen Mills VK2BQY, was that P29PL said they had been having some two metre and 70 cm openings down the Australian coast as far south as Bowen/Mackay. Also, Eric P29ZEF, worked a 9M6 at Sabah on two metres recently. He also confirms the reactivation of the H44HIR beacon at Honiara.

FROM JAPAN

JA1VOK says the afternoon-type TEP to northern VK has been good, but the evening TEP poor. YB1CS was copied in JA2 on 3/11/87 at 1130 so there appears to be some activity from Indonesia.

Hatsuo says he has a schedule with Geoff VK3AMK or Mike VK3BDL at 0700 UTC every Sunday on 14.285 MHz (pi9026 QRM) for exchange of VHF information between VK and JA. Interested VHF operators, with news, may break in. Hat says the 10 metre frequency of 28.885 MHz is still not reliable enough for it to be used on a regular basis so they are continuing on the 20 metre net for the time being. Hat also makes a plea for any operators sending QSL cards to include their grid locator square on the card as many operators are now chasing these squares.

The VUCC (VHF/UHF Century Club Award) now has sections for 100 grid squares for contacts on 50 and 144 MHz, 50 squares on 432 MHz and 25 squares on 1296 MHz. Only those contacts since January 1, 1983, are creditable for VUCC purposes.

THE SUMMER SPORADIC E SCENE

How you see the 1987 Es season can depend upon where you live! There is plenty of evidence some areas have been enjoying many good contacts on both six and two metres and in most places it seems two metres again has proved a good year for the third time in succession. However, it does seem the main period for consistent contacts on six metres started later than usual with not a lot of activity prior to December. It appears the Perth stations have been having a lean time again this year yet Dave VK6AOM, at Esperance, has had plenty of contacts but he is quite a bit closer to the eastern States. Alice Springs seems to be having its usual share of good contacts, as does Adelaide. The other States all appear to be about normal, although there are reports of considerable activity from New Zealand, indeed, New Zealand into VK5 has been most consistent this year.

In Alice Springs, Peter VK8ZLX, reported the first good Es opening occurred on 3/12 although there had been some limited contacts to VK3 and VK5 towards the end of November. On 3/12, Peter was working VK6KXW on six metres and reported hearing the Perth FM stations and observing Perth Channel 2 television. They tried two metres, 144.100, but there seemed to be some confusion on procedure with the result both stations heard one another but did not complete a two way contact! This was at 1015 UTC. VK8ZLX also heard VK4FXX on two metres. Since then the band has been open on six almost every day in Alice Springs, 4/12 VK3 and VK2DDC, 6/12 VK8ZWM in Darwin, 9/12 VK6ZPG and VK8KXW, 10/12 VK3, VK5MC and VK5RO, 11/12 VK3, VK2KAW, 12/12 VK2, VK1, VK8ZWM, 13/12 VK6ZBG, VK6GL and VK6YU, 15/12 ZL1NHX, ZL3TIC, ZL3ADT amongst a lot of others from ZL, then VK6YA, followed by VK6UF on Koolan Island off the NW coast of WA. On 16/12 VK3, ZL2 and ZL4, VK3NM. At 1105 the band opened on two metres to VK3NM, VK3DUT, VK3AUU, VK3UM, VK3AZG. On 17/12 all over the country on six metres, then 0733 to VK2DDC on two metres, same station on two again at 0808, 0816, then, because there was no one else, they had many contacts. Also heard VK1RK. On six, plenty of ZLs, VK2, VK5, VK6AOM, and VK2YVG, on RTTY. 18/12 at 0227 opened to VK3 on two metres with many stations including VK3ZBJ, VK3AZY, VK3XEX and VK3LK twice. The Mount Gambier beacon was heard for 40 minutes but no VK5 signals. Peter phoned VK5LP but there was no sign of two metres being open at the time in this part of VK5. To round off the day, it was VK2YVG on RTTY.

In the south-east, at South End, Roy VK5AXV

said six metres started in early December. On 16/12 the band was full of ZLs and on 17/12 he observed VK3AUU frantically calling a VK1 on two metres which would have given David WAS on two metres in 24 hours, but he was unable to make the contact. Several stations reported to me that they had worked seven of the eight call areas in 24 hours, so widespread was the two metre coverage.

Roy also said he had worked into Perth on six metres which was his first time for two years, so scarce have contacts been to that area. But he had worked Dave VK6AOM, on 52, 144 and 432 MHz on 18/12 during the morning. From 0800 to 0830, FK1, in Noumea, was heard calling CQ at S7 and worked FK1TK and FK1TS. Also, VK8ZLX for the first contact this year. Roy said there was a new station in Esperance, being Roy VK6JXX who is retired and presently living in the caravan park, and able to operate on six and two metres.

At this stage I had already made three phone calls for information, to Wally VK6KZ, who spoke of the rather dismal conditions over there, and Dave VK6AOM, who saw them much better. The third call went to Les VK3ZBJ, who reported there was certainly plenty of activity on the various bands, but was lamenting the fact that he could find no one to work on the bands above 1296 MHz and up to 10 GHz! Wally VK6KZ, also felt out on a limb in regard to these bands.

The call to VK6AOM, at Esperance, brought the news that he had worked 12 stations in VK3 and VK4 on six metres on 30/11, then on 4/12 it was VK4 again with VK4ZJB being the strongest, also VK1, 2 and 5. On 11/12 he worked VK5ZMK, VK5RO and VK5ZTS on two metres around 0920. On 13/12, two metres again to VK5NC, VK5EE, VK5AXV, VK5DJ, VK3AUU, VK3YTB and VK3LK, then on 70 cm VK5NC, VK5ANC and VK3YTB. 16/12 was a good day there as in most parts of the country with VK1, 2, 3, 4, 5, then ZL2, 3 and 4 in the late afternoon. At the same time VK7 was very strong — all were on six metres. During the evening conditions still remained good so he worked VK5ZMK, VK5AKK, VK5AN and VK5NY on two metres plus VK5AKK and VK5NY on 432 MHz. Short skip conditions allowed Dave to work six stations in Perth which was unusual for him! During the evening he was able to have further contacts to VK5NY and VK5ACY on both 144 and 432 MHz.

Dave found 18/12 to be a good day starting at 2127 (actually 17/12 UTC day) with VK8ZLX at S9+ then around 0400 a string of VK3s plus VK5BC and VK5AXV. This was repeated about four hours later with nine VK3s and VK5AYD. The day before there had been a good tropo opening on two metres to VK5ZMK, VK5AKK, VK5OH, VK5NY and, on 70 cm, VK5AKK, VK5ACY and VK5NY. Roy VK6JXX, the new station from Esperance worked his first VK5 on two metres.

On 20/12, Dave had quite a ball working stations in VK2, 3 and 5. He also reports being capable of now working on four bands to 1296 MHz although he found out that masthead preamplifiers do not like being fed with RF from the transmitter!

It is interesting to talk to Col VK5RO, (the next phone call) as he reports some six metre activity every day since December 1. Some of his better periods included many ZLs on 2/12; VK2, 4, 6 and 8, plus ZL1, 2 and 3 on 4/12' ZL1, 2 and 3 plus VK3 and 4 on 5/12; the next three days most States on six metres leading up to 9/12 with ZL1, 2 and 3, VK3, 4, 5 and 6, FK1TK at 0408, more ZLs including ZL4, all the rest of the VK States making it all VK States and all four ZL areas. (Col commented that, on many days, the previous situation existed, all States and all ZL with FK8 or FK1 thrown in for good measure.

Col reported 15/12 as being very good. Working ZLs he found them so strong he went over to two metres and heard ZLs calling there but was unable to get through interstate QRM. Then on six to VK8ZMA with the beam on ZL, then swung the beam to VK8 and promptly worked VK3! During the evening around 1110, while working Wally VK6WG, he observed a somewhat rare phenomenon of back scatter on two metres. On 16/12, while working VK6WG on two metres, he launched into working VK4s on two metres with the beam in the west! On 17/12, VK2s worked on two metres; on 18/12 six metres was wide open all over Australia. Worked VK4BKP on two metres at 0110 and, as no one was answering his calls, worked the VK4 several more times.

Col and several others in the course of conversation remarked on the very good Es which existed during the winter maximum period, particularly early July.

The next operator is Trevor VK5NC, at Mount Gambier, who has been on some sick leave and working quite a bit of DX. Being where he is, Trevor's log has many contacts into VK3 on 144 and 432 MHz; eg 1/10 VK2YEZ at Griffiths on 144 at 1248 and at 2108 to VK6WG on 432; on 24/10 to VK7JG on 144 at 0717. The first 52 MHz is on 4/12 to VK4KJL at 0705, VK4ZMI 0709, VK8ZMA at 0734 and VK2YDC at 0922. On 9/12 the ZLs were good with ZL2s being best, also VK3OT and VK5AXV. On 10/12 it was to VK4ZJB at 0026 and plenty of others throughout the day, VK2GMC at 0410. At 0525 it was to our old friend Lance VK4ZAZ, followed by a two metre contact to VK4ZAZ at 0551, others on two being VK4KJL, VK4TN, VK4AGQ and VK4BE up to 0604, VK3ZQB at 0609, VK5ZXV at 0612, back to VK4WD at 0626, VK3LK at 0636, after which six metres was used to VK2YME and VK2DDU, almost making it to VK2DVZ on 144.

13/12 at 0852 had VK6AOM at Esperance on 144, also VK6JXX, VK6AOM on 432 as well as VK3YTV, VK3ZBJ and VK3ZAT. Then VK6KJ on 144 and 432, VK3HV on 144 at 2058, VK3XEX 2106, VK5NY 2234, VK3ZBJ 2246, VK3TAY 2248, VK3ZBJ and VK3NW on 432 around 2325 then VK3KIR on 144 and 432 at 2355. So all in all, Trevor had been making good use of a bit of free time.

MENINGIE

The VK5LP establishment at Meningie finally got the antennas erected on Sunday, December 13, with the help of David VK5KK, who did all the above ground work, and the help of friendly neighbours who assisted with erecting the winch-up tower. There were no hitches and, at the end of the day, we had the big six element Hy-gain beam on a 25 foot boom at 70 feet (this antenna is nearly 25 years old and still in very good condition. It has as much gain or more than one of the eight element KLMs of which I formerly had a stacked pair). Also, one of my original 13 elements on two metres was at 80 feet, the 16 element KLM, with gold plated driven elements for 432 at 86 feet and above that, reaching to the final tip height of 95 feet, the stacked Ringo for the FM channels. The six and two metre antennas are fed with new 9913 coax plus a masthead preamplifier on 144; 432 with preamplifier used 5/8 inch Heliax and the poor old Ringo suffices with 75 ohm brand new ET13M which I had on hand. This is much better than the RG8 I could have used or even the 8214 which had fed the two metre system before. After adjustment, the two metre FM rig delivers its rated 25 watts to the antenna so it does not really mind the different impedance!

So the whole antenna system looks over all local obstacles and gives me a clear path in whatever direction I want to look. Although, due to some other commitments, I have been unable to get on the air as much as I would like, I have found the path to the south-east and into Victoria to be excellent on 144 and 432, and to find I can work the Albany boys on 144 and 432 without any trouble is a big bonus. It was good to work Wally VK6WG, on both bands on 16/12 around 2310 with signals to 5x9 and even finding 432 on that occasion was better than 144! With the enhanced conditions at that time it was no trouble to copy the Launceston Channel 8 repeater on the Ringo and was able to hear my old friend, Col VK7LZ, once again. I was unable to call him because when I did our VK5 Channel 8 repeater took over! It is also good to be able to work back into Adelaide at 5x9 using one watt! Provision has been left to mount a 1296 MHz antenna system between the six and two metre beams where they can be reached without having to lower the whole assembly and the 7/8 inch Heliax I have to feed the system can be handled without too much trouble.

Amongst the few things I have done since coming back on the air after four and a half months of silence was to work Lionel VK3NM, for the first time on two metres. We have only ever been able to do it once on six metres and never on two. I also gave John VK4PU his first VK5 on two metres on 16/12 at 2316 and finally caught up with John VK4ZJB on two metres the same day at 2331. In all, about nine VK4s were worked that morning. It is good to have the VK3s within range now and the VK5RSE beacon is again always audible.

Finally, I may not have quite the freedom I used to have on six metres as I now live in a town situation and with the television stations level being lower in Meningie than at Forreston, it may be necessary to be observant about TVI. No complaints so far but then I have not been using the linear amplifier (the pair of 811As). Running 10 watts from the transceiver I see nothing on my own television set, but a few faint lines from the fourth harmonic on Channel 10; at the moment I am not unduly concerned as I am sure there will be no problems if handled correctly.

Some information picked off air was that on 16/12 the ZLs were hearing the VK4RTT beacon on two metres at 1000 UTC. This was about the same time that ZL2TPY was working VK1s RK, VP and BG on two metres.

David VK3AUU reported contacting W5UN again via the moon on two metres on Sunday morning around 3 am local time! I think he said that was the fifth time he has done that so his antenna system and other equipment is certainly working.

At 2316 on UTC morning 16/12 I worked VK4VC and VK4PU within the minute on two metres SSB. That opening lasted exactly 40 seconds so, through not wasting time, two contacts were nabbed. Something similar happened at 0013 the same morning when Don VK4GP came through for a few seconds but it wasn't until 0024 when he broke through again that I was able to make the contact. Five second openings take handling!

One good thing I noted during the fine opening to VK4 on two metres was how the VK4s spread themselves out instead of all congregating on 144.100 MHz. There were about a dozen of them and they were found spread from 144.085 to 144.125 MHz. I am sure all of us could learn something from that object lesson.

Next morning it should be possible to have an even better idea of the extent of the various two metre openings, but everything at the moment is pointing towards a very good year again.

THE ANTARCTIC EXPEDITION

Don Richards has sent some further information which includes details of the six metre equipment taken by the expedition. Kenwood has loaned the TS680, Roger Harrison VK2ZTB, of *Australian Electronics Monthly*, has loaned a six metre linear amplifier, and Vince VK2VC, has loaned a Yagi antenna. Don has a six metre vertical which he can use during the passage down and the Yagi will be used whilst standing by out to sea whilst the climb is being made. If it is possible to set up a shore station the Yagi will be used.

Their operating plans are daily if possible on 14.105 MHz at 0900 UTC, 52.050 phone, 52.010 slow CW daily from mid-January to mid-February and onwards to mid-March, 1000 to 2000 UTC. Call signs are VK2BXM/MM and VK0AT. Les VK2LW will be the contact at the Sydney end for the HF contacts.

Don's contact in Sydney will be Miss Robin Miller at 1/13 Cross Street, Waverley, NSW. 2024 and phone (01) 387 6182.

FROM JAPAN

Further to my mention earlier of the information

from Hat JA1VOK, I have received a few brief pages from the independent DX magazine printed in Japan. From my very limited knowledge of Japanese and some translations by Hat, there are a few points you may find interesting. In the October 1987 issue is a greeting from the start of the VHF column, together with a list of the top 100 stations for countries worked on 50 MHz. Heading the list is JA4MBM with 79 confirmed and 81 worked. Next come VE1YX with 77/79, W5VY 72/75, KH6IAA 72/74, K8KWZ 71/73, K5FF 71/72. The above are those in excess of 70 countries confirmed. The lowest listing is WD4FAB with 44/45 which is still a very good score and just above our own Graham Baker who ran up 42 countries while living in Darwin. I see my friend Bill W3XO of *QST* is listed with 59/69 so he is quite well up the table, in fact, is in the 14th position.

Hat lists a new beacon Europe being CT0WW on 50.030 MHz and 40 watts output, also the South African beacon I am already reporting in my list. News has filtered through to me via Wally VK6KZ that this beacon is not able to transmit looking towards Australia due to TVI problems! That seems such a pity when we are starting to rise out of the low part of the cycle.

The November issue carries two graphic pictures on the cover showing what appears to be a DXpedition by J1RL and JF1IST/J1 standing on a rock in the ocean about the size of a room in a house at low tide and perhaps five feet out of the water. The other picture is at high tide with the area shrunk to about the size of an average bathroom and maybe two feet above the water, but with waves breaking over the rock! There is no one on the rock at high tide as you may gather. If that is 7J/Okinotorishima, then they can have it for mine!

It is mentioned that, on 21/6, N6CW heard JE2KPC at 0540 UTC, the distance being about 9000 km on 50.110 MHz. That is a very respectable distance if it was multi-hop Es, or was it F2? JE2KPC uses a 12 element Yagi on a boom 15 metres or 49.2 feet long!.

It is also interesting to note that from 7/6/87 to 23/7/87 the 50 MHz band opened between North America and Europe on no less than 17 days and G3COJ lists a total of 47 contacts during that period. Most were to eastern areas of the US into W1, 2, 3, 4, VE1, 2, 3 and 0.

The December issue of the magazine (called 59) shows from 5/10 to 7/11 that, for the greater part of October the JAs were only hearing some Australian beacons, VK8VF, VK6RTT then they worked VK4 and VK6 on 18/10, 28/10, 29/10, but with contacts to FK1TS and KG6DX at odd times plus VK3ZTK on 28/10. In November they worked to VK3, 4, 8, KG6, FK1TK plus YB1CS. There is also a copy of my beacon list from AR!

It also appears that JG3MRT operated from FK on 26/10/87 and worked 204 JAs and all JA call areas. Equipment was an FT680.

KC6CS was heard testing on 24 to 30/11 and transmitting as a beacon on 50.105 MHz.

The December issue includes an updated 50 MHz Standings List and this shows the top station is now VE1YX with 81 countries confirmed and 82 contacted. JA4MBM is now in second place with 79/81. Next K8WKZ 73/76, K5FF 73/76, W5VY 71/74, and down to Bill W3XO, who improved by one on 60/71.

WA6BYA's new six metre antenna is to be an 11 element Yagi on a 13.6 metre boom, two of them to be stacked 7.5 metres apart on a tower 40 metres high! Some antennas and some tower!

The *59* magazine also mentions the possibility of 28.385 MHz as being the International Net Frequency. I cannot decipher the reasons behind this except that Bill W3XO, of *QST* is mentioned, so he may say something in his column before long.

My thanks to Hat JA1VOK, for sending those information sheets and for the translations of some of the news.

OUT AND ABOUT

Des Clift VK5ZO, told me on the phone that, on 7/11, VK5ZTD and VK5ZDV had a three centimetre (10 GHz) contact between Mount Lofty and The Hummocks. They used a Philips radar type burglar alarm with the double cavity at the focal point of the dishes — the reflection was sufficient to provide the crystal current needed. They used an IF of 100 MHz. Des suggested they would be better to use the recognised 30 MHz IF Good work boys!

A short letter has found its way to me via the WIA Federal Office from Eric Parvin G2ADR, who, amongst other things, said that on 22/10/87 at 1537 UTC and again later "had the pleasure of making an all time record by contacting A22KZ of Maun, Botswana, on six metres to six metres, and also six metres to 10 metres *crossband*. Power used was nine watts to a dipole antenna at 28 feet." I don't know the distance but it is a long way and could be as far as anyone has worked on six metres in that direction. Eric is obviously an elderly gentleman with plenty of academic and electronic qualifications so it is good to see someone like that still able to take an interest in the six metre band.

A letter arrived today from Vince VK2VC to that he, VK2KJ and VK2BA had all worked Neville T20AR, at Tuvalu on 15/12 at 1104 UTC. Vince's report was 5x5 sent and 5x2 received. So far that is the only report I have received of Nev working anyone. They were lucky I would think with such low signal reports.

Vince says so far this year he has worked ZL1, 2, 3, 4, FK8 and TO8HI commemorative call sign, VK9NP Norfolk Island and T20AR. He also believes ZK1WL may be active on North Cook Island. Thanks Vince for your letter and standings update.

50 — 54 MHZ DX STANDINGS

DXCC Countries based on information received up to December 22, 1987. Cross-band totals are those not duplicated by six metre two-way contacts. Credit has not been given for contacts made with stations when 50 MHz was not authorised.

Column 1: Six metres two-way confirmed
Column 2: Six metres two-way worked
Column 3: Cross-band (6 to 10) confirmed
Column 4: Cross-band (6 to 10) worked
Column 5: Countries heard on 50 MHz
Column 6: Countries heard on 52 MHz

CALL SIGN	1	2	3	4	5	6
VK8GB	42	42			13	
VK2BA	30	30				
VK4ZJB	30	30				4
VK2QF	26	26				
VK2VC	26	27				
VK2DDG	25	26		2	12	3
VK3OT	25	26			10	
VK3AWY	22	22				
VK2KAY	21	23				
VK5LP	21	22			6	3
VK2BNN	20	21				
VK4ALM	20	20				
VK3XQ	19	20			1	1
VK4TL	19	19				
VK7JG	18	20			2	
VK3AMK	17	17				
VK9XT	17	21				
VK3AUI	17	21				
VK4ZAL	17	17				
VK3NM	16	17				
VK4ZSH	15	16				
VK2ZRU	15	16			1	3
VK3ZZX	12	13				
VK9YT	12	14				
VK6OX	10	10	1	1		
VK6RO	9	9	3	3	2	3
VK4KHZ	8	10				
VK6HK	8	13		3	2	
OVERSEAS						
JA2TTO	48	48			6	

The minimum number of countries confirmed for an operator to commence being listed is five, including VK.

The position on the list is determined by the number of confirmed contacts. Where two or more operators have the same total, those first date listed with that total can only be displaced by someone having a greater number of confirmed contacts.

The next list will appear in August 1988, and entries will need to be on my desk no later than June 15, 1988. Claimants are reminded that full details of all contacts are required; viz date of contact, time in UTC, call sign of station worked, country, mode, report sent and received, QSL sent and whether received, split frequency contacts should be indicated. Please add your own call sign, signature and date.

I reserve the right to ask any claimant for QSL cards for perusal to support any verification if considered necessary. Some claimants are sending photocopies of the back and front of the QSL cards received which is quite a good idea.

I hope I have not missed anyone this time. With the big shift to Meningie it is always possible something could be mislaid but I believe the listing is correct.

CLOSURE

It is rather interesting to note that around December 21 to 23, at Meningie at least, there has been almost no activity on six metres which seems rather unusual for the time of the year. Maybe the Es is waiting to reach a new peak between Christmas and the New Year.

Closing with two thoughts for the month: *"The only thing worse than an expert is someone who thinks he is an expert"* and *"If life were just, we would be born old and achieve youth about the time we had saved enough to enjoy it!"*

73 The Voice by the Lake

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Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

G — General
C — Constructional
P — Practical without detailed constructional information
T — Theoretical
N — Of particular interest to the Novice
X — Computer program

SILICON CHIP, November 1987. New Australian ELectronics magazine. Evolution of electric railways (G). Electronic sales and repairs (G). House Wiring Dangers (G). 1 GHz Frequency Meter (C).

73 MAGAZINE, October 1987. Doubly Balanced Mixers (P). Gunn and Impatt diode testing (P). Linear IC Amplifiers (G & N).

CQ October 1987. DX CW Contest Results (G). High gain Portable VHF Antenna (C).

BREAK IN, November 1987. The National Link (G). Control by Tones (P).

SHORT WAVE MAGAZINE, October 1987. FAX Special Issue (G). Marconi (G).

QST, October 1987. Surface Mounting Technology (G & N). Amateur Radio and the Blind (G). Microwave Dummy Loads (P).

QST, November 1987. QRP Omni Box (C & N).

REGION 3 NEWS, May 1987. Journal of the IARU Region 3 Association.

RADIO ELECTRONICS, October 1987. Commodore C64 Pulse Generator (C & X). SCR and TRIAC Circuits (P & N).

RADIO ELECTRONICS, November 1987. Surface Mounting Technology (P & N). Bell Telephone Story (G).

ar

DOTC

SBS AVAILABLE VIA SATELLITE IN SE AUSTRALIA

Close to three million Australians in regional areas of South Eastern Australia will have the potential to receive SBS television via the AUSSAT satellite, following the Government's decision to end the encoding of the SBS signal.

The decision, effective from December 2, 1987, will provide immediate access to SBS programs to the 1000 or so owners of small domestic B-MAC satellite receivers in the south-east zone who are outside the areas already served by SBS (see map). These people already receive ABC programs under the Homestead and Community Broadcasting Satellite Service (HACBSS).

The SBS has been using an AUSSAT satellite to distribute programs to its terrestrial transmitters in south-east Australia and Perth.

This distribution signal is not actually designed for reception by small domestic satellite receivers, and when it was commenced in March 1986, it was decided to encode the signal because it was thought that it would not provide a suitable quality for regional reception.

The B-MAC transmission system has, however, performed even better than originally anticipated, paving the way for the signal also to be received by small domestic receivers.

The SBS signal is of a lower power than the ABC signal and while the former may at times be affected by heavy cloud or rain, it should provide an acceptable picture at most times in the south-east. The distribution signal to Perth is a small offshoot of the main beam, and could only be received by a very large satellite antenna.

The decision should please the many people in regional areas of south-eastern Australia who have made representations to me for the signal to be unencoded.

An added benefit will be that people with domestic B-MAC receivers will now also be able to receive SBS radio programs transmitted by stations 2EA and 3EA. The SBS recently began distributing these radio services by satellite.

The commencement of unencoded transmissions will not affect the existing terrestrial capital city SBS transmissions, which now reach about 10.7 million Australians.

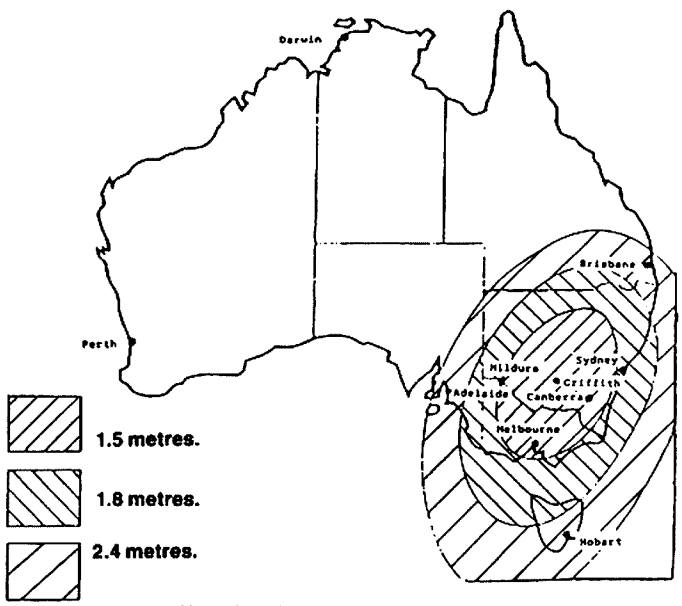
In addition to home satellite reception, it is possible for communities in the south eastern zonal beam to establish a facility to receive and locally re-transmit the SBS signal. This option, under the Self-help Broadcasting Reception Scheme, is often more cost-effective for communities than the purchase of individual satellite receivers. The technical design of these facilities also ensures high quality reception.

Information on the Self-help Broadcasting Reception Scheme, including advice on possible costs in particular locations, is available from the Offices of State Broadcasting Engineers of the Department of Transport and Communications in Sydney or Melbourne.

In announcing the decision to unencode, I am conscious that the licensee for the Remote Commercial Television Service for the south-eastern zone surrended its licence on October 22, 1987. The Government is still considering a number of alternative options, but in the meantime, people with satellite receivers will have the SBS service available in addition to the ABC.

Media Statement by the Minister for Transport and Communications, Senator Gareth Evans QC, December 2, 1987

Coverage Area of SBS Satellite
Transmissions — Domestic B-MAC Receivers. Satellite Receiver Dish Size.



Note that the signals have less power than the Homestead and Community Broadcasting Satellite Service (HACBSS) and that these dish sizes will permit acceptable reception in a clear sky. Reception may be difficult during periods of heavy cloud or rain.

CHANGES TO RADIOCOMMUNICATIONS LICENCE FEES

The Minister for Land Transport and Infrastructure Support, The Honorable Peter Duncan, MP, announced a revised fee scale for 1987/88 radiocommunication licences on September 15, 1987.

Mr Duncan stressed that the radio frequency spectrum would only be valuable while it was used in an orderly fashion.

"Licence fees are set to encourage efficient use of the spectrum which benefits all Australians, and users in particular, through the greater availability of this limited national resource," Mr Duncan said.

The main change in licence fees is in the land mobile service. A shortage of suitable radio frequencies in Brisbane means that new applicants for the use of mobile frequencies in this city will either have to share use of a channel, or pay a system fee of $2170 for an exclusive channel. This scheme already applies in Sydney and Melbourne.

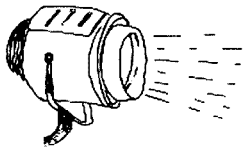
The other change involves the licence fee for base stations of mobile services in the Sydney area, which will be higher than the fee in other urban areas.

The fees increased about seven percent on December 1, 1987, which is less than the current annual inflation rate. It is estimated that revenue derived from the use of the spectrum in 1987/88 will be $37.413M compared with $33.218M in 1986/87.

The amateur licence is now $28.

Information on the revised fee structure can be obtained from the Radio Frequency Management Offices of the Department of Transport and Communications. These offices are located in the State capital cities as well as in 20 regional centres around Australia.

Abridged from a Media Statement issued by the Department of Transport and Communications



Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

News has come to hand about the exchange agreement between Radio China International and Radio Japan, to allow Canadian programming to go through the NHK transmitting site in Yamata, Japan. To do this, special legislation had to be passed in the Japanese Diet (parliament) because prior to this it was prohibited to allow relay facilities of another's programming via Japan.

For about 18 months now, Radio Japan has enjoyed the relay facilities of the RCI Sackville site, for their English and Japanese programs to the east coast of North America. The signals have been heard here in Australia with reasonable strength at 1100 UTC on 6.120 MHz in English. Now the RCI programming will go out via the Yamata site from the beginning of April. Programming will be in English/French, Russian and Japanese. The target is Asia and the Pacific. Canadian audience research has shown only four percent of their total audience is in that region, with the surprising results that their primary audience is in Eastern Europe. It should be emphasised that a large proportion of Canadian immigration over the years has come from there.

English from RCI via Yamata will be heard at 1200 to 1230 UTC on 15.290 and 17.810 MHz and from 2200 to 2230 UTC on the single channel of 17.885 MHz. From 2230 to 2300 there will be French programming, whilst 9.650 MHz will be utilised from 2030 to 2100 with Russian, beamed to Asiatic Russia.

Until now, RCI has produced Japanese programming which has been aired over the Japanese commercial shortwave station, Radio Tanpa. This is from 0830 to 0900 UTC, or 1730 to 1800 Japanese Standard Time, on 3.925, 6.055 and 9.595 MHz. This is more or less a commercially sponsored program and will cease on March 30. On April 4, Japanese programming will be coming via the Yamata site on the single channel of 6.150 MHz from 1300 to 1330 UTC. Incidentally, the programs are not produced at the RCI studios in Montreal, but rather at Vancouver on Canada's Pacific coast.

The much heralded relay of Radio Australia, via the ABC Radio National did not eventuate last year, probably due to budgetary constraints within the ABC. But it was announced on *Talkback* on November 21, that it will commence on Australia Day, January 26, between midnight and dawn local time. This means that MW DXers will find it even more difficult to get overseas stations, yet not impossible. MW loop antennas will help a little. Incidentally, I believe that regional stations will have a choice of either Radio National or the local Midnight to Dawn show on Radio 2BL and metropolitan stations. I believe that 3AB, in Albury, has been relaying RA for about 12 months between midnight to dawn.

It has also been revealed that the site for the third transmitter of the *Christian Science Monitor* to service Central and South America, is near Savannah, South Carolina. The land has been purchased as well as the sender and their target to commence was last month. At deadline time, I have no further indications either, when KYOI, in Saipan, is to switch to the World Service programs.

They are still using a music format. KYOI's signals have gone down at this location, but I have seen reports that they plan to install a second sender which will service the Pacific region.

Two American stations have commenced using the 22 metre broadcasting allocation. They are WYFR, Family Radio, and WRNO, in New Orleans. *Family Radio* has studios on the US west coast yet their transmitters are at Okeechobee, Florida. I have heard WYFR on 13.695 MHz, at 2015 UTC, in English to Europe. WRNO has been heard on 13.760 MHz at 2300 UTC with commercial programming. More international broadcasters are utilising this band, although it is not scheduled to come into full operation until 1989. The Soviets have been using this band ever since it was allocated at WARC and other broadcasters are slowly following suit.

Veteran religious broadcaster, Radio HCJB, in Quito, Ecuador, is hoping to upgrade their transmitters over the next few years. They plan to construct an additional 500 kW sender themselves at Elkart, Indiana, as well as four senders over the next five years. You may have noticed recently that they have been experiencing transmitter trouble, so there is a need to upgrade facilities. HCJB also has an Australian studio in Melbourne, which has been producing programming both for local outlets and for HCJB.

The International Committee of the Red Cross (ICRC) has been operating a broadcasting service for over 40 years. This service is activated monthly with test transmissions. It has its own recording studios in Geneva, Switzerland and broadcasting facilities are given free of charge by the Swiss PTT and Swiss Radio International (SRI). Programming is in English, French, German, Spanish, Portuguese and Arabic and consists of Red Cross action around the world. The RCBS welcomes reports of their broadcasts (IRC appreciated), which will be confirmed by QSL cards. Incidentally, the ITU has allocated a frequency exclusively for the RCBS and it is 7.210 MHz, although other broadcasters utilise the channel.

The next scheduled broadcast to Australia and the Pacific will be on Monday, February 1, and Monday, February 29, from 0740 to 0757 and repeated on Thursdays at the same time on the same channels of 9.560, 9.885, 17.830 or 21.695 MHz. Unfortunately, 9.560 MHz suffers from Radio Finland being on the same channel in English at equal strength, but 9.885 MHz is clear. I have not tried the other channels. The release to North America is also often heard in eastern Australia at 0310 to 0327 on 12.035 MHz, and it is on Tuesday, February 2, and Friday, February 5. Reports should be sent to Red Cross Broadcasting Service, International Committee of the Red Cross, 17 Avenue De La Paix, Geneva, Switzerland, CH-1202.

Well, that is all for this month, until next time, the best of good listening and 73 — Robin VK7RH.

ar

MORSEWORD 12

Compiled by Audrey Ryan
30 Starling Street, Montmorency, Vic. 3094

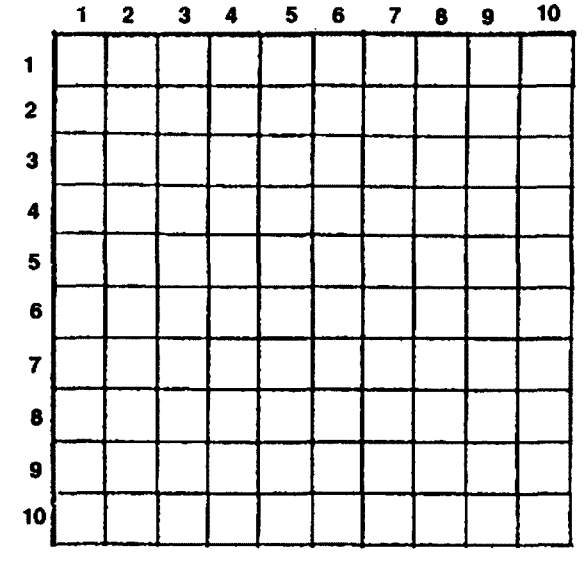
ACROSS

1 Foe
2 Brought lawsuit
3 Squander
4 Form in drops
5 Departed
6 Hair on neck of lions
7 A little margarine?
8 Pictures
9 Not that
10 Mountain in Jerusalem

DOWN

1 Holiday (abbrev)
2 Fish
3 Experience
4 Bonnets
5 Aeroplanes (colloq)
6 Gilding
7 Protruding tooth
8 Be ready for
9 Garment
10 Fatigued

Solution page 60. . .



CHRISTMAS EVE — a sad farewell

The *Nella Dan's* bow disappeared below the Southern Ocean off the coast of Macquarie Island on Christmas Eve after 26 years of sailing in the area for many Australian Antarctic expeditions.

This Danish vessel had created a record of service which probably will never be exceeded by any other vessel. It is sad, but fitting, that she will lay at rest in the area she traversed so many times, to become a haven for marine life on the floor of the ocean that she had carried scientific personnel who were intent on establishing more information on and facts of the Antarctic area.

The *Nella Dan*, carried numerous amateurs and their equipment to the cold inhospitable areas of the Antarctic for over a quarter of a century. These amateurs gave amateurs worldwide a new country, be it Heard or Macquarie Islands, or just the mainland of Antarctica.

The *Nella Dan* left Hobart on November 27, reaching Macquarie Island, 830 nautical miles to the south, five days later. On December 3, conditions though fine at first, deteriorated and winds reached gale force, with high gusting squalls and heavy seas when it is believed she dragged anchor and was washed onto rocks 50 metres from shore in Buckles Bay.

Her hull, was badly holed during this unfortunate incident, nevertheless all the personnel were safely removed as was some of the equipment including the Meteorological Bureau's valuable satellite equipment and supplies including a considerable volume of fuel oil, which could have caused considerable havoc to the ecology of the area. The safety of the personnel was uppermost in the authorities mind as a successful transfer was made to Macquarie Island, dramatically escalating the islands comfortable population accommodation for 30 to an all time high of 102, for a number of days, until the diverted *Icebird,* was able to relieve the situation.

The station at Macquarie Island. The fringe of Buckles Bay, where the 'Nella' went aground, is at the left of the picture.

Photograph courtesy of the Commonwealth Bureau of Meteorology

The *Nella Dan* in more peaceful days, as depicted on the March 1987 edition cover of *Amateur Radio*.

Photograph courtesy Bert Trupp VK5BVN

The vessel's owners made prompt arrangements for a viability study of a salvage operation to be made, which after considerable appraisal of the age, position and damage to the vessel, it was decided to tow her to an area of ocean, with a sea bed depth of about 5000 metres and open the sea cocks or blast a larger hole in the hull, as a last resort, to send the vessel to her resting place.

The evening before Christmas Eve, whilst a salvage crew of about 20 were removing equipment, souvenirs and mementos from the wooden paneled vessel, the vessel suddenly listed. All aboard were ordered into Army-type landing craft which were along side and the 'Nella' was towed further out to sea, where it was thought the vessel would sink overnight.

It did not sink, but caught fire next morning, apparently from the overheating of the engine of an air compressor which was used to control the balance of the vessel. Within half an hour, the ship was fully ablaze and the oil rig tender the *Lady Lorraine,* continually sprayed water from its high pressure hoses at the rate of 20 thousand litres per minute onto the stricken vessel from every possible angle. It was a hopeless task and the *Nella Dan* disappeared stern first below the waves at 0642 UTC, Christmas Eve, 1987.

On Macquarie Island, Antarctic staff paid their respects to a fine lady of the sea and it has been reported that an Antarctic spokesman in Tasmania said 'Some people think that it is fitting for the *Nella Dan* to complete its service this way. In a traditional Viking funeral, the warrior is pushed out to sea in a burning ship. 'Nella' is a Norse vessel and had its own Viking funeral. Maybe it is much better that it went in a blaze of glory in southern waters rather than end up in a scrapyard, somewhere'.

I believe that all of the personnel that have travelled to and from the Antarctic bases, will have the same sentiments as will the amateurs from all over the world that have had QSL cards and logs, generally for a new country, transported by this grand old lady of the sea.

The Antarctic Scientific programme has suffered very little setback, as new itineries were hastily prepared and a Canadian vessel the *Lady Franklin* was chartered. Both the *Lady Franklin* and the *Icebird* will be working overtime delivering supplies and transporting new and returning personnel from the many bases, before the Antarctic winter really sets in. Dave VK0HI, will leave lonely Heard Island at the end of this month, hopefully with his log book stowed carefully in a waterproof covering and containing many contacts for the worthy first timers, including some on six metres (if the band opened), who have managed to be recorded in the log.

—Contributed by Ken McLachlan VK3AH

Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7251

CONTEST CALENDAR

FEBRUARY 1988
13 — 14 Netherlands "PACC" Contest
13 — 15 YLRL YL-OM Phone Contest
20 — 21 ARRL DX CW Contest
27 — 28 REF French DX Phone Contest
27 — 28 UBA Belgian WW DX Contest SSB (Rules this issue)
27 — 28 YLRL YL-OM CW Contest

MARCH 1988
5 — 6 ARRL DX Phone Contest
12 — 13 QCWA Phone QSO Party
12 — 13 RSGB Commonwealth CW Contest (Rules December AR)
19 — 20 WIA John Moyle Memorial National Field Day Contest (Rules this issue)
19 — 20 NZART National Field Day
19 — 20 ISSB Phone QSO Party
19 — 20 BARTG Spring RTTY Contest (Rules this issue)
26 — 27 CQ magazine WW WPX SSB Contest

JOHN MOYLE MEMORIAL NATIONAL FIELD DAY CONTEST 1988

CONTEST PERIOD: From 0100 UTC, March 19 to 0700 UTC, March 20, 1988.

OBJECT: To encourage portable operation on the amateur bands by Australian amateurs. This form of activity is intended to help amateurs become familiar with portable operations and thus assist in training them for emergency situations. Emphasis is placed on working between portable stations.

CALL AREA DEFINITION:
a) Within ones own call area. VK7 to VK7 etc.
b) Outside ones own call area. VK7 to VK9; VK7 to ZL etc.

RULES:

1. DIVISIONS: There will be TWO DIVISIONS — a) 24-hours and b) 6-hours. In each division the operating period must be continuous within the time period allocated for the contest.

2. SECTIONS: In each division there will be separate sections as follows:

a) Portable Field Station, transmitting phone, single operator
b) Portable Field Station, transmitting CW, single operator
c) Portable Field Station, transmitting open, single operator
d) Portable Field Station, transmitting phone, multi-operator
e) Portable Field Station, transmitting CW, multi-operator
f) Portable Field Station, transmitting open, multi-operator
g) Portable Field Station, transmitting VHF
h) Home Transmitting Station, emergency powered
i) Home Transmitting Station, mains powered
j) Receiving Stations

3. STATION DEFINITION: A Portable Field Station is one which operates from a power supply which is independent of any permanent installation. The power source must be fully portable, ie solar panels, batteries, wind or motor generators, etc. A station located in an automobile and completely self-contained, apart from antennas, is classed as being portable, whether in motion or not.

A Single Operator Station is one where the work involved in setting up the station is carried out by one operator and where this operator is the one who makes all contacts from the station. This does not, however, preclude the operator from having minimal support such as a log keeper, or for the provision of food etc. This definition debars such practices as entering a club station using a single operator with massive support, in competition with stations which are set up and operated by an individual operator in the normal sense of the word.

It is considered that the terminology of Multi-operator Station is self explanatory.

4. INSTALLATION: No radio apparatus, including mast, antennas, feeders, etc, may be erected on the site more than 24-hours before the contestant/s begin/s operating.

5. BANDS: All amateur bands may be used with the exception of the 10, 18 and 24 MHz bands.

6. CONTACTS: Cross band contacts are not permitted. Cross mode contacts are permissible, however they will count only as phone contacts for scoring purposes.

7. SIZE The size of any portable station shall be restricted to approximately that of an 800 metre diameter circle.

8. MULTI-OPERATOR STATIONS: Such stations will provide a separate log for each band. Only one transmitter may be used on a given band at any one time, be it operating in a phone or CW mode. Only one call sign may be used from a multi-operator station.

9. NUMBER EXCHANGE: The exchange between stations will consist of a number/letter combination comprising the RS/T report as applicable, followed by a serial number commencing with 001 and increasing by one for every contact. Should the number 999 be reached, the series must then be re-commenced at 001. Following the serial number, a letter must be added indicating the Section (a) through (i) in which the station is competing. eg Number sent by a multi-operator station transmitting phone for the first contact would be 59001D. Both serial numbers sent and received must be recorded in the log.

10. SCORING: For Portable Field Stations — Contacts within Australia:
a) Portable/Mobile outside own call area — 20 points
b) Portable/Mobile within entrants call area — 15 points
c) Home Stations/Section H outside entrants call area — 10 points
d) Home Stations/Section H within entrants call area — five points
e) Home Stations/Section I outside entrants call area — two points
f) Home Stations/Section I within entrants call area — one point
— Contacts outside Australia:
g) Contacts with overseas stations, ie other than VK — two points

Scoring, for Home Stations/Emergency Powered — contacts within Australia:
a) Portable/Mobile outside entrants call area — 15 points
b) Portable/Mobile within own call area — 10 points
c) Home Stations/Section H irrespective of call area — five points
d) Home Stations/Section I irrespective of call area — one point

NOTE: Home Stations/Emergency Powered must operate independently of mains power.

Scoring, for Home Stations/Mains Powered — Contacts within Australia:
a) Portable/Mobile outside entrants call area — 10 points
b) Portable/Mobile within entrants call area — five points
c) Home Stations/Section H irrespective of call area — one point

11. VHF/UHF MULTIPLIERS: For contacts made on frequencies from the 50 MHz band and upwards, the QSO points score for each contact is multiplied as per the following table:

DISTANCE	MULTIPLIER
Under 50 kilometres	1
50 — 150 kilometres	5
150 — 300 kilometres	10
over 300 kilometres	20

12. BONUS POINTS: For any contact made using a natural power source, a bonus score of 10 points may be added. A natural power source is regarded as one where power is derived from such as solar cells, wind, methane gas, etc, as well as from batteries which are completely charged by natural means. All power produced under this category must have been derived independently of commercial mains or the use of petroleum derivatives.

13. CW CONTACTS: CW to CW contacts earn double points. These points must be shown as claimed on the log sheet prior to the application of any multiplier or bonus points. *NOTE:* See below regarding CW Trophy under Rule 22.

14. REPEAT CONTACTS: Portable Field Stations and Home Stations under Section H may contact other stations within these categories (Section A to H) provided that a period of at least three hours has elapsed since the last contact with the station concerned. Home stations operating under Section I may be contacted provided that a period of at least six hours has elapsed. This applies for each band and mode. *In the case of Portable Field Stations operating in the NZART Field Day Contest*, repeat contacts are allowed. Contacts with any one station permitted twice each hour on each band provided that one contact is on phone and the other is on CW, and provided that some other station is contacted between the two QSOs. *Note:* "each hour" means between the even hours such as 1600-1700; 1700-1800, etc.

15. RECEIVING STATIONS: Stations in this section must record the serial number being sent by any of the stations operating in the contest within Sections A to G inclusive. QSO points scoring will be on the same basis as for Home Stations/Section I as per Rule 10 above. VHF/UHF Multipliers and Bonus Points as indicated under Rules 11 and 12 also apply.

16. REPEATERS: Operation through any active earth repeater is not allowed for contact purposes, however, the use of such is allowable for the purpose of making contact arrangements. Contacts made using orbiting satellites or EME as a medium are acceptable.

17. MODES OF OPERATION: AM, FM, and SSB all count as PHONE operation. RTTY and CW are both regarded as CW. It would not be expected that more exotic modes, such as SSTV, Packet or Fast Scan television would be used in this contest.

18. LOG FORMAT: All logs shall be set out under the following headings and in the order shown:
Date; Time UTC; Call Sign; Band; Mode; RS/T Sent; RS/T Received; QSO Points; Multiplier; Bonus Points; Total Points Claimed.
NOTE: The last three columns need only be shown where applicable. Contacts must be listed in order of Time and Serial Number. Each log page must also carry a progressive Total Points Score Claimed at the bottom of each sheet. Scores Claimed must be calculated by first multiplying the QSO Points Score as taken from Rule 10 by any applicable multiplier from Rule 11 and then adding any Bonus Points as per Rule 12.

19. SUMMARY SHEET: A Summary Sheet must be included which indicates the following details:
For each contact for which a multiplier is applicable, the Serial Number of the contact and also details of the respective stations locations which apply to the contact. Such details must include either latitude/longitude references for each station or some satisfactory proof by such as a

map reference or distance calculation as to the distance over which the QSO was conducted.
For Bonus Points to be claimed, suitable evidence must be provided as to the method of Natural Power Generation employed. Such evidence could take the form of a photograph of the generating equipment used or a signed statement by another amateur showing his call sign, declaring that he has inspected the generating equipment referred to.
20. FRONT SHEET: Each log must be accompanied by a Front Cover Sheet which provides the following information:
Name; Address; Call Sign; Division (six or 24 hour); Section (A to J); Number of Contacts; Claimed Score. This sheet must also indicate station location, equipment used, power generating system employed and, in the case of Multi-operator Stations, a list of operators names and call signs, together with their signatures.
This Front Sheet must also carry a declaration signed by a licensed amateur as follows:
DECLARATION — I hereby certify that this station was operated in accordance with the rules and spirit of the contest. Signed..... Date.....
21. MULTIPLE STATION OPERATION: In the case of amateurs who have entered the contest in the six hour Single Operator Section it is allowable for them, upon their return to their Home Station, to make contacts with portable field stations. For this purpose they must submit a separate log which will be regarded as a Check Log only; ie they cannot enter into more than one section of the contest for competitive purposes. Operators who are interested in providing more field day activity are encourages to adopt this practice where possible. It should be noted however, that the practice of Multi-operator Station participants considering themselves to be portable stations and making contacts with the portable field contest station so as to bolster that station's score is deemed to be not in the spirit of the contest, and, as such, contravenes the intent of Rule 20.
22. CERTIFICATES AND TROPHY: Certificates will be awarded to the winner of each section in both the six and 24 hour Divisions of the contest. The six hour certificates cannot be won by the 24 hour entrants. The Contest Manager also reserves the right to award other certificates where the effort made by a particular station is of special worthiness.
The Highest **CW** Scorer outright in the contest, irrespective of the section of the contest entered, will receive a trophy in the form of the President's Cup to hold for a period of 12 months. This award is intended as an encouragement to operators to utilise the CW mode whenever possible.
23. **DISQUALIFICATION:** The general Contest Disqualification Criteria, as published in *Amateur Radio* page 46 August 1987, apply to this and all WIA contests. It is again pointed out that you should read the above rules properly so as to understand them and ensure that your log does comply with the contest rules laid down.
24. LOG SUBMISSION: Logs should be forwarded to the WIA Federal Contest Manager, 37 Nobelius Drive, Legana, Tas. 7277. The front of the envelope should be endorsed **John Moyle Memorial Field Day Contest.** Closing date for entries is April 29, 1988.

UBA CONTEST 1988

The Union of Belgian Amateurs (UBA) invites all amateurs world-wide to participate in the UBA Contest 1988.
NAME AND AIM: To contact as many Belgian and other amateurs as possible in the UBA Contest.
PERIODS: Last full weekend of January and February each year.
CW — January 30, 1300 UTC to January 31, 1300 UTC.
SSB — February 27, 1300 UTC to February 28, 1300 UTC.
CLASSES:
a) Single operator, single band, maximum 18 hours.
b) Single operator, multi-band, maximum 18 hours.
Note: All off-periods for single operators must be at least one hour long and clearly shown in the log.
c) Multi-operator, single transmitter, all bands.
d) QRP, 10 watt, as Class B.
Log entries from SWL stations are appreciated and will be awarded.
BANDS: 10, 15, 20, 40, 80 metre bands.
CONTEST CALL: CW "Test UBA", **SSB** "CO UBA".
EXCHANGE: RS/T, plus serial number starting from 001.
NOTE: Belgian stations give their province abbreviation, eg 59001/AN.
SCORING:
QSO with **ON, DA1** and **DA2** counts 10 points.
QSO with other European Community country stations, **DL, I, F,** inc **TK, LX, PA, EI, G, OZ, SV, CT, EA,** counts three points.
QSO with own country counts only once per band for QSO credit.
QSO with any other station counts one point.
MULTIPLIERS: All Belgian provinces, **AN, BT, HT, LB, LU, NR, OV, WV,** maximum nine per band.
Each of the prefixes **ON4, ON5, ON6, ON7, ON8, ON9, DA1, DA2,** maximum eight per band.
All other countries from the European community; **DL, I, F, LX, PA, EI, G, OZ, SV, CT, EA, TK,** counts for **F,** maximum 11 per band.
FINAL SCORE: Total QSO points times the total number of multiplier points.
LOGS: Showing date, time UTC, station worked, reports exchanged and respective serial number, points and multipliers. Use a different sheet for each band. Each entry must be accompanied by a summary sheet showing all the scoring information, the off-periods, class of entry, mode, name, call sign, full address and a signed declaration.
DECLARATION: "I declare that all contest rules and all the rules and regulations for amateur radio operations in my country have been observed and adhered to. I accept the decisions of the contest committee.
ADDRESS FOR LOGS: UBA HF Contest Committee, Galicia Jan ON6JG, Oude Gendarmeriestraat, 62, B-3100 Heist Op Den Berg. Belgium.
DEADLINE: All entries must be postmarked not later than 30 days after the contest.
AWARDS: The new "UBA Contest Award" will be sent to the highest scoring station in each class in each country. Other participants receive a certificate. A special engraved plaque will be awarded by ON6JG to the first entry in Class B of the **SSB** contest who proves all 28 multipliers have been worked. It is also possible to achieve the WABP (Worked all Belgian Provinces Award) for contacts with all provinces on two different bands, **QSL** cards for this award are not mandatory.

WORKED ALL BELGIAN PROVINCES AWARD

Enclose your claim with the contest log, or send your claim check list with 10 IRCs or US$3 to: UBA HF Awards Manager, Van Campenhout Mat ON5KL, Hospicestraat 175, B-9080 Moerbeke-Waas. Belgium.

BARTG SPRING RTTY CONTEST 1988

WHEN: 0200 UTC Saturday, March 19 until 0200 UTC Monday, March 21. The total contest period is 48 hours but not more than 30 hours of operation is permitted. Time spent as listening periods count as operating time. The 18 hours of non-operating time can be taken at any time during the contest period, but off-periods may not be less than three hours at a time. Times on the air must be summarised on the summary sheet.
WHO: There will be separate categories for single operator, multi-operator and shortwave listener stations.
BANDS: 3.5, 7.0, 14.0, 21.0 and 28 MHz amateur bands.
STATIONS: Stations may not be contacted more than once on any one band but additional contacts may be made with the same station if a different band is used.
COUNTRIES: The ARRL DX countries list will be used, and in addition, each W/K, VE/VO, and VK call area will be counted as a separate country. *NOTE:* W/K, VE/VO, and VK count once each only for QCA purposes.
MESSAGES: Messages will consist of:
a) Time UTC. This must consist of a full four figure group and the use of the expression "same" or "same as yours" are not permitted.
b) **RST** and Message Number. The number must consist of a three figure group and start with 001 for the first contact made.
POINTS: Points can be claimed as follows:
a) All two-way **RTTY** contacts with other stations within one's own country will score two points.
b) All two-way contacts with other stations outside one's own country will score 10 points.
c) All stations can claim a bonus of 200 points for each country worked, including their own. *NOTE:* That one country may be counted again if worked on a different band but continents are counted once only. *NOTE:* Proof of contact will be required in cases where the station worked does not appear in any other contest log received or the station worked does not submit a check log.
SCORING:
a) Two-way contact points times the total of countries worked.
b) Total country points times 200 times the number of continents worked (maximum six).
c) Add a) and b) together to obtain the final score.
Sample calculation:
Exchange Points (302) X Countries (10) = 3020
Country Points (10) X 200 X Continents (3) = 6000
a) and b) added together to give a score of 9020.
LOG AND SCORE SHEETS: Use a separate sheet for each band and indicate all times on the air.
Logs to contain:
Date, Time UTC, Call Sign of each station worked, **RST** and message number sent, Time **RST** and message number received and the points claimed. *NOTE:* Logs received from shortwave listeners must contain call sign of station heard, report sent by that station and call sign of the station being worked. Also date and time that the QSO was logged. Incomplete loggings are not eligible for scoring and will be classified as check logs. The summary sheet should show the full scoring, the times on the air, address for correspondence, and in the case of multi-operator stations, the names and call signs of all the operators involved with the operation of the station during the contest. All logs must be received by May 28, 1988, in order to qualify.
Send logs to: Peter Adams G6LZB, 464 Whippendell Road, Watford, Herts, England, WD1 7PT.
The judges decision will be final and no correspondence can be entered into in respect of incorrect or late arrivals. All logs submitted shall remain the property of the British Amateur Radio Teleprinter Group. Certificates will be awarded to the leading stations in each of the three groups, the top station in each continent and to the top station in each W/K, VE/VO, and VK call area.
ADDITIONAL NOTES: If any contestant manages to contact 25 or more different countries on two way RTTY during the contest, a claim may be made for the Quarter Century Award (QCA) issued by BARTG and for which a charge of $US4 or 18 IRCs is made. Holders of existing QCA awards should indicate and list new countries to be added to their existing records. Make your claim at the same time you send in your log. However, in view of the high volume of work which the contest manager will have to deal with, it will not be possible to prepare and dispatch any new awards or up-date any existing records until the final results of the contest have been evaluated and published.
Pressure of work, and the extra work involved in checking a long list of untidy Remembrance Day Contest logs has caused me to miss the deadline of February AR that I had set for the publication of the results of the 1987 Remembrance Day Contest, however they will be out with the March issue.

The vast majority of the logs that I have dealt with so far have been of a high standard and have not been penalised in any way. Some, however, are most untidy and attract intense scrutiny as can be expected.

Copy of the rules for the Belgian UBA contest arrived too late for publication in the January AR so those who enjoy a good CW contest missed out on the contest details, the full all mode rules as published this month will serve for the 1989 contest.

As you can see from the contest calendar column, the ZL and VK field days now coincide, and with the change to the rules allowing more repeat contacts with the ZL stations to be made, should make this contest more interesting on both sides of the Tasman Sea. Stan ZL2AHC, is the new ZL administrator for the NZART NFD and he, together with Jock White ZL2GX, have given much publicity to the two field days in New Zealand. It is now up to us to make the contest a memorable one. We have all agreed to hold our national field days on the weekend following the RSGB Commonwealth Contest.

VK2 TWO—METRE FM SIMPLEX CONTEST

On Friday, September 25, 1987, the New South Wales Division of the WIA held their first two metre FM simplex contest. The idea of the contest was to show that it is possible to talk city-wide without the need of repeaters. The contest was extended to the country as well, with a division for stations more than 160 kilometres from the Sydney General Post Office (GPO). The contest was from 9 pm to 11 pm on a Friday evening with a frequency limit of 145.000 to 145.600 MHz.

The contest had a built-in multiplier effect, by basing the points on the number of postcode areas worked. The final score is made up of the total number of stations worked multiplied by the number of stations worked multiplied by the number of postcode areas.

The results speak for themselves — 45 logs and over 50 other stations worked. Scores ranged from 2714 down to one (with two stations equal for 44th place). Power and antennas ran the full range from 2.5 watt hand-helds with rubber duckies, up to 120 watts into multi-element beams.

VK2AMV sent some photographs from 1950 showing him working two metres AM portable at Mount Panorama, Bathurst. The portable equipment has certainly got smaller and simpler. The hard-luck story of the contest must go to VK2DRR who went portable at Gan Gan Lookout near Port Stephens — but missed the country zone by only two or three kilometres.

Based on the success of this contest, the NSW Division of the WIA decided to hold more contests based upon the same formula — the next was a two metre SSB contest which was held on Friday, November 27, 1987.

RESULTS OF THE FIRST VK2 SIMPLEX CONTEST

VK2BIT	59 X 46 =	2714 M
VK2DLE	51 X 43 =	2193 M
VK2KAA	52 X 41 =	2132 M
VK2DAY	49 X 38 =	1862 M
VK2FJO	47 X 39 =	1833 M
VK2XDG	44 X 37 =	1628 M
VK2AST	44 X 35 =	1540 M
VK2BUV	43 X 35 =	1505 M
VK2HS	43 X 33 =	1419 M
VK2XZZ	39 X 35 =	1365 M
VK2HZ	40 X 35 =	1360 M
VK2BHG	40 X 35 =	1360 M
VK2WH	40 X 33 =	1320 M
VK2WI	38 X 32 =	1216 M
VK2YEW	38 X 32 =	1216 M
VK2AGF	39 X 31 =	1209 M
VK2CKL	37 X 30 =	1110 M
VK2ATV	35 X 31 =	1085 M
VK2BQS	35 X 30 =	1050 M
VK2XGX	35 X 25 =	1050 M
VK2KFU	34 X 28 =	952 M
VK2ZQA	34 X 28 =	952 M
VK2ELS	33 X 26 =	858 M
VK2XGK	33 X 25 =	825 M
VK2ZFZ	30 X 27 =	810 M
VK2AUE	29 X 44 =	696 M
VK2TSO	26 X 22 =	572 M
VK2CZZ	26 X 20 =	520 M
VK2DRR	24 X 21 =	504 M
VK2ZTM	24 X 20 =	480 M
VK2END	21 X 19 =	399 M
VK2XEH	22 X 18 =	396 M
VK2XDW	20 X 17 =	340 M
VK2BMX	19 X 17 =	323 M
VK2HT	20 X 16 =	320 M
VK2AXT	17 X 17 =	272 M
VK2AIC	15 X 14 =	210 M
VK2XHQ	14 X 13 =	182 M
VK2XGJ	12 X 12 =	144 M
VK2XNF	12 X 11 =	132 M
VK2XGM	10 X 9 =	90 C
VK2AMV	9 X 8 =	72 C
VK2GJ	5 X 4 =	20 C
VK2KAT	1 X 1 =	1 M
VK2ZKQ	1 X 1 =	1 M

M denotes Metropolitan zone
C denotes Country zone

First Overall
VK2BIT with 2714 points

Second Overall
VK2DLE with 2193 points

Third Overall
VK2KAA with 2132 points

First Country
VK2XGM with 90 points — Byron Bay

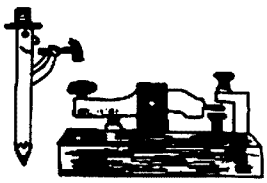
Second Country
VK2AMV with 72 points — Forbes

Third Country
VK2GJ with 20 points — Brunswick Heads

Contributed by Peter O'Connell VK2EMU

REMINDER!

Membership subscriptions are now due



Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

Have you noticed of late, a decline in your operating standards?

Are you becoming bored with the quality of your Morse contacts?

Perhaps we can blame the low sunspot cycle, as for the last few years we are more likely to have been chatting to the locals than working a lot of foreign operators. Are we getting sloppy?

Every amateur using the HF bands in Australia has passed an examination to prove that he can send and receive plain English text in Morse code. Even if you are a newcomer you will recognise that passing the examination has very little to do with operating on air successfully. We soon discover that we have been taught *nothing* about operating on air, so we get nervous. More nervous than we did before the examinations. And a great percentage of amateurs, unfortunately, never bother with Morse code at all. Those who do persist find many pitfalls to developing into a finished Morse operator, not in the least of which is the acquisition of bad habits. Many of these come from mimicking your peers and elders, some of whom are themselves the victims of bad CW habits.

Through the years amateur radio has developed a number of operating standards and procedures. If we all use different procedures, we will have difficulty in communicating with each other. This is especially important when dealing with non-English speaking amateurs. You can find the standard procedures in the Call Book, ARRL and RSGB Handbooks, etc. Next month I hope to expand on them. However, no matter how well or how fast you can send and receive, you will *still* come up against problems if you:

a) are on the wrong frequency, or
b) don't listen, or
c) don't think before you send.

a) THE RIGHT FREQUENCY

Although it is quite in order to operate split or duplex, it is usually unnecessary and wasteful of valuable spectrum space. Nothing is more frustrating than to work a net which is spread over 2 kHz or more of bandwidth. Not only do you have to juggle the RIT knob, but you may not know the proper net frequency, and you will not even hear a station if it is outside the passband of your receiver. All it takes is a knowledge of how your particular rig works (read the instructions) and the special effort, no matter how small, of tuning to the *exact* frequency. It will help if you turn off the RIT.

b) LISTENING

The Australian Call Book and most other publications are most specific, "Listen first before calling CQ and ask if the frequency is occupied at least twice."

It is no good listening if you have the attenuator in circuit, or if you are on the wrong antenna, so, whilst you are checking the little details (RIT off) you can jot down the date and time, frequency etc, in your notebook. A friend of mine recently related that he spent the weekend listening for moonbounce signals, something that involves a lot of setting up with antenna direction, amplifiers, etc. Only to discover the antenna coax lying on the bench! So remember to check the details while you are listening. If you hear someone using the frequency you can either wait for them to finish, change frequency, or, of course, you could turn on the linear an walk all over them. I am being sarcastic but it seems to happen often enough, especially if QRP stations are on the frequency. You might also care to have a look at your frequency list to see that there is no net scheduled for the next half-hour or so on that frequency. Then simply call QRL? twice before you use the frequency for tuning, select your power requirement and call CQ only if you hear no reply (don't forget to use your dummy load!).

If you wish to tail-end, break-in, or join a net, it is only polite to move up or down a few kHz and tune your rig there, using the above procedure first. Then listen on the frequency in use until it is time to send. If you like to listen to a 1000 Hz note, your transmit frequency will probably be 250 or 300 Hz low, check your instruction manual and know the various offsets your rig has — most commercial rigs transmit 600 Hz down and the passband favours a tone of 750 to 800 Hz.

Remember your transmit frequency will be way out is you accidentally leave the RIT on. As you can see, the above is all learned through listening, and although it becomes second nature after a while, it is a bit of a chore at first. We haven't even touched the key yet!

c) WHAT TO SEND

To many people, operating time is precious. There are few amateurs who will stay around while someone "waffles" on about the weather or calls CQCQCQ constantly for minutes on end. Morse code is slow enough already, we don't ums, ahs, there's or call signs *every* start and finish of *every* over. You know what I mean, that is why we have to learn so many abbreviations. It is common (if unofficial) to send "R" when returning to a contact to indicate that you have received the previous over. "Okay on your rig, antenna, weather, power" etc, etc, ad nausium, is not only superfluous, but time consuming. We would get nowhere if we spent half the time on air repeating back everything said on the previous over. Don't laugh! I have heard it done. You can take it for granted that, if the other station sends "R" he has received your over. If he misses something he will question you for a repeat. You can bet that an operator "rabbitting-on" about trivialities will provide all the listeners with an opportunity to nip out of the shack and they may then miss something important.

Here are a few quick guidelines:

Don't send "R" if you did not copy or read the *whole QSO.*

It is only required to identify every 10 minutes, merely send "de VK3CQ" as appropriate at the start or end of an over when you notice that 10 minutes has elapsed. It is certainly not necessary to send *both* call signs at the start and finish of every over.

If you are rag-chewing and wish to over, merely send a fullstop and "K".

If you are on a net, send the next station's call sign followed by your own. It is a waste of time raving on by sending "I will keep it short and pass it on to Fred as I think it is his turn next" as you will have taken over a minute to send that much if you are working at 10 WPM or so! ! !

Make your good-byes short and sweet.

Have your feelings been hurt because you were just getting interested in a QSO and the other station sent "QRU 73 VK3XXX de JA1XXX SK"? Many operators tend to over-compensate and may spend five minutes or so merely saying good-bye. This can be downright painful if you are in a hurry to nip out of the shack. "SK" is all you will get in a contest, don't let your feelings be hurt by this. A "GL" or "73" sent during a contest is really a bonus and may cost the sender valuable points.

By following standard procedures well, you can take pride in the fact that the people listening will be learning from you. Other operators will enjoy talking to you and you will make many more enjoyable contacts. Don't be shy in giving praise to others whose style you admire, they may be fast and accurate, or easy to copy, if you like their Morse, say so. Conversely, if someone is off frequency or too fast for you, they will appreciate it if you tell them. It is not much good pretending you can copy bad spacing, be polite, but tell them to slow down. That is QRS, not QRN. There are Q codes for some, and old (but good) Z codes for others.

ORG	Your exact frequency is . . . kHz.
ORH	Your frequency varies.
QRI	Your note varies.
ORK	The intelligibility of your signal is (1 to 5).
QSW?	Will you send on . . . kHz or MHz?
ZCK	Check your keying.
ZCL	Transmit your call letters intelligibly.
ZDM	Your dots are missing.
ZSU	Your signals are unreadable.

There are also a number of ON codes for net operation that I hope to give in next month's column.

CW OPERATORS QRP CLUB

I have recently relented, contrary to my policy of not joining any more clubs, and was accepted for this club in November. Even though I do not usually operate QRP, I believe it is the only CW-only club in Australia and, therefore, well worth joining for that reason alone. I hope my home-brew equipment will now get some use.

The clubs three basic aims are:

1. Promote the use of low-powered two-way radio communication in the amateur service. (QRP for all club activities means five watts maximum output to the antenna).
2. Promote the use of CW mode.
3. Promote "home-brewing" of all QRP station equipment used by members.

Current fees as at the end of 1987 are — VK $A10, ZL $A12, DX $A14. A bulletin is sent quarterly. For more information or for applications contact Len O'Donnell, 33 Lucas Street, Richmond, SA. 5033.

I hope to have more information on the club available in future as I become more involved and get the "bugs" out of my equipment. I hope you will support them too. If you have any special interests please let me know.

BALLARAT HAMFEST

It was a long trip, four hours each way, but well worth the effort. My thanks to the President, Ron VK3XOA and Annette for providing my accommodation on Saturday night.

The Morse Speed Test was a bit of a speed writing test, but typewriters were allowed, even though no one brought one. I will give you a hint if you want to be ready for next year. Make up a tape of random letters and numbers with very close spacing and no breaks. A lot of fun. Thanks Ballarat Club and see you next time.

73, Gil VK3CQ.

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REMEMBER

When inquiring about products published in AR always mention where you read of the product.

Electro-Magnetic Compatibility Report

What can we learn from an improvised Jacky Test?

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

EMC engineering distinguishes between three different ways wanted and/or unwanted RF radiation may enter electronic equipment.

1. The signal may enter via the antenna and affect the front end. The front end should have sufficient selectivity and signal handling capability (dynamic range) to select only signals which are specifically transmitted for the service appropriate to the equipment.
2. The signals may enter via attached leads, interconnecting cables (VCR to television set, turntable to AF amplifier, etc) or the mains cable and loudspeaker cables.
3. The signals may be picked up by the components and wiring of the equipment chassis, because of inadequate shielding and earthing.

For all three EMC problems there are standards by DIN (Deutsche Industrie Norm = German Industrial Standard) and VDE (Verein Deutscher Elektrotechniker = Association of German Electrical Engineers). Many DL radio amateurs are prominent members of these organisations and committees, also executives in the electronic industry.

The DARC speaks for roughly 50 000 members, about 80 percent of all DL amateurs, with a fairly strong voice.

The third mentioned case — RF pick-up by chassis components and internal wiring — is investigated with the "TEM Test Cell" called "Jacky". The DIN standard No 45 305 Part 302 describes the test equipment. In order to obtain both qualitive and also quantitatively precise results, which can be repeated by all concerned and anywhere in the world, usable in a court of law, very detailed information is given. Precision equipment for the generation of the wanted and unwanted signals, matching circuits, filters, field strength meters, blocking circuits, and load resistor, as well as the screened room and the dimensions of the test cell are specified. This *information was* distributed world-wide — including Australia — via the ITU, because all countries face the same problems. Australia is not a "different country" as far as EMC is concerned!

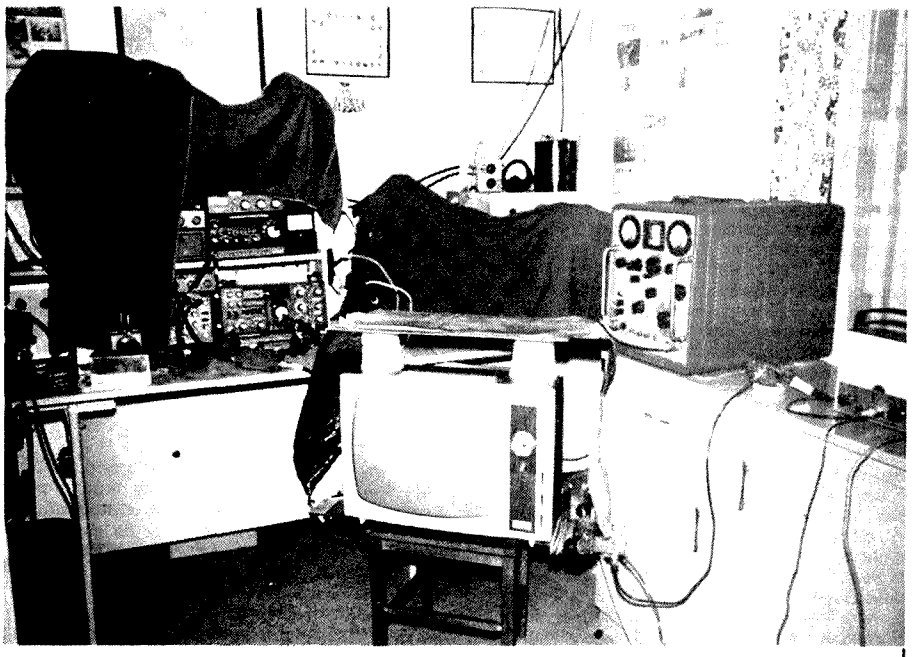
Radio amateurs have been known for not giving up too soon, from the early days, when they discovered the usefulness of short waves for low power DCX communication, to the present time, with the construction and operation of satellites. It is therefore of great interest to see how far we can simplify the Jacky test, using only radio amateur equipment and still getting useful and expected results. We may not know whether the RF field to test a television set is 2.8 or 3 volts per metre, but we can definitely find out whether one set is 100 times more immune to unwanted power from an amateur transmitter than another television receiver from a different manufacturer. Meaningful test results have been obtained with:

- Amateur band transmitter (100 watt PEP maximum adjustable from zero)
- A match-box, so that the transmitter sees 50 ohm as load
- A low pass filter with about 70 dB attenuation for frequencies above 45 MHz
- An SWR bridge
- A dummy load 50 to 200 ohm
- A mains line filter (home-made)
- A multimeter with diode RF probe (home-made).

The television set to be tested should have a coaxial feeder to the television antenna for the wanted signal (if no signal generator for this signal is available).

All radio amateurs should have this equipment.

A further requirement is two pieces of sheet metal of the necessary size and shape to form the test cell (a wideband Lecher line). Parts of this line can be made from kitchen-type aluminium foil.



Photograph depicting Improvised Jacky Test.

The block diagram shows the assembled equipment interconnected with coaxial cable. The photograph shows one way of doing it.

An aluminium sheet is placed on a chair. It is the same size as the base of the television set. At both sides, smaller sheets of aluminium are attached and the ends at both sides carry coaxial fittings. This is the earthed plate. The mains line filter is attached to the right hand end of the earthed plate. The unwanted signal from the television is connected to the left hand coaxial fitting. The signal generator output cable goes to the television set antenna terminal. The test cell output coaxial connector is attached via a coaxial cable to the load resistor (dummy load), which is in this case a 100 ohm resistor combination capable of handling 20 watts continuously (or 100 watts in short pulses). The RF probe enables the voltage across this load resistor to be indicated by the voltmeter. On top of the television set, two plastic cups are used as spacers to carry the top (RF-carrying) plate. A handy way to extend this RF line plate is to put aluminium foil on top of the upper plate and let it hang down at both sides. The ends are brought to a point and connected to the centre pin of the coaxial fitting. The transmitter could be operated with the carrier only in AM mode, or for SSB an audio generator (homemade) was used as a source. (Two to ne could also be used). A television antenna may replace the signal generator as source for the wanted signal of one millivolt if the television antenna has a coaxial feeder. A picture just free of snow will be produced on a typical television set by this order of signal.

TEST NO 1

The first television set was a black and white model T-19-P3 from General Electric, purchased in June 1969. Removing the rear cover showed that the designer was most likely an American radio amateur who understood his job very well. The company also deserves praise for allowing the designer to do his job properly. The metal chassis could be earthed. It had openings for the valve holders and otherwise covered the printed board. The tuner and EHT components were fully shielded. A large shield was placed above the picture tube. All these metal parts were interconnected at several places with 12 millimetres wide short metal strips, thus of low inductance and resistance. The mains cable had three cores and the earth lead was connected to the chassis.

For radio amateurs it is only of interest how the equipment behaves when the unwanted legally transmitted signal is on an amateur band frequency. The television channels 2, 7, 9 and 10 were tested, with the transmitter in the 20, 15 and 10 metre bands. The unwanted transmitted signal was tuned over the whole amateur band to find the most critical frequency. Sometimes more than one critical frequency was found (as shown by two readings in the table). Channel 2 and 21.4 MHz transmitted frequency are a difficult pair. With lower levels of the unwanted channel signal the AGC increases the front end and IF gain of the television set, but due to limited front end selectivity the harmonic free 21.4 MHz signal reaches the television mixer stage.

Here in the mixer, the harmonics are now generated, with the same result as if the transmitter had produced them in the first case. The transmitter has about 70 dB attenuation of the third harmonic, and the low pass filter add another 70 dB for frequencies above 45 MHz. Therefore, it is not an incoming third harmonic of the 21.4 MHz transmitted signal which affects the television set. This problem becomes even worse when the transmitter is on 28.8 MHz, and especially with the television on channels 7, 9 and 10, because the front end selectivity gets worse at higher frequencies (lower L/C — ratio, higher RF losses of the tuned circuit components) and the transmitted signal is closer to the television IF (intermediate frequency) so can reach directly the high gain IF amplifier stages. By comparing the field strength values measured by DL1BU (*Ama-*

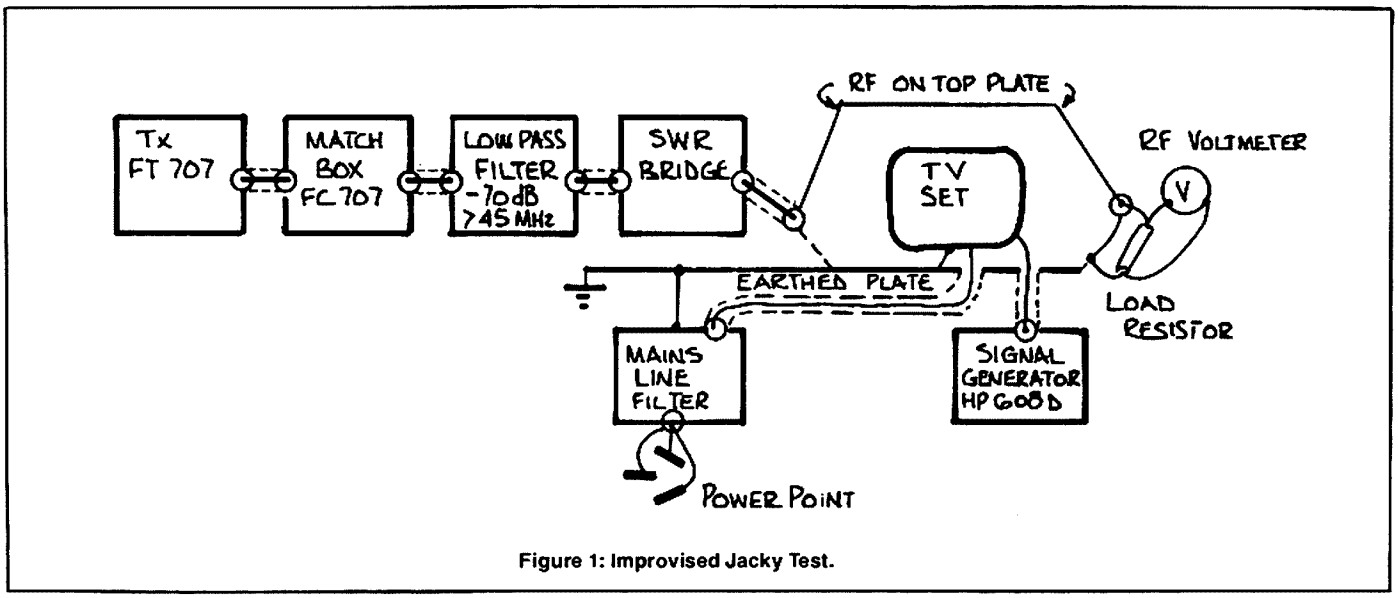


Figure 1: Improvised Jacky Test.

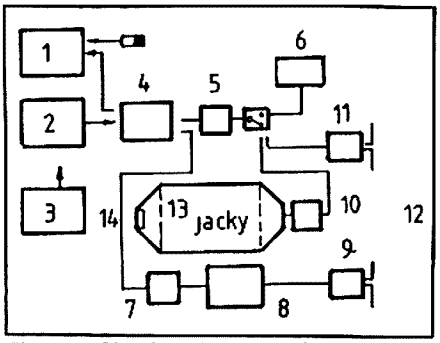


Figure 2: Circuit of the measuring set-up for the extended Jacky method at the Philips measuring cabin at the Krefeld plant.

1 Signal generator up to 30 MHz
2 Signal generator 30. . .300 MHz
3 External modulator
4 Low pass filter
5 Matching network (also 10 and 7)
6 RF voltmeter
7 See 5
8 Wideband amplifier
9 Balun (also 11)
10 See 5
11 See 9
12 Dipoles, 2 x 10 metres rolled up, one placed at the top wall and one placed at the bottom wall of the measuring cabin
13 Jacky Lecher line, 200 ohm impedance wideband
14 200 ohm load resistor (dummy load)

teur Radio January 1987, page 53) which can be expected around a typical amateur radio transmitter installation running 400 watts PEP, we can understand the problem. FTZ (the German DOC) and DARC (the German WIA) wanted a test cell field-strength of 10V/m, the industry fought for 3V/m (present standard) and the EEC wants only 2.8V/m, although several leading manufacturers have achieved mush better immunity already. In the USA 1V/m was suggested for voluntary introduction. This is a next to useless step — and they know it!

TV CHANNEL	WANTED SIGNAL			
UNWANTED SIGNAL				
	uV	MHz	V/100 ohm	MHz
2	1000	66.2	10	14.3
2	100	66.2	7	14.3
2	10	66.2	3	14.3
7	1000	176	7	14.3
7	100	176	4	14.3
7	10	176	2	14.3
9	1000	198/191	7 13	14.3
9	100	198/191	2 6	14.3
9	10	198/191	1.5 2	14.3
10	1000	212	7.5	14.3
10	100	212	4	14.3
10	10	212	0.7	14.3
2	1000	68.2	4	21.4
2	100	68.2	0.5	21.4
2	10	68.2	<0.4	21.4
7	1000	176	7	21.4
7	100	176	4.5	21.4
7	10	176	2	21.4
9	1000	198/191	3 13	21.4
9	100	198/191	0.6 6	21.4
9	10	198/191	0.3 2	21.4
10	1000	212	7.5	21.4
10	100	212	3	21.4
10	10	212	0.6	21.4
2	1000	68	4.5	28.8
2	100	68	1.5	28.8
2	10	68	0.3	28.8
7	1000	182	0.6	28.8
7	100	182	0.1	28.8
7	10	182	~0.01	28.8
9	1000	202	0.3	28.8
9	100	202	0.05	28.8
9	10	202	0.03	28.8
10	1000	212	0.15	28.8
10	100	212	0.01	28.8
10	10	212	~0.01	28.8

1 mV modulated to 80 percent with 1 kHz audio is the standard test cell wanted signal.

The listed voltage reading of the unwanted signal are those where either the picture or the audio began to be affected, tuning to the most critical signal frequency.

TEST NO 2

This television set was a VHF-UHF colour set of local manufacture, purchased in November 1977. It ad a small metal chassis for the power supply, which was earthed via the three-core mains cable and three-pin plug. Good features were the shield around the picture tube, and the shielding covers of the tuners and IF strip, which were both open on the printed board side. Not so desirable was the unshielded EHT section, bundles of unshielded cables of ½ metre length, and the unshielded hinged circuit boards.

TV CHANNEL	WANTED SIGNAL			
UNWANTED SIGNAL				
	uV	MHz	V/100 ohm	MHz
2	1000	68-70	25	14.3
2	100	68-70	10	14.3
2	10	68-70	5	14.3
7	1000	180-190	1	14.3
7	100	180-190	0.6	14.3
7	10	180-190	0.6	14.3
9	1000	200	0.7	14.3
9	100	200	0.7	14.3
9	10	200	0.7	14.3
10	1000	212	0.7	14.3
10	100	212	0.7	14.3
10	10	212	0.7	14.3
2	1000	70	0.03	21.43
2	100	70	0.02	21.43
2	10	70	0.01	21.43
7	1000	180	1.5	21.43
7	100	180	0.8	21.43
7	10	180	0.7	21.43
9	1000	202	4.5	21.43
9	100	202	4	21.43
9	10	202	0.6	21.43
10	1000	212	2	21.43
10	100	212	0.2	21.43
10	10	212	0.2	21.43
2	1000	68	3	28.8
2	100	68	0.5	28.8
2	10	68	0.3	28.8
7	1000	189	0.3	28.8
7	100	189	0.2	28.8
7	10	189	0.01	28.8
9	1000	199	0.05	28.8
9	100	199	0.01	28.8
9	10	199	>0.01	28.8
10	1000	210	1	28.8
10	100	210	0.3	28.8
10	10	210	<0.01	28.8

28	no	sig	0.6	30 MHz
28	no	sig	20	21.4 MHz
28	no	sig	10	14.3 MHz

In the television IF range 36-37 MHz 40 mV at antenna terminal caused IF breakthrough of the front end.

COMMENT

With the exception of Channel 2 and 14.3 MHz transmitter operation, the situation seems to be very critical. Even this improvised Jacky test reflects quite clearly the design features of different television sets and construction concepts. Hi Fi AM/FM tuners, audio amplifiers, VCRs, and tape recorders, computers, etc may be tested in this way. The test can be carried out with typical, and usually available, amateur station equipment pulse some sheet metal.

One may test electronic equipment family members intend to buy; or demonstrate to a neighbour, sales or service person, how well the offered equipment may stand up to legal radio signals. These signals may come from a nearby television or BC high power station too, not necessarily from our amateur transmitter. In one case, garden club members of some towns (Hamburg was one) used long wire antennas to catch enough RF energy from a nearby 100 kW (plus) broadcast transmitter to feed light globes. They were later charged with stealing transmitter energy!

Unwanted television antennas also absorb RF energy from amateur radio transmissions. It is hoped that many readers will soon test their television sets, etc and the WIA could perhaps pass the collected results on to DOC.

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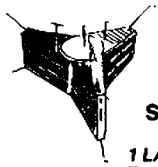
CAUTION: Dangerous voltages are present in the circuitry of all televisions. Remove power before removing cover and/or working on circuitry.



AMSAT Australia

SATELLITE ACTIVITY FOR THE MONTHS OF SEPTEMBER/ OCTOBER 1987.

1 LAUNCHES

The following launching announcements have been received:

INTL NO 1987	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INC deg
083A	Cosmos 1887	Sep 29	USSR	90.5	406	224	62.8
084A	Cosmos 1888	Oct 01	USSR	24hr03m	35980		1.4
085A	Cosmos 1889	Oct 09	USSR	90.4	400	216	70.0
086A	Cosmos 1890	Oct 10	USSR	92.9	442	414	65.0
087A	Cosmos 1891	Oct 14	USSR	104.9	1030	957	83.0
068A	Cosmos 1892	Oct 20	USSR	97.8	678	647	82.5
069A	Cosmos 1893	Oct 22	USSR	89.7	374	179	67.0

2 RETURNS

During the period 82 objects decayed including the following satellites:

1977-102A	ISEE 1	Sep 26
1977-102B	ISEE 2	Sep 26
1987-075A	PRC 21	Oct 04
1987-077A	Cosmos 1882	Oct 06
1987-003A	Cosmos 1887	Oct 12

3 NOTES

Cosmos 1887 carried instruments for research into the effects of spaceflight on monkeys and other biological objects as well as radiation safety and physics. Experiments are also being carried out to study and use space for peaceful purposes. Taking part in this work are scientists from Hungary, Germany (GDR), Poland, Rumania, Czechoslovakia, United States of America, France and the European Space Agency.

The descent module of the satellite touched down at 0403 UTC, October 12, 1987, in an area which was not its predetermined landing site.

—Contributed by Bob Arnold VK3ZBB

ar

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

Many of us look back with nostalgia to the days of essay-type examinations which let us use our sometimes active imaginations. We do not accept easily the multiple choice examination. It is 'not the same'. Many of us sat for the common 'seven out of nine' essay examination. It was not always so.

The 'answer all questions' examination was used during the 1920s. The most interesting changes were from the almost wholly descriptive towards a higher theoretical content and the development of a structured question paper. The two examples below illustrate these changes fairly well. Perhaps the multiple choice paper was simply an inevitable step in evolution towards the impossible perfect exam.

The emphasis on circuit diagrams had already declined in 1924. The reduced requirement for two or three in each examination continued until the multiple choice examinations were introduced. Perhaps the inability of multiple choice questions to cope with circuit design and complex circuit principles is the most important limitation of this sort of examination for amateur radio. There is not much scope for careful circuit analysis.

Those who have passed recently might think about how they would have coped with these papers. You might not need much maths but you would certainly need some drafting skill, and reasonable neatness. If you should be tempted to design and build an arc transmitter circa 1920, please take note that there are no questions on interference, bandwidth, and unorthodox transmissions generally.

EXAMINATION PAPER (c1920. Marks for each question not shown)

1. Give a diagram of a Valve Transmitting Set that you propose to use.
2. What are the relative advantages of direct coupled, two and three coils, inductively coupled sets.
3. Give the dimensions of your proposed aerial and calculate the natural wavelength of same.
4. Show a diagram of an arc transmitter.
5. Describe the various components of the arc set you propose to use.
6. Give a diagram of a receiver with three valves employing one HF, one LF, and one detector, utilising regeneration which is permissible under the regulations.

Amateur Operator's Certificate of Proficiency. Melbourne, September 23, 1924 (10 marks for each question)

1. Define
   (a) Ohms Law,
   (b) Wavelength,
   (c) High frequency resistance.
2. Give a diagram of a 10 watt transmitter capable of being used for CW Tonic Train and Telephony, showing the source of primary energy supplied, the means of rectification, smoothing, etc, and including indicating meters in the aerial circuit, high tension and low tension circuit. State the high tension and low tension voltage, and the amount of plate current at maximum efficiency.
3. Explain briefly the functions of the various parts of the apparatus shown in Answer No 2.
4. Show a diagram of an instrument capable of rectifying alternating current in full wave form by the use of an electrolyte, and explain its operation.
5. (a) Take your own aerial as an example and state how you would ascertain its natural frequency.
   (b) Explain briefly the theory of the three electrode valve.
6. (a) Describe the action of any accumulator you are familiar with.
   (b) Explain the theory of a counterpoise.
7. Explain the construction and operation of a microphone suitable for Radio Telephony.
8. Show a diagram of a three valve receiver designed for use as a High Frequency amplifier, Detector and Audio Frequency amplifier. Arrange the circuit so that, with a change over switch or unit-capacity key, the following combinations are possible:
   (a) One Detector only.
   (b) High Frequency Amp and Detector.
   (c) High Frequency Amp, Detector and Low Frequency Amp.

   Plugs and jacks in this circuit not to be used.
9. (a) What is decrement, and what decrement is permissible in a CW transmitter?
   (b) How do you know when your receiver is in a state of oscillation, and what effect will an oscillating valve have on damped wave reception?
10. (a) What will be the total resistance of three resistances of 6 ohms each —
    (a) connected to parallel.
    (b) connected to series.
    (b) What will be the total capacity of four condensers each 5 mf connected —
    (a) in series.
    (b) in parallel.

ar

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

1987 CONTEST

For me the contest got off to a very slow start, and things went from bad to worse later in the evening on 80 metres, with 5/9+ static. After battling with the noise level for an hour or so I decided to call it a night!

My only DX-YL contact was Diana G4EZI, although I was informed that some of the North American YLs were working the contest. Unfortunately, I didn't catch up with any of them. Probably a case of not being in the right place at the right time.

Once again I would like to thank the many OMs who gave us their support on phone and CW, and helped to make the contest successful.

We have a winner for the Five Year Trophy, and the Florence McKenzie Trophy, and hope to have the contest results in time for next month's *Amateur Radio*.

At the time of writing, 27 logs have been received, 16 ALARA members and 11 OMs, (one of these being from Finland). Six were DX logs, and there were three check logs.

In conjunction with South Australia's Jubilee 150, Carol VK5PWA, was co-ordinator of a project involving 15 unemployed young people. Although they did not receive the award, we would like to congratulate Carol on a fine achievement.

Jobless tourism project in line for top award

PORT LINCOLN — A Jubilee 150 project which involved 15 unemployed young people in the production of Port Lincoln tourist brochures is in the running for an Australian Tourism Award to be decided in Perth on Friday.

The project, co-ordinated by Ms Carol McKenzie, of Port Lincoln, won an SA tourism award for the Port Lincoln City Council this year, under the category of the most effective use of funding by a local authority to promote SA tourism. The win made it eligible for the national titles.

The project cost $130 000, which came from the Office of Employment and Training and was managed by the city council.

Ms McKenzie said each member of the team had helped research, design, write, print and distribute a series of eight brochures highlighting Port Lincoln's best tourist spots, eating places, entertainments and historic sites, including the city's cemetery.

The mayor of Port Lincoln, Mr Tom Secker, said there had been a heavy demand by tourists for the brochures. He will attend the national awards ceremony in Perth and is hoping to bring back a prize.

From *The Advertiser*, Monday, October 19, 1987

YL ACTIVITY DAY

I have received a letter from Diana G4EZI, regarding YL Activity Day, which is held on the sixth of each month. Diana says:

"I am trying to get YL Activity Day on the sixth of the month reactivated. I know the information still goes out faithfully in all the YL magazines, but I do not think anyone actually goes on these days! It used to be such fun in the "good old days" of '79 when it first started and lots of YLs took part, so now that conditions are improving, I think we ought to get it revitalised. It just needs a bit of enthusiasm!"

YL Activity Day has not been well patronised of recent years, with poor propagation most of the time, or no propagation at all. Perhaps now things are picking up again we should consider this opportunity to get together on air for a chat.

Listen on the hour UTC:

PHONE — 3.588, 14.288, 21.188, 21.388, 28.588, 28.688 MHz

CW — 3.530, 14.058, 21.058, 21.133, 28.088, 28.133 MHz.

If no YL activity is heard, call "CQ YL" as others may be listening too.

YL-DX

Annabelle N7GGH/KH9, has been active from Wake Island, and Lois WB3EFQ/PJ7, Nellie ZE1CI, Geny PY5YL and Amanda LU1MFZ (mainly operating CW), have given new YL countries to many needing them.

Jan WB2JCE and Mary Lou NM7N, will be going on a DXpedition to Niue Island this month and hope to be on air from February 21 to 26, using both CW and SSB. Call signs will be ZK2JS and ZK2MB, respectively. QSL via home call.

NEW MEMBERS

A warm welcome to:

Noela VK4MBP, Val ZL3GW, Christine VK4KCA, Phyl Vk3PYL. Great to have you in ALARA.

Bye for this month, 73/33

Joy VK2EBX

ar

Intruder Watch

As mentioned in the January column, the 28 MHz rubbish coming from Asia is increasing, and, as forecast, is now being heard in southern Australia. Formerly it was only being heard in VK8 and VK4. This will turn out to be bad news. Let us know if you hear it. Short Asian contacts, no amateur call signs, from 28.000 up to about 28.700 MHz.

The DARC (West German) Intruder Watch received a telegram to the effect that "Radio Pakistan (Islamabad) has discontinued the use of the frequency 7.100 MHz from October 20, 1987" — Hooray! Chalk one up for DARC.

October last year saw reports come in from VK2s DEJ, OS, QL; VK3s AMD, XB; VK4s AKX, BG, BHJ, BTW, DA, OD; VK5s GZ, TL; VK6RO; VK7RH; VL8s HA and JF. Many thanks to those who helped out. Statistics were as follows:

87 AM intruders;
176 CW intruders;
109 RTTY intruders;
87 intruders using other modes, and
49 intruders identified themselves.

THE MODE FOR THE MONTH

This month we deal with the mode R7B, which is Amplitude Modulated, reduced carrier, multi-channel voice frequency telegraphy. Being a mode that amateurs are not permitted to use makes it a little easier to identify as an intruder.

It sounds to me like a timber yard circular saw, and, once heard, is easily remembered. If you hear it on any of the following band segments, you can be sure that it is an intruder.

80-metres — 3.5 to 3.7 MHz;
40-metres — 7.1 to 7.3 MHz;
20-metres — 14.0 to 14.25 MHz;
15-metres — 21.0 to 21.45 MHz, and
10-metres — 28.0 to 29.7 MHz.

R7B is by no means a rare signal to be heard on the bands, and often occupies a bandwidth up to 30 kHz, but it is usually around 5 to 6 kHz wide.

Next month we will look at the mode B9W. See you then.

ar

How's DX?

INTERESTING QSOs ON THE EAST COAST

November 16, 1987 — 14 MHz, CW: Norman GB4ORH, from Hull, England. Special Event Station for launch of *Operation Raleigh*, a scientific expedition all over the globe for young adventurers. QSL via the bureau.

December 5, 1987 — 14 MHz, SSB: Terry TO8KD, from Noumea, PO Box 2116, Noumea, New Caledonia. During December amateurs in FK8 were using the Special Prefix to commemorate the South Pacific Games, which were held in Noumea during December.

December 5, 1987 — 14 MHz, CW: Laurent J28EN, from the Republic of Djibouti. QSL via PO Box 1076, Djibouti.

INTERESTING QSL CARDS RECEIVED

PZ1DC (Direct); JW1LK (Bureau); BV0BG (Senator Barry Goldwater (from the USA) on a Dxpedition to Taiwan in January 1986) (via Bureau).

Contributed by Steve Pall VK2PS

NAVASSA ISLAND DXPEDITION

Bob N2EDF and Tony K2SG, of the 1985 6Y5NR?KP1 DXpedition, will lead an assualt on KP1/Navassa Island, from February 10 to 18. The other members of the party will include Lefty KE4VU, Dan N4GNR and Bob W3GH. A charter has been arranged from Kingston, Jamaica.

The DXpedition will be operating sideband as N2EDF/KP1, and CW as K2SG/KP1, using 160 through to 10 metres, 24 hours a day, with the possibility of RTTY and SSTV. QSLs will not be via the home calls, and will be announced later.

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Club Corner

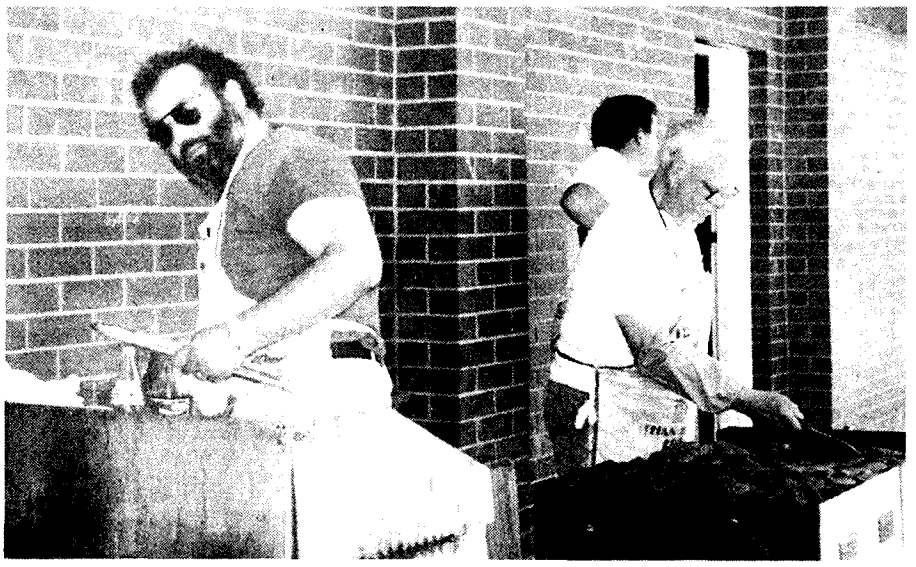
BALLARAT AMATEUR RADIO GROUP HAMVENTION

Ballarat Amateur Radio Group once again held their Annual Hamvention at the Marty Busch Sports Ground on Sunday, November 1, 1987.

Hamvention Organiser, Kevin VK3WN.

Kevin VK3WN, assisted by an enthusiastic band of helpers, provided an excellent spread of "'what everyone likes to see at a convention" — displays, events, eyeballs and, of course, radio equipment.

The weekend began on the Saturday night with an informal counter tea which was well attended. Sunday saw the Hamvention begin. All major amateur radio brands of equipment were represented, preloved equipment dealers were also present. The DOTC stand and satellite television display were extremely popular as was the working packet radio display. Meanwhile, outside the foxhunters and other contestants were toiling away in 30 degree Celsius heat!



Lou VK3DFI (left) and Maurie VK3XEX — Chefs of the Day.

From left: Ewen VK3BMV, Ron VK3XOA and George VK3DOK.

As usual, an excellent lunch was provided by the BARG ladies.

The lucky winner of the special effort was Dick VK3AEX, with Ewen VK3BMV, being the highest points-scorer in the events section.

Thanks are extended to those who provided activities for the children, as a radio convention can be rather boring for children after the first five minutes!

Contributed by Ron Watkins VK3XOA, President, Ballarat Amateur Radio Group

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ST GEORGE AMATEUR RADIO SOCIETY

The weekend of March 28/29 1987, was a centennial historical date for the city of Hurstville, NSW.

One hundred years ago the first steam train service starting at Hurstville and running to Cronulla was established.

The local municipal council and the Chamber of Commerce decided to pool ideas to present a really enjoyable weekend event and named it "The Great Steam Train Centenary Celebration".

A large section of the main road was closed off for the day to allow setting up many side-shows, stalls, food stands and musicians. The Council Civic Hall was a spacious exhibition area with widely differing displays of hobbies and arts. The St George Amateur Radio Society were happy to represent amateur radio.

Several amateur items were operating including a computer, VK2PD, giving video readouts of various sections of amateur radio. Two metres was fairly active for all to hear and was involved in the Hurstville to Cronulla Great Steam Train Race.

The fun race between vintage cars and the train, with VK2BZD using two metres on the train and VK2DQP in one vintage car.

Members of the club endeavoured to generate new interest for the club which is in the district, and distributed WIA literature when requested.

All who assisted with the display, club members or not, enjoyed the fine all-round show.

—Contributed by John Bunn VK2NDJ, for SGARS

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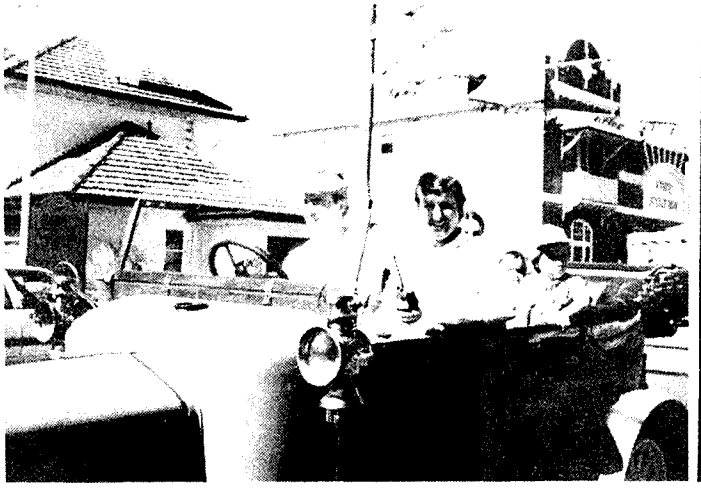

VK2DQP took part in the Great Steam Train Race.

The St George Amateur Radio Display.

WICEN News

THE SMALLEST WICEN EXERCISE? ? ?

Peter O'Connell VK2EMU
3A Algernon Street, Oatley, NSW. 2223

Not every WICEN exercise or operation is an "all singing and dancing event" with two dozen operators, multiple nets and kilowatts galore. Several months ago, what could be the smallest possible WICEN event took place.

The Volunteer Air Patrol (VAP) and the Royal Volunteer Coast Guard (RVCG), are both members (as is WICEN) of the Volunteer Rescue Association (VRA), the umbrella organisation of such groups in New South Wales. The VAP and RVCC has organised a joint exercise for Sunday, October 18, consisting of a number of simulated air/sea searches off the coast between Sydney and Wollongong. This would give some RVCG personnel a look at the ocean from an aircraft, to understand the difficulities associated with looking for a speck on the ocean, as well as giving the VAP some experience in sea searches. The VAP were bases at Webberburn about 15 kilometres south of Campbelltown, while the RVCG were based at Garie Beach carpark. While these two sites were only 25-30 kilometres apart, the VRA low band VHF radios were unsuccessful because of hills in between.

A request was made for WICEN to provide a radio link between the two sites. Kevin VK2CKD and Peter VK2EMU, volunteered and headed out to Garie Beach and Webberburn. A link was made on two metres first via the Heathcote repeater and then switched to the WICEN repeater at Chatswood. This path was a little scratchy, but the operators were uninterrupted all day, except for one or two calls of "CQ JOTA"! Only about a dozen messages were passed all day, but these were used to co-ordinate the exercises, aircraft movements, etc. Once the aircraft got to 500 metres, direct communications from the aircraft to Garie Beach and Webberburn was possible on all frequencies — VRA VHF Aircraft VHF Marine VHF and Marine 27 MHz. One or two of the aircraft looked a little like an amateur's car — antennas everywhere.

On the whole a very small exercise, but one which showed other rescue groups exactly what WICEN could do, as well as giving the WICEN operators some practice working with them.

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Beacons & Repeaters

Tim Mills VK2ZTM
FTAC BEACON CO-ORDINATOR

There have been several letters recently on both beacon and repeater matters — thank you. The Beacon Policy Paper will be further considered at the April Federal Convention.

At last year's convention, the subject of two metre repeaters above 147 MHz was discussed with respect to the effect the adjacent paging band was having on is operation. The subject has remained under investigation and the recent expansion of paging networks in VK2 has highlighted the need to do something. It is important to maintain an amateur presence in the top MHz. At present, the repeater inputs are at the top end, closest to the pager band. It may assist many repeaters to reverse the existing input/output which would add a further 600 kHz of separation to the repeater input frequency.

The repeater channels are included in the national band plan. A change requires a national vote. One problem a change would introduce would occur on the south-east coastline of Australia, whenever there was a trans-Tasman opening. The New Zealand repeaters use the same channels as Australia. If an opening were to occur, the respective countries' repeaters on the same channel would lock-up. This may be a small price to pay if it improves the lot that some in the system are at present suffering.

A repeater and beacon list was included in last month's *Amateur Radio*. Any corrections or updates should be sent to FTAC via the Federal Office.

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HIGH-Q VHF/UHF CHIP CAPACITORS

For many years RF engineers have been hamstrung by the lack of good quality capacitors that are readily available in this country. Stewart Electronics are pleased to announce the release of a selected range of High-Q VHF/UHF multi-layer chip capacitors as one solution to the problem.

These capacitors are specifically designed for use in the VHF/UHF region in high current and high voltage applications, as well as in low noise applications. Whilst many people have used surface mount capacitors for RF use they are unfortunately not specified for that application and thus their characteristics are uncontrolled in many important aspects.

These multi-layer chip capacitors are characterised with graphs of AC current ratings at 100 and 500 MHz, Q figures at 100, 200, 400, and 800 MHz and self-resonant frequency.

General specifications are:

Dielectric	*HQ (porcelain)*
Temperature range	-55 to 125 degrees Celsius
Insulation resistance	> 10E12 ohms
Temperature coefficient	0 ± 60 ppm/C
Terminations	Palladium silver, nickel plated and tinned

VALUE pF	Stock No	Size	Volts DC	Q 100 MHz	SRF Irms 500 MHz	
1.0	CF256	0805	200	> 10k	6 GHz	0.9A
1.5	CF257	0805	200	> 10k	5 GHz	1.5A
2.2	CF258	0805	200	> 10k	4.2 GHz	2.0A
3.3	CF259	0805	200	9000	3.7 GHz	2.5A
4.7	CF260	0805	200	8000	3 GHz	5A
6.8	CF261	1111	400	5000	3 GHz	5A
10	CF262	1210	400	4000	2 GHz	5.5A
15	CF263	0805	200	3000	1.7 GHz	6A
22	CF264	0805	200	2700	1.5 GHz	6A
47	CF265	1111	500	1500	1.1 GHz	7A
100	CF266	1005	200	870	600 MHz	10A
470	CF267	1210	200	380	180 MHz	11A
1000	CF268	1210	200	NA	200 MHz	20A

For convenience in prototyping and experimenting, these capacitors are available in a labelled package of two pieces. Values not listed are available on indent in minimum quantities of 100 pieces per value.

High-Q VHF/UHF capacitors find application anywhere low losses, combined with high self-resonant frequencies are needed, such as filters, matching networks and resonant circuits, both power and small signal at frequencies up to 1500 MHz or so.

FILTERS:

When a filter is designed it is possible to predict its performance when using components of varying Q, or conversely a minimum Q can be specified for each element for a minimum calculated level of performance. As the Q of the components increases, so the actual performance of the filter will approach the theoretical performance of a filter using ideal components. At VHF and UHF frequencies where gain and noise figures are hard and expensive to come by, it is important that filters have absolutely minimal losses, thus making them an ideal application for High-Q capacitors.

POWER AMPLIFIERS:

Whilst metal clamped mica capacitors have desirable characteristics for use in power amplifiers, they can have performance degrading effects at higher frequencies and higher network Qs due to their own finite Q. High-Q capacitors will allow you to achieve gains closer to the maximum possible with a particular transistor, improvements of 3 dB in circuit gain have been noted at UHF frequencies.

With bipolar power transistors it is often necessary to place capacitors right at the base and collector terminals. These low impedance points are the most critical in terms of losses. At these points the circulating currents can be quite high and any losses can significantly impact overall performance. Many RF power transistor manufacturers now use High-Q capacitors in the test jigs for VHF and UHF transistors.

SMALL SIGNAL AMPLIFIERS:

Several areas of application suggest themselves for High-Q capacitors in small signal amplifiers. Their very low losses and lack of parasitics renders them useful for such jobs as source bypasses for GaAsFET preamplifiers. Matching networks at the input of low noise amplifiers need to have extremely low losses to allow the utilisation of the variable noise performance of the active device. Any losses ahead of the gain stage directly effect the noise figure obtained from that stage. By using High-Q capacitors, strip line inductors and microwave trimmers the performance of VHF and UHF low noise amplifiers can be significantly enhanced.

For further information, prices, etc, contact Stewart Electronic Components Pty Ltd, 44 Stafford Street, Huntingdale, Vic. 3166, phone (03) 543 3733.

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Forward Bias

Ken Ray VK1KEN
Box 710, Woden, ACT 2606

After a long absence, news from the VK1 Division graces the pages of *Amateur Radio*. Much has happened in the Australian Capital Territory and surrounding area in the past 12 month, and I hope to fill you in on these events in this, and the next few issues.

MEETINGS

The monthly meetings of the Division continue to be well attended, with a variety of interesting speakers presenting topics ranging from the Ionospheric Prediction Service (IPS), military communications and two metre antennas. Most meetings have completely filled the Studio Room at the Griffin Centre, and coffee and biscuits are a regular feature of each meeting.

This year, 1988, has seen the start of a second monthly meeting, this time on the second Monday evening of each month. This has been dubbed the "Technical Interest Group" and the topics presented will be of a deeper technical nature than the general meeting topics.

Meetings are held in the Griffin Centre, Civic, and doors open at 7.30 pm, with the meeting proper commencing at 8.00 pm. As well as the previously mentioned coffee and biscuits at the conclusion of the meeting, the bookstall and the QSL bureau are available for members.

The Griffin Centre is between Bunda and Cooyong Streets in Civic, close to the main bus interchange and adjacent to car parking. The TIG meets on the second Monday of each month, in Room 3, which is upstairs at the Bunda Street end. The general meetings are held on the fourth Monday of each month, in the Studio Room, which is upstairs and the Cooyong Street end of the building.

All amateurs and interested persons are most welcome to attend, whether WIA members or not, VK1's or visitors.

DIVISIONAL BROADCASTS

The VK1 Divisional Broadcast goes to air each Sunday evening at 8.00 pm local time, using the Divisional call sign, VK1WI. Frequencies and modes are:

3.570 MHz LSB
28.485 MHz USB
52.075 MHz USB or
52.525 MHz FM
146.950 MHz FM (via repeater VK1RGI) or
146.900 MHz FM (via repeater VK1RAC)
438.375 MHz FM (via repeater VK1RIR) or
438.575 MHz FM (via repeater VK1RGI)

Call backs are taken on the above frequencies at the conclusion of the broadcast.

Broadcasts are re-transmitted on Monday evenings at 8.00 pm local time, on two metres only. On meeting nights, the re-broadcast is on the Tuesday evening.

REPEATERS

Considerable work has been done on VHF and UHF repeaters in the past year. Almost all VK1 repeaters have had considerable work done to them to improve their performance or add new facilities.

TWO-METRES

VK1RGI (146.950 MHz): After some considerable degradation in performance — not unexpected as the repeater has been in operations for over nine years — there has been a complete refurbishment of the Mount Ginini installation. A new hard line feeder was installed, and the repeater unit replaced by a modified commercial unit. The original unit is currently being refurbished, and will probably replace the Channel 6 unit. By the time this article "goes to press", a new antenna will probably be in operation. All this work has substantially improved the performance of Australia's highest amateur repeater. As well, a packet digipeater, on 147.525 MHz has been established on the site.

70 CM

VK1RGI (438.525 MHz): By this time, or not long afterwards, the 70 cm repeater will be finally installed on Mount Ginini.

VK1RIR (438.275 MHz): A second UHF repeater was developed, and it has been installed on Issacs Ridge, a major communications site within the Canberra metropolitan area.

The VK1 Division has now developed substantial expertise in developing, constructing and maintaining repeater equipment. Many people have helped over the past few years, and particular thanks are due to:

Neville VK1NE, Dick VK1ZAH, Maurie VK1MD, Tom VK1BUD, Rob VK1KRM, Neil VK1KNP, Paul VK1BX, Peter VK2APP and Carl VK1KCM.

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW 2150

ANNUAL GENERAL MEETING

Members of the NSW Division are notified that it is proposed to hold the 1987/88 Annual General Meeting on Saturday, April 30, 1988, at Amateur Radio House, 109 Wigram Street, Parramatta. The meeting will commence at 2 pm. Nominations for election to the Council and agenda items for the meeting will close at the Divisional Office on Tuesday, March 15, 1988. Council nomination forms are available from the Divisional Office.

SPECIAL CALL SIGN

The VK2 special call sign, VI88NSW is available for use by clubs and groups for periods of one week. Clubs have already been notified of the availability and a register is being maintained for a roster. Further information is available from the office or on broadcasts. Schedules of the various club operations are being given on the VK2WI broadcast. The alternative prefix 'AX' is available to all amateurs throughout this year.

GOSFORD FIELD DAY

A reminder that this event will be held at the Gosford Showground, regardless of weather, on Sunday, February 21. Because of the large attendance to this event, it has been decided by both VK2WI and VK2TTY to conduct their respective broadcasts for this weekend on Saturday, February 20. Check the broadcasts for the alternative starting times.

POSTCODE CONTEST

The trial contests conducted late last year proved popular. It has been decided to conduct a contest on the last Friday of each month, with different bands being used. Details via the broadcasts or a list is available from the office or your local club.

TRASH AND TREASURE

This event will be held on a regular basis on the last Sunday of each odd month, in the car park of the Parramatta office. The next event will be on March 27, at 2 pm.

CONFERENCE OF CLUBS

The next C of C will be held during April and will include discussion on the Federal Agenda Items for the Convention in Melbourne over the weekend, April 23/24. Club agenda items should be received at the Divisional Office by the end of this month.

NEW MEMBERS

R M Benafatto VK2CRB, Allawah
R L Carden VK2XRL, Chatswood
F Foti VK2XFF, Surry Hills
P L Leeper (Mrs), VK2JPA, Blacktown
J J Martin VK2JJM, Parramatta
E A McCloskey VK2KEM, Bundanoon
W J Mills VK2MCV, Shalvey
M Prochazka Assoc, Bronte
S E Sheridan VK2ZJH, Bondi
G R Tracey Assoc, Caringbah
J Van De Geyn VK2MDH, Bass Hill
F G Windsor VK2CFW, Lidcombe

VK3 WIA Notes

The following applications were received for the month of November 1987, and accepted by Council on November 26, 1987.

Harold Armstrong	
VK3TBM	East Preston
Christopher Arthur	
VK3PYH	Bendigo
Ken Dobson	
VK3BKD	Nunawading
William Jamieson	East Doncaster
John Luke VK3DUZ	Creswick
G V Marshall	
VK3MAN	Mount Eliza
Monash University	
Radio Club VK3ETS	Clayton
Gerdard Noss	
VK3CGA	Point Lonsdale
Allan Styles VK3TV	Devenish
Peter White VK3CTW	Melton South
Noel Winzenried	Bayswater

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

Back in November, it was my pleasure, once again, to attend the Old Timer's Luncheon. (And before any of you can make rude remarks about my age, let me tell you that I am one of a group of ladies who either have call signs, or are attached to one of the OMs present, who meet for lunch at the same time).

I think this is the fourth or fifth year now, that I have attended, and it is an occasion that I look forward to, every year. There is no hard and fast rule about how many years you must have had a licence, to attend this luncheon, so if you would like your name put on the invitation list for next years' luncheon, please contact George Luxon VK5RX, and he will see that you receive an Invitation. My only complaint is that I never get around to talk to all the people that I would like to see. Many of them come down (or up) from the Country, and it is good to get this rare chance to see them. One of the saddest parts of the occasion is the calling of the roll of those who have become Silent Keys during the year, happily not as many this year as last, but perhaps more poignant because one of those was Jack Trembath VK5JT, who started and organised these luncheons, in conjunction with George VK5RX. Despite the fact that Jack was only licenced in 1974, he had been involved with amateur radio for many years (including giving CW lessons to would-be amateurs) and was considered an 'Old Timer' by many. Jack's place on the organisational side has been filled by Ray Deane VK5RK, who did an excellent job.

For several years now, George has asked me to draw the lucky number, for the prizes which are donated by various firms, etc. I may never be asked again! The first number I drew, belonged to Maria McLeod VK5BMT, (which I was pleased about, as I persuaded Maria to come along for the first time). When I pulled the second number out, and it was for Joy VK5YJ, I thought that I was going to have to leave without my dessert! Luckily for me, I managed to find an OMs ticket for the third prize and I am not sure if Barry Clarke VK5BS, (the recipient) or myself was the most pleased! I look forward to seeing many of you again next year.

Another group which I always enjoy meeting are the members of the Adelaide Hills Amateur Radio Society. There is no truth in the rumour that I only go for the food — although they do put on a superb suppper! The speaker, on the night of their Christmas break-up, was Henry 'Scotty' Scott, the brother of Brian VK5NOS, who gave an insight into his work on the Overland Telegraph lines, from just after the War (1944) to the present.

I was pleased to hear that the club has offered to do a 10 metre relay of the Sunday Morning Broadcast, in the New Year. Nominally, to begin with, the operators will be John VK5SJ and Ted VK5PEB. I would like to thank them for giving Tony VK5AH and Chris VK5UH, some much needed 'breathing space' (it doesn't allow for sickness and holidays to clash If there are only two of you on the roster). We will look forward to hearing VK5BAR on 10 metres soon.

I would like to thank Colin Taylor VK5CE, for stepping in to fill a vacancy left on the 20 metre relay team by the retirement of Arn Van Der Harst VK5XV. Arn was first licenced in 1967 and shortly afterwards was asked to do a 20 metre relay . . . he has been doing it ever since! Local interference problems have finally forced Arn to give up and, on the night of our Christmas Social I had hoped to give Arn a pen and pencil set, inscribed with his name and call sign, to thank him for his 20 years of service to the Division.

Unfortunately, Arn was unable to be with us that night but Hans Van Der Zalm VK5KHZ, our Clubs and Country Members Representative (who lives near Arn) presented it at a later date. I believe John Masters VK5AV, may also have to give up the 20 metre relay for the same reason. John has moved into the same street as Arn so now shares the same interference problem. Thank you for the four or five years which you have been doing the relay, John, and perhaps if the problem goes away we might see you back one of these days. In the meantime, this has left us with a large gap in the 20 metre team. Colin VK5CE, has said that he would do a two metre relay, but when it became obvious that 20 metres was needed more, Colin agreed to do that. Thanks Colin, for your timely help, and if there is anyone else who could also volunteer, it would be greatly appreciated.

We are still looking for a Program Organiser and a Historian, as I have regretfully accepted the resignation of Ray Bennett VK5RM. Family commitments this year will prevent Ray from continuing as Historian. Thanks Ray for the time that you have put into the job. Anyone who would like to take on one of these important positions, please let me know.

December 13 saw the end of an era, when Neil White VK5WN, did his last 160 metre broadcast from the BGB. Neil has been doing this for 14 years, with only a short break last year due to ill health. You may remember that we presented Neil with a pen and pencil set last year to thank him for the 30 years, on and off, that he has been doing one job or another for the Division. We wish you a long and happy retirement, Neil.

Speaking of Broadcasts, I learned recently that the first post War broadcasts went out under the call sign of VK5RR in 1947. A couple of weeks later the official VK5WI call sign was issued and Reg continued to put out the broadcast under this call sign. Reg is still a very active Old Timer, both on the air and at WIA meetings.

It is with regret we announce the passing of two silent keys, Danny Rogers VK5FG, who will be known to many Old Timers; and Chas Swan VK5PAN, who although he upgraded to VK5WG, was best known under the VK5PAN call sign. Chas was a very active and well-known amateur and a member of the Lower Murray ARC. We extend our synpathies to the families of both gentlemen.

DIARY DATES

Tuesday, February 23	(to be confirmed) Ray Dobson VK5DI on the latest in Micro-Technology from Philips. 7.45 pm.
Tuesday, March 22	Den Smith VK5LS on Radio Communications in WWII (Den was in the French Resistance). 7.45 pm.
Tuesday, March 29	Buy and Sell night. 7.30 pm. (no ESC, QSL Bureau, Publications, etc).

JSA AWARDS

1414	YC1IOI
1415	VK1NAS

ar

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

EXPO 88 — a non-event

Our would-be involvement with the 1988 Exposition: Authority began some three years or so ago. We approached the Authority as the Queensland Division of the Wireless Institute of Australia. The Authority wrote back and said that they would only consider an application from the Federal body of the WIA. We should have known then what we were up against.

So we tried again, this time with the backing of Federal Executive. We were advised of the cost of floor-space. The space needed would have run into some $25 000. This was quite out of the question. Time passed.

Then, quite out of the blue, as if we had never contacted the EXPO Authority, we received a letter asking for our help as amateur radio operators to publicise EXPO 88!

Council appointed two negotiators to deal with the Authority. They were Theo Marks VK4MU, and John Aarsse VK4QA. Theo and John met with several of the officials of EXPO and started to realise just what sort of bureaucracy they had to contend with. With the assistance of Murray Kelly VK4AOK, a professionally prepared presentation was submitted.

The intention was to have an amateur radio exhibit with an operating station. At one stage space, free of charge, was promised. More time passed, our delegates were passed from one official to another. Then we were offered some spare EXPO office space in a building just outside the EXPO site and not open to the general public. This, of course, was totally unsuitable.

The final outcome of the whole sad story was an apology from EXPO saying that they would like to give us space on the EXPO site but it was then (November 1987) too late to shuffle things around to fit us in. We are of the opinion that we would not have been $15 000 too late, even at that stage.

So there will be no AX4XPO operating from EXPO 88, but we have applied for and received that call sign and it will be used on the air from April until the end of October. The EXPO Authority have, at least, given us 50 000 OSL cards, a large percentage of which will be used for the special call sign.

Even though the result was a very negative one, the Queensland Council, on behalf of the members, must thank Theo, John and Murray for the tremendous efforts that were made, alas in vain, to put amateur radio before the visitors to EXPO 88.

Bud Pounsett VK4QY

ar

QRM from VK7!

John Rogers VK7JK
VK7 BROADCAST OFFICER
1 Darville Court, Blackman's Bay, Hobart, Tas. 7052

The will be meetings of the WIA during February as follows:

Penguin — February 9, at 8 pm, Penguin High School
Launceston — February 12, at 7.30 pm, at the Maritime College
Hobart — February 3, at 8.15 pm, at the Activities Centre, 105 Newtown Road, Hobart.

At each of these meetings one of the important topics will be that of the Divisional AGM to be held at Rutherglen, Hadspen, on Saturday, March 19, at 1400 hours.

All notices of motion for that meeting must be in the hands of the Secretary by February 19.

All nominations for Divisional Council must be in by February 26, and all eight positions are being vacated. Please send nominations and notices of motion to:

The Divisional Secretary
PO Box 1010
Launceston, Tas. 7250.

This meeting has been publicised on the weekly broadcasts in VK7, as well as here in AR, so don't complain if either you are not represented at Divisional level, or you have WIA problems not being sorted out — you have had plenty of time to take action!

A General meeting will follow the AGM, and one important item to be considered is the re-writing of the Articles of Association, in view of the changed circumstances of the Division. Council has decided to separate these meetings from the TARC and annual dinner — see later notes — and to centralise the location to attract more members to the meeting.

Members should make their own arrangements for meals available at Rutherglen, and site facilities will be available for members' families.

The Tasmanian Amateur Radio Convention (TARC) will be held this year in the Hobart area, and the host branch has determined that it is to be run in conjunction with the Tasmania Day festivities in November 1988. TARC will be organised at one or more venues, to be self-funding as far as possible, and to serve both as a contributor to the community events of the Bicentennial celebration and the Tasmania Day Festival. Its publicity must naturally provide a means of highlighting the hobby of amateur radio. A committee is to be established at the Southern Branch AGM to provide a planning brief for the March meeting. Peter VK7ZPK, leads the group for TARC operations, and looks for strong support from amateurs — and others — in the south during the coming months.

A new broadcast roster is coming out this month and the frequency of participation has now improved to approximately one in two months. The Broadcast Officer is appreciative of the support he is now receiving from over 30 amateur operators in VK7, and especially so of the regular participation of several who "come up" every week, rain or shine, to provide additional relays. We are always searching for ways to improve the presentation of our broadcasts, to include interviews, tapes and live "OB" inserts. In addition, the arrival of AMTOR, under the auspices of Lew VK7LJ, and his offsider, VK7XD, plus the packet system set up by Andre VK7AE, will certainly have a beneficial effect on the actual news-gathering. John VK7JK, is always awaiting ideas and constructive criticism, but, even more, he looks for participation, if only from time to time.

At the time of writing, the Westcoaster (Melbourne to Hobart) Yacht Race was well under way, and 18 amateur operators were involved in the radiocommunications systems for that race. Based at the Derwent Sailing Squadron in Hobart, the equipment included computer graphics and FAX facilities, and the media could be provided with a printout of relative positions, handicap positions, distance-to-travel and other details of all the 44 boats within three or four minutes of the end of a sched. A great deal of preparatory work went into the system, and the results proved very satisfactory to all those concerned with the race.

73, John VK7JK

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"BELOW COST SELLOUT"

ALINCO POWER SUPPLIES
EP-670 10V-15V DC Regulated 5.5A DC cont. Was $259 Now $169
EP-570 10V-15V DC Regulated 5.5A DC cont. 6.5A max Was $220 Now $159
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VV INTERFACE REMOTE UNIT for power supply & switching of M/Mounted preamps via Coax Feeder Was $59 Now $20
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THETA-777 DECODER for AMTOR, RTTY & CW and has complete software for Communication Rx/Tx etc. Was $729 Now $499

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HL-30U UHF 30W 430 MHz LINEAR AMP with GaAsFET receive preamp. FM, SSB, CW mode. Was $299 Now $199
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SP-122 SWR & P/METER 1.6-60 MHz. (20W/200W/2kW) Was $189 Now $169
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RS-3050 POWER SUPPLY 3V to 15V dual outputs 30A/10A. 50% duty cycle, etc. Was $539 Now $449

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CREATE 2X713 (430 MHz) 2 x 11 element Yagis compl W/Phasing Harness. Was $319 Now $199
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Chirnside CA-33 3 el Triband Beam (20, 15, 10) Was $429 Now $359
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CONNECTORS GALORE . . . 2 pin, 3 pin, & 4 pin @ $1 each

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Sakata SP-1200 Plus 9 wire Print Head, 120 CPS, Draft, etc. Was $790 Now $590
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PS-45 POWER SUPPLY Great value Was $357 Now $199
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UT-23 VOICE SYNTHESISER for IC-3200A Was $83 Now $66
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SP-430 SPEAKER Was $79 Now $65
SC-9 VINYL CASE Was $29 Now $10

CUSTOMERS NOTE: We are now taking bookings for buses from Melbourne & Brisbane for the Gosford Field Day, February 21, 1988. Book now to avoid disappointment.

CORRESPONDENCE
BOX K21
HAYMARKET NSW
2000

EMTRONICS

MAIL ORDERS
WELCOME

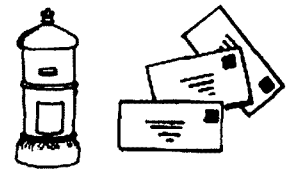
NSW & HEAD OFFICE:
92-94 Wentworth Ave, Sydney
NSW 2000 TLX:AA73990
P O Box K21 Haymarket, NSW 2000
Ph: (02) 211 0988
FAX: (02) 281 1508

VICTORIA:
288-294 Queen St, Melbourne
Vic 3000
Entrance from Lt Lonsdale St.
Ph: (03) 670 8551 or 670 0330
FAX: (03) 670 0671

QUEENSLAND:
416 Logan Road, Stones Corner
Qld 4120 TLX 144696
Ph: (07) 394 2555
FAX: (07) 394 4316

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Over to You!



OUR MAGAZINE

Regarding our magazine, I enjoy it as it is and would not like to see it turned into an American-style "glossy" with large headings and waste space, in which one can't find the articles for the ads.

Yours sincerely,
M J Young VK3PKV
69 Kangaroo Ground Road
Warrandyte, Vic. 3113

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AND MORE YET

I do not wish to monopolise this column, but feel that some further comments are very necessary.

In my letter (December AR), I said I was surprised by the (apparent) intolerance shown by various groups within the amateur fraternity. (In this context, I feel that Arthur Oliver's letter, in the same issue, is very relevant. And, in passing, congratulations and thanks for a fine job with the net, Arthur, my sympathies re the problems).

I was even more surprised by the amount of comment I received by various means, some in agreement, some in strong disagreement with my views. This, I feel, is healthy and encouraging. What wasn't so encouraging was some (admittedly not many) snide remarks and personal abuse I received for daring to criticise the WIA and "winge" about the fees.

Which brings me to the second point, and that is that it seems my original letter was largely misinterpreted and taken as (yet another) criticism of the WIA.

This was not my intention, (unless one interprets criticism of suggestions made in readers' letters as a criticism of the WIA). I am only too well aware of the time expended by officers of the WIA, and appreciate their efforts.

However, I would hate to think that the WIA had become such a sacred cow that it was above all criticism or comment.

Should that day ever arrive, then it really will be time to give the game away!

Once again, good luck, and my subs enclosed (for one more year, at any rate!).

Dmitri Perno VK4BDP
110 Panorama Drive
Nambour, Qld. 4560

Agreement and/or disagreement is everyone's right. Snide remarks and personal abuse have no place in intelligent discussion and only demean their users. We who attempt to keep the WIA in operation welcome all comment and criticism. It shows you care! —Ed.

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HOW TO SAY AND WHEN TO SAY IT

The *How's DX?* on page 40 of December's issue has prompted me to write that I am sure there are many readers like myself, who would appreciate articles similar to it.

It was not much effort for me, at the age of 72, to study for a novice exam and buy the required number of black boxes to get on air; but when it came to opening my mouth to talk into the microphone, I was completely lost.

Everyone I heard seemed to know what to say, and how and when to say it. How to go about operating DX was simply impossible, and there must be many new amateurs coming into our hobby facing that problem.

73 from
Basil Thornton VK2EQY
35 Hughes Avenue
Ermington, NSW. 2115

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PACKET EFFICIENCY

Referring to Arthur Oliver's letter in December AR, I am a long time fan of the *Travellers Net* and in particular the present net controller. I have never needed it for travel assistance but it is a classic example of the knowledge and expertise in radio communication which can be acquired by amateurs with a 'hands on' experience of the medium. Such expertise will never be attained by pseudo experts in 'modern' technique whose main preoccupation is 'one upmanship'!

Arthur's good manners and gentlemanly characteristics showed in that letter as they do on-air. I am not the dedicated gentleman that he is and therefore feel free to take issue with those anonymous 'Packet' buffs competing with the Russian 'woodpecker' on 20 metres.

First, a few facts to dispel the mythical aura that is building up around 'Packet' and the like:

- Packet message switching is not an amateur invention.
- AMTOR is not an amateur invention.

Both have been known for many years in professional circles and have been recently 'discovered' by amateurs looking for uses for their toy computers. Yet, hardware solutions are possible and probably better.

The main difference between ordinary machine telegraphy and so called 'data communication' is in the acceptable error rates. Acceptable error rates on HF circuits are

Ordinary uncorrected teleprinter — 1 in 10^3 characters

ARQ error correction systems — 1 in 10^4 characters

Data error standard for circuits conditioned for 600, 1200 and 2400 bits per second is one in 10^5 bits.

The amateur HF bands are not conditioned for that error rate. High speed packet switched data communication attempted on the amateur HF bands is plagued with retries because of the high probability of bit corruption. The retries are responsible for excessive channel occupancy. One wonders what would result if a couple of unattended subscriber computers were deliberately or inadvertently loaded with corrupted packets; maybe that is the way to 'blast them off the air' Art!

One other aspect of Packet worth noting — an AX25 frame is 152 bits minimum, comprising:
Leading flag (8 bits) + destination call (56 bits) + source call (56 bits) + control field (8 bits) + frame check (16 bits) + trailing flag (8 bits).

And, that is without any digipeater addresses and etc. Add the standard 20 character message (160 bits) and the answer is 312 bits at least. One corrupt bit is that initiates a retry, therefore on HF the bit tally per character could be 16N where N is the number of retries. Compare that with — uncorrupted Baudot five bits per character, ARQ Moore code seven bits per character and ASCII with a parity bit, eight bits per character. It seems to me that attempting packet on HF is a waste of time and spectrum space. Will someone please tell me why it is becoming popular (?) on the HF bands? Also, why it is allowed to compete with and perhaps displace such a useful service as the 'Travellers Net'?

Yours sincerely,
Lindsay Lawless VK3ANJ
PO Box 112
Lakes Entrance, Vic. 3909

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QUO VADIS

It behoves all radio amateurs throughout Australia to read in depth (and re-read) the aptly titles "Quo Vadis", AR 10/87, p3, by George VK1GB. A telling message, it concerns us, irrespective of age, sex, nationality, financial circumstances or license level.

Too few of us digest in total each AR magazine, rarely listen to news broadcasts, and probably never study the annual balance sheets. Thus we become somewhat isolated from the complex ramifications of the WIA's ongoing efforts at State, National and International levels, which are solely for the benefit of you and me.

Our annual WIA fee syndrome is overplayed by many — it is less than ONE coffee per week at any snack bar.

Financial viability in the 80s can only be maintained by pooling resources, eg Industry, Commerce, Legal and Medical professions, Churches etc. VK1GB's suggestion of combining AR and ARA magazines is worthy of consideration.

Let us all ponder broadly and without bias, uninhibited by axe grinding, on the issue of the WIA and a united amateur fraternity in this country. These two factors will ensure the preservation of our national autonomy, which should not be taken for granted. There is little resemblance between our comparative freedom, and that of much of the present world.

Today change on a global scale is rampant — we will achieve much, if change which poses detriment to our hobby, can be minimised. Even more so, if changes advantageous to the majority of us can be implemented.

This will only be possible if we all stand united behind our official representative body, our mouthpiece in contentious issues.

Reg Glanville VK2ELG
63 Buffalo Crescent
Thurgoona, NSW. 2640

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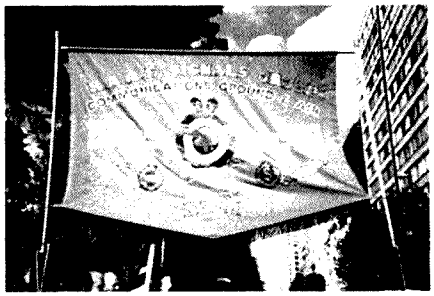
REUNION

I was very interested to read Noel Abie's letter in October 1987 AR regarding proposed signals reunions, and would like it known to Noel, and any other interested ex-RAAF signals personnel, that every ANZAC day in Sydney, the ex-signals group have been marching, and holding a reunion afterwards, since 1946. In this time, many have passed on, and some have never contacted the group. Most amateurs that were in the RAAF signals, and who were, or have become amateurs since the war, have kept in constant contact since those early times. Many, of course, on discharge went back to former occupations, and have not taken part in radio activities. The Sydney group represents all ranks, and most of them went through W/T Air courses at Point Cook.

The accompanying photograph is of the Signals banner at the commencement of the Sydney march in 1987.

The 1988 Bicentennial year reunion is bound to be a big one in VK2. Why not come along?



The Secretary of the NSW ex-RAAF Signal Group is: John Williams, 3 Beane Street West, Gosford, NSW. 2250.
Pete Alexander VK2PA
(Ex-W/T Air/WOM Course 50A 1941, HF/DF Course 43 1943)
"Nandari"
Rollands Plains
via Telegraph Point, NSW. 2441

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CARRIER PIGEON?

The accompanying photograph was taken in October 1987.

Yes! It is "fair dinkum". This Homing Pigeon lost his way one windy weekend and landed right into my shack and settled in the position photographed. Perhaps he came for a recharge or a DF bearing, who knows? I thought it very unusual as he stayed around the vicinity of the shack for several days before finally taking off about two weeks later.

An illustration of the old and new ways to communicate.

Best regards,
Pete Alexander VK2PA
"Nandari"
Rollands Plains
via Telegraph Point, NSW. 2441

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SCOUT JAMBOREE ON THE AIR (JOTA) — 1987

Canberra Branch members of the RNARS again established official Scout Station VK1BP in the grounds of Government House, Canberra for the 1987 Scout Jamboree on the Air.

The official opening address for JOTA, on Saturday October 17, 1987, was made by HE Sir James Rowland and broadcast on the Scout frequencies 7.090, 14.190 and 21.190 MHz at 0400 UTC.

Operators at VK1BP were Jim VK1JL, Jack VK1FM and Jock VK1LF

Excellent results were obtained to all States with reports of Q5 S8/9 and the VIPs present were very pleased with the results.

On the Thursday and Friday prior to JOTA, the RNARS team were busy erecting antennas for the 40, 20 and 15 metre bands. Extensive testing of the equipment was done on Friday October 16, and reports of reception on the Scout frequencies was acknowledged.

The antennas erected were a 40 metre dipole; 20 metre two-wire beam; and 15 metre dipole.

VK1LF operated his Uniden 2020 on 40 metres with 100 watts PEP output and had 16 call-backs from Scout and Guide stations in VKs 2, 3, 4, 5 and 7, which was pleasing to Sir James who kindly responded to their calls.

Both Jim and Jack had good results on 20 and 15 metres, respectively.

Despite the local weather conditions, which were overcast with thunderstorms in the vicinity and much QRN, the good efforts of the Canberra RNARS team at JOTA were commendable.
Jock Fisher VK1LF
RNARS No 308
Assistant Operator VK1BP
PO Box 94
Lyons, ACT. 2606

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SAFETY AROUND THE SHACK

Many thanks to the readers who wrote and pointed out the error in the September article.

The paragraph on page 10 which begins "It must be remembered that you no longer have an Earth wire from your Distribution Board. . ." is false and should be deleted. Naturally the safety of your existing Earth wire will continue to exist and provide the safety for which it is intended. The writer apologies to anyone who was misled or had concern for this statement which was referenced to UK regulations which are not appropriate here in Australia.

Kindest regards.
Sincerely
David A Pilley VK2AYD
15 Forest Glen Crescent
Belrose, NSW. 2085

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TEA AND SCONES?

I would like to comment on remarks made by Colin MacKinnon VK2DYM, in *Over to You!* page 61, November AR.

He asked the question "Do we need a *Women's Weekly* type column to learn thah Ethyl and Harriet entertained 12 other old buddies to tea and scones?" (He did then say "Wow — that will get some affirmative action!" Ed).

As there is only one column in AR which looks at things from a feminine point of view I must conclude that he refers to the ALARA Column. (I think you're right, Joy! Ed).

If the gentleman? ? ever bothered to read the ALARA Column, which is very doubtful, I think he would find that it pertains mainly too the activities of women in amateur radio, and ALARA members in particular. Tea is mentioned rarely, and scones even less. Many men read and enjoy our column, and much of the material received is contributed by men.

For your enlightenment, Sir, women are active in every field of amateur radio, and enthusiastically their numbers are growing steadily. ALARA is a strong organisation, and not, as you imply, a bunch of silly old women sitting around drinking tea. Our members ages range from 16 (yes, 16) to 89, and one thing we have in common is the enjoyment of our hobby — amateur radio.

It is all too easy to criticise the efforts of others, but unless your criticism is constructive, it is of little value.

Your sarcastic and derogatory remarks cast a slur, not only on myself, but on ALARA, the group of people I represent in the pages of AR.

I think, Mr MacKinnon, you owe ALARA an apology.
Joy Collis VK2EBX
Publicity Officer
ALARA
PO Box 22
Yeoval, NSW. 2868

Yes, he got some affirmative action for sure! Please accept our apology on Colin's behalf. He has done, and is continuing to do a great deal of work for AR and the WIA. I am sure his tongue was in his cheek, and a grin on his face, as he wrote the offending words. —Ed.

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SIMPLICITY, PLEASE

Having waded through the article "The More Things Change, The More They Stay The Same" by John Anderson VK5ZFO, in the October issue of AR, I am puzzled as to the author's purpose.

If it was to propose a future course for amateur radio, I feel that the coverage of such matters as the history of the hobby, the philosophies of admninistration, organisation, examination and regulation, and even the proposals for new licensing and examination systems, was unduly elaborate and detailed.

Long involvement with presenting ideas to large groups has taught me that a proposal must be concise and clearly put if it is to be understood and supported by a majority. Circumstances leading to the proposal should be known by most of those concerned, so that the germ of the idea is all that is required. The individual can elaborate on this, or inquire further if greater detail is sought.

I suggest that the issues raised must be considered and determined sequentially. Of these, the first must be the nature and types of licensing deemed necessary to meet the current and perceived future requirements of the hobby, given present trends and technology. Subsequently, associated examination, regulation and administration systems may be evolved. To attempt these any earlier is non-productive.

This was why, in a previous letter (*Over to You!*, September 1987), I confined my suggestions to a new licensing system consisting of a basic Communicator's licence, with subsequent endorsements for additional privileges as relevant expertise was demonstrated. VK5ZFO seems to have essentially supported this concept.

I hope that when the Institute's committee studying this subject produces its findings, it will be a basic, simple proposal, unlike the elaboration of the above article.

Yours faithfully
S V Ellis VK2DDL
98 Holmes Street
Kingsford, NSW. 2032

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NEED FOR PERSUASION

I think we WIA members, and non-members if they happen to read this, owe George VK1GB, a great deal for his "crie de coeur" in the October edition of AR, "Quo Vadis". If we are honest we will have recognised ourself many times in the article, for it is undoubtedly true. However, I feel that within the confines of our Institute, it is a case of the converted preaching to each other.

It seems to me that we of the WIA have to carry our crusade to those operators — the "something for nothing" brigade — who for whatever reason are not in our ranks. This issue has all the elements of the perennial argument about compulsory unionism, and has no simple answer, otherwise I am sure better brains than mine would have found one. Nevertheless, I, for one, will be asking my future on-air contacts if they are WIA members. If not, I will try persuasion to get them to join. Apart from the points raised by George, I will be using the example of what is happening in another amateur sphere which is being "heavied" by commercial interests, to wit, club flying/general aviation.

Hardly a week goes by in Europe, UK and USA but some new regulation restricts the rights, zones, airspace amateurs can use. Soon they will be able to use but a fraction of the space they used to, and for that they can thank fragmented associations of interest (food and drink to the bureaucrats) and commercial interests wanting more in a way Oliver Twist never dreamed of. The analogy is real, it is urgent and if we collectively fail, we shall be able to

beef about it to one another on our cellular phone.
Bicentennially yours
Alan Smith VK2BHF
10 Banool Avenue
St Ives, NSW. 2075

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CHATHAM ISLANDS

On a recent holiday east to New Zealand, I enjoyed the North Island and satisfied my curiosity re the Chatham Isles — 800 kilometres further east. They have been settled for nearly 200 years but have a minimum of modern institutions. There is no television or FM, but a delightful HF link to the mainland that includes a 2182 watch and a standby 500 kHz rig for maritime search and rescue. Operators do spells from the mainland in maintaining and operating links. The HF service is via two Rediffusion 1 kW units — 18 years and still mint. They cram two phone and three telex channels into their 6 kHz. The rigs are run very conservatively at 370 watts. The screen current of the four output pentodes barely registers. With one boat a month and a plane each seven to 10 days, conservation is a fact of life on the isles.

The island had one local amateur — well 19 years residence — Bob Hyndmens ZL7AA. After a short introduction on CB he passed his ticket and, from his cottage on a hillock, now enjoys his hobby nightly. A 430S via an ATR50 feeds a single coax up a 10 metre metal mast to 80 and 40 metre drooping dipoles at right angles and a 10 metre antenna with no switching! Power is from a discarded truck battery, encouraged by a trickle charger whilst on air.

All this is pretty successful as in two years he has had 9500 phone contacts, over 200 countries and I could not memorise the certificates and awards. At 79, his only regret is he didn't start earlier!

This is a different place for a DX holiday where you can take the family. I strongly advise the Lodge for accommodation — it has 900 acres and lots of isolated trees for 160 metre dipoles and Vee beams! Any spare moments can be filled in touring. Fishing is good, the crayfish are monsters. Horse riding, pig shooting and wild-fowl hunting. The weather is mild due to a strong maritime influence. There is furniture to caress tired spines whilst consuming fresh scones and coffee at 1000 — stronger fuel for the afternoon requires a 10 km journey. When inquiring please use the New Zealand Tourist Bureau — no one else knows it exists!

Happy holidays and DX
Bob McGregor VK3XZ
2 Wiltshire Drive
Somerville, Vic. 3912

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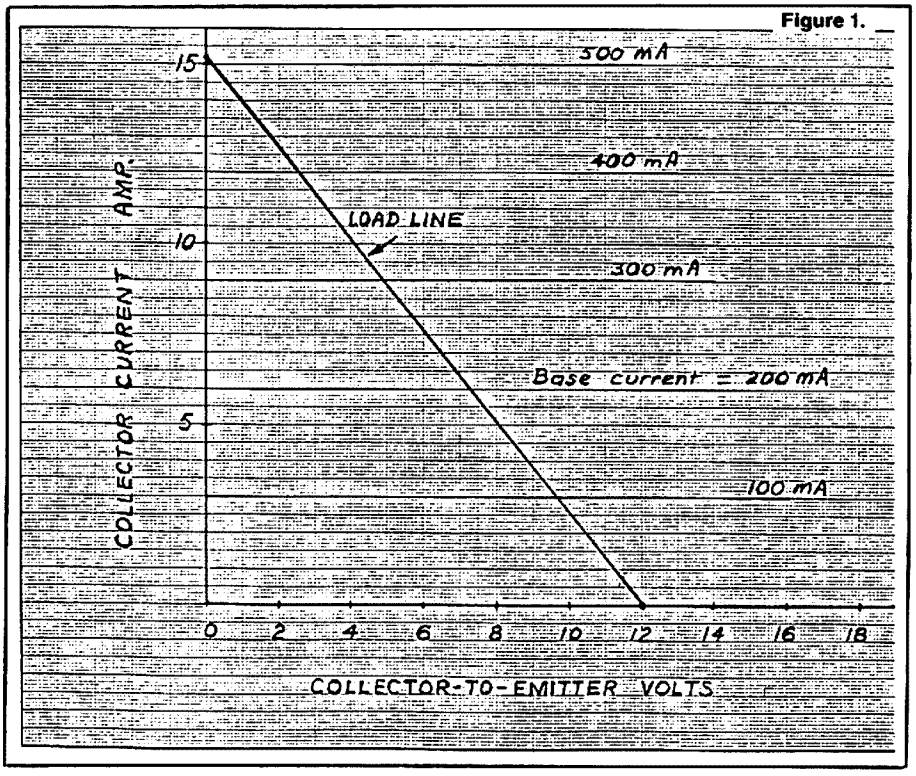
TECHNICAL CORRESPONDENCE

I wish to accept the offer by Lindsay VK3ANJ, and take issue with him over his *Topical Technicalities* published in the November issue of *Amateur Radio*. Well may he apologise to G3VA! Because of the fact that his article was featured at the front of the magazine it is necessary for responses to be printed in the magazine lest the erroneous statements contained in Lindsay's article be taken to be correct.

Firstly, the "conventional wisdom" that Lindsay is taking a shot at is, of course, established sound technical convention. Possibly Lindsay is referring to an unsound version spread by some technically handicapped persons.

I take no issue with Lindsay's statement that matching of the output stage to its design load does not follow the conjugate matching rule because of such practical reasons as efficiency of energy conversion and current and voltage limits of active devices. Perhaps this should be more widely known and Lindsay is to be commended for trying to assist. Certainly, such design approaches are part of established sound technical convention.

Figure 1.



Unfortunately, Lindsay's explanation contains some glaring errors and leaves some points unexplained. For example, Lindsay's amplifier has no losses and it could be shown to have zero output resistance! Try and match that, conjugately or otherwise!

If Lindsay had stuck with the conventional explanation he would have done much better. For example, the solution to Lindsay's equation 2 is -9.7 A by my calculations yet this negative sign is ignored. Perhaps Lindsay might like to explain this. Does this mean a negative power input Lindsay? And, what does it mean for the "DC" resistance he calculates later?

Another mistake made by Lindsay is to confuse PEP with the maximum instantaneous value of the product of voltage and current. I note that on the following page, Harold VK3AFQ, appears to have made the same error. Tsk, tsk, where were the technical editors? Well Lindsay, at least you are in good company. The PEP output of the VK3ANJ amplifier is, of course, 91.4 watts. Further explanation of this point can be obtained from the references given later.

Having pointed to errors in the article I should, in all fairness, try to give some further explanation about the matching mystery, although most electronic design texts treat this very well. I will assume that the amplifier is the same perfect device described by Lindsay but will use Figure 1, which shows the idealised characteristics curve of an amplifier transistor. The supply voltage is 12 volts and this point can be marked on Figure 1. This point represents the resting or quiescent point of the amplifier without drive. When driven, the amplifier collector voltage falls and the collector current rises. If we have 91.4 watts output then the peak collector current will need to be 15.2 amps. (This can be obtained from Lindsay's Equation 1). At this point, the collector voltage will be zero and this point is also marked on the characteristic curve. A line joining these two points is drawn. This is the locus of the collector current, collector voltage, under signal conditions. With no signal the collector current is zero and the collector voltage is 12 volts. At maximum base current drive the collector voltage is 15.2 amps and the collector voltage is zero. For intermediate base currents the collector voltage and current have values in between the extremes. This line is called the load line as the slope of the line gives the value of the load resistance seen by the transistor. This is 12/15.2 = 0.789 ohms, not the 1.57 ohms calculated by Lindsay. (Sorry Lindsay, another error!). To achieve the 91.4 watts output (CW or PEP) the 50 ohm load would have to be matched to this value, not 1.57 ohms. Lindsay has mixed a peak voltage, albeit the DC supply, with an average current this getting double the correct value.

The load resistance is not a DC resistance, it is the transformed 50 ohms of the load resistance and its value is determined by the supply volts and desired power output.

It remains to be stated that it is necessary to have two output transistors in push-pull. The collector to collector load would be 1.57 ohms but each transistor would see 0.789 ohms. If the output stage was single ended, then the peak current would need to be raised as power would be generated only every second half-cycle.

Finally, I would like to mention that the impedance seen looking into the output port of most transmitters is less than 25 ohms, even when they are designed to operate into a 50 ohm load. Thus they have an output VSWR of greater than 2:1. Signal generators are designed for testing and measurement and are designed to have output VSWRs of less than 2:1. It is a matter of horses for courses.

I hope that Lindsay is not totally discouraged as he is quite right in his assertion that the design of matching circuits for output stages is based on conversion efficiency and, of course, device limitations.

PEP REFERENCES

1 "Care and Feeding of Power Grid Tubes" Varian Eimac, 4th printing 1982, 67-30070.
2 "Novice Notes" Amateur Radio, June 1981.
3 "Novice Notes" Amateur Radio, November 1981.
4 "PEP Revisited" VK3AFW, Amateur Radio, January 1988.

Yours sincerely
Ron Cook VK3AFW
7 Dallas Avenue
Oakleigh, Vic. 3166

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TOPICAL TECHNICALITIES

Correspondence and discussion about the subject of the first *Topical Technicalities* indicates a difference between my understanding of impedance matching and that of others. The following is a summary of my understanding.

Refer to Figure 1 — the source has an open circuit volts of E volts and an internal impedance of $Z_s = R_s \pm jX_s$ ohms. To obtain maximum power transfer from source to load the source resistance R_s must equal the load resistance R and the source reactance X_s must equal the load reactance X, but the opposite kind. The load impedance is then the conjugate of the source impedance, which means there is a reciprocal relationship joining the two. The product +j by -j is unity and that is the test for reciprocals. To further study the argument, assume there is no reactance.

The power supplied is $E^2/(R_s + R)$ and if $R_s = R$ the power supplied to the load is $E^2/4R_s$ and that is the maximum possible. The efficiency however is only 50 percent. Most practical cases require maximum efficiency.

Efficiency = power out/power supplied

Power out is $E^2R/(R_s + R)^2$ and

Power supplied is $E^2/(R_s + R)$ therefore

Efficiency is $R/(R_s + R)$

It is obvious from that last expression that R needs to be larger than R_s if efficiency is to be greater than 50 percent. Putting $R = nR_s$ efficiency in $n/(n+1)$ which makes it more obvious. An example:

$R_s = 50$ ohms

$E = 100$ volts

If R is 50 the power supplied is 100 watts and the power out is 50 watts; efficiency is 50 percent.

If R is 75 ohms the power supplied is 80 watts and the power output is 48 watts; efficiency is 60 percent.

That is just a theoretical illustration. When dealing with amplifiers it is necessary to allow for the effect of loads other than the design load.

There are two terms related to impedance matching about which there are also some differences of opinion. These are:

Mismatch loss — which is the ratio of actual power out to the maximum possible. In the example above the maximum possible is 50 watts to a 50 ohm load and that supplied to a 75 ohm load from the same source is 48 watts. The 'mismatch loss" in dB is:

$$10 \log 48/50 = -0.2 \text{ dB}$$

Insertion loss — is the ration of the power supplied to a load via a network between source and load to the power which would have been supplied with the load connected direct to the source. Insertion loss can include mismatch loss if the network input impedance is not the design load. If, for example, the connection from a 50 ohm source to a 75 ohm load is made by 75 ohm coax with a loss of 3 dB, the insertion loss is 3.2 dB.

All of the above is very interesting and proves that I can manipulate Ohm's Law with the best but, for practical reasons, it has a very simple explained weakness. It assumes that the source impedance and the EMF (E) does not change when the load is not the design load. There are rare circumstances when that is fact but not in solid state or valve amplifiers.

The 'moral' to that story is — "for maximum efficiency of power transfer from amplifier to aerial use a coupling network to ensure that the final is connected to its design load and at the same time ensure minimum insertion loss in the coupler and transmission line." The following illustrates the importance of low insertion loss networks.

A commercial coupler (ATU?) was recently reviewed in AR. The reviewer included in his performance analysis the claim that the tuner coil temperature increased to 85 degrees Celsius after running for one minute at 100 watts; the supplier countered that claim with one of his own; "the temperature level (of the coil) assessed by touching it with a sensitive part of the hand was not unpleasant"; that after running for 30 minutes at 200 watts. It is possible that the temperature rise was the same in both tests.

The review article included a picture of the 'innards' of the unit and it is my guess that the coil is 50 millimetres diameter, 25 turns of one millimetre diameter wire. That amount of copper weight about 30 grams.

The specific heat of copper is 0.09 calories per gram per degree Celsius, therefore the heat energy required to raise the temperature from say 20 degrees to 85 degrees is 195 calories. One calorie is the equivalent of 4.2 Joules therefore 819 watt seconds of electrical energy is required to get that coil to 'hand warming' temperature (neglecting losses by conduction, convection and radiation). Both testers avoid telling how long it took for the coil to reach operating temperature so we cannot be accurate with an estimate of efficiency. It must be longer than one second because that would require 819 watts. Ten seconds would require 81.9 watts and 100 seconds would require 8.19 watts. Those possible losses persuade me to continue building my own couplers! My coils don't even get 'pleasantly warm' which is only natural. I hope the copper used in the coil is tinned or silver plated; at 85 degrees copper oxidises quite freely.

By the way, we are still using baluns on the output of couplers in spite of all the good advice against it. Maybe that is why the coils are blushing.

If you have to buy a coupler I suggest you get an authenticated statement of its efficiency at the loads you anticipate.

Lindsay Lawless VK3ANJ
PO Box 112
Lakes Entrance, Vic. 3909

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KNIGHT IN SHINING ARMOUR

Arthur Oliver (Over to You! AR December 1987), wants to be a "Knight in Shining Armour" defending his end of the band against all-comers. Unfortunately, he really appears to be "King Canute" and is destined for the same fate, unless he soon realises that the waves of digital communications are likely to engulf his little empire.

Nothing in Arthur's letter suggests that he has made any effort to understand why this situation has come about. He seemingly fails to understand that the small segment above 14.100 MHz has necessarily come into international use so that traffic can be passed between International/National/State and Regional "gateways" for onforwarding by local VHF/UHF nets. This is a 24-hour-a-day function and interference only delays the ultimate receipt of a packet. The assumption that these packet signals are one-on-one QSOs is generally false — such links are usually below 14.100 MHz.

Arthur seems to argue that this auto-transler function should remain in the laboratory until catered for by some distant ITU-IARU or WIA convention!

Sadly, it appears that no one in the WIA has seen fit to counsel Arthur and his cronies about the effect of his self-appointed role on amateur radio public relations; or to brief him on the real world of digital communications.

Finally, bearing a long-standing grudge against packet, achieves nothing worthwhile. Making an effort to understand how packet works, and who is getting the worst of any international interference claims, will I hope convince Arthur to turn the big knob away from his tormentors.

73

Col Harvey VK1AU
16 Leane Street
Hughes, ACT. 2605

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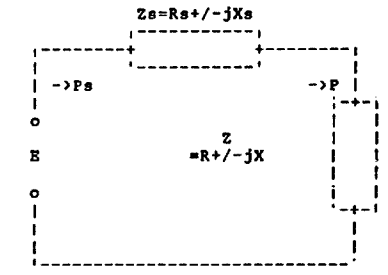
GENTLEMENS DISAGREEMENTS, TRAVELLERS' NETS AND SUCH

Isn't it a shame when a small issue that could be discussed and, most likely settled, is blown way out of proportion. It never ceases to amaze me that someone with an axe to grind seems to take pleasure in causing as much chaos amongst the amateur ranks as possible. It should be obvious to all amateurs, that agreements can never completely cover all aspects of our hobby due to the diversity within it and so we must give and take a little for the good of the majority.

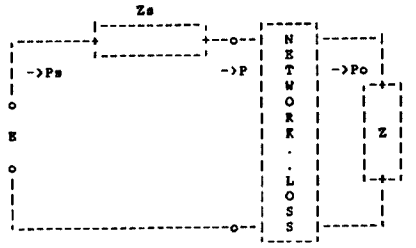
This all comes under the heading of the spirit of amateur radio, that is if amateurs can still remember what that is. Has the bond that has promoted goodwill and peace amongst amateurs all over the world left the hobby only to be replaced by dissatisfaction and selfishness? It is starting to look that way. I am referring to the unfortunate experiences that VK6ART and some others have had recently in reference to the Travellers' Net. I have been quietly observing the problem and now, after reading VK6ART's letter in AR, feel compelled to comment. As Arthur raises some good points in his letter, perhaps an explanation of packet activities on 20 metres is in order.

It seems to me that the reason for packet activity on the section 14.100 to 14.110 MHz is not clear to most SSB operators, and my understanding is as follows:

Figure 1.



a) when Z s the conjugate of Z_s P = Pmax = $E^2/4R_s$ and P/P_s = 0.5



b) Mismatch loss = P/Pmax
Insertion loss = Po/Pmax

The unattended packet bulletin board operation's involve transferring huge amounts of traffic and information around the world on an auto-forwarding basis. These stations automatically call other stations in the network at specified time intervals and, when propagation is suitable, connect and transfer files. As the other packet bulletin board stations around the world operate on a common frequency 14.103 MHz USB, VK operations have naturally centred there. There is much general DX packet activity from Europe, Asia and North America on 14.099, 14.101, 14.105, 14.107 and 14.109 MHz also and unfortunately many packet signals can be heard in the 14.106 MHz area so therein lies the rub. The splashover from strong packet stations can be heard and provides interference to the Travellers' Net.

Now, this Travellers' Net is a pretty important part of Australian amateur radio because of the service it provides to the travelling amateur and most VK packet operators realise this too. I have called in once or twice myself in past years and appreciated the pains taken by operators to assist travellers.

Since the problem became public knowledge, I have noted changes in Australian BBS operating procedure which has been slowly brought into action, perhaps because most BBS systems work during the day and therefore were not always aware of the problem developing. These changes consist of complete programmed cessation of packet operations or a change of band for the duration of the Travellers' Net, which hopefully has stopped some ORM. Some BBSs have moved to 30 metres permanently in an effort to ease the present congestion on 20 metres.

As to the Gentlemens' Agreement, you may have noticed that, in the 1985-86 Call Book, the narrow band modes section was listed as 14.070 to 14.110 MHz but in the 1987 Call Book I have recently been told that it is now 14.070 to 14.100 MHz. In my opinion, if it is not a misprint, it was pretty bad planning by the WIA for the fastest growing mode in amateur radio today. Many amateurs seem to forget also that this Gentlemens' Agreement has not been legislated, in other words, is not law. This is why sometimes RTTY appears in the CW section and also why SSTV and FAX frequencies are in the SSB portions. Of course, another reason is different allocations in different countries. Remember the non-interference basis of amateur operations works both ways. DOTC would need something more substantial in relation to packet before action could be taken as some amateurs have suggested. The chances of prosecution arising due to failure to check if the frequency is clear is unlikely as most of the equipment used in Australia will not transmit if a signal is detected, even the woodpecker or electrical noise will prevent it at times. Above all, one must remember that DOTC have approved unattended operations provided a watchdog timer is fitted so the rest is purely fanciful thinking. The other point of importance is that, as observations have shown, little interference is now being caused by VK stations anyway and DOTC can do little to cure the overseas ORM.

Amateur radio is supposed to be a hobby that combines friendship, respect, generosity, education and tolerance so let us start practising what we preach and all work together for the betterment and protection of our hobby in the years to come.

de

Peter McAdam VK2EVB
PO Box 433
Coffs Harbour, NSW. 2450

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MEMBERSHIP

I write again further to my letter in AR, September 1987, "Membership — A Marketing Approach". And to the letters by Colin MacKinnon VK2DYM and Dmitri Perno VK4BDP, who both made comment about the marketing approach that I suggested.

When I wrote my first letter it was worded deliberately in an attempt to try and draw a little blood. At the very least, to provoke some lively discussion on the points made.

Blow me down! It hardly caused a ripple. I didn't even see mention of it in another magazine where I expected it to be picked up as a beginning of a controversy.

Those comments that I wrote were not meant to be, or to draw unconstructive comments from the fraternity, but rather constructive discussion on the ideas put forward.

I noted that Colin VK2DYM agreed with my thoughts, but Dmitri VK4BDP was not too sure about my intentions.

Let me then clarify a few points. To adopt marketing techniques does not imply going up-market. The term going up-market is used to describe where you are going to place your product or service.

To take the other extreme, an organisation can elect to down-market its product. That does not mean that it not utilising marketing as a strategic management tool or system.

As regards the morality of selling something to people who did not even know they wanted it, if you consider that we usually become aware of products and services through some sort of promotional campaign. If equipment manufacturers did not promote their new products, then we would only slowly, or never, learn about new products and developments in communications equipment.

Marketing is not a flash term for unscrupulous selling. Marketing is a form of management adopting one common premise: ie marketing decisions always begin with the consumer.

If we extend this theory, it follows that the WIA should find out what its customers, both existing and potential (non-members) want.

It is that simple! ! !

When this simple piece of information is discovered, it then only has to be made commercial reality.

The other alternatives are many, I guess.

Perhaps restrict WIA privileges and services to members only: eg restrict repeater-use to members only, fight for band space for members only, etc.

Another school of thought is to start another body in addition, or opposition to the WIA.

If this thought has crossed anybody's mind before, and I have heard it rumoured, then let me warn the protagonists with an example from the aviation industry.

I am a member of the Aircraft Owners and Pilots Association. This body largely represents the interests of the private/business pilot, and aircraft owner.

There are many other aviation organisations as well: eg General Aviation Association, Helicopter Association of Australia, Australian Federation of Airline Pilots, Gliding Federation of Australia, Royal Federation of Air Clubs of Australia, Regional Airlines Association of Australia, etc, etc.

The problem is that, at times, all these organisations will make separate approaches to the Federal Government on the same issue with differing views. Various factional approaches have at times been frustrated.

This problem has led Government to ask the industry to try and represent itself under one umbrella organisation so that the Government can negotiate with one body.

We amateurs have a big advantage in this area, in having one unified body to approach DOTC.

I can assure you the DOTC would not take kindly in the long term to having to try unraveling the conflicting views of two, or more, organisations representing our hobby.

We need to get more members, we need a clear majority, ideally, of all licensed amateurs. There must be a way of doing this. If marketing works for organisations from small firms right through to the BHPs of this world, I think we need a very convincing argument as to why the WIA should not adopt similar strategies.

This does not mean we have to go trendy with "Flashing Lights", or anything else that would detract from the hobby. But it does mean we must not look inwardly at ourself, but outwardly at the rest of the non-member fraternity.

The only way to do this is to seek out non-members' views. This needs to be a well orchestrated attempt, not a half-baked questionnaire designed only to skim the surface.

It will cost money, it will also need expertise — expertise that I called for in my first letter, but to no avail!

I would be more than happy to discuss this matter with any amateur, the Federal or State Council members or anybody who is at all interested.

We will see how many takers I get this time.

73

Bruce R Kendall VK3WL
8 Walwa Place
Werribee, Vic. 3030

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Hamads

PLEASE NOTE: If *you* are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper. Please do not place a WANTED and FOR SALE item on the one sheet of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Copy is required by the Deadline as indicated on page 1 of each issue.

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Across: 1 enemy 2 sued 3 waste 4 bead 5 left 6 manes 7 marg 8 pix 9 this 10 Sion
Down: 1 vac 2 cod 3 feel 4 hats 5 kites 6 gilt 7 tusk 8 await 9 kilt 10 tired

	1	2	3	4	5	6	7	8	9	10
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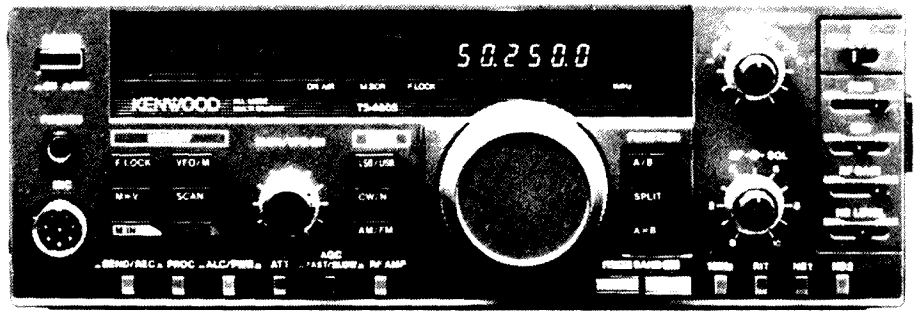

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- REG STOCKMAN COMMUNICATIONS — CNR BANOCKBURN ROAD & SHIRLEY STREET INVERELL (067) 22 1303
- WORMALD COMMUNICATIONS — 51 DENNISON STREET HAMILTON NEWCASTLE (049) 69 1999
- ROBERTSON ELECTRONICS — 62 DESMOND STREET CESSNOCK (049) 90 7908
- MACELEC PTY LTD — 99 KENNY STREET WOLLONGONG (042) 29 1455
- ALEX JOHNSON — 19 BANKSIA STREET O'CONNOR, A.C.T. (062) 47 9125
- DX ENGINEERING — 158 GRANITE STREET PORT MACQUARIE (065) 84 9922
- FRANK BOUNDY — USMORE (066) 86 2145

INTERSTATE

VIC.:
- PARAMETERS PTY. LTD — 1064 CENTRE ROAD SOUTH OAKLEIGH (03) 575 0222
- EMTRONICS — SHOP 5 TO 7 288 294 QUEEN STREET MELBOURNE (03) 670 0330
- BRIAN STARES — 11 MALMSBURY STREET BALLARAT (053) 39 2808
- SUMNER ELECTRONICS — 78 KING STREET BENDIGO (054) 43 1977

TAS.:
- WATSONS WIRELESS — 72 BRISBANE STREET HOBART (002) 34 4303
- MARINE & COMMUNICATION — 19 CHARLES STREET LAUNCESTON (003) 31 2711

V.K. ELECTRONICS — 214 MOUNT STREET BURNIE (004) 31 7733

QLD.:
- MITCHELL RADIO CO — 59 ALBION ROAD ALBION (07) 357 6830
- EMTRONICS — 416 LOGAN ROAD, STONES CORNER, BRISBANE (07) 394 2555

S.A. & N.T.:
- INTERNATIONAL COMMUNICATIONS SYSTEMS PTY. LTD — 6 NILE STREET, PORT ADELAIDE (08) 47 3688

W.A.:
- WILLIS ELECTRONICS — 165 ALBANY HIGHWAY, VICTORIA PARK (09) 470 1118
- BAY RADIO — 22 GRACE STREET, FERNDALE (09) 451 3561
- FORD ELECTRONICS — UNIT 19, 70 ROBERTS STREET, OSBORNE PARK (09) 242 1766

Obituaries

JAMES WILLIAM PORTER VK2AXP

Jim Porter died on November 19, while mowing his front lawn Earlier in the day he had a medical check up which had pronounced him fit and well. Jim was 74 years of age.

Jim obtained his AOCP and the full call sign VK2AXP after World War II, and continued to operate continuously since then. He had served in the Army during the War and decided to take up the hobby after discharge. Jim operated his station from the same address in Caringbah for approximately 37 years prior to his death.

I first made his acquaintance in the early 1950s in regard to a matter pertaining to amateur radio, and we remained firm friends ever since. From that time I had a real friend in a man who was one of the world's unassuming and sincere people and whose integrity was boundless. I feel that I was privileged to maintain this friendship for so long with one who was one of "nature's gentlemen".

Jim Porter was always a keen radio amateur and a longtime member of the WIA and was an example of the dedicated hobbyist who takes a great interest in his hobby.

To his wife, Nancy, condolences, which is shared by his amateur friends.

Vale — James William Porter, a fine man, good friend, and a loss to the amateur ranks.

Contributed by Ben Mills VK2AJE
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WILLIAM (Bill) NEVILLE ROBERTS VK2DMM

It is sad to report the passing of Bill at Newcastle, on November 5, 1987 aged 68 years. He was recovering in Newcastle Hospital but succumbed to a thrombosis.

Bill had held an amateur licence for a number of years, but prior to becoming an amateur was the holder of a PMG commercial licence, which he gained in the 1940s whilst he was a member of the NSW Police Force. He was a Radio Technical Officer in the Police Force and played a significant part in the improvements to the mobile two-way radio and related systems. Later Bill joined Ampol Petroleum and became an executive officer in the State of Victoria.

Following his retirement in 1975, Bill and his wife, Nance, travelled extensively by caravan, becoming well-known to those frequenting the Travellers Net.

Bill was an active amateur and took a keen interest in all that flashed across the ether waves.

To Nance, his widow, and his family, we extend our deepest sympathy.

Contributed by Norbert Scott VK2QS
Fred Meyer VK2AAX
John Howard VK2AMH
ar

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HAROLD GRIFFITHS DICKS VK6QD 1915 — 1987

Dr Harold Dicks, AM, MB, BS, passed away at his home in Brentwood on October 10, 1987.

During the period of World War II he was resident in the Pilbara region of Western Australia as a doctor, pilot and aircraft maintenance engineer for the West Australian section of the Australian Aerial Medical Service, operating from Port Hedland. The aircraft at that time was a single-engine Fox Moth. At the same time he was District Medical Officer, Magistrate, Mining Warden and Protector of Natives, in the Pilbara, for the Commonwealth Government of the day. He also held the rank of Captain and later Major in the AMF.

The late Harold Dicks VK6QD, in the "shack" of his yacht *Seaflight*.

In 1956, while still continuing an active role as a flying doctor, he became President of the Service which was to be renamed the Royal Flying Doctor Service of Australia (Western Australian Section), a position he held for 20 years. During this period, he also held the office of Operations Manager and served two two-year periods as Federal President of the RFDS.

As Executive Director (1968-1978) he was heavily involved in the procurement and ferrying of aircraft from the USA to VK6. Through amateur radio it was possible to check his progress after landing at each stop. In all, 12 aircraft were ferried; 10 across the Pacific Ocean and two via the Atlantic Ocean and Europe.

In 1977, as a memorial to his late wife, he founded the Robin and Harold Dicks Memorial Foundation, which is administered by the RFDS (WA Section) to train nursing personnel to commercial pilot standard, so as to perpetuate the care of the sick and injured in remote areas using aircraft as transport.

On January 26, 1978, Harold was made a Member of the Order of Australia for services to medicine and the RFDS. During this year, using his own private aircraft, he established a weekly clinic and surgery in the remote locality of Dongarra. He had previously conducted similar services for the township of Ravensthorpe and the Murchison communities.

Over the years he had been actively engaged in medical work the field, training pilots, setting up maintenance facilities, procurement of hangars, administration, fund raising, negotiation with various business companies and adviser to both Federal and State Governments. On the medical side, he was Involved with the design of stretcher installation and standardisation for various aircraft and ambulances. Medical equipment purchased and carried included the first Bird respirators used in RFDS aircraft.

Although medical services took much of his time, Harold was a true family man. They frequently sailed to Rottnest Island for brief holiday periods. It was during these little excursions on his yacht *Seaflight* that Harold and his wife Patricia VK6QL, could be heard in radio communication with their friends across Australia. They also had two metre equipment on board and in both of their cars. At the time of his passing he was considering the construction of a lightweight aircraft.

On behalf of their many friends we extend our sincere condolences to his wife Patricia, daughter Robin aged nine, and son David aged six years. As was stated by the VK6 WIA President, VK6OO, "It was a privilege for amateur radio to have been associated with Dr Harold Dicks — the founder of the RFDS in Western Australia."

—Compiled by David Couch VK6WT, from information supplied by VK6FR and VK6FH, at the request of VK6QL
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COL FLETCHER VK2ASF

It is sad to report that Col VK2ASF is a Silent Key. The only CW that ever rivaled VK3s VHP and VIS in strength, clarity and perfection; the only CW that would be working Gs, XEs and Europe on 7 MHz while the rest tried hopefully for a JA. Others like VK2s DO, JR, QL, WH, and ADB were as perfect, but never so strong.

When a little audio was added by some unearthly disposals conglomeration to the carrier running maximum authorised power from a pair of 813s — there never could be such a friendly voice welcoming any visitor to the south coast, assuring all that the signal was coming from three full wave lengths of wire connected by matching stubs for correct phasing. At times the signal was said to come from several miles of fence wire keeping sheep from cattle. The height of the fence was never given, but the three full waves in phase varied with the cloud base. One night I remember the signal was deafening through headphones plugged into a one-valve regenerative receiver. Col claimed there were two horses tangled in his matching stubs, effectively increasing the ERP (and HP?).

We only met three times in 30 years, but spoke every day for over 20 years. Every amateur who used 40 metres in the 50s knew Col.

His mobile would have been eagerly bought by any museum today. The remains of three jeeps lashed together with fencing wire sporting a few sections of a tank whip and improbably bearing a registration number plate! Except for an on/off switch and a carbon microphone, there was nothing else to suggest amateur radio. Col would drive about in this with gleeful R5 S9 signals, attending to his timber yard business, or later his television trade.

Visitors to Mailing Street could rely on a gift of large fish, freshly caught by Col. His fish stories inevitably ended with the need to find an axe to remove a few portions for Jean to cook. His maritime mobile was beset with corrosion and never equaled base or jeep.

Always generous and helpful to a newly licensed beginner, Col shipped his old AT5 rig to me about 1960. The VFO was gradually steadied, and a good signal at last came from VK2AXK. The last few years I have only been on two metres so have been unable to contact Col.

Contributed by Lee Kinsella VK2AXK
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GORDON HARLEY VK4GH

Gordon passed away quietly at Fairhaven Aged Christains' Home, Maryborough, on October 3, 1986, after a slow deterioration of health over a period of several years.

As a newly licensed amateur in 1928,

Gordon was living with his parents in Ipswich and was quite often seen scaling 60 feet *oregon* masts to adjust ailing aerials, much to the alarm of a nearby tennis club.

Prior to the war, Gordon was a member of the Militia Signals and when hostilities began, he joined the Army Signal Corps, serving in Brisbane and North Queensland. By the war's end, he had risen to the rank of Captain.

After the war, Gordon resumed activities as an amateur and maintained an active interest in all matters relating to radio communications. Right up to the end of his life, he gladly helped any person with a genuine interest in becoming an amateur radio operator and was responsible for many locals achieving that status, among them Col Paton VK4BCP and myself.

Gordon was one of the early members of the now defunct Wide Bay Branch of the WIA in Queensland. His main area of operations was HF, and being a real Old Timer, all of his equipment was home-brew right up to April 9, 1975, when his three sons presented him with a transceiver and beam. In later years, he was often the only person to be heard around Maryborough on VHF during *working hours* providing assistance and greeting to mobiles passing through town.

A teaching career for Gordon began in Ipswich, continued on to Didcot, and finally to Maryborough where he eventually retired. Of course, thousands of children passed through Gordon's hands over the years and much to Gordon's quiet pride, many ex-pupils showed their appreciation of his efforts at the Centenary of the Albert State School, Maryborough, a few years ago.

No father could be prouder than *Gordon* was of his sons. Eric, the eldest, is a surveyor in Western Australia; Ian, has high scholastic achievements and currently lectures in Surveying at a university in England; and Geoff, the youngest, is a solicitor and partner in a large law form in Brisbane.

An active interest in music kept Gordon busy in various choirs and the local Eisteddfod. In the days before Emphysema took its toll, he had a strong, deep singing voice that almost made it unwise to sit in front *of him* in church.

Unfortunately, Gordon's wife, Win, predeceased him by more than a few years. Consequently, amateur radio assumed an important part of his life and he used it to maintain a large circle of old and new friends around the world.

In July 1986, Gordon was made the first life member of the Maryborough Amateur Radio Club. He Is sadly missed by his many friends.

Contributed by Wade Millwood VK4ACB
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BERNARD (Bernie) STANLEY ROGERS VK5FG

Born in 1912 at Port Broughton, Bernie started his career with the then Post Master General's Department as a Telegraph Boy and retired as a Supervising Telegraph Traffic Officer in the Adelaide Operating Room.

His interest in amateur radio began as a lad whilst a member of the Balakalava Crystal Set Club. As his interest grew he graduated to being the proud owner of a small home-brew set which he situated in a small room adjacent to the kitchen of the then stylish Balakalava Coffee Palace. It was from here that his first CW contacts were made, much to the amazement of family and friends. He gained his licence on March 24, 1934.

Operating in the CW mode, Bernie made countless friends and contacts world-wide, and also filled the role of CW examiner at times for a number of years. He also operated SSB and keenly promoted the hobby of amateur radio to those genuinely interested. Bernie's key became silent on December 8, 1987, and he will be sadly missed by family and friends, including those who knew him as a true gentleman of the air.

Contributed by T B Rogers VK5BTR
ar

Silent Keys

It is with deep regret we record the passing of:

MR G CAMPBELL	VK2ZQC
MR H G DICKS	VK6QD
MR COL FLETCHER	VK2ASF
MR DAVID KING	VK2NHL/ZAA
MR HAROLD H LACK	L40357
MR PHIL LEVENSPIEL	VK2TX
MR LEO S MEYERS	VK2KS
MR BERNIE S ROGERS	VK5FG
MR J TREMBATH	VK5JT

DEADLINE

All copy for inclusion in the **April 1988** issue of *Amateur Radio*, including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162**, at the latest, by **9 am, February 22, 1988.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS**, Box 157, Mortdale, NSW. 2223. (No inquiries at office please . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

COMPONENTS: Wide range of parts for receiver, transmitter and other electronic equipment. Semiconductors, valve, plate bypass capacitors, coaxial connectors and many more. Mail inquiries welcome. Sorry, no catalogue available. D Dauner Electronic Sales, 51 Georges Crescent, Georges Hall, NSW. 2198. Telephone: (02) 724 6982.

WANTED — ACT

INFORMATION & PHOTOCOPIES/CIRCUIT DIAGRAMS: for Swan power supply, model PSU-5. Copy of Scripsit Word Processor Program & documentation for TRSDOS Model 1 system. Ph: Richard (062) 58 1228 or write to VK1UE QTHR.

QSL CARDS: for WIA QSL collection. Rare DX, uncommon & commemorative prefixes, pre-war & excellent pictorial designs especially appreciated. Please write to the Curator, VK3TL, Box 1, Seville, Vic. 3139, or ph (059) 64 3721 & cards will be picked up from your home if you live in the metropolitan area. For country & interstate readers, arrangements for pick-up can be made by contacting the Curator.

WANTED — NSW

AR7 COMMUNICATIONS RECEIVER: original condition. Ph: (02) 525 5559.

DRAKE 3300 LP FILTER: VK2QT, QTHR. Ph: (048) 71 1018.

FT-7B TRANSCEIVER: no mods. Ph: Joan VK2AKW, Ph: (02) 632 6748 please.

OLD SLAVE CLOCKS: of the type that were driven off master clocks in the head offices of factories & government buildings of yesterday. Slave units were stepped on by a pulse every 30 seconds. Ray VK2FW. Ph: (063) 65 3410.

OSL CARDS: for WIA QSL collection. Rare DX, uncommon & commemorative prefixes, pre-war & excellent pictorial designs especially appreciated. Please write to the Curator, VK3TL, Box 1, Seville, Vic. 3139, or ph (059) 64 3721 & cards will be picked up from your home if you live in

the metropolitan area. For country & interstate readers, arrangements for pick-up can be made by contacting the Curator.

WANTED — VIC

FT-200: must be in mint or clean condition. Melbourne area. John VK3ABW. Ph: (03) 568 7428.

ICOM IC-502: 6m SSB, SC9 link 70-85 MHz rec module. Black & White TV camera suitable for ATV use. Ian. Ph: (03) 523 9405.

OPERATING & MAINTENANCE MANUALS: or photocopies for "Dumont" cathode ray oscillograph Mod 304H, or contact address/telephone no for "Dumont Laboratories" or their agents. Also A11 mode 6 metre transceiver in working order. Reverse charges to Rob VK3XLZ. Ph: (03) 870 5792, or PO Box 477, Croydon, Vic. 3136.

QSL CARDS: for WIA QSL collection. Rare DX, uncommon & commemorative prefixes, pre-war & excellent pictorial designs especially appreciated. Please write to the Curator, VK3TL, Box 1, Seville, Vic. 3139, or ph (059) 64 3721 & cards will be picked up from your home if you live in the metropolitan area. For country & interstate readers, arrangements for pick-up can be made by contacting the Curator.

WANTED — QLD

QSL CARDS: for WIA QSL collection. Rare DX, uncommon & commemorative prefixes, pre-war & excellent pictorial designs especially appreciated. Please write to the Curator, VK3TL, Box 1, Seville, Vic. 3139, or ph (059) 64 3721 & cards will be picked up from your home if you live in the metropolitan area. For country & interstate readers, arrangements for pick-up can be made by contacting the Curator.

WANTED — SA

QSL CARDS: for WIA QSL collection. Rare DX, uncommon & commemorative prefixes, pre-war & excellent pictorial designs especially appreciated. Please write to the Curator, VK3TL, Box 1, Seville, Vic. 3139, or ph (059) 64 3721 & cards will be picked up from your home if you live in the metropolitan area. For country & interstate readers, arrangements for pick-up can be made by contacting the Curator.

WANTED — WA

QSL CARDS: for WIA QSL collection. Rare DX, uncommon & commemorative prefixes, pre-war & excellent pictorial designs especially appreciated. Please write to the Curator, VK3TL, Box 1, Seville, Vic. 3139, or ph (059) 64 3721 & cards will be picked up from your home if you live in the metropolitan area. For country & interstate readers, arrangements for pick-up can be made by contacting the Curator.

WANTED — TAS

QSL CARDS: for WIA QSL collection. Rare DX, uncommon & commemorative prefixes, pre-war & excellent pictorial designs especially appreciated. Please write to the Curator, VK3TL, Box 1, Seville, Vic. 3139, or ph (059) 64 3721 & cards will be picked up from your home if you live in the metropolitan area. For country & interstate readers, arrangements for pick-up can be made by contacting the Curator.

WANTED — NT

QSL CARDS: for WIA QSL collection. Rare DX, uncommon & commemorative prefixes, pre-war & excellent pictorial designs especially appreciated. Please write to the Curator, VK3TL, Box 1, Seville, Vic. 3139, or ph (059) 64 3721 & cards will be picked up from your home if you live in the metropolitan area. For country & interstate readers, arrangements for pick-up can be made by contacting the Curator.

FOR SALE — ACT

TONO 7000E RTTY/CW/ASCII COMMUNICATIONS COMPUTER: Complete with manual & original packing $500 ONO. TNC2 with add-on 7910 modem board. $200 ONO. Richard VK1UE, QTHR. Ph: (062) 58 1228.

FOR SALE — NSW

BEAM: 5-element Hy-gain No 411 10 metre. 1 Crown rotator Model CAR 24. Both with manual. Perfect condition. $300. 1 Sideband SE-502 28.3 to 28.6 MHz, new in box. $90. Norm. Ph: (065) 69 5242.

DECEASED ESTATE — VK2DMM: Yaesu HF/SSB station complete. Yaesu FT707 transceiver, Yaesu FB707 power supply, Yaesu FC707 antenna tuning unit, with all manuals, all unmodified, performance & appearance as new. Will not separate. $700. Norbert Scott VK2QS. Ph: (049) 63 5653.

EPROMS BLANK INTEL 2716s: As new $2 ea. Bulk orders in excess of 100 units special price $1 ea. Ph: (049) 29 1967.

FT7: no mods, 10, 15, 20, 40, 80 m. Mic, mob mount, manual, schem circuit. Full set (5) Yaesu whips with λ 2m stub & gutter mount. K/wood AT130 tuner (8 bands) illum meter, mob mount, coax & fittings — the lot $480. Icom IC22S 2m FM 10/1W, mic, mob mount, manual, schem circ, 12 chan matrixed, plus diodes for extra chans. Complete overhaul by Icom 1984. $165. All equip VGC, very little use last 3 years. VK2ELG. Ph: (060) 43 1044.

ICOM IC-751 BASE/MOBILE HF TRANSCEIVER: General coverage rx, mint condition. $1350. Ph: (049) 45 4989.

KENWOOD TS-130SE TRANSCEIVER: & AT130 antenna tuner. 3.5 MHz to 29.7 MHz, 200W PEP. Perfect working order. $500 ONO. Ph: (02) 969 6606.

TRANSFORMERS: (as listed below). 1 off 240V Pr/6.3V 12A CT SEC. 1 off 0-230V/240V/250V Pr/5V 10A + 5V 10A CT SEC. 1 ofl 0-220V/240V/260V Pr/500V 250 mA CT SEC. 1 off 0-210V/220V/230V/240VPr/ 750V 250 mA SEC 250V 250 mA SEC 25V 250 mA SEC. 1 off 0-210V/230V/250V Pr/ 1500V 500 mA No CT. 1 off 0-220V/240V/260V Pr/1875V 750 mA CT SET. What offers? Art VK2AS, QTHR. Ph: (02) 467 1784.

FOR SALE — VIC

CLEARANCE TEST EQUIPMENT: commercial & home brew. Radio engineering & amateur handbooks circa 1940-1960. Ph: (03) 29 3523 for lists or inspection.

DECEASED ESTATE: Complete contents of amateur shack including components, test equipment, etc. Yaesu FT-107DM c/w FP-107 power supply $950. Yaesu FV-101DM digital VFO $250. Hy-gain 10-60m trapped vertical antenna $95. Fluke digital bench multi-meter 8000A $350. Mod 43 teletype $100. Precision model makers lathe. For further information contact Barry Willon VK3XV. Ph: (03) 555 6281 between 7 & 9 pm.

KENWOOD R-5000 RECEIVER: 50 kHz to 30 MHz. AM, SSB, CW, FSK, 100 memories. Mint condition. $1000. Will pay postage if needed. Ph: (058) 21 0846 AH.

LINEAR AMPLIFIER: Collins 30-LI. Ex cond. $1300 ONO. Drake TR4, ex cond with power supply & some spare tubes. $700 ONO. Ph: (03) 842 6919 after 6 pm.

MODEL 15 TELEPRINTER: Offers. Two Siemens teleprinters. Both in excellent condition with power supplies, tested & working well. $150 ea. Tono 7000E communications terminal in ex condition incl monitor & many leads. $700. Complete 2 metre station — Icom IC-251A plus Mutek front end in mint cond. (Includes factory mods for preamp). Service manual. AG25 masthead preamp. 16 dBd beam antenna & liftings, cable etc. Aluminium stock for another 16 dBd ant (worth $90). 06/40 in chassis for conversion to linear. The whole lot for $1200. Gil VK3CQ, QTHR. Ph: (057) 55 1158 BH.

TOWER: Crank up to 50 feet, four section, complete with guys. $200. JIL SX100 scanner, not working. Offers. Ph: (03) 544 8958.

VERIAC: input 115V, out 110V. Ex cond $20. Q-multiplier, notch filter kit. Model 340-A. New. $20. Automatic keyer. Ex cond. $25. Power supply, regulated Southern Cross, 13.8V, 4A peak, 1.5A continuous, input 240V, with circuit diagram. Perf cond. $30. Skyphone VHF tcvr VC-10 series. Handbook, crystals for VC-10, AWA MR-20A carphone, instruction book #3-59650R. Instruction book #59680R AWA carphone junior installation. Best offer. Power supply, Southern Star, 240V in, 13.8V DC out, 4A peak, 1.5A continuous. PC $30. Hallam Magnetics power transformer. Input 240V, 50 Hz, 1 ph, 4.4A, output 1100V, .91A. New $100. Vulcan Mini-range stovette. Elsc, hotplate & oven. Ex cond. $100. Log books (3), Collins Radio Co, new Collins labels. Collins instruction book & circuit for 625-1 VHF converter. Mechanical filters & catalogues 1963-64. Other Collins literature, etc. All in ex cond. Best offer. Ph: (055) 62 6016.

YAESU FT-200: SSB HF transceiver. Manuals, spare valves, four spare finals, power supply, hand mic. $260. Ph: (052) 55 4047.

YAESU FT-270RH: two metre FM transceiver. 5/45W output, 10 memories, dual VFOs & scanning facilities. Plus two metre vertical antenna, both under 12 month old & in excellent condition. $600. Scott. Ph: (03) 818 1934. ***Licenced Amateurs Only.***

FOR SALE — QLD

ANTENNA TUNER: Drake MN2000, 2kW, with 20/200/2000W power/SWR meter, manual. $350. Speech processor, Japan w/circuit. $30. Receiver, Drake R2B w/manual. Full coverage capability. 50 kHz IF with sleep-sided LC filter. (Excellent for CW). $200. Hustler 5BTV vertical antenna wanted. Low imp headset wanted. John VK4SZ, QTHR. Ph: (070) 61 3276.

KENWOOD TS-520S: HF transceiver together with an AT-200 antenna tuner. All in excellent order, original packaging & manuals included for $550. Ph: Ron (075) 57 1336.

RF SIGNAL GENERATORS: Marconi TF995A/5 1.5/220 MHz FM/AM/CW $550. Marconi TF144H/4 10k/72 MHz AM/CW $200. Matrix 931H 50k/50 MHz AM/CW $200. Ratcliffe 205 45/180 MHz AM/CW $75. Airmec CT212 85k/32 MHz FM/AM/CW $50. Hewlett Packard 52.45L frequency counter 0/500 MHz $550. Takeda Riken Ditto $450. 8 two-way radios (3 base) $300 the lot. Will swap any or all, for Tx Rx or transceiver. Bob VK4OY, QTHR. Ph: (07) 396 0886.

YAESU FT-757GX: HF transceiver, gen cov rx. Good cond with scanning mic & w/shop manual. Original packing $1100. VK4ALN QTHR. Ph: (075) 35 9854.

YAESU FT-225R: 2m all mode tcvr. 240/12V, rplr xtals. $350. Ken. Ph: (075) 58 2293.

1-WS C42, 1-WS C45: Both up & running 10m & 6 m FM. C42 — 23 to 38 MHz cont. C45 — 36 to 60 MHz cont. Plus spare C45 set nearly complete, good for spares. 2 power supplies to suit plus switches, cables, J boxes, etc. Plus circuit diagrams, manuals & other mod info. Also original carton. $500 the lot. VK4AUK, QTHR. Ph: (071) 29 6247.

432 MHz to 1296 MHz TRIPLER & FILTER: $35. FT-221R in original condition. $450 ONO. FM321 70 cm with mobile antenna. $250. 8/8 Skeleton slot J beam $60. Chirnside 15/10 duo-band with balun. $110. Kevin. Ph: (07) 814 3006 AH or (07) 377 4286 BH.

FOR SALE — WA

KENWOOD TS-930S HF TRANSCEIVER: 160-10m & gen coverage receiver. In-built PS & aulo ATU. Perfect cond with mic, h/book & original carton. $1600 including delivery Australia-wide. VK6ED, QTHR. Ph: (097) 52 1173.

FOR SALE — TAS

SWAN TRANSCEIVER: 240. Tribander (20, 40 & 80 metres). Valve job, with separate power supply unit. $250. Dave VK7DS. Ph: (002) 29 6538.

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Advertiser's Index

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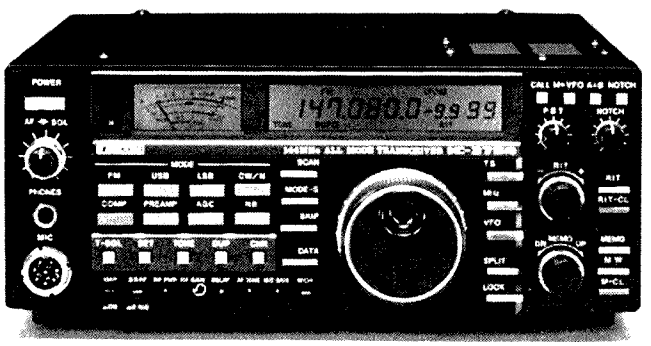
WE COULD HAVE YOU LOCKED UP IN 5 MILLISECONDS.

ICOM proudly brings you the fastest lock-up time ever, thanks to our new Direct Digital Synthesiser (DDS) units.

By using an advanced double phase-locked loop system, the 5 millisecond lock-up time makes them ideal for use with the popular PACKET and AMTOR communications systems.

IC - 575A/H (dual bander). 28/50 MHz.

IC - 475A/H. 430 MHz.



IC - 275A/H. 144 MHz.

However, DDS is not the only break-through on these state-of-the-art, all-mode transceivers.

For example, the built-in data communications and packet switching capability is another ICOM first.

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The Ball Partnership

Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL. 56, No 3, MARCH 1988

KENWOOD

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10 WATTS OUTPUT ON 6 METRES

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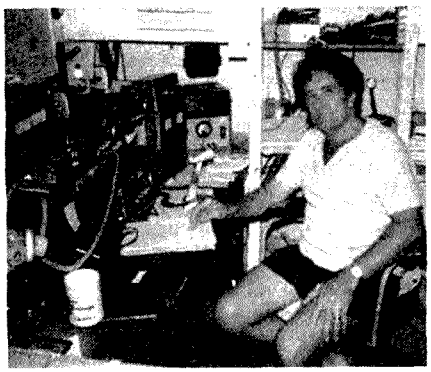
Amateur Radio



—Photograph courtesy Bill Murphy VK8ZWM

Geof VK8GF, from Alice Springs, was a guest at the Darwin ARC 21st Celebrations. (See centre pages for a pictorial display).

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Technical Features

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DEADLINE

All copy for inclusion in the May 1988 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, March 21, 1988.

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Editor's Comment

ACROSS THE TASMAN

I began to write this on January 5, at Eltham. Not Eltham, Victoria, but Eltham, Taranaki, New Zealand, almost at the foot of snow-capped Mount Egmont. A magnificent site for repeaters, and of course there are two metre and 70 centimetre repeaters just below the summer snow-line.

Your Editor is enjoying a month in New Zealand, travelling the country in a hired camper-van. We are the same two-couple group who so much enjoyed sailing the Whitsundays last September, as mentioned in a previous editorial. Amateur activities, as on that trip, are confined to two metres FM, mostly while stationary in motor parks, and mostly via local repeaters. Maybe some VHF purists will shudder, but one can acquire much valuable local knowledge this way.

I was much impressed by the help given me by the New Zealand RF Service (like the RF Management Division of DOTC) to enable me to enjoy this privilege. I wrote to RFS early in December, sending copies of my AOCP licence, etc, seeking a visitor's licence. Imagine my surprise to receive a telephone call from across the Tasman a few days before Christmas, telling me that their offices would be closed until January 5, and I would need to fill in a form and pay a fee. In the meantime I was nevertheless welcome to the call sign ZL0AHF!

(I filled in the form and paid the fee on January 8, at New Plymouth).

We arrived at Auckland airport on New Year's Eve, and we are scheduled to leave from Auckland on January 28. In these four weeks we will have travelled about 6000 kilometres in the camper-van, spending about the same time in each of the North and South Islands. We will be leaving the van in Christchurch and flying back to Auckland.

In answer to the inevitable question "What have been the highlights so far?", I can only say there have been many, and more are to come. There are three editorial travelogues about Australian trips awaiting composition before we can tackle a New Zealand story. But one of the highlights must be the QSO across the Tasman on 2FM on Friday, January 8, at 0425 UTC between VK2MT in Wollongong and ZL0AHF halfway up Mount Egmont (via the Kakaramea and Wollongong repeaters on Channel 7275). The locals tell me that trans-Tasman openings are not uncommon during the summer, but even so, and even though repeater-assisted, it was still a thrill!

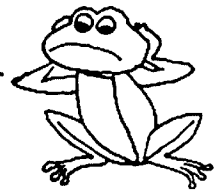
For now, on January 14 near the beach at Ngakawau, I must say "haere ra" from "Aotearoa" and 73.

Bill Rice AX3ABP
(temporarily ZL0AHF)
Editor

INSATIABLE APPETITE

Amateur Radio Is always in need of a steady supply of articles for publication, whether they be short technical tips or long technical articles; even interesting anecdotes. Whilst articles on advanced and new techniques are needed, it must not be forgotten that new amateurs and novices are always interested in good basic items which the "seasoned amateur" may class as too basic for AR. So, write-up that project that has worked for you, as *Amateur Radio* has an enormous appetite for a well-balanced and varied diet.

Preparing an article for *Amateur Radio* is very simple. Just commit your thoughts to paper as you would when explaining to a friend over the air. Manuscripts may be clearly handwritten or typed **original** copies (*no photocopies please as the photocopier invariably prints blank in a crucial portion of a technical explanation or mathematical formula*). Include circuit diagrams if applicable — they do not have to be ready for publication (clear sketches are adequate). Don't overlook a photograph too, but please be careful when labelling them — many good photographs have been damaged by heavy ball-point pen marks coming through from the back or felt-tip pens smudging from the back of one to the front of another!



Main QSP

WARC 92 (?) — A WIA POSITION

INTRODUCTION

With indications that there could well be a World Administrative Radio Conference (WARC) of the ITU, perhaps called something different, as early as 1992, involving the review of frequency allocated to the Amateur Service, it is therefore essential that the WIA gives early consideration to its position, particularly as the IARU Region III position may well be developed at the Seoul Conference in late 1988. Indeed, if a position is not developed then, the development of a Regional position may well be too late to influence the other Regions.

1. AIM

This paper proposes an initial WIA position in respect of Australian amateur involvement in such a Conference.

2. IARU ADVICE

IARU advises that such a Conference could examine frequency bands including, or affecting, the bands allocated to the Amateur Service at 7 MHz, and all the bands above 420 MHz to 5 GHz.

In 1985, at the Region III Conference in Auckland, a preliminary position in respect of amateur bands was developed, and similar positions have been discussed at the Region I and II Conferences since then.

There is concern in Region I at the apparent hardening of attitudes to the Amateur Service by some administrations — 'Amateurs have too much under utilised valuable spectrum allocated already."

3. THE AREAS OF POSSIBLE WIA INVOLVEMENT

The WIA can advance the Amateur Service position,

3.1 By influencing the development of the IARU position,

3.2 By supporting and encouraging Region III in its participation in an IARU delegation to any Conference,

3.3 By participating in the development of an Australian national position, including involvement in the CCIR preparations, representing the Australian Amateur Service, consistently with an IARU policy,

3.4 By seeking and providing one or more accredited members of the Australian delegation to such a Conference.

The first two are funded through the Region III Association, and the cost is shared among the members of the Association, and the second two are entirely at the cost of the WIA.

4. THE VALUE OF NATIONAL INVOLVEMENT

The formulation of a global IARU policy, and the advancing of that position by national societies to their own administration, and an IARU delegation at a Conference is an important part of the advocacy to advance the amateur position.

However, the IARU delegation at a Conference can only have observer status, cannot vote and necessarily, as against the representatives of sovereign States, must keep a very low profile. It can lobby, but can only lobby in a way that preserves its creditability and acceptability.

The involvement of WIA national representatives in the preparation for a Conference, and as Australian delegates to a Conference, may enable the development and advancement of a position in ways not open to the IARU by itself.

5. NATIONAL REPRESENTATION AND THE IARU

Clearly, the more administrations persuaded to adopt the global IARU position, the more votes for that position. There is a positive disadvantage, for the Amateur Service, in the adoption at a national level, of positions different from the IARU position. They attract only one vote, a common position, if effectively advanced, will attract the votes each administration adopting them. Identification of a position at the national preparation stage as an IARU position will often assist the adoption of that position.

Once at a Conference an accredited delegate can only advance a national position. He is, however, no more restricted from liaising with the Amateur Service observer delegation than is the aeronautical service representative from liaising with the ICAO or IATA observer delegations, so long as he is not advancing a position different from his delegations national position.

Thus a close involvement in the development of an IARU position, and a close, but responsible, relationship with an IARU delegation at a Conference is the optimum position for a national representative to take.

6. A CRITICAL POLICY ISSUE

Annexure 1 is the policy adopted by the IARU Region III Association at the 1985 Auckland Conference.

Since then an issue has emerged that does require careful consideration. That issue affects the bands above 420 MHz and turns on whether it is better to continue to seek larger shared bands, or to now seek smaller exclusive segments, perhaps centred on amateur satellite bands.

There is an argument that the present approach gives flexibility.

However, in favour of the possible alternative approach, is the argument that the amateur is being disadvantaged and band segments are being eroded.

Among other matters, to support that position, reference is made to:

420 MHz	SLYDES	World-wide
420 MHz	MOULD	UK
420 MHz	VHF Radar	USA, UK, Europe
1.2 GHz	Windshear Radar	USA, Canada
1.2 GHz	Aviation Radar	USA, Australia
2.3 GHz	MDS	Australia

It is suggested that the adoption of a policy in respect of this matter, if different from the present IARU position, is a WIA policy to be taken to the IARU Region III Conference in Seoul. If not adopted there, or subsequently by the IARU as a whole, it is not a policy to be advanced nationally, and contrary to IARU policy.

7. RECOMMENDATION

It is recommended that the WIA consider the following issues raised in this paper and resolve to:

1 Review its policy in respect of frequency allocations to the Amateur Service, and
2 Advance that policy (whether amended or not) generally to the IARU, and particularly at the Seoul Conference of the IARU Region III Association, and
3 Subject to its review of the policy ultimately adopted by the IARU, participate in the national preparation for any frequency Conference, including preparation undertaken by the CCIR, taking positions consistent with the position adopted by the IARU, and
4 Seek the IARU Region III Association to nominate effective representatives as members of an IARU observer delegation to a Conference, and
5 Seek the accreditation of one or more representatives of the Amateur Service as members of the Australian delegation to a Conference, and
6 Establish the means of adequately funding the participation of the WIA in the forgoing.

David A Wardlaw
Michael J Owen

Members of the Federal Executive
January 16, 1988

LCT A New Transmission System

Peter J Cox PA3DSX
Malvert 68-51, NL-6538-ER, Nijmegen, Netherlands

LCT (Low Cost Transmission) makes it possible for computers to "speak to each other" using an inexpensive "modem" for your transceiver.

This modem (Figure 1), is designed for the C-64, but can be used with any computer having a data cassette I/O facility.

TRANSMIT MODE

Only two resistors (R1 and R2) form the basic modem between the computer and the microphone input of your set, making a perfect data signal transmission possible.

RECEIVE MODE

The received signal is taken from the loudspeaker direct to a fixed audio level CA3130 IC amplifier, inverted by a 1/4 4001, after which the "data" is sent direct to the computer. At D4, some more level conversion may be required on some computers.

PROGRAM

The LCT does not require any computer knowledge. Transmit/receive is accomplished without any special programs.

To exchange data, follow these procedures (considering the "local" commands for your computer, it may be advantageous to see a C-64 owner and find out what these commands do. I have been told that my old, trusty Model i, should have no problems — VK4QA).

SAVE(RETURN). .press switch S1

simultaneously, as arranged on air, the other station will:

Press LOAD(RETURN). . .press switch S1

The data contents can be anything, for instance CW exercises, printer commands, usual home-brew programs. Technically, LCT will be able to transfer any sort of program.

In practice, the F1 key was sufficient to prepare my computer/transceiver for receive.

TECHNICAL ASPECTS

During data transmissions, point D6 (sense) is automatically earthed through ports 3 and 4. These parts are sufficient to ensure "load-error-free" data transfers.

So, why the other parts in the circuitry?

1. C1 and C2 isolate the computer and transceiver.
2. Port 2 is excess. You may use it to connect a speaker or LED across it for monitoring purposes.
3. Z4 (Zener diode) keeps static charges from the computer.
4. The yellow LED is switched in by the computer during a LOAD or SAVE command.
5. C=80 uF prevents RFI destroying ports 3 and 4 of the memory. It did happen with one particular set.
6. S2 replaces the datasette "PLAY-key", enabling automatic start after "found name" on the screen.
7. The purpose of the fifth order filter is to chop off the many harmonics from the computer's square wave signals. Application depends on the sensitivity of your set's microphone input.

R1 should never be of a lower value than indicated. It is preferable to try and feed the computer signal into the transceiver after the first microphone amplifying stage.
This will aiso enable you to use the microphone without plugging/unplugging.

8. The transistor and reed-relay in the circuit diagram after "X". With this circuit you will be able to automatically control a cassette deck motor. The existing datasette is then not needed. On the reverse side of my PCB a five-pin plug is mounted and this will connect, for instance, a stereo deck with a four hour tape at 4.5 cm/sec. This makes it possible, with turbo loading and with an average program length of 30 seconds, to store more than 1500 programs on the one tape. This system will not work with cassette decks with automatic volume control, the signals will be corrupted.
9. The incoming signal must be at least 900 mV PP, pot P1 is then 40 percent open. The signal strength may be measured with the help of a simple S-meter during the incoming header-tone.
10. The print (lay out not shown) is about 40 x 40 mm and is soldered to the six-pin plug of the datasette. Through this print the computer, transceiver and cassette deck are permanently earthed.
11. A signal, being 10 percent too low, creates a bigger problem than too high signals. The incoming square wave signals are not "filled-in" properly causing corruptions.

NB: Do not deviate from the indicated values

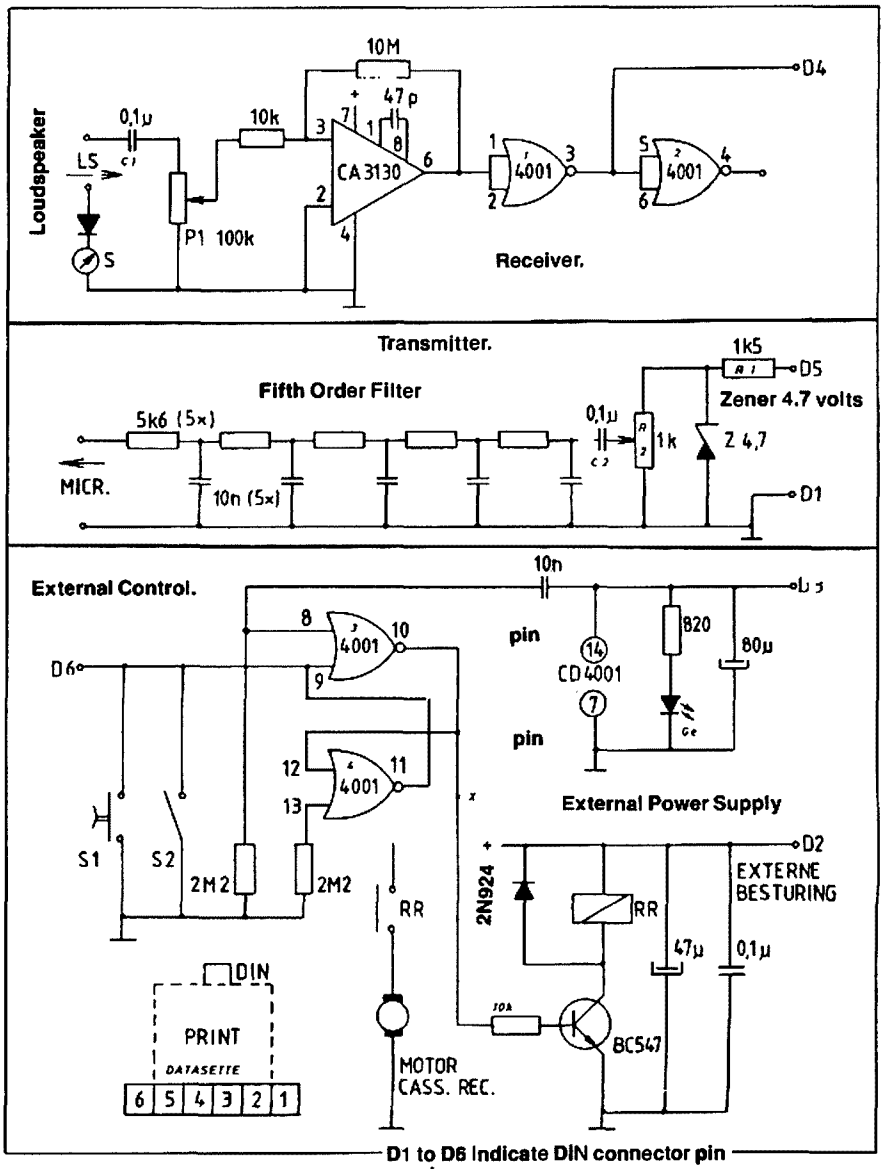


Fig. 1 Low Cost Transmission.

Please turn to page 29

THE BUG HUNT

Gil Sones VK3AUI
30 Moore Street, Box Hill South, Vic. 3128

This is a story of the hunt for a bug on the VK3REC repeater on January 13 and 14, 1988. Hunters were VK3GJ, VK3JH, and VK3AUI.

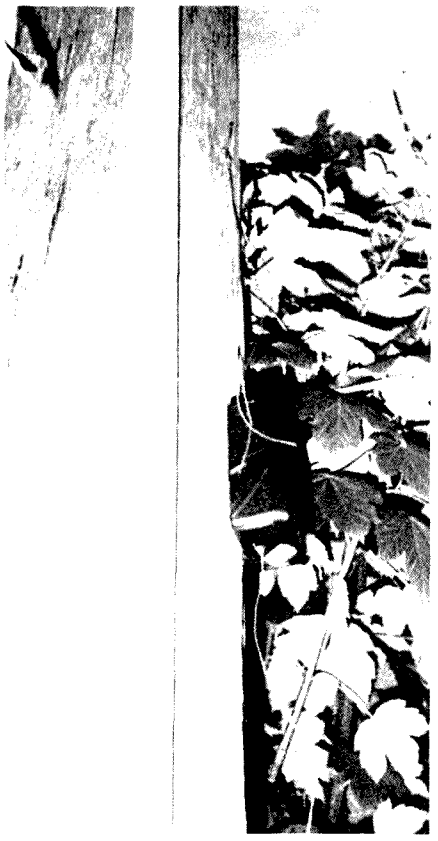
Summer brings out a great variety of insects which flourish in the good weather and the long balmy nights. Many a pleasant occasion has been marred by the insects which flock to the light.

Amateur radio unfortunately has its share. Nets and repeaters act much like the light at the barbecue. Pests flock to enjoy the attraction in their own way.

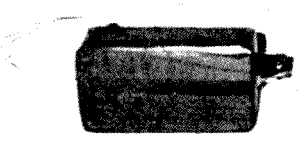
Recently a local repeater began to act in a rather strange manner. The maintainer of the repeater observed the strange way in which the repeater was acting. He came to the conclusion that a bug had been planted on the repeater, and the repeater was closed down immediately.

By way of explanation, a bug is a device which is placed maliciously to interfere with the operation of the repeater. It is usually a small device which transmits a signal which mimics a fault on the repeater or alternatively interferes with the operation of the repeater.

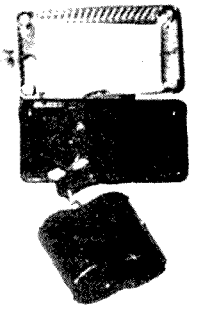
After closing down the repeater a group of fox hunters was organised to go and search for the bug. Some expertise in finding hidden transmitters is useful. However given enough time even the most inexperienced will find the bug.



The Bug Exposed.



The Device after removal.



Internal View of the Bug.

The fox hunters assembled with a variety of equipment and set out to search the area around the repeater. A fairly simple field strength survey narrowed the area down. A fairly intensive search soon led to the discovery of the bug.

A field strength survey is the simple technique of looking for the area of greatest signal strength. Move along a straight line or along the road and take note of the signal strength. Then do the same but at right angles to the first line so as to find the area where the signal is strongest. After a few false starts you will have localised the signal to a small area. Murphy will always send you *off* in the *wrong* direction at first.

Now the real fun starts as the signal is much stronger. You may have got by so far with nothing more than a hand-held transceiver but now the signal is embarrassingly strong. You may get further by various means of reducing receiver sensitivity such as tuning off the signal or removing the antenna and relying on leakage. Keen eyesight should not be underrated in the final stages.

A directional aerial or beam together with a gain controlled receiver and an attenuator is a great help. However do not think that such sophistication is mandatory. In this case whilst a beam was available and was used, the intelligent use of a hand-held and keen eyesight led to the discovery of the bug.

Following removal of the device the repeater was switched back on and returned to service.

The bug was passed on and examined for any clues as to its source. Hopefully the repeater will continue to give good service without further incident.

Finally, I would like to acknowledge the efforts of the other members of the team. Whilst they are not named their work has been greater than that of the writer.

ar

CANBERRA AIR PAGEANT — VI88ACT

On Sunday, March 13, Canberra will host a large air display and amateur radio will play an active part. The WIA (ACT Division) will provide on-site VHF communications to assist with the smooth running of the Air Pageant. Also, the special call sign, VI88ACT, will operate portable from the Canberra Airport.

VI88ACT will be the Division's station for the John Moyle Field Day over the weekend of March 12-13, and will be hoping to achieve honours for the ACT Division this year as well as to promote interest in the Australian Bicentenary. VI88ACT will try to operate as much as possible on the following frequencies: 3.588, 7.088, 14.188, 21.188 and 28.488 MHz.

VI88ACT OPERATION

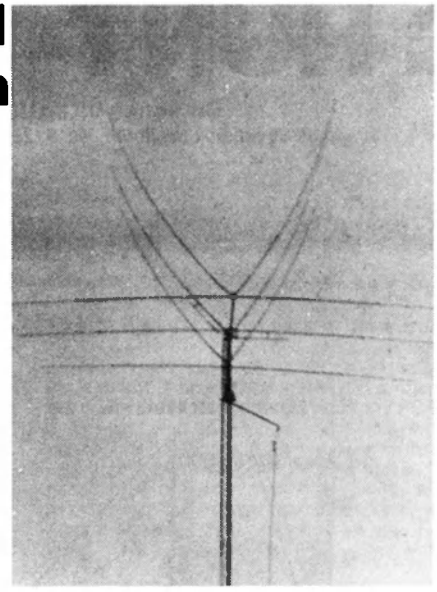
During January 1988, the National Capital's Special Event Station, VI88ACT, made over 1000 contacts, including 70 countries, and over 400 different prefixes.

On Australia Day, January 26, nearly all of the VI88 prefixes met on 14.188 MHz at 0900 UTC, in recognition of the Bicentenary. The following VI88 stations were on the air simultaneously: VI88ABC, VI88ACT, VI88NSW, VI88NT, VI88QLD, VI88SA and VI88WA.

THE DELTA-YAGI . . . a solution

The captivating Delta-Yagi!

M Glisson VK2JMG
7 Hely Avenue, Wagga Wagga, NSW. 2650
Barry Gilmour VK2MUZ
58 Tobruk Street, Wagga Wagga, NSW. 2650



IN THESE DAYS of sharply increasing prices this form of duo-band antenna yields good performance for the monetary outlay involved. The band combinations only to be limited by the strength of character of the builder. The basic design is non-critical in terms of variance of the basic design and available building materials. Several different forms have been built by the co-authors, utilising different construction techniques and basic antenna design. After 12 months of comparison between two similar forms of this antenna, antenna performance appears equal. They therefore conclude that this antenna provides a dual band capability with good performance without a considerable monetary outlay on an interlaced or trapped antenna system.

INTRODUCTION

In 1983, VK2JMG (ex-VK2KMG, VK2NIB and VK3NIB), moved from Melbourne to Wagga Wagga and traded a small inner city flat for a large suburban block. At last he had somewhere to contemplate an *antenna farm*. In researching back-copies of AR, an article by VK2VPN entitled *Delta-Yagi* was found (November 1980). This article described how a Delta-Yagi had solved his problems.

In VK2JMG's case, he had acquired a four-element 10-metre Yagi and had a desire for 15-metres, a fascination with quads and limited finance. The Delta-Yagi seemed perfect and a two-element Delta Quad was constructed to share the same boom as the 10-metre Yagi.

Performance of both antennas was good, in comparison with other local stations using more power (better than the FT-7 used by VK2JMG), and trapped beams, a DX station's report would be comparable and occasionally greater. The size of the 15-metre Delta Quad was enormous on the ground, but relatively "small" in the air. The latter illusion led to neighbour acceptance quite quickly. The wind survival factor initially was of great concern. A technique of parking the array into the prevailing wind allowed the antenna array and lightweight rotator to easily survive winds that tore trees apart! This form of antenna had certainly captivated VK2JMG.

Barry VK2MUZ, gained his call in mid-1986, and had been previously been involved in helping to erect and adjust the Delta-Yagi arrangement at the VK2JMG QTH.

This antenna was also to prove a fascination and upon gaining his call he decided to build a 15-metre Yagi, and 10-metre quad version, each of three elements.

After exhaustive research on pricing components, it was decided the best overall value for money was to purchase a commercially manufactured beam for 15-metres and construct the quad himself. Subsequently, a 15-metre beam was selected which has proven performance. Importantly, it also has a boom large enough to support the three-element quad without added extra support.

The Delta-Yagi was constructed and the entire cost remained far below that of a trapped or interlaced commercial array. This antenna has been in the air for over 12 months and its performance has been more than satisfactory on both bands.

Also, in early 1986, VK2JMG purchased a home elsewhere in Wagga and the recent success of Barry's antenna prompted the building of a similar unit. This new antenna was significantly lighter in gauge due to materials available. The construction techniques varied to accommodate this aspect. As the two antennas were similar in design, comparison in friendly competition was undertaken. The two systems are the same height above sea level and, after 12 months, the results gained are similar. This leads to the conclusion that the Delta-Yagi system is fairly non-critical in terms of basic constructional techniques and provides reasonable performance for monetary outlay.

The rest of this article will describe the basic antenna design, and constructional variations as used in the two forms of the antenna built. It will outline aspects which are found by experience which will hopefully stimulate constructional activity with this form of antenna array.

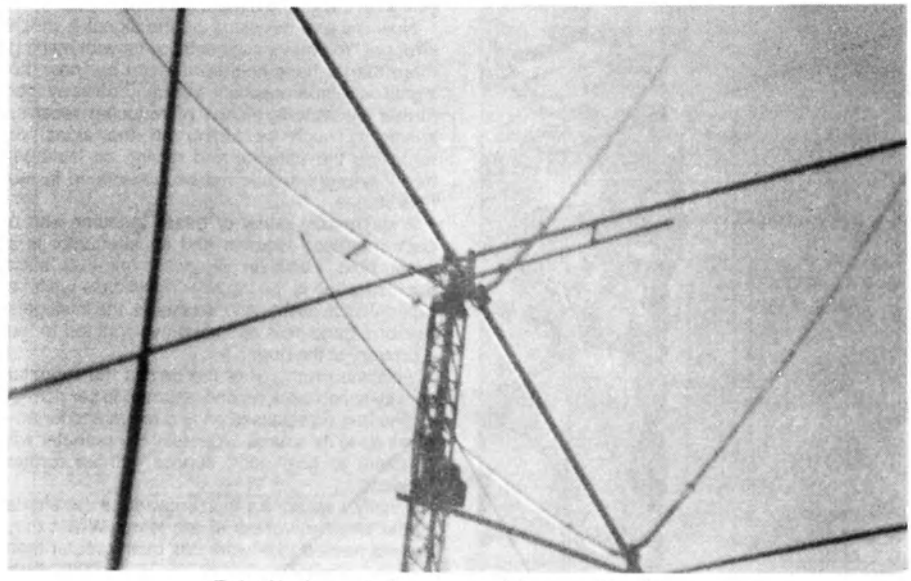
CONSTRUCTION

General — A three-element 10-metre delta quad over a three-element 15-metre Yagi. The three-over-three arrangement appears to be the best all round compromise in terms of performance, size, cost and mechanical balance for this type of antenna. On 10-metres, the three-element quad provides a similar gain to that of a four-element Yagi. On 15-metres, the three-element Yagi provides satisfactory performance without being excessively large. Both antennas theoretically have more than satisfactory front-to-back rejection ratios which show in the finished product.

Figure 1 shows the general form of the antenna with theoretical dimensions and a table of dimensions as used in the two basic forms constructed. These should serve to assist the would-be constructor.

The following notes will generally aid the constructor. These will be followed by specific details of the quad spreaders and variations, as well as the effects observed in the two delta quads built.

The delta quads are all "plumber's delight" constructions! A separate coaxial cable was used in both models to feed each antenna. The use of a single cable and remote switching system sounds attractive but has not been tried as yet! The match to each antenna is via a gamma match. The sliding-tube-type is recommended and dimensions are available in the *ARRL Antenna Handbook*. The two matching sections need to be opposed. Experience showed that a radiation pattern slew resulted on both bands if this was not done. The 10-metre match and 15-metre match are best mounted on each side of the boom centre as shown in Figure 1.



Delta Yagi — note the opposed Gamma Matches.

If a sufficiently heavy boom is used for the Yagi, the added quad elements do not necessarily need further support. However, if an overstay is required, ensure a good quality long-life Ultra-Violet resistant marine rope is used. A wire broken into what was thought to be non-resonant lengths, caused havoc with the tuning of the quad. Replacement with a non-conductive rope cured the problem. The vertical support for the boom should also be a non-conductor. PVC electrical conduit is ideal. (See Figure 2).

Another important point concerning this antenna is that it has height, width and breadth. It can therefore become difficult to manipulate or move about. By experience, once the delta loops begin to rotate, a massive torque is felt by anyone trying to hold the boom. (See Figure 3).

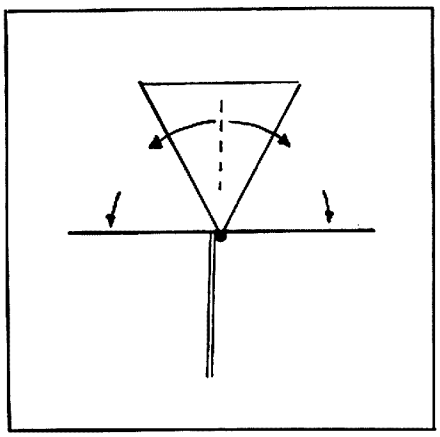


Figure 3a: Mounted on the Mast. Stable rotational effects are even.

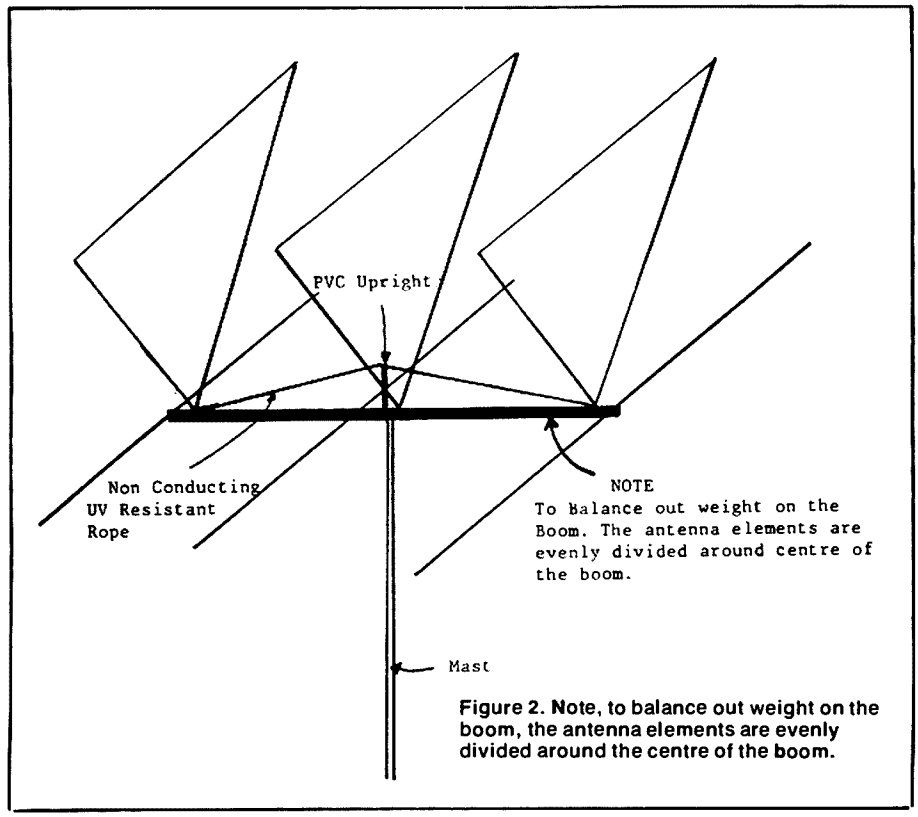


Figure 2. Note, to balance out weight on the boom, the antenna elements are evenly divided around the centre of the boom.

It requires two people to move the array about on the ground, although once the structure is mounted firmly on the mast, and the loops balanced, it is quite stable and capable of withstanding high wind loadings.

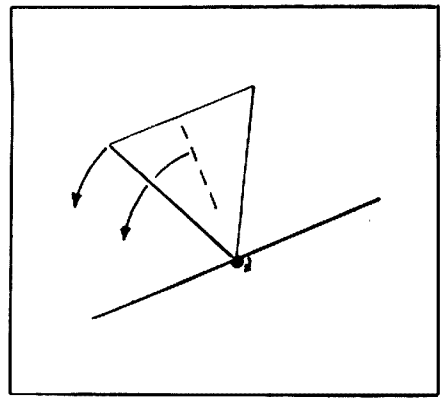


Figure 3b: During assembly or movement to the mounting point can be potentially difficult. It requires two people to safely manipulate.

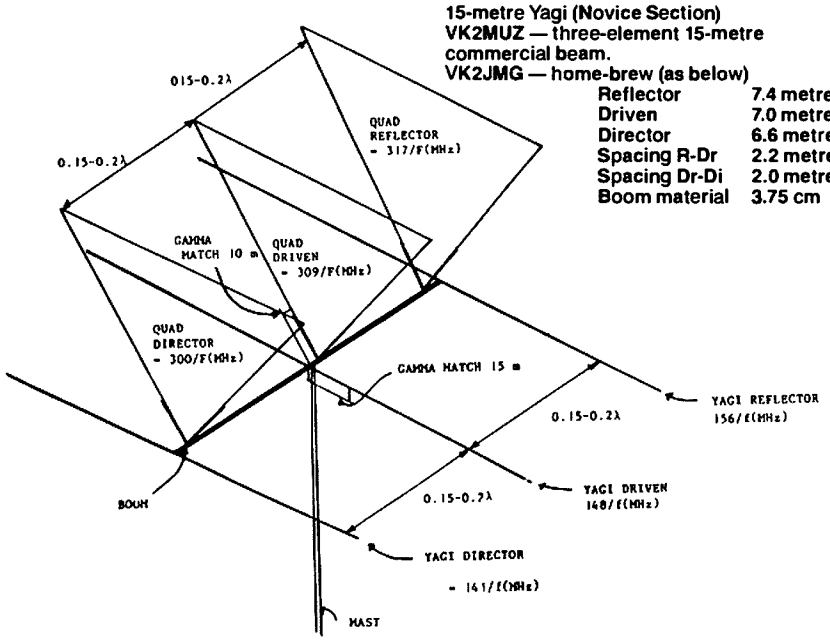
Figure 1. (All theoretical values derived from *The ARRL Antenna Handbook 1977.*

Dimensions:

Delta Quad	**Reflector Loop**	**11.12 metres**
	Driven Loop	**10.84 metres**
	Director Loop	**10.52 metres**
	Spacing R-Dr	**1.9 m/2 m**
	Spacing Dr-Di	**1.7 m/2 m**

15-metre Yagi (Novice Section)
VK2MUZ — three-element 15-metre commercial beam.
VK2JMG — home-brew (as below)

Reflector	**7.4 metres**
Driven	**7.0 metres**
Director	**6.6 metres**
Spacing R-Dr	**2.2 metres**
Spacing Dr-Di	**2.0 metres**
Boom material	**3.75 cm**



Tuning the Antenna — The 15-metre Yagi is assembled without the delta quad. Connect it to the length of coaxial cable to be used for 15-metres, point the director to the sky and adjust the match for minimum VSWR. (It was found that this adjustment remained fairly constant even after the delta quad was added and the structure raised to final height). The delta quad elements are then added, careful design will allow the constructor to mechanically balance the array around the mast mounting point. It is suggested that carpenters' horses or similar be used with G-clamps to hold the Yagi secure during mounting of the quad elements. Alignment of the delta loops can then be made — it is easier at this height!

Tuning the quad at this stage is nearly pointless as the array is far too close to the ground. If the array can be raised to about four-metres, or so, above ground and the length of

Figure 4.

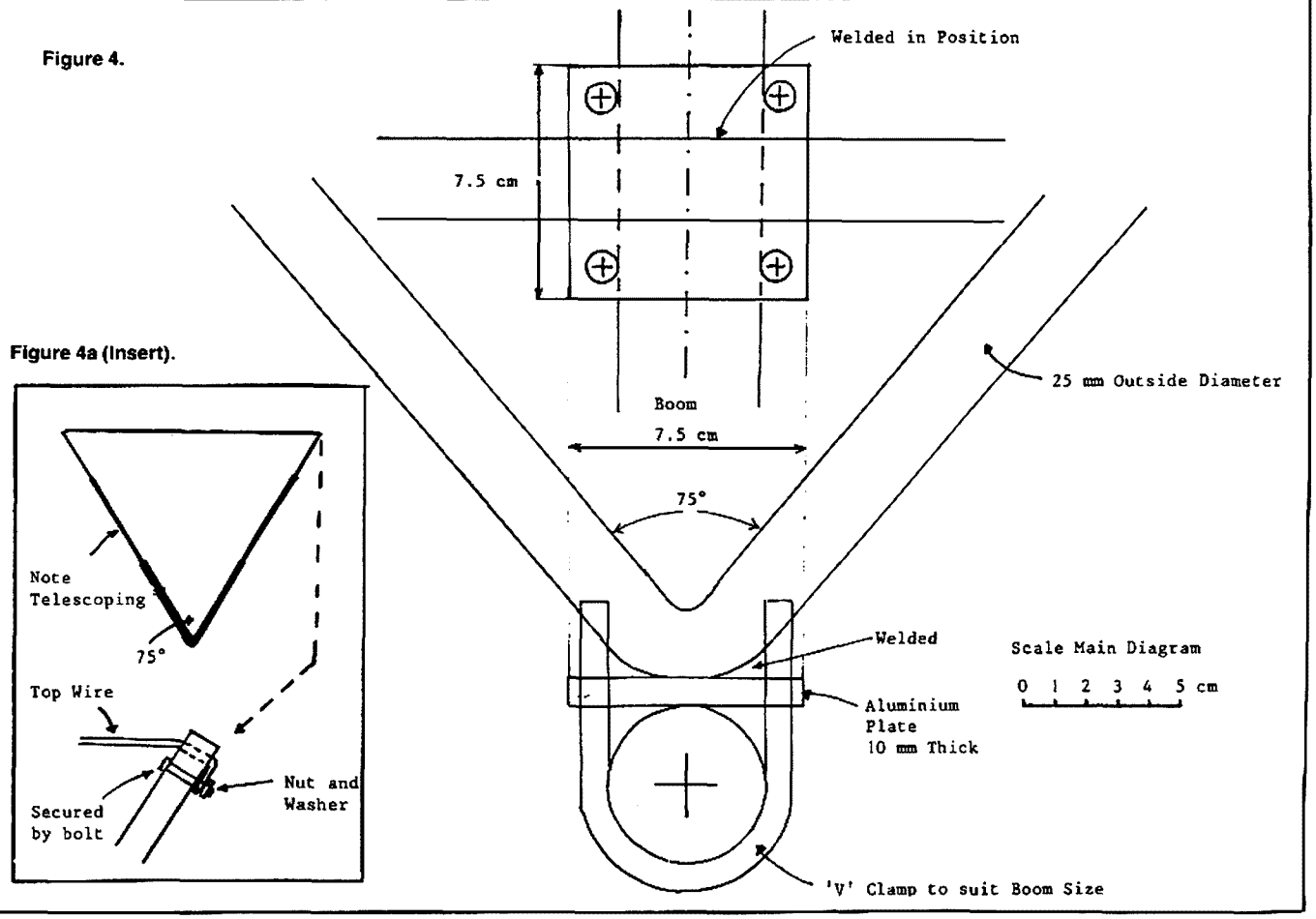


Figure 4a (Insert).

coaxial cable, to be used, attached, the VSWR adjustment will place the antenna in the "ball-park"! A touch-up will still be required when the quad is in the final position.

The method of mounting the boom to the mast must be substantial, a double clamp system to both mast and boom with a large aluminium plate is recommended. This is to negate any rotational forces exerted by the delta loops when side-on to a stiff wind. Although wind survival of this antenna is surprising, it is recommended that, if a light weight rotator is used, (a light duty television rotator was used by the authors) the array should be parked with the director or reflector into the wind. This appears to even out any rotational forces.

Specific — It is assumed that amateurs who contemplate this design will have a 15-metre Yagi and a desire for 10-metre operation. If this is not the case, there are many good texts on the construction of Yagi antennas. If possible, ensure that the boom material is reasonably sturdy and the gauge in the walls of the tubing not too light or the quad loops will twist it over its length! (The authors tried and the wind beat them). Alternately, a commercial beam may be purchased and the delta quad added later.

The most important part of the delta loop is the spreader at its apex. Figures 4 and 5 show the two forms used. Figure 4 shows the spreader used by VK2MUZ, which is very robust as he has a very windy location. Note that the apex angle is approximately 75 degrees and two U-clamps are used. The aluminium has been bent by a pipe bender as it is hard-drawn tubing which is used as tie-down railing on a semi-trailer. The 75 degree angle was used by W6SAI and W2LX in their book *All About Cubical Quad Antennas*, and is consistent with the VK2VPN article.

The welded U extends 60 centimetres up each arm where aluminium of a lesser diameter slides in so as to extend it to the required length. The wire over the top is a length of hard drawn copper wire, about 14 gauge, which is connected as shown in the insert to Figure 4. The VK2MUZ loops are very sturdy and operate over a significant frequency range due to their relatively large loop tubing size.

Figure 5 shows the spreader used by VK2JMG. It is much lighter than the previous one and is similar to the original version described by VK2VPN in his article. However, corner reinforcements have been added and the apex angle is 90 degrees. The increased angle has been used to ensure the sides will tension adequately. They are composed of three lengths of telescoping aluminium tubing with the top diameter of only 1.0 centimetre. As a consequence, the loop has near vertical sides at the top. It is assumed, due to this, the antenna has an interesting response to local vertically polarised signals. This may also help with polarisation rotations during DX work as signals remain fairly constant during a "fading band". The VK2JMG loops are much lighter than VK2MUZ's, both mechanically and physically. This was necessary due to the 15-metre beam's lightweight boom.

In terms of frequency response, this quad shows a sharper response than VK2MUZ's, however this was expected!

Both delta quads, despite minor differences, show essentially equivalent gain with reasonable front-to-back ratios on the SSB portion of the 10-metre band. The interaction between bands is minimal. If listening on 10-metres and transmitting on 15, the "bleed-over" is no worse than two Yagis sharing the same mast.

CONCLUSION

Both authors admit to a fascination with this type of antenna design. The information presented has been distilled from a desire to understand and make a decent idea work! Further development work will continue to optimise the system as they research, experiment and learn more about the delta antennas. In the meantime, it is hoped this article will stimulate others to construct a Delta Yagi.

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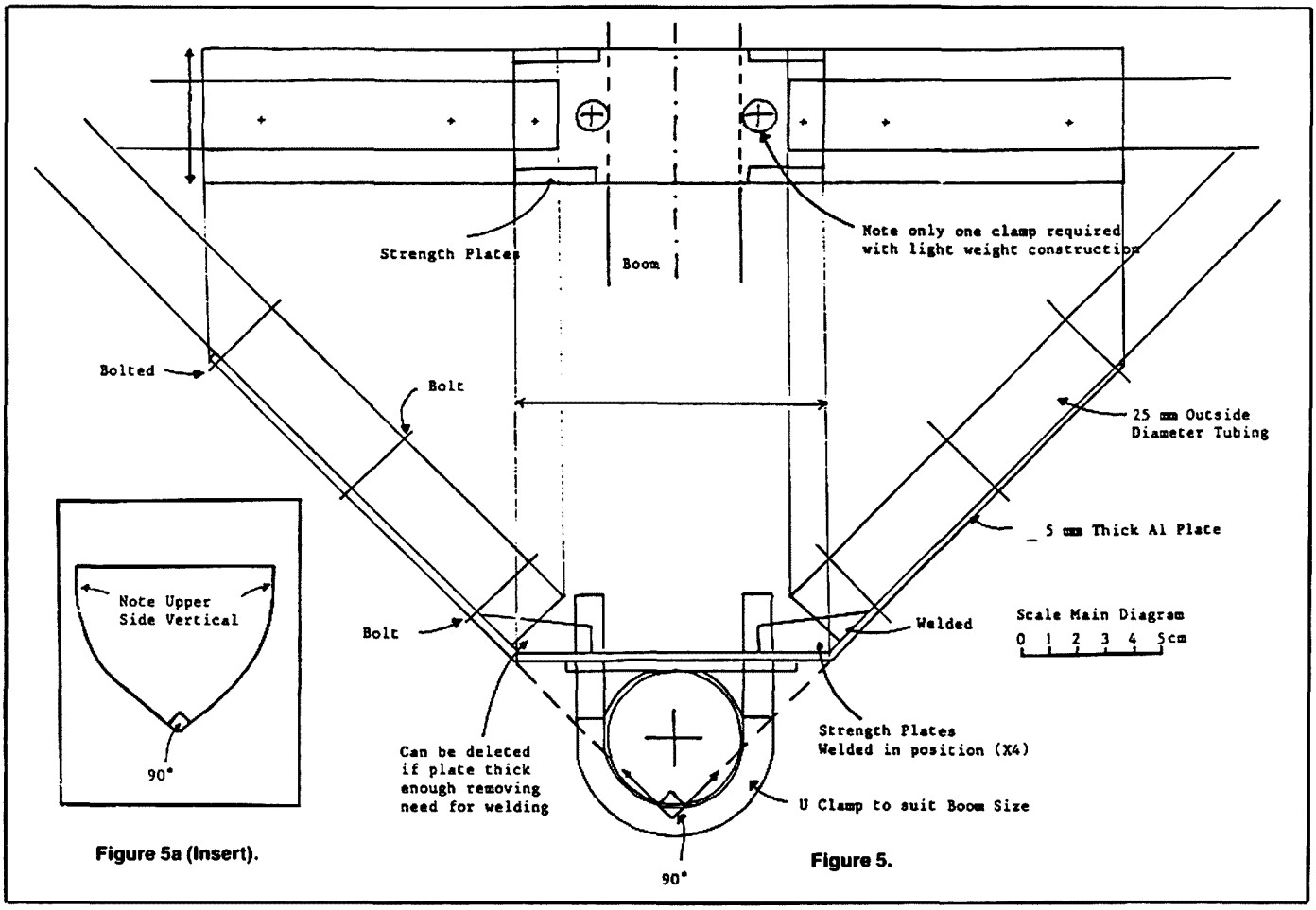


Figure 5a (Insert).

Figure 5.

Try This!

Gil Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

A SIMPLE IC22S CHANNEL LAYOUT

What about those new repeaters?

At last, I am the proud owner of the famed IC-22S, who now knows how many others have felt over this particular set.

It is a pity that the signal/RF meter did not survive the trip from VK4. A couple of pilot lamps would not go astray either!

I have been saving up all the circuits of modifications for weeks. It looks like too much work for such a little set though. I do not really need that extra box plugged into the back, nor those 80-odd channels. And scanning is for listeners, so that's out too!

Take a look at that matrix board. There are channels all over the place. It is a hassle unsoldering all those diodes without a desoldering tool.

I am only going to use the unit mobile on holidays and trips, so I really want something simple that I can memorise as I don't want bits of papers floating around when I am trying to watch the road.

I will just take a peek at the repeater listings in the Call Book and see what I am going to need. The following covers just about everything.

CHAN	FREQ	CHAN	FREQ
1	146.050/650	12	147.200/800
2	146.100/700	13	147.250/850
3	146.150/750	14	147.300/900
4	146.200/800	15	147.350/950
5	146.250/850	16	146.450
6	146.300/900	17	146.500
7	146.350/950	18	146.550
8	146.400/147.000	19	147.400
9	147.050/147.650	20	147.450
10	147.100/147.700	21	147.500
11	147.150/147.750	22	Rear Socket

What about those new repeaters?

Why not hook that DØ line to a switch so that I can get 25 kHz up on every channel?

Check the circuit board and then run a wire from the nine-volt rail to the switch. Then run a wire back to the DØ terminal on the matrix board.

Now, unscrew the channel knob and cut a neat little hole in the top corner of the plastic case. Put a small dab of super glue on the switch and slip it in there. You can hardly see it as it is so small!

Replace the knob.

Remember when it is pushed to the right means it is 25 kHz-up. A frequency readout is not necessary.

Now, memorise the list and you are ready for operation!

ar

THE SQUEAKBOX

An Audible Readout for the Amateur Shack

Leigh Harrison VK6WA
47 Mason Way, Padbury, WA. 6025

This unit was originally designed for a sight-impaired amateur to provide an audible indication of SWR in conjunction with an antenna tuning unit.

The unit uses a voltage controlled oscillator to give a very high pitch tone, proportionally to the voltage across the terminals of a moving coil meter. Calibration is achieved by setting "full scale" using a LED indicator. Once set up, the *Squeakbox* frees the operator from the need to look at the meter during tuning up.

However, it occurred to me that it might also be a very useful item in the shack for antenna adjustment, or any other application where a moving coil meter is used and not visible to the operator.

The Squeakbox connected directly to the meter terminals; the block diagram of a typical station set up is shown in Figure 1.

FUNCTION OF UNIT

This device has two functions:
it converts the DC meter voltage of an SWR bridge to an audible tone, and,
provides a visual indication (LED) of meter full scale deflection (FSD).

CIRCUIT DESCRIPTION (Refer Figure 2)

U1a forms a variable gain DC amplifier to raise the small voltage across the meter terminals to about 2V for FSD.

RV1 sets the DC gain, hence the RANGE of the amplifier.

U1b is connected as a comparator, the output of which drives the FSD LED via Q1. RV3 sets the point at which LED2 indicates the full scale reading of the meter.

U1d is connected as a voltage follower to provide a low impedance reference for U1a.

U1a output is connected to U1b and also provides the control voltage for Q2 and Q3 which form a voltage controlled multi-vibrator.

Q3 in turn drives Q4 which is connected as an emitter coupled switch to drive a small loudspeaker.

The speaker may be turned on or off via S1, the TONE switch.

The power supply consists of a standard pair of full-wave capacitor-input rectifiers for both positive and negative rails, formed by T1, BR1, C11 and C12.

U2 and U3 are fixed positive and negative five volt regulator ICs.

CONSTRUCTION

The prototype was constructed on a single piece of Vero-board and housed in a small plastic instrument box.

Layout is not critical, although wiring should be kept as short as possible to avoid RF pick-up by the unit.

The speaker used was a small 32 ohm headphone insert, however any suitable small transistor radio speaker will do.

The volume of the tone may be increased by lowering the value of R16 to no less than 56 ohms.

Do not reduce this value any further or the dissipation of Q4 will be exceeded.

A double pole toggle was used for the tone switch only because it was in the junk box; however, any single pole unit will also by okay.

PRELIMINARY CHECKS

Connect 240 volt mains power to the unit; the PWR LED should light. Check the positive and negative power rails for +5 and -5 volts respectively.

TESTING THE UNIT

Connect a short screened lead, preferably RG174/U or similar coaxial cable, from the SWR bridge meter terminals to the RCA connector on the rear of the Squeakbox (positive to inner conductor).

With no input applied, connect a DC voltmeter to U1a pin 1, and set RV2 to give approximately zero volts.

Next, ensure that RV1 is at minimum resistance and apply the input signal from the SWR bridge meter; positive to centre conductor of SK1. Set the SWR bridge for FSD reading and adjust RV1 to give about +2 volts at pin 1 of U1a.

Disconnect the input signal and switch on S1.

Set RV2 for most reliable oscillation at a high pitched tone (about +0.6 volts at U1a pin 1).

Next, apply the input signal varying it from zero to FSD. The tone should now decrease in pitch with increasing meter reading. RV1 may be set to get the greatest change in tone pitch for meter reading. The prototype was found to perform at its best at about +2.0 volts at U1a pin 1. Once satisfied with the VCOs performance, the FSD indication can be set. Adjust RV3 to illuminate LED 2 at about 95 percent of FSD. This avoids possible meter damage due to errors during calibration.

OPERATION

Set the SWR bridge to FORWARD and increase SET control until the FSD LED is just illuminated (equivalent to a full scale meter reading).

Turn the TONE switch on; a low pitched tone should be audible.

Set the SWR bridge to REV and the tone pitch should now increase.

Adjust the ATU for highest pitch, whilst keying the transmitter on and off, to compare minimum REV reading.

Turn the TONE switch off for normal operation.

IMPROVEMENTS

This unit was not designed with totally blind amateurs in mind, however it may be possible to use the device in this situation.

One fairly obvious change is required to the "full scale" indication by changing this also to an audio tone.

The easiest method is to incorporate a 555 timer to repetitively turn the VCO on and off at FSD. See Figure 3.

The 555 is held reset by Q1 until the FSD threshold of U1b is reached. At FSD the 555 is enabled and keys Q2 on and off at about 0.25 seconds.

Any technical inquiries may be sent to the address at the head of this article, enclosing an SAE.

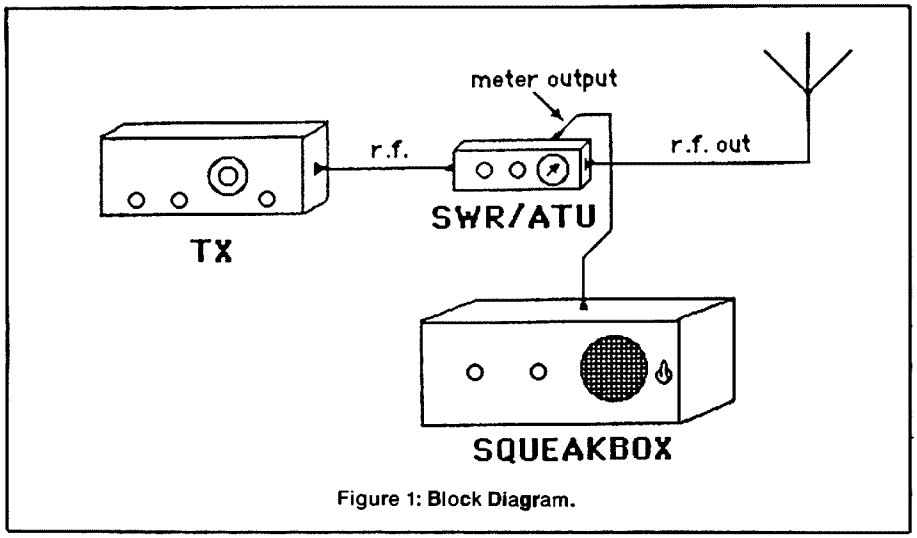


Figure 1: Block Diagram.

PARTS LIST

Capacitors	
C1-5, 9, 10	100 nF 100V Ceramic
C7, 8	1 uF 35V Tantalum
C11, 12	470 uF 25VW Electrolytic
C13, 14	470 pF 5kV Ceramic
C15, 16	10 nF 100V Polyester

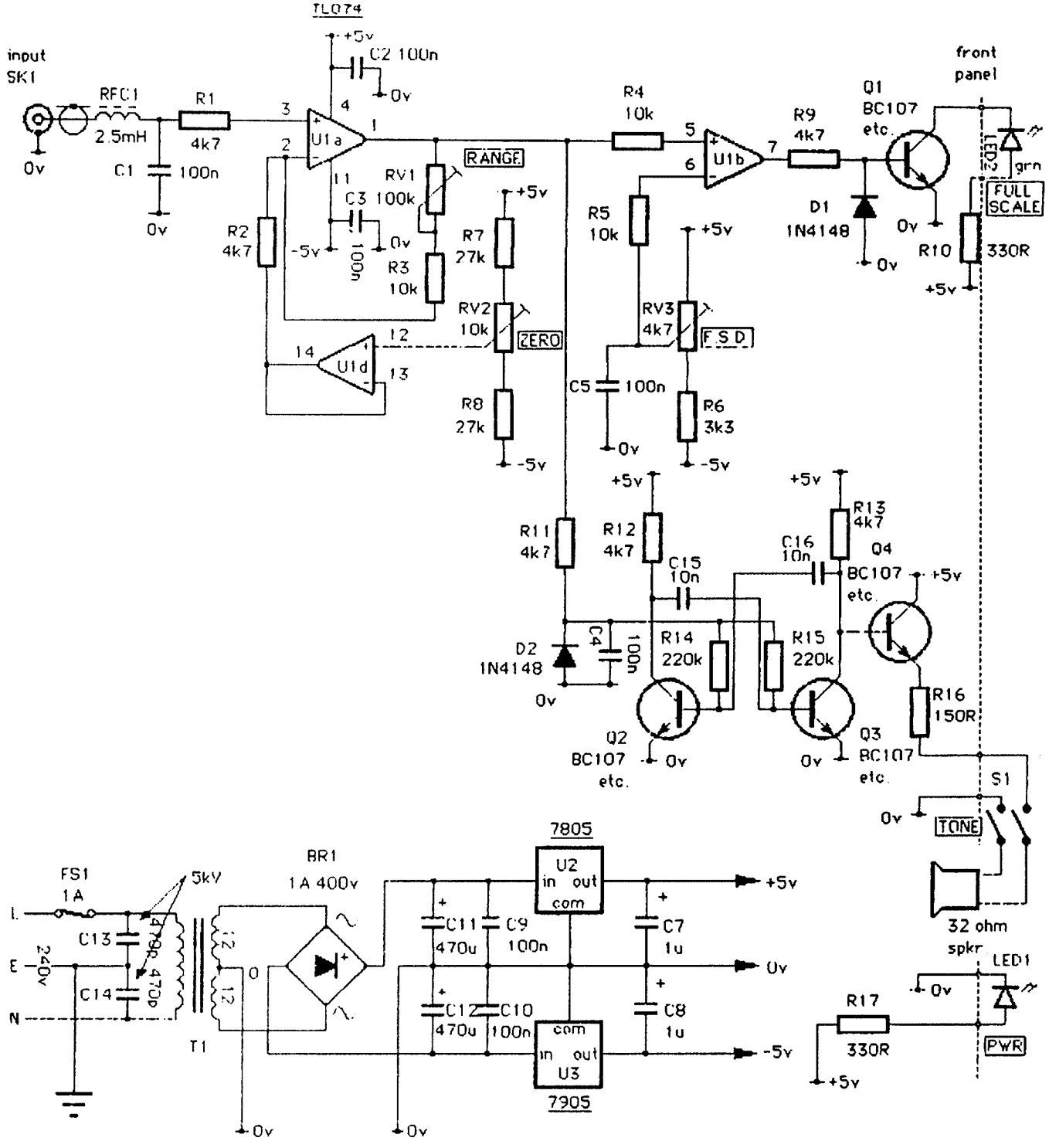


Figure 2: Circuit Diagram of Squeakbox.

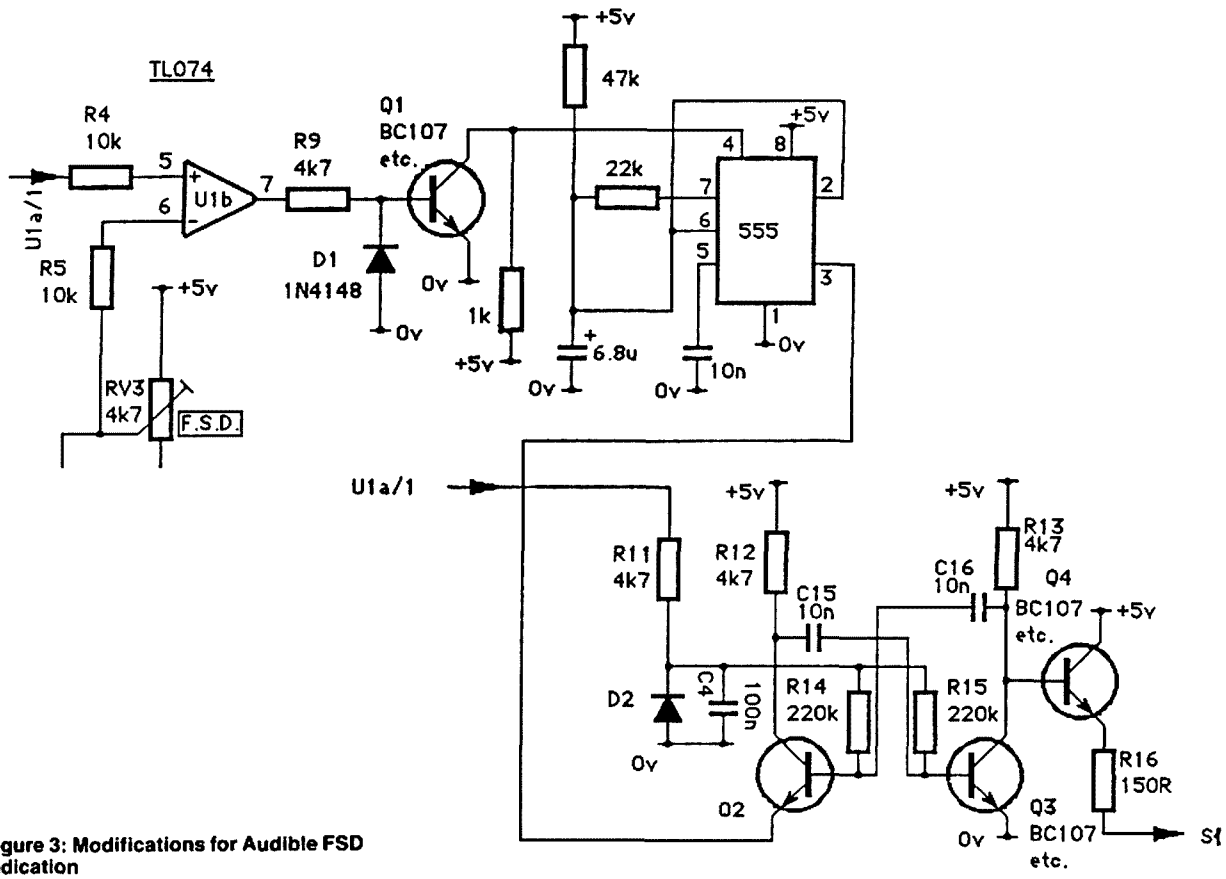


Figure 3: Modifications for Audible FSD Indication

Resistors (all resistors are ¼W 5 percent

R1, 2, 9, 11-13	4k7
R3-5	10k
R6	3k3
R7, 8	27k
R10, 17	330 ohm
R14, 15	220k
R16	150 ohm

Potentiometers

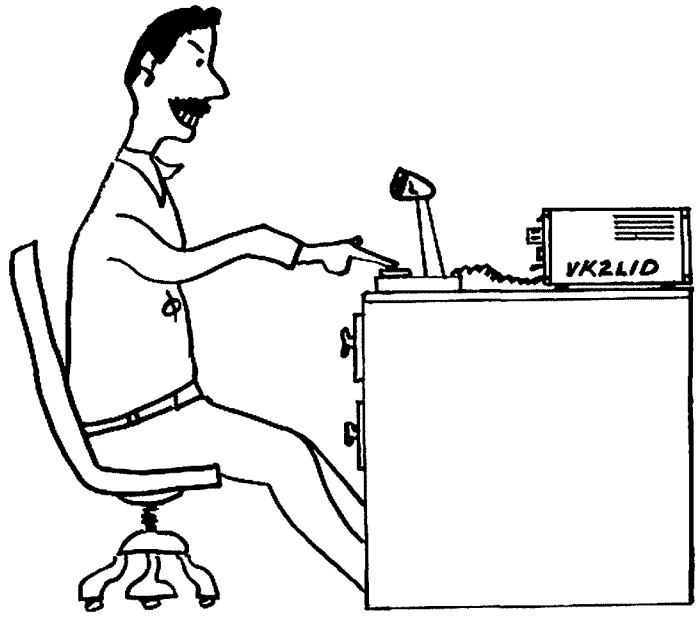
RV1	100k Trimpot
RV2	10k Trimpot
RV3	4k7 Trimpot

Semiconductors

BR1	Bridge Rectifier 400V 1A
D1, 2	1N4148
LED1, 2	Light Emitting Diode
Q1-4	BC107 etc
U1	TiL074 Quad Op Amp IC
U2	7805 +5V Regulator IC
U3	7905 +5V Regulator IC

Miscellaneous

FS1	1A 20 mm HRC Fuse and Holder
RFC	2.5 mH RF Choke
S1	DPDT Toggle Switch (SPST will do)
SK1	RCA Phono Socket
T1	Mains transformer, 240 volt primary with 12-0-12 volt secondary



"I've got 1000 new QSL cards here — who's going to be the first? I ?"
—VK2COP

EIGHTY METRE, FIVE WATT QRP TRANSMITTER

Rod Green VK6KRG
72 Yelverton Street, Bonnybrook, WA. 6239

Full band coverage. Full break-in. Very simple to net to your receiver frequency No clicks, chirps, whistles or bangs.

This little transmitter should have a wide appeal because of its many features. These have been incorporated whilst keeping cost to a minimum and include:

Full 80 metre coverage — 3.5 to 3.7 MHz using a very stable VFO.
VFO tuning can be restricted to any one portion of the band.
Full maximum output for QRP — five watts.
Only two presets need to be adjusted. This ensures good reliability and should suit novice constructors.
Four small, easily constructed boards. This brings versatility in that some boards will be common to all rigs designed by the writer so that 'standard boards' will become popular.
Full break-in is incorporated. That is, the receiver operates as the key is lifted.

OTHER FEATURES

As a cost-saving measure, no frequency readout is provided. It is necessary to net the transmitter to your receiver with the Netting Button. This puts an S1 signal into your receiver thus tuning the transmitter to the frequency at which you can hear the signal. Therefore, a calibrated receiver or crystal calibrator is needed. A frequency counter readout would raise the cost too much initially. To use a receiver is only a minor inconvenience. A frequency counter option will be made available soon.

If using an ATU, a very small frequency shift may be noticed whilst tuning the antenna resonance. This is due to the enormous impedance changes while tuning. This shift is frequency is in the order of 200 Hz and does not prove to be a problem. On-air stability after this tuning is excellent. The extra cost and the complexity to prevent this was not considered necessary.

Much care has been taken to eliminate spurious transmitter products such as key-clicks and TVI by the careful use of envelope shaping and output filtering. There is no compromise here as our very reputation as amateurs is at stake. Signal reports have never been anything but a nine for the last digit of an RST report and that is how it always should be.

Very fast reed relays are used for antenna switching because I found that diode switching caused TVI on my own nearby receiver. This could cause real problems for a novice to track down so it was found best to steer clear of that type of circuit.

CIRCUIT BOARDS

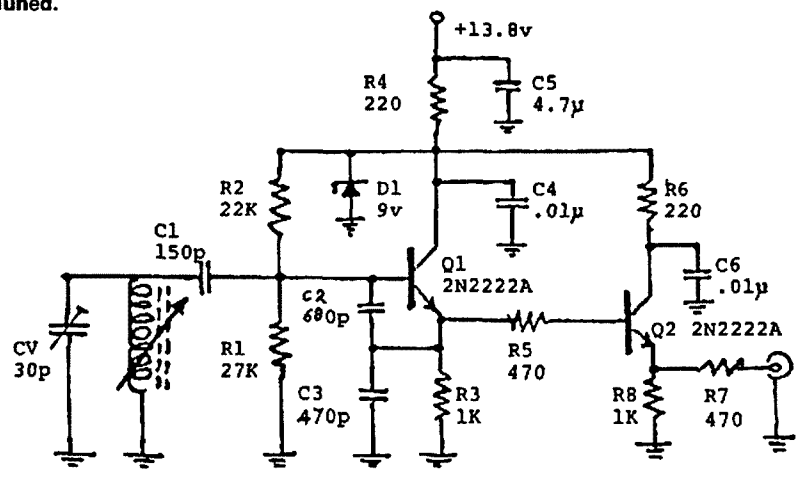
The VFO Board (See Figure D1). The lack of suitable variable capacitors has led to the development of this permeability *tuner* oscillator. it was found that most ferrite cores caused excessive drift due to temperature changes so that brass was then chosen. A brass rod instead of ferrite proves far superior for temperature stability. The brass slug is screwed in and out to change the frequency. A threaded brass rod is used here and extends from the inductor out to the front panel by the coupling shaft supplied in the kit.

Transistor Q1 is the oscillator. It is supplied with regulated supply voltage by zener diode D1. The oscillator is quite stable even if the supply voltage is not regulated. The emitter of Q1 feeds the buffer transistor Q2 via R5, which seems to improve oscillator frequency stability caused by changes in load capacitance. The output of Q2 feeds the next stage via R7 which was also used to reduce drift. All the important circuit voltages are listed in the appendix.

Buffer, Divide by 2, Timer Board (See Figure D3). This board is called the BDT Board from now. It employs two CMOS ICs and an operational amplifier as follows:
The output from the VFO feeds the input of this board. The first stage, IC1a, is set up as a low level voltage amplifier. This brings the oscillator RF level to about 12 volts peak to peak. The next two stages, IC1b and IC1c, add extra isolation. The VFO frequency is 7 MHz so it will not get into the receiver when you are listening. In this way, the oscillator can be kept running all the time which aids long-term frequency stability. From IC1c, the now square-wave signal passes on to IC2. This is a frequency divider dividing by two. Basically, it is enabled by the Morse key. When the key is DOWN, IC2 is turned ON generating 3.5 MHz at pin 13. When the key is UP, the divider is turned OFF and pin 13 reverts to plus 12 volts. There is, therefore, *no* 3.5 MHz when the key is up.

Although the key controls the operation of IC2, a delay is introduced such that after the key is lifted, IC2 continues to generate 3.5 MHz for a few milliseconds. The amount of time delay is controlled by the setting of RV1. Delay is necessary so that once the key is lifted the CW envelope shaping network around the RF final transistor does not instantly turn off the final but decays over a few milliseconds. To allow this to happen, the full RF drive to the final must be supplied until the RF envelope has completely decayed. If the final RF input to the final transistor was suddenly removed as the key came up, there would be nothing for the network to shape. The envelope would suddenly collapse causing severe key clicks.

Figure D1 — 7-8 MHz VFO Permeability Tuned.



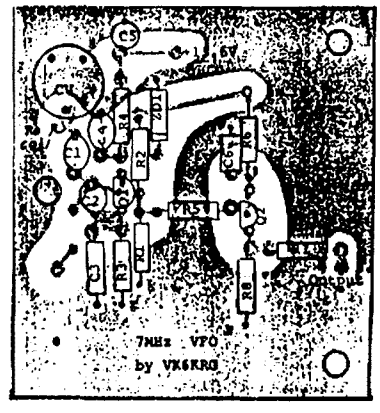


Figure D2 — QSK Board.

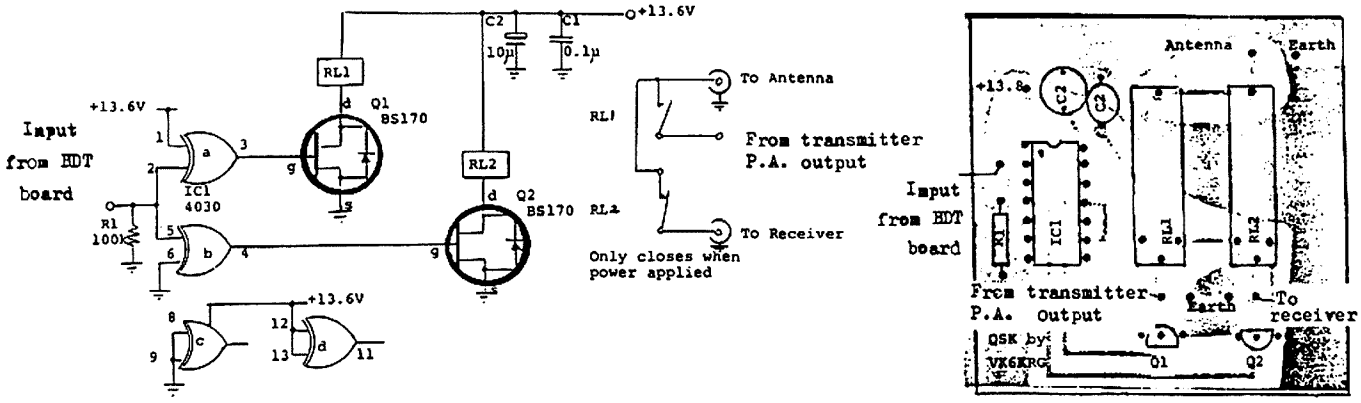
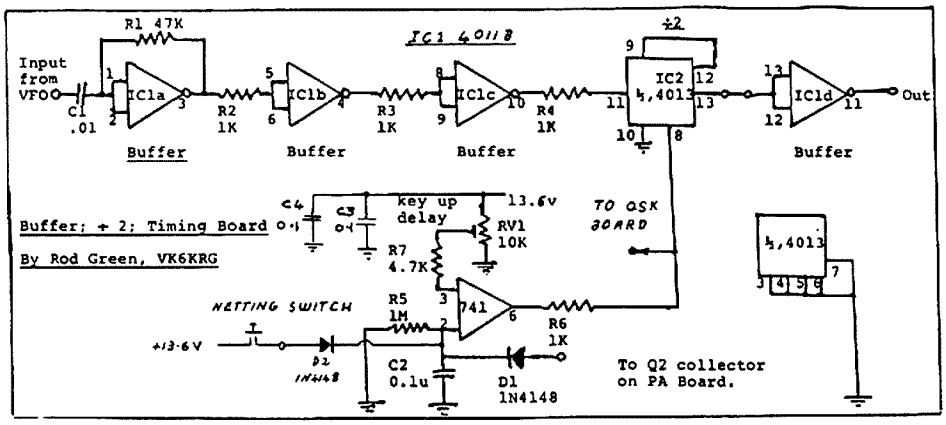
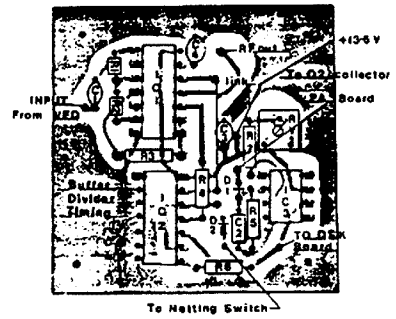


Figure D3 — BDT Board.





A further function of the BDT Board is to supply the netting signal mentioned earlier. It does this by turning on IC2 without keying the final. A small amount of this signal leaks into the receiver for netting.

Finally, the BDT board is not directly controlled by the key but from Q2 on the PA Board. This transistor is directly controlled by the key.

PA Board (See Figure D4). This board is also very versatile in that it can be used with other QRP transmitters. For instance, it can be directly fed from a well isolated VFO.

The signal from the BDT Board passes to IC1 via C1. Potentiometer R2 sets the operating point of IC1a. R2 has only little effect when fed from the BDT board, but when it is fed from a sine wave VFO, R2 then acts as a power control and can be set for any power level from 0 to 5 watts. This feature is dispensed within this model.

Capacitor C3 couples the signal to IC1c and R3 is used to ensure that transistor Q1 is turned off in the unlikely event of RF drive failing with the key down.

Transistor Q1 is the five watt final. L1, C7 and C8 form a matching network to convert the drain impedance of 19 ohms to 50 ohms. The remained of the inductors and capacitors to the right form the 50 ohm low pass filter. Transistor Q3 is the main keying transistor and is used in sequence with the key to gradually turn the final on and off. The time taken for the rise and fall of the RF envelope depends on the components of the envelope shaping network R6, R7, R8 and C5. Transistor Q2 is used to interface between the key and the envelope shaping network. This entire keying network has proven to be both simple and very effective. It will possibly be seen on QRP Club rigs in the future!

QSK Board See Figure D2). This board does the function of transmit/receive switching. With the key UP, plus 12 volts will be applied to the input. This turns ON Q2 via IC1b, relay RL2 operates and switches the ANTenna jack to the RECeiver jack. When the key is DOWN, IC1b turns Q2 OFF and releases RL2. At the same time IC1a turns Q1 on which operates RL1, thus switching the ANTenna jack to the TRANSmitter output on the preamplifier board. The input control voltage to this board comes from the output of IC3 on the BDT board and should be plus 12 volts for receive and zero volts for transmit.

CONSTRUCTION

Check all of the components supplied with each board. Check packs off against master parts list.

Notes for Constructors by Rev VK6SA, President of Peel Amateur Radio Club, VK QRP Club Member No 61 — Happy Assembler of Kit No 1.

Empty all components from small bag onto a dessert plate to ensure they do not get blown away or knocked off the table.

Sort the resistors. I write the numbers of the circuit resistors (R1, R2, etc) on a piece of paper, then make a hole at each position and insert the requisite resistor. This way it is possible to check them all before they are mounted!

Board 1 — QSK (Keying) Board (See Figure D2). Component positions are easily located. Take the relays first. These are little reed switches which are always in the open position without power. Mount them in position and solder.

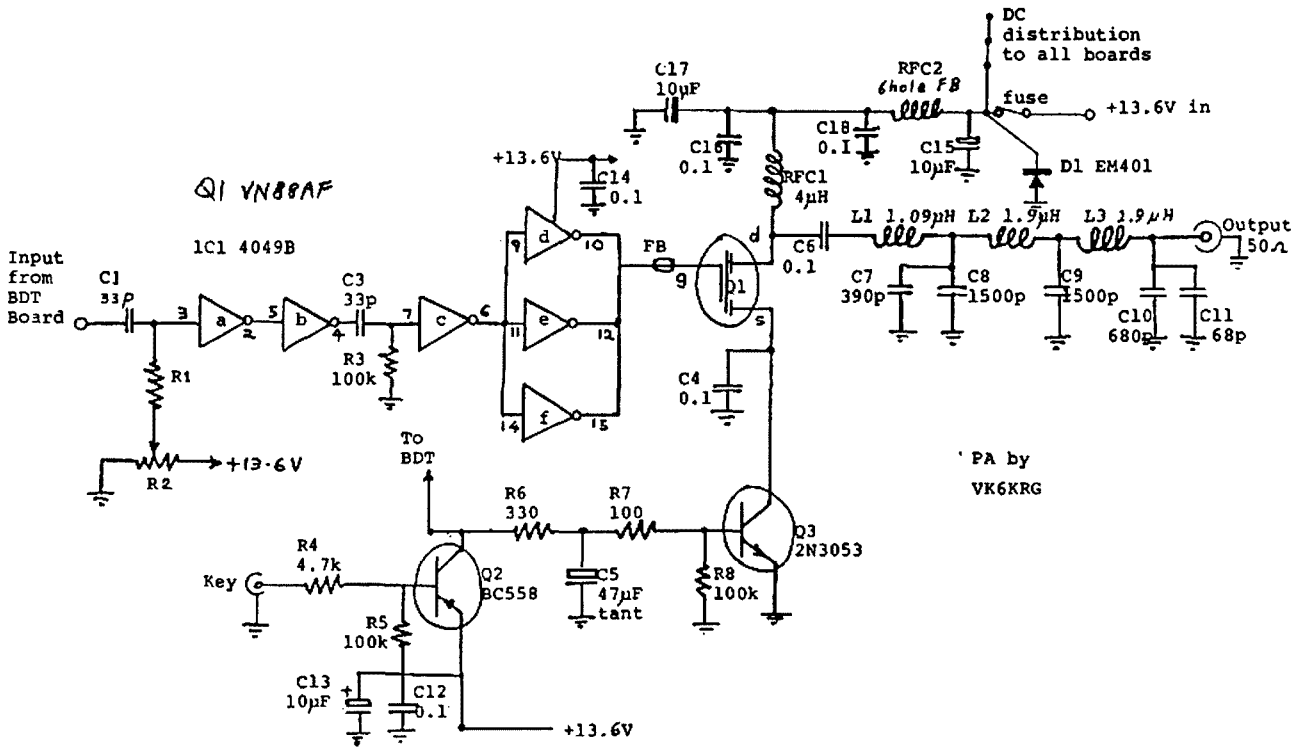
Mount the electrolytic C2 noting the polarity.

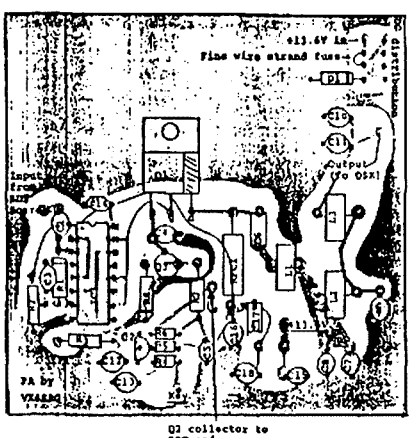
Mount and solder bypass C1 **before** placing the IC in position.

Mount IC4030 being careful that all pins go through the board. Solder earth pin 7 first. Then solder the +ve pin 14.

Replace completed QSK Board in plastic bag.

Figure D4 — PA Board.





Board 2 — VFO Board (See Figure D1). Sort, mount and solder resistors. Mount zener, noting polarity. The marked end points to the +ve part of the circuit.

Affix C1 and C6.

Mount Q1 and Q2. Do not have them sitting on the board but do not have the legs too long — the body about five millimetres from the board is ideal.

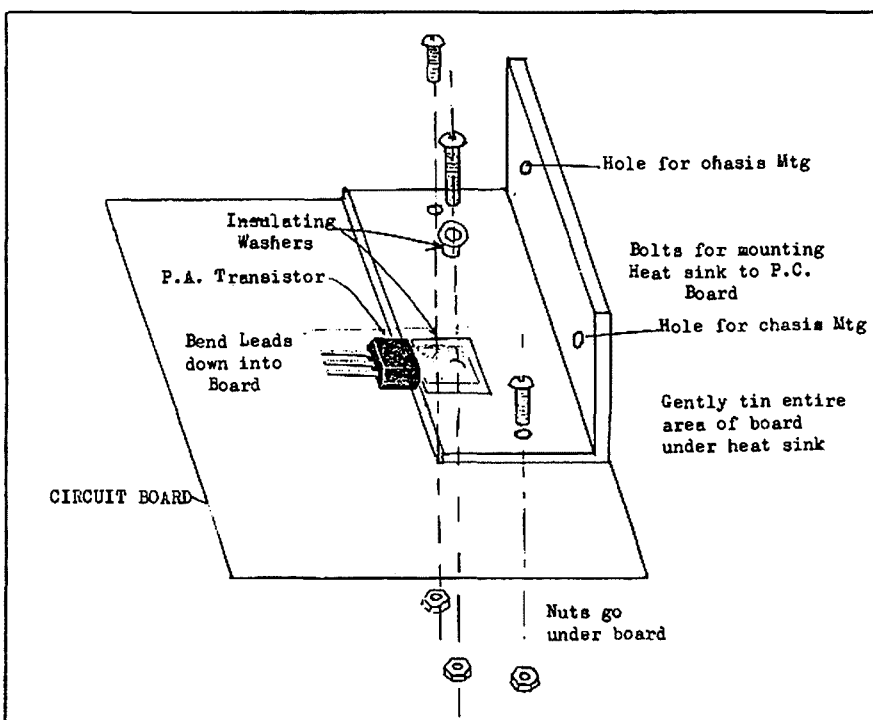


Figure D5 — PA Assembly.

Mount electrolytic C5 noting polarity.

Mount polystyrene (Styrocap) C1, C2, C3. Two need to be mounted on-end.

Mount trimcap, CV then replace completed board in plastic packet.

Board 3 — BDT, Buffer, Divider, Timer Board (See Figure D3). Mount R7 before mounting VR1. Position other resistors, solder and trim leads. Fit link.

Mount diode, then capacitors and replace board in plastic packet.

Board 4 — Power Amplifier Board (See Figure D4). Position heat sink alongside board edge. Drill holes and mount in position. Solder nuts to lower the earth plane of the circuit board.

Drill hole for Q1 and de-burr. Fine-sand the aluminium surface so that nothing can puncture the thin separating plastic transistor mounting membrane. Spread heat paste in position. Place plastic sheet and flanged washer in position. Insert ferrite bead on gate lead, bolt Q1 in position and solder.

Identify the circular wound toroid RFC1, 4 uH. Label an envelope, place RFC1 in envelope and put in a safe place. This component is not mounted until after the complete set is assembled and tested.

Mount the resistors, then the transistors. Sort the capacitors in a similar fashion as the resistors of the VFO Board. Some toroids may need to be mounted to help sort out the capacitor position.

Mount transistor Q3, then the IC. Remember to solder the earthed leads to both sides of the board.

Replace the completed board in the plastic bag.

ASSEMBLY

Using the template supplied, mark two dividers from the sheet metal. Cut the pieces slightly larger to allow for a six millimetre lip all round. This metal also solders nicely without bother.

Carefully read the Construction Notes. Drill all holes. Place dividers in position and firmly tack-solder the dividers in position in the tin.

Drill and enlarge hole in cake tin to take the tuning spindle for the VFO coil adjustment.

Solder 15 centimetres of small coaxial cable to each inlet, outlet or inter-board connection point on the QSK and BDT Boards, and to the key position on the PA Board. A very short piece soldered to an RCA socket is the VFO Board output.

Solder 15 centimetres of red-covered wire to the 13.8 volt position on each board, except the VFO. For 13.8 volts supply to the board, use a piece of heavy copper wire which must be well insulated where it passes through the VFO compartment divider.

Carefully label each coaxial lead so that misunderstanding of its other termination is impossible. Assemble all boards and loosely mount them in their positions in the cake tin.

A small dab of solder is required on each board where contact is made with a stand-off. Use a fine black felt-tip pen to make temporary marks. Such marks are easily removed. Carefully mark all plugs, switches and sockets.

Remove all boards, drill all holes and spot-solder the stand-offs positions. Paint tin if desired. Fit all sockets, switch, netting button and power inlet.

Replace all boards and cut-to-length all pieces of hook-up coaxial cable. It is most important that all wires curve around tidily. One day, it may be necessary to remove one board for maintenance. Solder hook-up leads.

TUNING — by Rod VK6KRG

When all boards are wired in position, except for the RFC1 of the PA Board, check the power supply line for shorts to earth. Assuming all is well connect 13.6 volts to the supply socket. The VFO should now be operating. Place a receiver in close proximity with its antenna lead to a pick-up loop adjacent to the transmitter VFO. Wind the coil tuning slug to the outer position.

Set the receiver to exactly 7.000 MHz and adjust the trim-cap on the VFO Board until a beat-note is audible. This completes the VFO adjustment. Wind the tuning knob such that the slug is about halfway into the coil. The exact position is not critical.

Adjust the receiver to half the current VFO frequency. Insert the key into the socket provided. Depress the key and again tune the receiver for a beat-note. The antenna pick-up loop should be close to the BDT Board now. Adjust RV1 on the BDT Board until such time that, when the key is lifted, the beat-note will still be heard for a very short time.

The exact time is not critical but it must be there. A quarter-second is about ideal. This completes the BDT Board adjustment.

PA Board. With key down. If a high impedance DC volt meter, 20 kohm/volt or better, is available measure the DC voltage at the PA RF input. It should be about six volts ± one volt. Adjust R2 to get 6.8 volts at the junction of R1 and R2. Alternatively, adjust R2 for half rotation. The next check is very important.

With key up there should be zero volts DC on pin 15 of IC1. If this is not the case under no circumstances insert RFC1 on the PA Board as this would ensure instant destruction of the final transistor on key down.

Now, depress the key and again measure the DC voltage on pin 15 of IC1. It should read about six to seven volts. This is a sure indication that RF is being fed to the final.

FINAL CHECK

Disconnect the power and solder RFC1 in position. Insert a zero to one amp meter in the supply. Connect a dummy load to the antenna jack and connect the power. With key up all components should remain cool and the ammeter should read less than 100 milliamps.

Depress key and the current should rise to a value between 500 and 700 milliamps. Five watts is the optimum. If the output is low, say three watts, and DC current is less than the maximum recommended above, some power can be gained by adjusting R2 such that the DC voltage at its wiper increases. Just ensure that it does not exceed 700 milliamps. Conversely, if the current is near 700 milliamps, reduce current by winding R2 in the opposite direction. The optimum is five watts with 650 milliamps.

CHASSIS PREPARATION AND CONSTRUCTION

Using the paper template supplied cut flat plates from sheet metal to match templates. Mark the hole positions with a centre punch before cutting to ensure that, in the event of template damage, the hole positions are still marked. If desired the templates can be glued to the metal with a glue-stick.

Drill holes, and solder partitions in box — flux purchased from a hardware store will assist. Note placement positions on diagram.

Drill a small hole in the front wall of the chassis to line up with the axis of the coil. Check by temporarily mounting the coil and pass a knitting needle through the hole. It should pass through the throat of the coil. If not, file the hole slightly to move the centre before enlarging the hole to take the particular spindle bushing supplied.

Place the BDT Board on the side wall of the chassis with its input side closest to the VFO partition. Place the board on the outside of the chassis to mark the hole positions. Drill (⅛).

Place the OSK Board on the bottom (which will become the top) and mark the hole positions. Drill. The PA Board is mounted by it's heat sink on the narrow wall of the chassis.

Ensure that the QSK Board does not foul or is mounted too close to the chassis opening. Remember, the bottom plate will need to be mounted without fouling the PA Board — and it will be on a slope.

Mark and drill holes for switch, power, netting button, antenna, receiver and key sockets.

Drill 10 holes around the chassis lip to accommodate the base-plate. Solder nuts to take the bolts coming through the base-plate. Thoroughly remove excess flux so that paint will adhere to the surface. Affix first set of labels before painting. Paint. Remove first set of labels. Apply clean set.

GENERAL NOTES

● This symbol indicates sockets on chassis.

Use supplied coaxial cable for joining: BDT output to PA input; PA output to QSK Board; from chassis receiver socket to QSK Board receiver tag; antenna socket to antenna tag on QSK Board; VFO output to RCA socket on partition wall; VFO socket to BDT Board.

Remember to earth the coaxial braid at each end. Sometimes there are holes provided for this. At other places, the cable enters a board near the edge in which case the braid may terminate at a convenient place under the board.

The following components are mounted on end (as in small transistor radios):
BDT — R1, R2, D1, D2.
VFO — C1, C2.
PA — R4, R5, R6.

Solder both sides of the PA Board where components are earthed.

All components overlay drawings are shown from the component side, as if looking through the board.

Lightly tin around all board mounting holes before mounting in chassis as these are earth connection points.

VERY IMPORTANT: PA transistor mounting hole must be large enough to take a small round insulation washer. This ensures that the drain tab does not contact earth.

The above unit is available in kit-form. For further information contact Rod at the above address.

COMPUTER PROGRAMS

Due to the length and quality of some computer program printouts, it is frequently impossible to reproduce them effectively for others to copy. Members interested in particular programs are advised to contact the author for an original copy of the relevant program. (Please include an SASE).

Authors of computer program articles, please remember to send a copy of your program on disc or cassette when sending an article for evaluation.

WIDEBAND VARIABLE FREQUENCY AUDIO OSCILLATOR

Lloyd Butler VK5BR
18 Ottawa Avenue, Panorama, SA. 5041

This oscillator makes use of a switched capacitor filter to shape square waves into low distortion sine waves over a frequency range of 2 Hz to 20 kHz.

A low distortion audio frequency sine wave can be easily generated by passing the output of a simple square wave oscillator through a sharp cut off low pass filter to attenuate the odd harmonic components. The output level of the sine wave is precisely defined by the rail voltage and the gain or loss in the filter.

A problem is that most filters have a fixed cut off frequency hence such a sine wave source is restricted to a small frequency range. There is, however, one type of integrated circuit package containing a switched capacitor filter in which the cut off frequency can be controlled by the frequency of a clock running at a multiple of the cut off frequency. The circuit described in this article makes use of a switched capacitor low pass filter type MF6-50 (a sixth order Butterworth) which operates with a clock frequency 50 times its cut off frequency. By controlling the frequency of the clock, the cut off frequency can be set to a range of values extending to above 20 kHz.

Using this filter, the circuit forms a variable frequency sine wave oscillator which can be tuned, at constant output level, over a frequency range of 2 Hz to 20 kHz with harmonic components less than 0.1 percent of the fundamental frequency amplitude, that is, more than 60 dB below that amplitude. As the sine wave is formed from a square wave, the square wave is also available as an alternative output.

THE SYSTEM

The basis of the system is shown in the block diagram, Figure 1. A clock (fck), tunable within the range of 112 Hz to 1.12 MHz drives both the switched capacitor filter and a divide by 56 counter which gives square wave output in the range of 2 Hz to 20 kHz. The counter output is fed to the input of the filter which has a cut off frequency (fc) equal to fck divided by 50, that is, 12 percent higher than the output frequency of the counter. With this arrangement, odd order harmonics in the square wave are attenuated to a level less than 60 dB below the fundamental frequency. Whatever the fundamental frequency, the cut off frequency tracks at 12 percent higher because both are controlled by the same clock source.

A characteristic of the filter is that it produces components near clock frequency 34 dB down from the fundamental frequency. These can be clearly seen on the CRO display and spectrum plot of the filter output illustrated in Figure 2. The actual components are the clock frequency itself plus difference components between the clock frequency and the fundamental frequency. For general audio frequency testing, these components, around 56 times the operating frequency, are possibly unlikely to upset the results of the testing. Notwithstanding this, their presence is a little disconcerting hence a simple secondary R-C filter is included, at the output of the switched capacitor filter, to reduce their level.

RANGE	FREQ	C3*	C6
1	2 - 6.3 Hz	200 nF	1.2 uF
2	6.3 - 20 Hz	62 nF	390.0 nF
3	20 - 63 Hz	20 nF	120.0 nF
4	63 - 200 Hz	6.2 nF	39.0 nF
5	200 - 630 Hz	2 nF	12.0 nF
6	630 Hz - 2 kHz	510 pF	3.9 nF
7	2 - 6.3 kHz	130 pF	3.0 nF
8	6.3 - 20 kHz	27 pF	1.5 nF

THE CIRCUIT

The complete circuit is shown in Figure 3. In addition to the switched capacitor filter, the MF6-50 package includes circuitry which can be connected up to form the clock by the addition of an external resistance-capacitance network which determines the frequency of oscillation. A frequency range of 112 Hz to 1.12 MHz can easily be covered with four ranges of selected capacity using a 40 kohm potentiometer, however it was found that eight ranges using a 25 kohm potentiometer was more satisfactory, firstly because of the improved resolution in setting a given frequency and secondly because of a problem in making the secondary R-C filter effective over too wide a range. The clock R-C network in Figure 3 is made up of R4, RV1 and C3A-H.

The secondary R-C filter is provided by resistor R6 and capacitors C6A-H switched in tandem with those selected for clock frequency range. The circuit reduces the high frequency ripple component to 55 dB below the operating frequency level at the high frequency end of

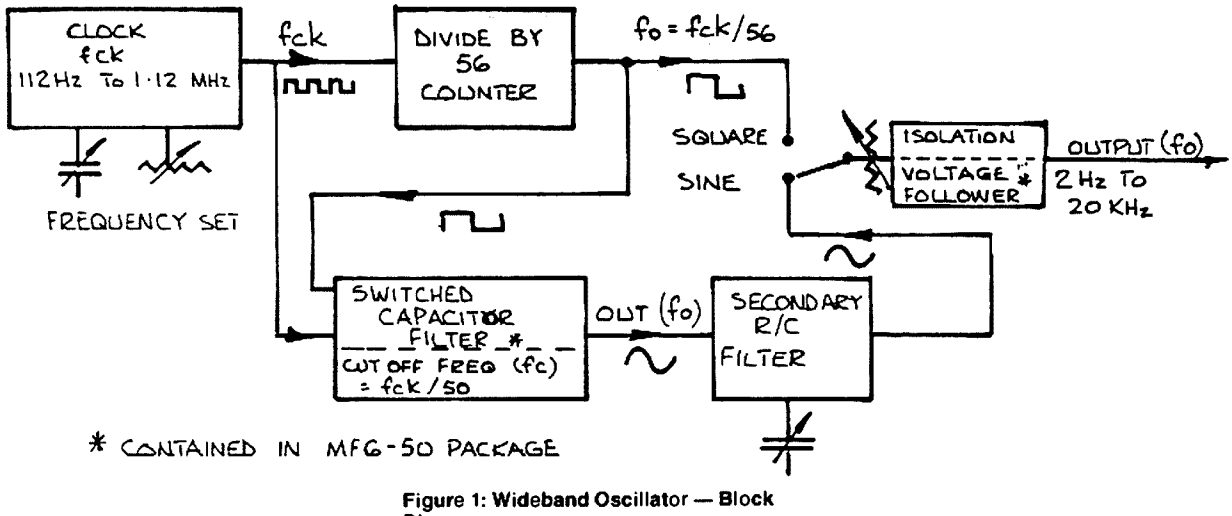
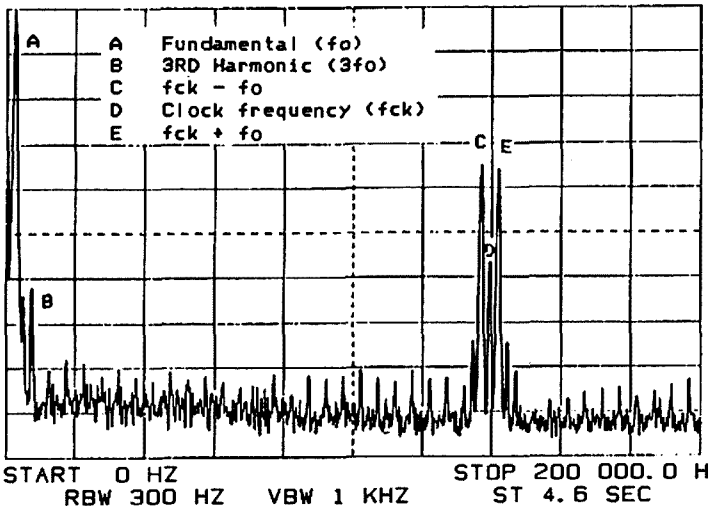
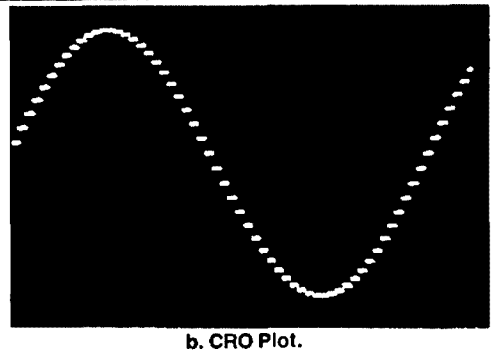


Figure 1: Wideband Oscillator — Block Diagram.

Figure 2: Output of switched capacitor filter with no secondary filtering.



a. Frequency Spectrum.



b. CRO Plot.

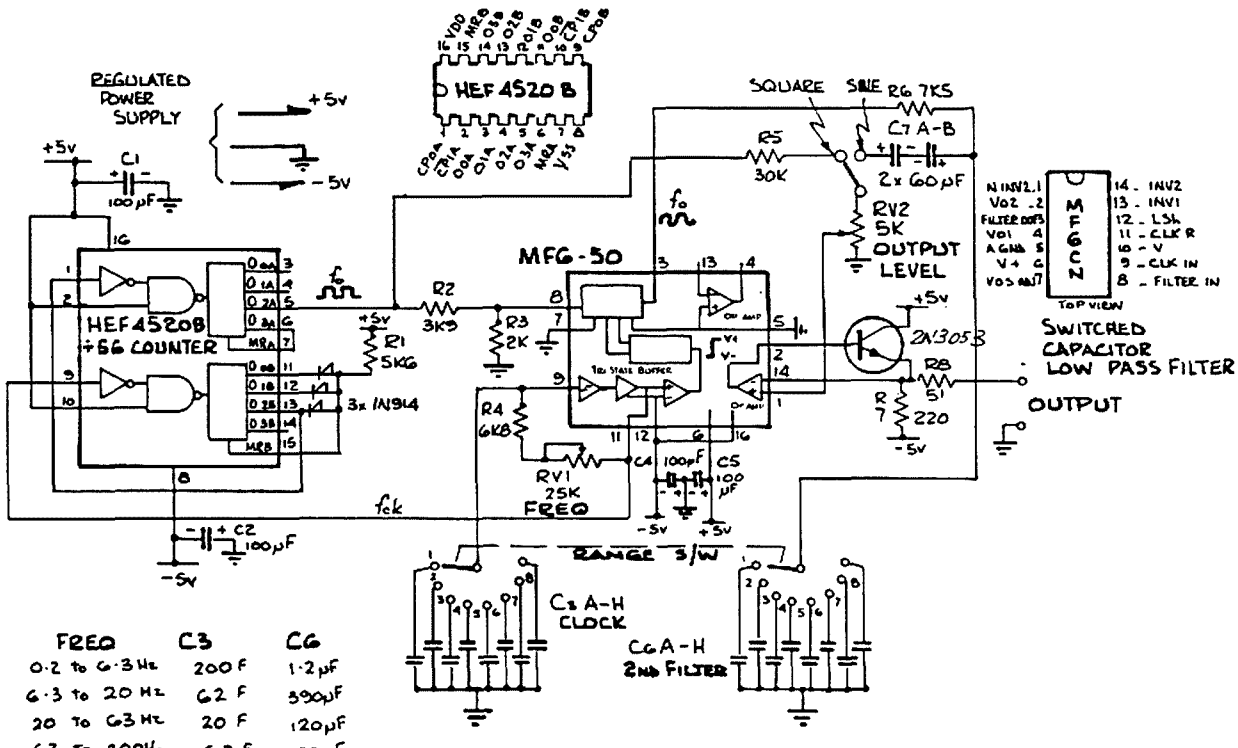
the selected range (refer to Figure 4) and 45 dB below at the low frequency end (refer Figure 5). At 45 dB down, the ripple can just be seen on the CRO trace.

Included in the MF6-60 package are two operational amplifiers. One of these is used as a source follower stage to isolate the secondary filter and output level control from the output circuit as well as providing low source resistance at the output. A transistor (V1) is included in the operational amplifier loop to provide sufficient current drive for the amplifier to operate as a 50 ohm source. Output of the stage is directly coupled to eliminate the very large coupling capacitor needed to prevent excessive waveform drop on 2 Hz square wave. Output resistance is set to 50 ohms by resistor R8.

A switch is provided so that either sine wave or square wave can be selected. The sine wave circuit is coupled via capacitor C7, found necessary because the output of the switched capacity filter had a DC offset.

The 4520B package contain two four-stage counters connected to divide by seven and eight respectively. The divide by seven counter must not be placed last because a divide by seven counter has an asymmetrical output waveform. The high speed CMOS version of the 4520 was used to ensure short rise time in the square wave output.

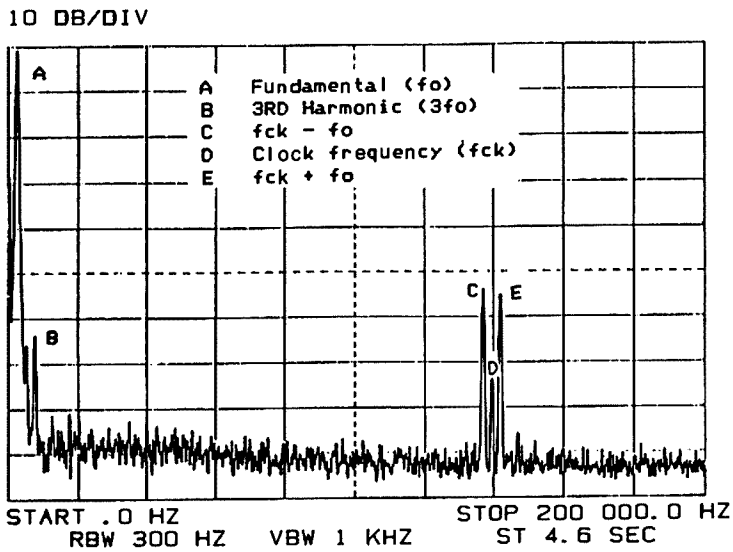
Provision of a split power rail (dual five volts) simplifies the application of direct coupling used throughout the circuit. The supply must



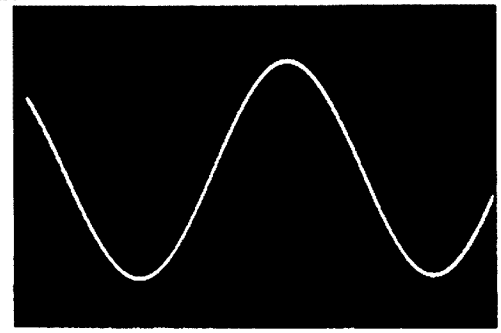
RANGE	FREQ	C3	C6
1	0·2 to 6·3 Hz	200 F	1·2µF
2	6·3 to 20 Hz	62 F	390pF
3	20 to 63 Hz	20 F	120pF
4	63 to 200Hz	6·2 F	39µF
5	200 to 630Hz	2 F	12µF
6	630 to 2KHz	510 pF	3·9µF
7	2 to 6·3KHz	130pF	3µF
8	6·3 To 20 KHz	27 pF	1·5µF

Figure 3: Wideband Oscillator — Circuit Diagram.

Figure 4: Output at High Frequency end of Range.



a. Frequency Spectrum — Ripple components 55 dB down.



b. CRO Plot.

be regulated as both clock frequency and output amplitude vary with rail voltage.

PERFORMANCE

Figure 6 is a spectrum plot showing the level of harmonics in the output. The highest level component is the third harmonic at 62 dB down and other odd order harmonics are more than 80 dB down. The second order component, 65 dB down, is not actually a harmonic originating from the square wave at the input to the filter. It is caused by interference from the second to last stage of the counter running at the second order frequency.

Examining the circuit (Figure 3), large capacitors are connected across the rails to ground at both circuit packages. These are essential to reduce interference from the counter and are quite large because of the very low frequency ranges covered by the oscillator.

The capacitor values in the secondary filter have been carefully selected to reduce the high frequency ripple as much as possible without upsetting the consistency of output voltage over the tuning range. An increase in capacitance value can reduce the ripple further but would cause a reduction in output level as the high frequency end of each range is approached.

On the highest frequency range, the switched capacitor filter produced an increase in output level towards the high frequency end of the range. The reason for this was not clear but its effect was compensated by increasing the secondary filter capacitor to a higher order than the other ranges. In consequence, the ripple level on this range is lower than on the other ranges.

Maximum output level for both sine wave and square wave is 1.5 VPP when unloaded or half that with 50 ohms load. DC load current on the five volt rails is 28 mA, mainly consumed by the output transistor.

ASSEMBLY CONSIDERATIONS

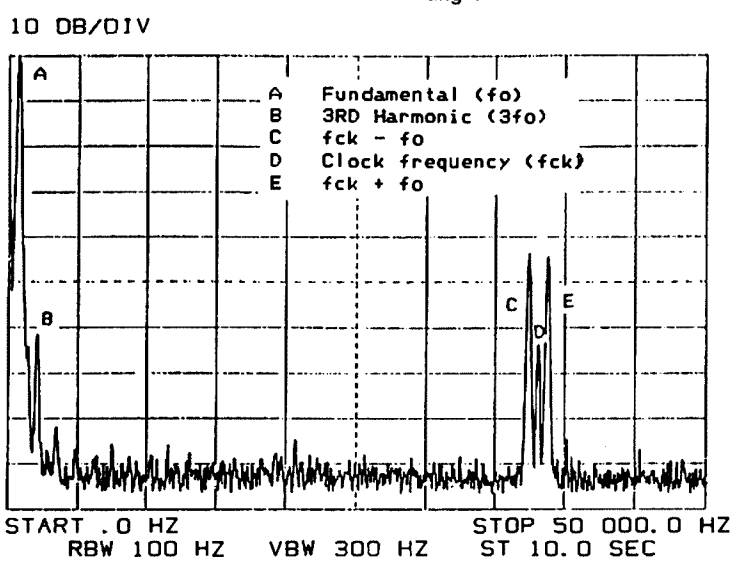
With the clock operating to a frequency above 1 MHz, at a voltage level of 10 VPP, inappropriate layout and proximity of wiring can lead to coupling of clock frequency component into sections of the output circuit. In the experimental model built, it was found necessary to shield all wiring following the switched capacitor filter output to reduce stray coupling into the output circuit when operating on the two highest frequency ranges.

Range selection capacitors were mounted around the switch wafers rather than on the component mounting card. This eliminated the need for a large number of wires between the switch banks and the card. The values of capacitors (C3A-H) which set the clock frequency are shown in Figure 3 as nominal values. In the experimental model, ordinary 10 percent ceramic capacitors were used and trimmed by experiment using large and small values in parallel to make the frequency ranges overlap.

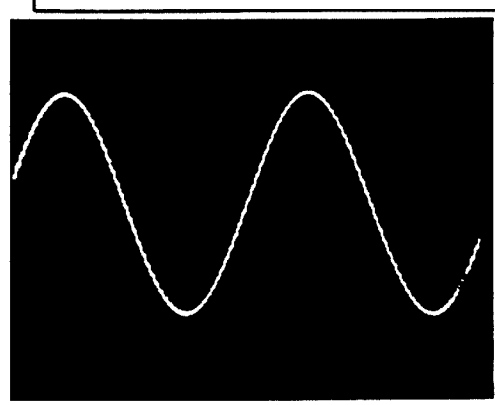
CONCLUSION

The circuit described is an interesting alternative to the conventional Wien Bridge oscillator

Figure 5: Output at Low Frequency end of Range.



a. Frequency Spectrum — Ripple components 45 dB down.



b. CRO Plot — Ripple just noticeable.

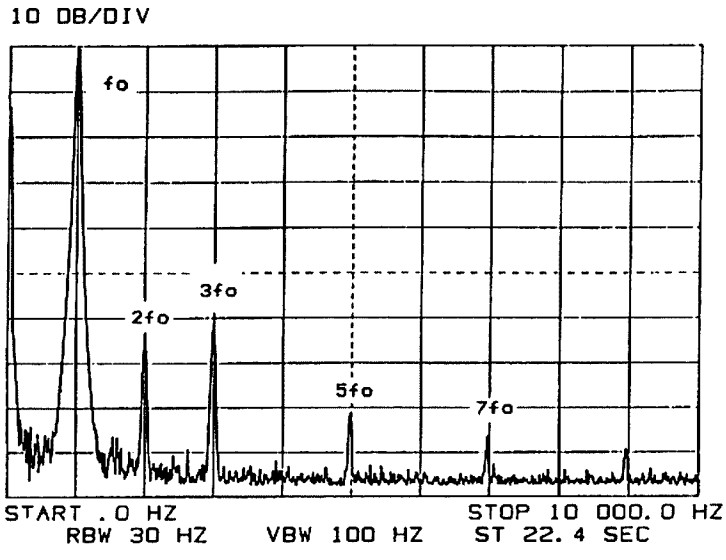


Figure 6: Spectrum plot of output showing harmonics.

which requires a ganged variable tuning capacitor and feedback to stabilise the output level. A criticism could be the ripple level near clock frequency 45 to 55 dB down. The level of this is determined by the secondary filter and could be improved with a more complex filter circuit than the simple one used.

TWO VALVE AUDIO AMPLIFIER

Peter Parker VK6NNN
Aged 15
C/- PO Witchcliffe, WA. 6288

This amplifier is quite sensitive and gives speaker output with a high impedance microphone.

It would also amplify the output of small valve receivers and could be used to play records with a ceramic cartridge and a turntable.

The original circuit appeared in *Fun with Shortwave Radio* by Gilbert Davey. This circuit uses 6J7 and 6V6 valves and has negative feedback.

More modern valves have been substituted and the negative feedback has been omitted. Try to build this amplifier carefully and use shielded wire to and from the 500 kohm volume control. Three or four tag-strips with five terminals each are sufficient to build the amplifier.

Editor's Comment: This inspires nostalgia for the times before solid-state! Nevertheless, for a novice with no money and some old valve television sets it could be instructive and fun. Caution, beware of high voltage. An LM380 will not bite you, but this certainly can!

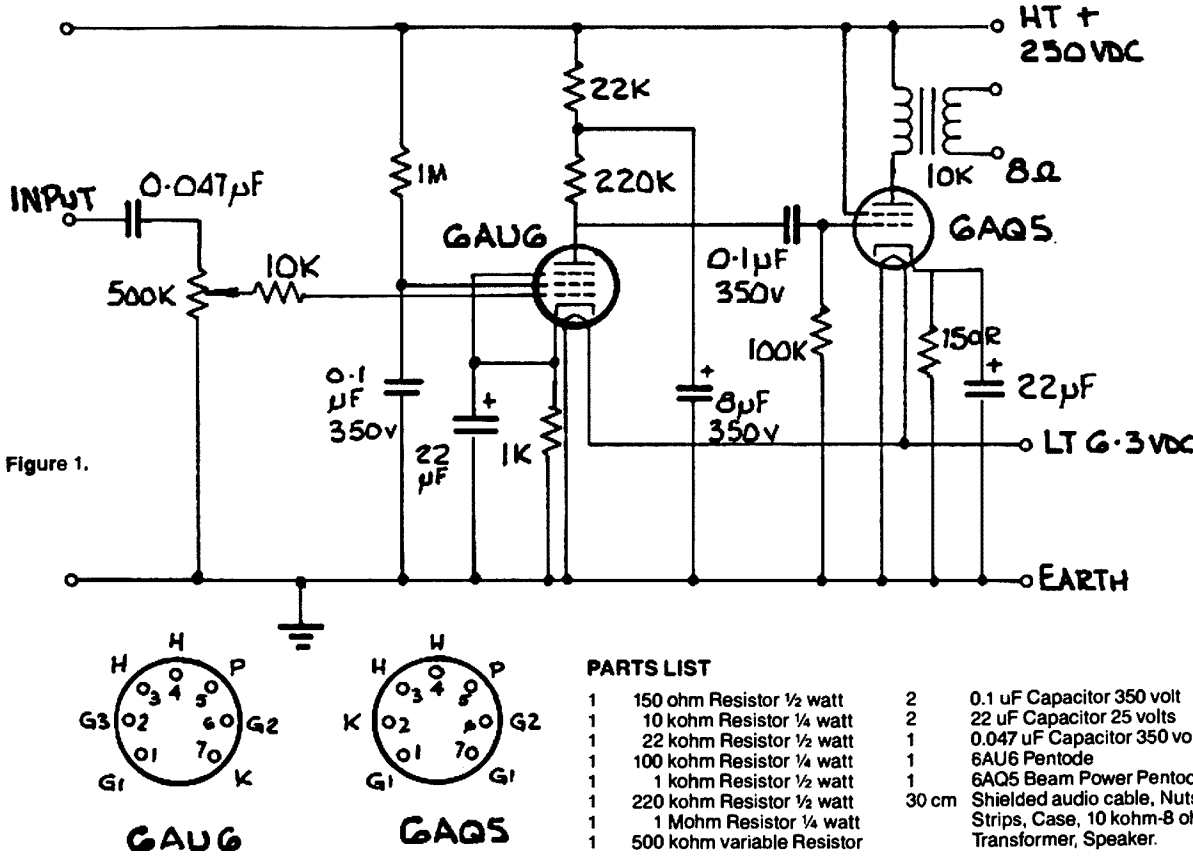


Figure 1.

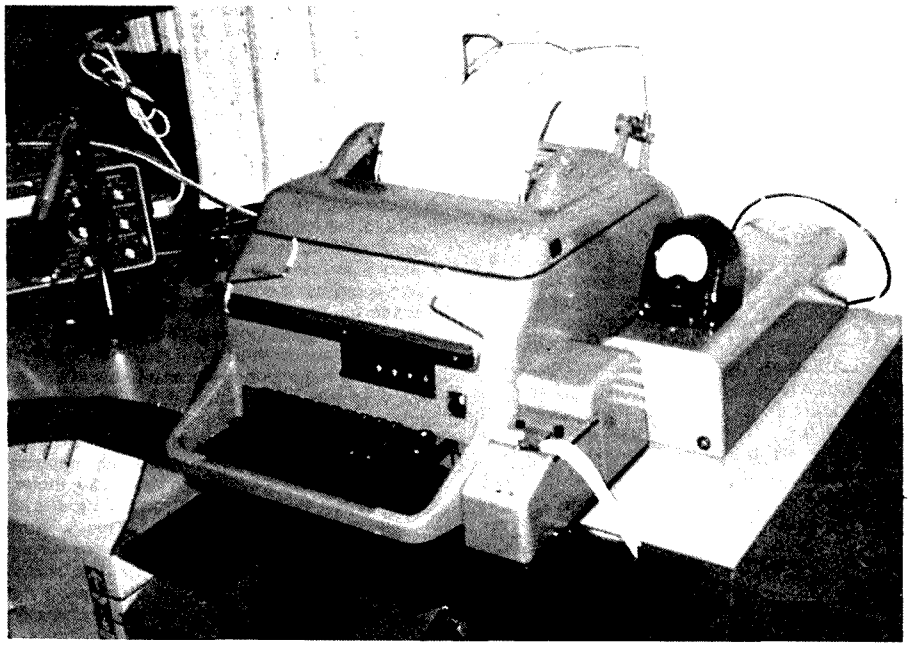
PARTS LIST

1	150 ohm Resistor ½ watt	2	0.1 uF Capacitor 350 volt
1	10 kohm Resistor ¼ watt	2	22 uF Capacitor 25 volts
1	22 kohm Resistor ½ watt	1	0.047 uF Capacitor 350 volt
1	100 kohm Resistor ¼ watt	1	6AU6 Pentode
1	1 kohm Resistor ½ watt	1	6AQ5 Beam Power Pentode
1	220 kohm Resistor ½ watt	30 cm	Shielded audio cable, Nuts, Bolts, Tag Strips, Case, 10 kohm-8 ohm Speaker Transformer, Speaker.
1	1 Mohm Resistor ¼ watt		
1	500 kohm variable Resistor		

DUAL SPEED CONTROLLER FOR THE SIEMENS MODEL 100 TELEPRINTER

Morris Odell VK3DOC
84 Hill Road, North Balwyn, Vic. 3104

The M100 is just the thing for working HF DX, but it is necessary to change the speed for reception of different HF signals.



LIKE MANY OTHER amateurs, I had my introduction to the world of RTTY on the two-metre band using a computer or "glass" system. This gave much pleasure, both in its' design and construction, also its' operation. It indeed opened up a whole new world of repeaters, mailboxes and many new friends. After a time, I began to wonder if similar pleasure could be achieved from HF operating with this exciting new mode and, in due course, an interface with the HF rig was arranged.

At first the bands seemed alive with signals but it was not long before it was realised that these signals were, in fact, emanating from the computer — a potent source of interference with its master oscillator right in the middle of the 20-metre band and all those digital ICs merrily switching and generating "birdies" right up into the VHF spectrum. Initially, conventional means were tried to alleviate the problem — screening, optocoupling, etc — but, eventually I had to admit defeat. This was when I met my *Marvellous Mechanical Mistress* — the Siemens Model 100 teleprinter.

The M100 was just the thing for HF DX operation but it soon became apparent that there were different speeds being used on HF Whilst it may be easy to change the speed of a computer RTTY program by merely pushing a button, it is quite another matter with the electro-mechanical governor in the M100.

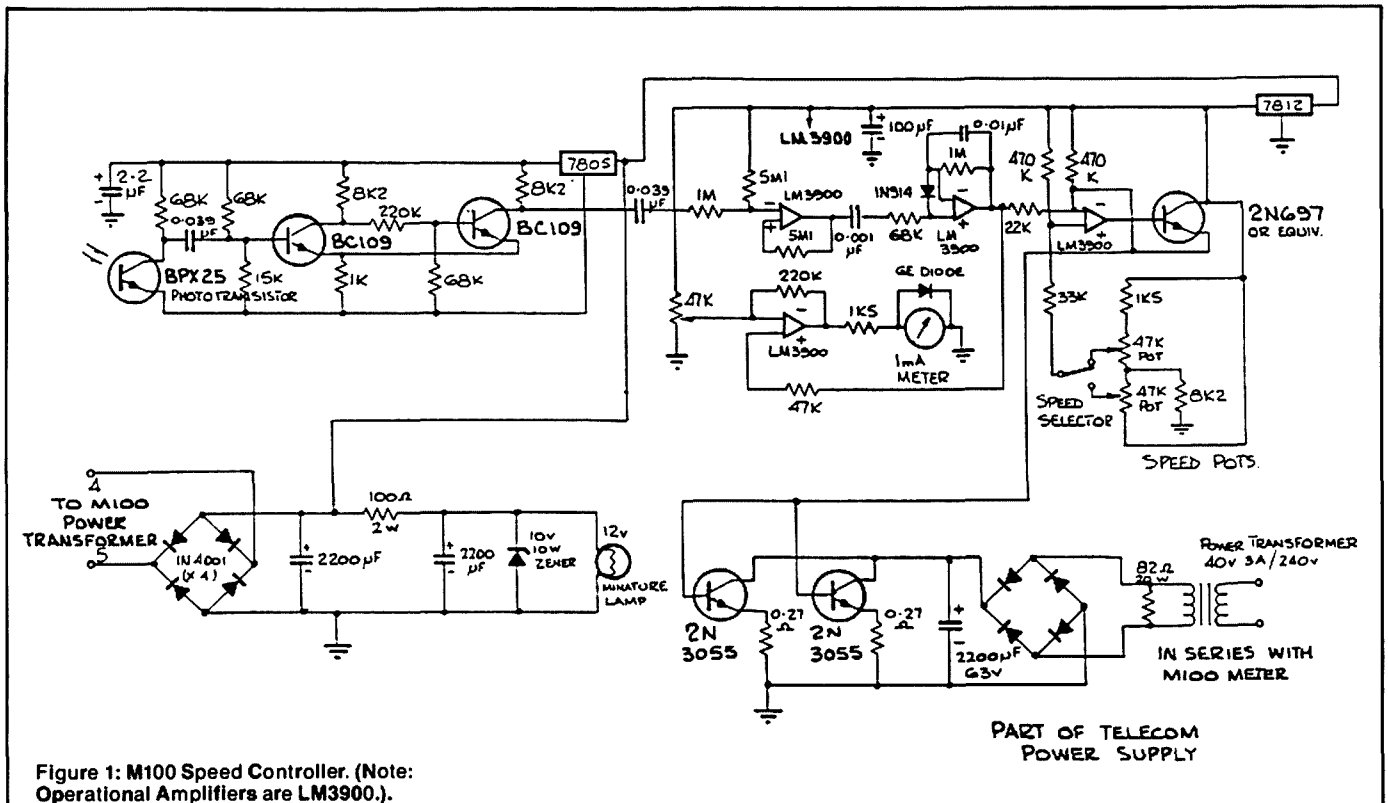


Figure 1: M100 Speed Controller. (Note: Operational Amplifiers are LM3900.).

As fellow addicts will know, the motor in the M100 is a series wound universal type, similar to those used in electric drills, which is equipped with a centifugal governor which opens and closes a set of contacts across a ballast resistor in series with the motor. It is enclosed in an RF-proof diecast housing and has extensive filtering provided for the mains leads. The system works extremely well but, in order to change speed the cover must be removed and an adjusting screw on the governor "tweaked" with frequent checks of the speed, either with a stroboscope or by timing a test-tape through the paper tape reader. Two sets of strobe markings are provided, one on the governor housing and thus not normally visible, and one on the motor shaft where it is accessible to this device.

The first attempt at a speed control was an elaborate affair using optical speed sensing and a digital, crystal controlled comparator working through a triac arranged to trigger at the zero crossings of the line waveform to minimise noise generation. This worked well, but still generated significant noise, mainly due to problems with motor reactance which meant that the voltage and current waveforms did not pass through zero at the same time. The range of control was also a little "jerky" because of the requirement that only integral cycles could be let through. Therefore, reluctantly, it was dismantled and the project started again, this time avoiding digital ICs and switching. Although this device dissipates some power as heat, it does not dissipate any as RF!

THE SPEED SENSOR

This is the only piece left over from the digital version and could be improved upon in any future version by using an IC comparator. It consists of a photo-transistor and lamp oriented to look at the strobe disc on the motor shaft. The photo-transistor signal is amplified and squared in a Schmitt trigger formed by the two BC109 transistors. The lamp is supplied from a regulated supply derived from the internal power transformer in the M100, which also supplies the rest of the controller. The output of this circuit is a square-wave at 250 Hz for 50 Baud and 227.250 Hz for 45.45 Baud. The lamp and sensor are mounted into holes in a scrap of perspex mounted over the strobe disc. It was found that the mechanical arrangement of the lamp and photo-transistor, as well as the lamp voltage were critical in order to get a reliable output, and once the right arrangement was found, it was sealed to the motor housing with epoxy resin. The amplifier/trigger was built on a small piece of circuit board and mounted over the motor gear housing.

THE CONTROL CIRCUIT

This uses a quad operation amplifier type LM3900. The first section is a Schmitt trigger/ line receiver and serves to stabilise the pulse amplitude from the sensor to provide a constant amplitude square-wave which is required for the next stage.

This is followed by a "frequency doubling" tachometer which develops an output voltage proportional to twice the frequency of the input square-wave. The output of this stage feeds the final stage which is a summing (servo) amplifier which compares the speed signal with a DC reference derived from the (regulated) power supply rail via two trimpots, which set the two speeds, and a switch for speed changing. The output voltage controls the current through the pass transistors and, ultimately, through the motor. The output of the tachometer also feeds the fourth amplifier which controls a meter to display the speed directly.

THE REGULATOR

A power transformer and rectifier are used in an unconventional series connection to "transform" a DC series pass element across to the AC side. This allows the 2N3055 transistors to function as if they were effectively in series with the motor. The 2200 μF capacitor charges rapidly when power is first applied and acts as an initial short circuit across the regulator, thus applying full power to the motor for a quick run-up. It also acts to smooth out any transients which might otherwise cause QRM. The 82 ohm resistor allows a base amount of power through to the motor thus reducing the power dissipation in the regulator transistors and also acts to damp the control loop in order to avoid possible speed oscillations.

TELEPRINTER MODIFICATIONS

A number of minor modifications need to be made to the Model 100. Apart from the speed sensor previously described, the main modification is to bring out the motor active lead so that the regulator does not reduce the supply to the internal power transformer which would be the case if this device was merely inserted in the power lead to the teleprinter. This requires separating the insides from the base-plate and removing the jumper between terminals two and three on the terminal strip under the components. A new wire is then run from terminal three to pin a2 on the main machine connector — this is the active lead to the motor.

The only other important modification is to double the old speed regulator. This is most conveniently done by soldering a wire across the green power resistor mounted just above the governor brushes. Alternatively, the governor could be set for a "ceiling" speed above 50 Baud, but this would involve destroying its previous calibration. It is possible to use some of the previously unused pins on the machine connector for the various connections required for this circuit and, if this is thought desirable, the connections under the machine should be modified accordingly whilst the bottom plate is removed — a little thought beforehand is vital as there is no sense in disassembling such a hefty machine more than once!!!

POWER SUPPLY

The power supply was built on a small board tucked above the power transformer in the M100 which has two free windings, a low voltage (about 18 volts) and a high voltage (about 140 volts). Many amateurs use the high voltage winding for a loop supply. If it is decided to use this transformer, the low voltage winding is brought out to terminals four and five which are the upper two on the left side.

The circuitry requires five volts for the Schmitt trigger (a relic of the original digital version) and 12 volts regulated for the control circuit. Regulation is quite important as the speed reference voltage is derived from the 12 volt rail and, if this varies, the speed varies with it. When power is first applied, the lamp does not reach full brilliance for a few milliseconds and there is no speed feedback thus allowing the regulator to apply full power to the motor for a rapid run up. The time this takes can be reduced by reducing the lamp series resistor and the zener diode is required to limit the lamp voltage for normal running.

CONSTRUCTION

There are very few critical parts in this circuit. The author used an ex-Telecom disposal power supply such as were available from the WIA in Melbourne some time ago. The transformer, rectifier and filter capacitor in these devices are ideal and there is plenty of room in the well-ventilated housing once the filter choke and bleed resistors are removed. Anyone who has felt the ballast resistor in the M100 motor knows how hot it gets and, of course, an equivalent amount of heat is generated by this regulator. The power transistors should be mounted on a hefty heat sink and adequate ventilation should be allowed for this and the 82 ohm resistor. It would be possible to us a differently rated transformer, but the 82 ohm resistor and the number and rating of the power transistors may have to be changed to suit. The meter was mounted in a plastic housing on top of the housing with the speed selector switch just below.

A few component values may require individual adjustment, especially if the power supply voltage is changed. No trouble has been experienced from nearby transmitters affecting the circuit.

ADJUSTMENT

The only adjustments required are to set the two trimpots to the proper speed. This is best accomplished with a frequency counter connected to the sensor output. Adjust the pots for the frequencies given above. If a frequency counter is not available adjustment can be achieved with timing a paper tape with a known number of characters through the tape reader or set the pots up for good copy with a signal of known speed from a computer, or off the air. Failing all else, tuning for a motor note that sounds right is remarkably accurate, especially if the operator is used to the sound of the M100 from long experience. Once the speeds are right, set the meter range pot to give convenient indications on the meter. Slight speed variation with typing will be indicated on the meter and this is a useful indication that the control loop is working properly. There is also some warm-up drift due to gain variations in the power transistors with temperature but this is not enough to move the speed out of range.

MODIFICATIONS

There is plenty of room for improvement in this design, as much of it has evolved through many versions and experiments and the choice of components reflects what was in the junk box at the time. It is by no means intended as the last word in speed controls and there is plenty of room for experimentation. The light bulb could of course be replaced with a LED and the zener diode with a three terminal regulator IC. It is not recommended using the same regulator as for the rest of the circuit as it may have an adverse effect on voltage (and therefore speed) regulation. The Schmitt trigger stage could be dispensed with altogether, the operational amplifier stage being redesigned accordingly.

Increasing the servo gain would certainly reduce any speed error although this has not been tried. Including the power transistors in the servo amplifier feedback loop would also help, but may require higher emitter resistors which would introduce an unwelcome current feedback component. The response time and over-shoot would also be improved but the physical inertia of the mechanical parts of the M100 will set a limit on this and any further increase in servo gain will eventually result in oscillation.

The M100 manual says the machine can be used on 75 Baud and the controller can certainly accommodate this speed but it is not known whether other modifications may be required to the machine for such a high speed.

POWER SUPPLY LOW LOSS FULL PROTECTION

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3078

With a fixed voltage power supply it is easy to provide over-voltage protection with a Zener diode across the output.

The use of a current sensing resistor for providing protection for a power supply has the disadvantage that a wide range of current variation results in the voltage drop being too high at one end of the range, or too low to work effectively at the other. The voltage drop can be eliminated entirely by using an audio transformer with a single turn in series with the secondary of the supply power transformer. Having used this method successfully for some time, an unusual, but catastrophic fault — a short circuited regulator transistor — prompted the further development of a circuit which would protect the equipment as well as the power supply itself. With a fixed voltage power supply it is easy to provide over-voltage protection with a Zener diode across the output, the Zener voltage being slightly higher than the fixed voltage. With a variable voltage supply this cannot be done. One practical alternative is to use any sudden, small rise in the regulated output voltage to shut down the power supply. The circuit in Figure 1 incorporates both the no voltage drop current and the over-voltage protection.

A single turn (or possibly two) of 10 gauge wire in series with the power transformer's secondary and the supply's rectifier bridge is wound on to a small transformer and gives a negative pulse to cut off Q1 at the level set to trigger the control. The potentiometer across the secondary provides this continuously adjustable level control and R1 can be placed in series if a fixed maximum current limit is required. D1 contributes negative pulses to the summing junction of Q1 which is normally conducting. D2 is added to clamp the junction when the pulses go in to the positive half-cycle. The 47 ohm resistor in series with D2 gives the voltage drop necessary to keep Q1 normally conducting and this causes Q2, which replaces the conventional UJT, to be normally cut-off.

Returning to Q1, it can also be cut off by a negative pulse through C2 from Q3. Q3 is normally cut off by its base being grounded through the 5M resistor to the negative rail. The base, however, is also connected to the regulated output of the supply through capacitor C1 and if the voltage rises sharply (about 0.7 volt) then Q3 will conduct and cut off Q1. This is independent of the actual DC level of the regulated output and thus can be used with a variable voltage power supply. Diode D3 in series with D4 provides about 1 volt drop and, if test switch SW1 is closed, the rise is sufficient to trip the circuit. Apart from a test facility, SW1 can be used as a fast acting remote control to trip the power supply.

Q2, which replaces the conventional UJT, actually functions as an emitter follower and a delay. When the supply is first switched on, the rail voltage rises sharply and this would normally trigger the circuit. But, even if Q1 is cut off by the voltage rise, and/or a current surge, the silicon controlled rectifier will not be triggered provided that R3 and R4 in parallel and in series with R5 cannot provide a trigger signal for the SCR. But, as soon as the voltages and current stabilise and Q1 conducts and Q2 is cut off, the capacitor C3 charges and thereafter supplies sufficient current for the SCR to be activated instantly whenever Q2 conducts again. The SCR can be used to cut the output, put a "crowbar" short across the regulated output, and/or disconnect the mains and provide protection both to the power supply and the equipment.

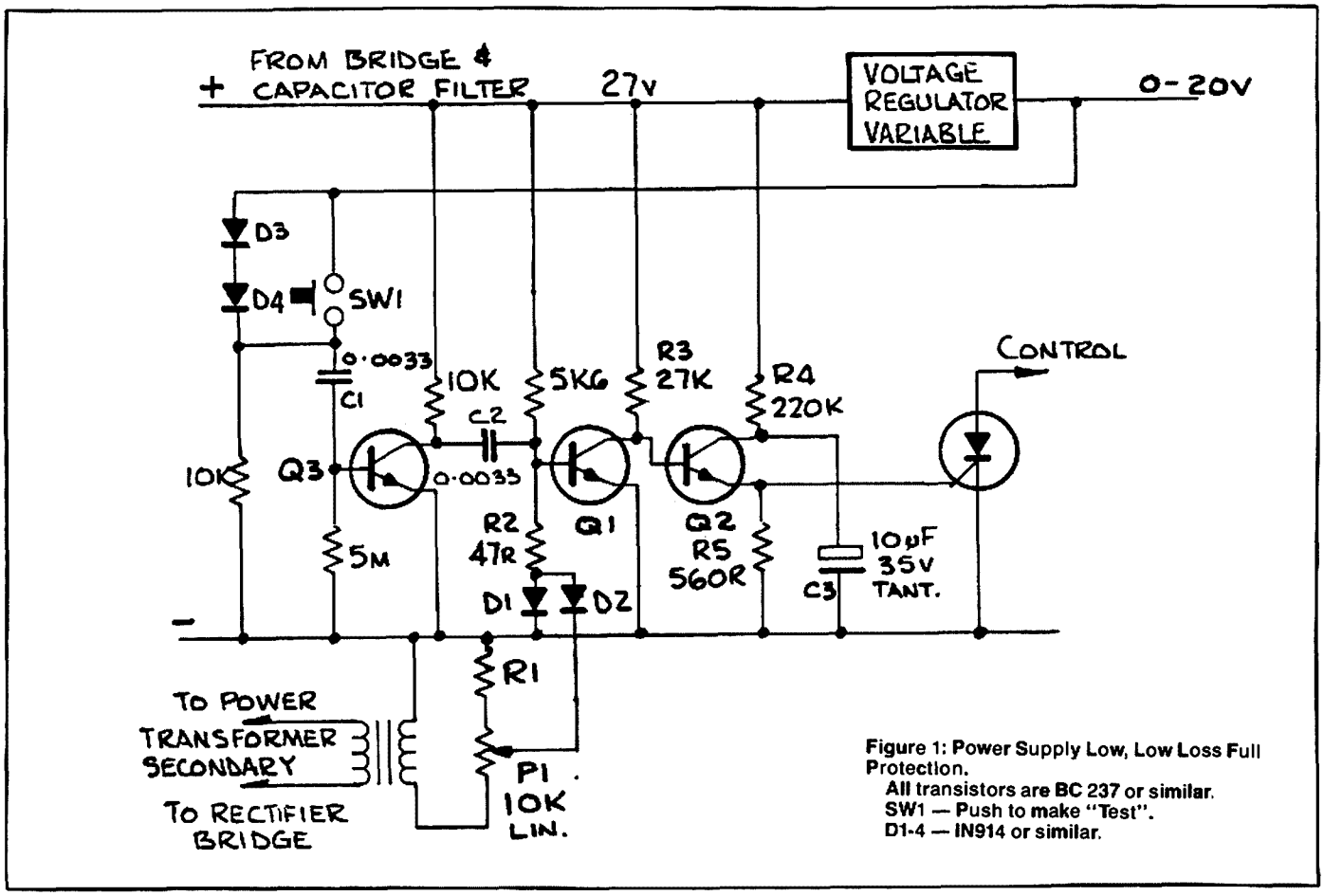


Figure 1: Power Supply Low, Low Loss Full Protection.
All transistors are BC 237 or similar.
SW1 — Push to make "Test".
D1-4 — IN914 or similar.

THE TEARS AND JOY OF OWNING AN FT102

Imagine watching your new equipment in flame and blowing madly until the smoke subsided!

C H Castle VK5KL
29 Turnbull Road, Enfield, S.A. 5085

In 1983, I read all details on the then available transceivers to come to a decision on which to buy to replace my old faithful FT101B. I took a fancy to the FT102, which I thought would satisfy my requirements. Reasonable power output, band coverage 1.8 to 30 MHz with WARC bands, good selectivity, notch filter, IF bandwidth, shift audio filter, etc, valves as driver and in the final, ideal without resorting to memories and computing facilities as per the latest models.

After taking delivery, I sat down with the instruction manual to familiarise myself with the finger touch controls, etc, before switching on.

After a couple of hours, I ventured to explore the receiver and then the transmitter. Imagine my thoughts when, after one hour of operating, the output failed. The 6146 valves were soft and replaced by the agent. Receiver selectivity was extremely broad on 1.8 MHz, a signal on 1.870 MHz covered the whole dial. The 3.5 MHz band was a little better, as was 7 MHz and higher.

Everything was tried to improve this, from installing available CW filters — the 8 MHz was useless, but the 455 kHz did improve selectivity and a 10, 20, 30 dB attenuator in the antenna was tried. This helped also, but selectivity still left something to be desired. Writing to Yaesu provided no solution to the fault.

After a few hours of operation, the transmitter again failed — RO4 a 470 ohm, 2 watt resistor in Rectifier A PCB had failed. Over one weekend, this resistor was replaced six times — the final time smoke poured out of the top cover and burst into flame. Can you imagine watching your new equipment in flame unable to get the top cover off? Quickly the power was switched off and blowing madly until the smoke subsided, the resistor was then replaced with a five watt wirewound.

Reading of a cure to stop the faults in 6146s, having screen grids expanding and shorting to the plate, causing the 900 volts back voltage flowing through the screen voltage components, a 1N4007 1000 volt diode was placed in series with the screen voltage on the PCB. Also, an in-line fuse was placed in the HT line to the final. There was no more indication of the fault after this modification.

Until now, the set had not been used above 14 MHz. The search for poor selectivity continued.

Whilst the set was still under warranty I was in QSO with a P29 and he asked me to QSY to 28 MHz. Half-an-hour later, returning to 14 MHz, he asked me where I had been — I had been unable to tune-up on 28 MHz.

With top cover removed, and looking down on the wave-change switches with a strong torch, I could see that the wafers were irregular and not making contact when switched to 21, 24 and 28 MHz. The set was returned to the dealers who replaced the damaged wafers.

The next fault began with the mains fuse blowing, and continuing to blow each time it was replaced. Isolating circuits proved the trouble was in the final. One 6146 was replaced. The receiver still performed poorly so the FT102 was replaced with the old reliable FT101B!

After use for an hour or so, a new fault showed in RO1, with the Rectifier B board heating-up, the IF shift/width control wouldn't centre, monitor oscillator was audible through the speaker on receiving and the transmitter signal chirpy. With switching the transmitter heaters and fan on altered the width of the IF, on tune and closing the key a chirpy carrier could be heard.

The high current through RO1 proved to be due to QO1 (2SA733Q) being open circuit and all the current was being carried by RO1, which then went open-circuit.

Replacing RO1 and QO1 restored the 12 volts, but regulation was still poor. QO2 was replaced with a 1 amp regulator and I retired to bed. Next morning,, instead of 12 volts, it now read 24 volts! All circuits were isolated and the fault tracked to Q1 (2SB705R) which had broken down. Unable to obtain a new one, it was replaced with a higher rating JE2955.

A few days later, the receiver 24 volts and transmitter 12 volts failed. Replacing QO3 and QO4 did not restore the voltages and DO7 was found to be shorting to earth. Replacing DO7 restored the voltages.

Now, for the breakthrough. Checking all voltage outputs showed there was no 15 volts, Replacing QO5 restored the 15 volts and, when checking the receiver, the difference in operation was miraculous. Sensitivity was something to hear and the IF shift/width now operated as per specifications. At last, the joy of operating on crowded bands with the aid of modern technology, and one could appreciate the use of an IF shift/width notch filter or the audio filter.

A study of circuit diagrams showed that the 15 volts operates the IF shift and the poor selectivity was due to the absence of that voltage. The search had taken a long time, but then one would not expect to find a missing voltage in new equipment!

It appears that component rating has no safety margin. The advice is to replace voltage regulators and other components with ones of higher rating as they fail.

There has now been several months of trouble-free operating. One well-known 160 metre SSB net identity offered to send a tin of yellow paint to put on the transceiver as it was considered a "lemon." "Sell it" said another, but how could one sell a piece of equipment with so many faults.

Periodically, the in-line 900 volt fuse or main fuse would blow and one would have to undo the final compartment and check for a faulty 6146. Sometimes one would have a bright red glow. This was most evident by low plate current and output.

It is good practice never to operate the transmitter while the set is upside down. Remember the 900 volts is always on the plates and any sagging in elements or material dropping from the cathodes can cause destruction.

I had a run of fuse-blowing and came to the conclusion that the tubes were running hot and the elements expanding. Taking the compartments away, they ran normally. A small hole was cut with a valve socket cutter to the top plate above each valve so that the fan drew air down from the top and circulated it around each tube. The final is much cooler.

Another period of time lapsed before the mains fuse blew again. This time it was traced to the bridge diode rectifier, S4V10, which supplies 15 volts to Rectifier B board. It had shorted across the input, so was replaced with a 10 amp component.

Next thing to be noticed was the meter reading 700 volts instead of 900. Checking with another meter confirmed this. Replacing D1, D2, D3 and D4 on Rectifier B board restored the voltage to 900 volts. Surely this must be the end of the line — but no!

Interested in the new Russian satellite, I was checking the receiver on 21 and 29 MHz. The receiver sounded low. Lengthy investigation eventually revealed a dry joint in the antenna relay unit.

A few weeks later the mains fuse again blew, along with the 900 volt line. Plate current was very high as they blew but screen and bias supplies were to be alright. It was found that bias was not on one of the 6146s. Whilst removing the tubes movement of a pin was noticed through the PCB, which made connection to the bias voltage. This pin, over a period of removing the valves, had worn a hole slightly larger until it was no longer making contact. The result was no bias, the reason for the high current and fuse blowing.

Looking through a magnifying glass showed that the pin had never been soldered on the board — consequently fault cured.

Time elapsed until one day the final would only draw 200 mA on tune-up, a sign of poor emission in the valves. Many hours were spent changing to spare valves but all showed the same state. Finally, voltage of the 6146 plates was measured which revealed just over 400 volts, yet the in-built meter showed the normal 900 volts. A search showed the lead that connects to the 900 volts pin on the Rect B board had been broken with movement of wires. Resoldering cured the problem.

Next the digital readout started to go blank on the 21, 24 and 28 MHz bands. In attempting to restore the readings the wrong transformer must have been tweaked which upset the whole local unit board so there was nothing working from 1.8 to 30 MHz.

A study of the frequency relationships and careful re-alignment as per the manual restored all except the 21, 24 and 29 MHz bands. These bands rely on the mixer Q25 being fed with 13.715 — 14.215 MHz from Q24 and with 10 MHz from Q27 or 20 MHz via doubling in Q29. The mixer frequency of 33.715 — 34.215 MHz was not being tuned through TO7, TO8 or TO9. The use of the RF probe on a VTVM, frequency counter signal generator and oscilloscope failed to produce the required frequencies. The signal generator was used to feed a signal through T7, 8 and 9 and I managed to peak the transformers but there was nothing when connected to the mixer via D68. Diode 68 was replaced. I was able to peak the transformers and the correct

Please turn to page 26

BOILING WATER — RF-style

David Barneveld VK4BGB
PO Box 275, Booval, Old. 4304

No self-respecting amateur's shack would be found without a dummy load or terminating load resistor these days, but have you ever wondered what our big brothers (the broadcast stations) use to soak up multi-kilowatts of RF energy during transmitter tests?

The purpose of this article is to enlighten readers to the construction and operating attributes of a large commercial dummy load unit, capable of sinking 50 kilowatts of power with ease. Whilst not the thing to be found in the average amateur's shack, (I could be wrong!), it will be seen that it is comparable to the small units that amateurs are used to operating.

The terminating load resistor that will be described has one major difference compared to our smaller units. That is, it will be capable of dissipating a large quantity of heat and have the ability to remove this heat rapidly in order to avoid destruction of the load element. To this effect, the unit is comprised of three assemblies.

a. The resistive element,
b. An efficient cooling system, and
c. A control network.

Each of these assemblies will be examined in detail.

Resistive Load Element

The terminating load resistance is composed of a tin oxide film which is fired at high temperature onto a high quality hollow glass tube. The design as such allows the passage of a high velocity coolant (in this case, distilled water) through and over the resistor to remove the heat generated by the transmitter power. The coolant enters through the end of the glass tube, flows through it and then by means of specifically designed baffles, about faces and flows back over the film and absorbs the dissipated heat energy.

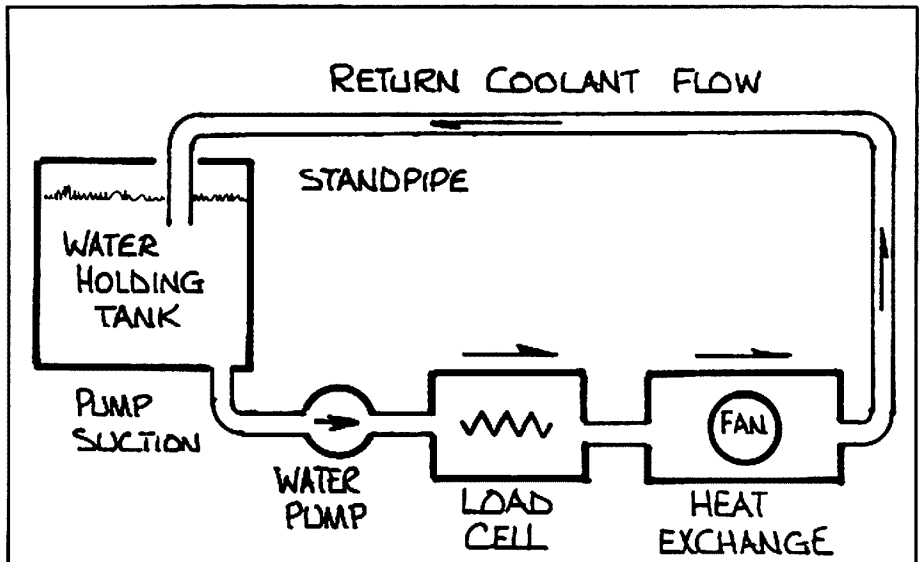


Figure 2: Coolant Flow.

The heated coolant then flows through the heat exchanger and is cooled by forced air before entering back into the reservoir holding tank.

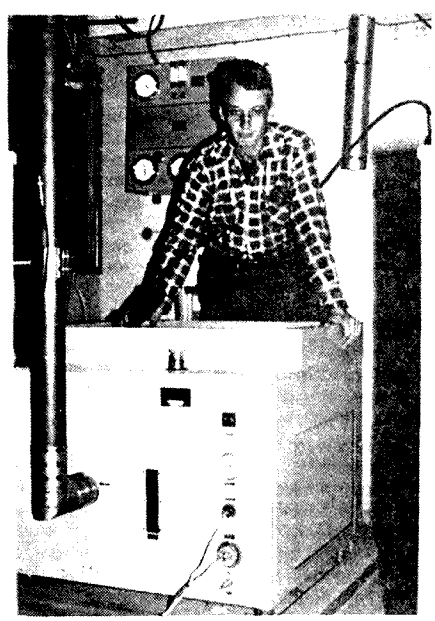
Figure 1 shows the construction of the load cell, Figure 2 shows the coolant flow and Figure 3 illustrates the electrical overlay.

It should be noted that the physical dimensions of the load resistor are approximately 200 millimetres (8 inches) long by 50 millimetres (2 inches) in diameter. When one considers that, up to 50 kilowatts of heat will be dissipated on a surface area of roughly 50 square inches, which corresponds to one kilowatt per square inch, it can be seen that a highly efficient and reliable cooling system will be required!

The Cooling System

The system comprises a high velocity, medium pressure pump, water reservoir holding tank, finned copper cooling coils and associated forced draught cooling fan.

The system operates as follows:
Water is drawn from the reservoir tank into the pump suction inlet, and excited under a pressure of approximately 50 pounds per square inch to the inlet manifold of the load resistor housing. Heated coolant then flows under pressure into a series of finned coils similar to those found on the back of a room air-conditioner. These coils surround the walls of the entire unit. A high capacity fan mounted in the top of the enclosure draws cool outside air through the fins and re-



A Super Dummy Load!

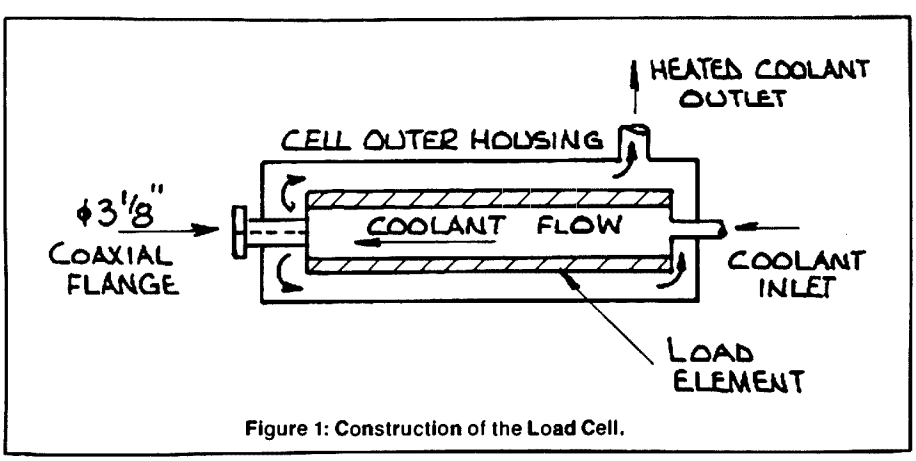


Figure 1: Construction of the Load Cell.

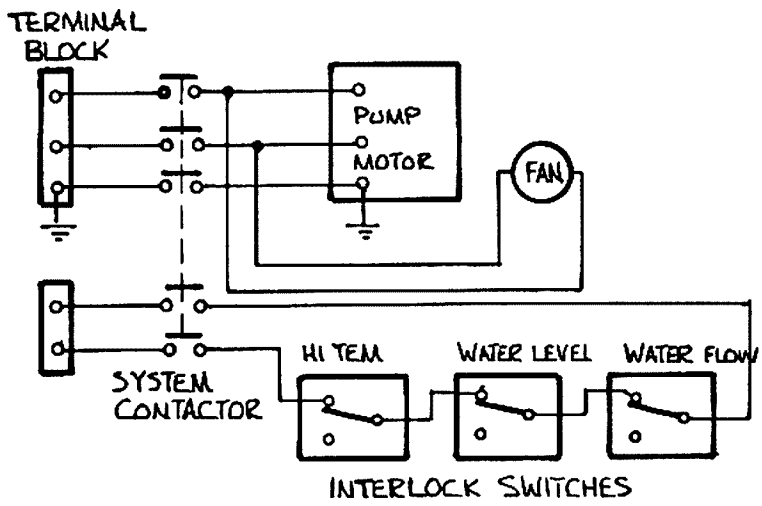


Figure 3: Electrical Overlay.

moves the sensible heat component from the coolant. The lower temperature coolant then flows back into the top of the reservoir tank and the cycle is repeated.

As stated earlier, the inlet pressure to the manifold is roughly 50 pounds per square inch. This coupled with a three-quarter inch diameter inlet pipe allows one to visualise that a hefty flow rate across the resistor will be evident. The heated exhaust air is vented to the outside of the transmitter building.

Control and Protection Circuits

As can be appreciated, considerable damage can be done to the dummy load in the event of a malfunction of the cooling system. Damage could also very likely occur to the transmitter should the resistive element fail.

In this regard, protection and interlock circuits are incorporated to shut-down the transmitter in the event of a failure of the load. The interlocks are grouped as follows:

Flow transducers pick up the movement of the coolant as it enters the load resistor manifold and supplies a closed contact output from its switch assembly to the other switch contacts as can be seen on the circuit diagram. Should the flow drop below a predetermined level, the switch opens and trips the control circuits in the transmitter.

High temperature coolant sensors also monitor the flow and likewise open the control circuits should the temperature rise to a level of 185 degrees Fahrenheit. This condition could easily occur if excess power were to be applied to the load and/or if the coolant flow was restricted in any way. Finally, a level switch trips the circuit if the reservoir capacity drops to a preset low level.

The RF connection to the dummy load described is made by a three and one-eighth EIA coaxial flange fitting.

The loads technical specifications are as follows:

POWER RATING: 50 kilowatts
INPUT IMPEDANCE: 50 ohms
FREQUENCY RANGE: DC to 1000 MHz
VSWR: 1.1:1 DC to 1000 MHz
OPERATING MODES: CW, AM, FM, TV
TEMPERATURE RANGE: 0 to 40 degrees Centigrade
AC POWER INPUT: 240 volts 10 amperes
COOLANT CAPACITY: 60 litres
WEIGHT: 250 kilograms

Well, there it is! An effective way of sinking many kilowatts of RF power or a great way to boil water — the choice is yours.

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Continued from page 24

frequencies were readable at TP5. All is well and working again!

The lesson here is, do not adjust any cores in transformers without first reading, marking and being fully aware of what to re-align. Do not use a metal tipped tool to adjust these small cores, they appear to be brittle and will chip easily.

One last modification has been done — a 240 volts AC fan has replaced the 12 volt one. It does a better job and keeps the final tubes much cooler.

Here's hoping for a little peace of mind for a while. For one who began in radio when crystal sets and reinartz detectors with reaction and audio were the state-of-the-art, and transistors and computers were unthought of, I still would not swap my FT102 despite all the inconvenience.

If anyone has one to sell cheaply, I will buy it for spare parts!

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LOW COST ANTENNA CONSTRUCTION IDEA

Peter Parker VK6NNN
Aged 15
C/- PO Witchcliffe, WA. 6288

A simple idea devised but, as yet, not constructed.

This is just an idea which I have devised but have not built a working model. It is a full wavelength loop for two-metres using a hula-hoop as a support for the antenna wire, which is threaded inside the hoop.

The hoop must be cut open so the correct amount of wire can be threaded through. Using the formula for quad loops, the correct wire length is about 2.1 metres. Dividing this figure by π (3.1416) the diameter that the hoop should be is obtained.

This calculates to be about 67 centimetres. If the circumference of the hoop is greater than 2.1 metres, a short section of the hoop should be sawn off and discarded. The amount to cut off will be π times (hoop diameter - 67 centimetres).

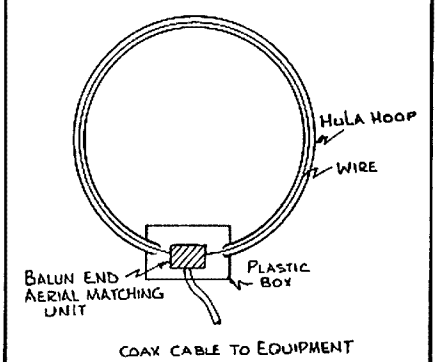

Figure 1:
Diagram of Hula-Hoop Aerial.

At the break of the hoop the 2.1 metres of wire should be threaded in. If there is not three or four centimetres of wire protruding from the ends of the hula-hoop, saw more off the hoop. A small plastic box is used to house the connections to the coaxial cable, a balun and possibly an aerial matching unit. It is important that the hoop-to-box join be sealed as any moisture entering this join will ruin the coaxial cable. It may be desirable to use coaxial cable, plugs, and sockets on the antenna.

Parasitic elements could be added using the same formulae as for quad aerials. The gain would be equal to a quad of similar size.

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TRACTOR MOBILE ANTENNA

Robert Pavan VK4FUE
PO Box 843, Ayr, Old. 4807

Operating "Tractor-Mobile" and changing bands "on the go" without having the tractor looking like a porcupine was quite a problem.

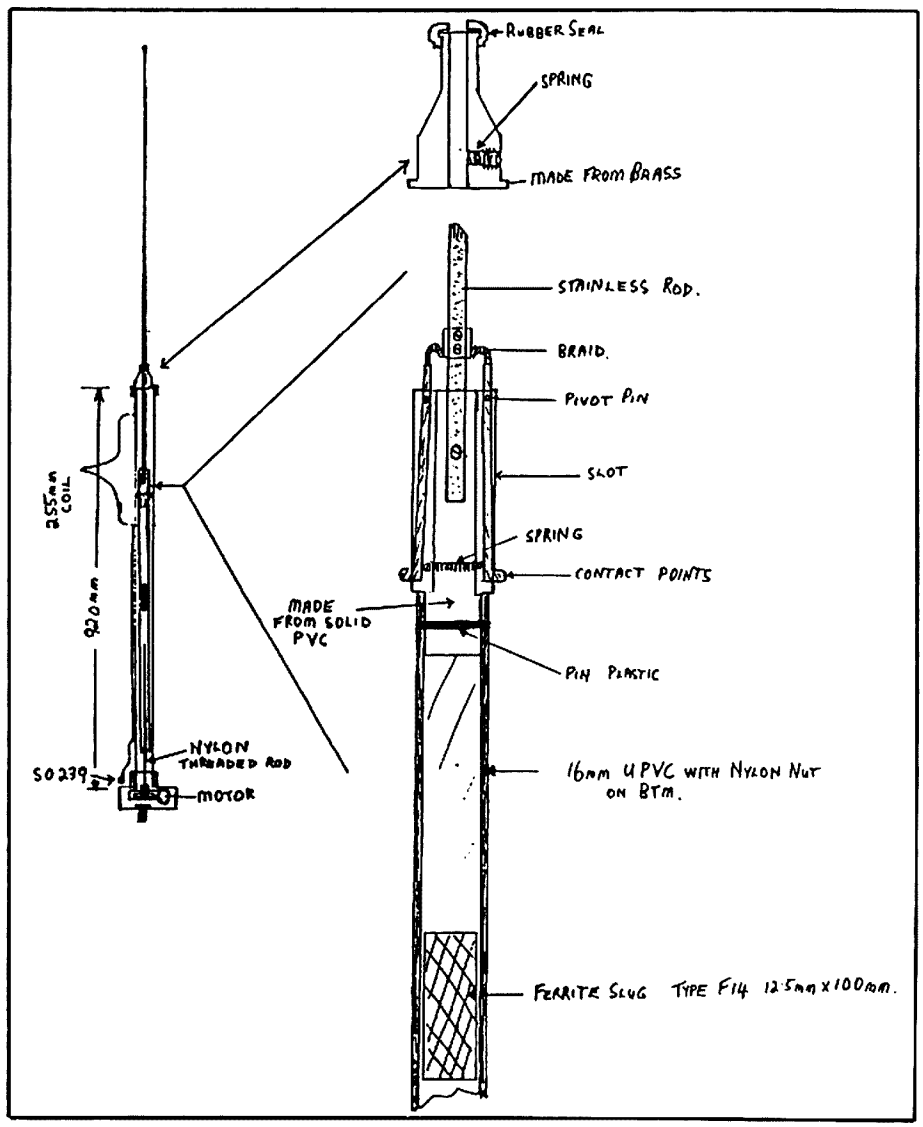
THE EXISTING ANTENNA required stopping the tractor to move the banana plug to change bands. After many months of thought and trial and error the antenna described below was designed. It is workable, practical and reasonably pleasing to the eye, and, most of all, seems to perform as well as any other six feet mobile antenna. On the highway it's wind resistance is low which was another consideration.

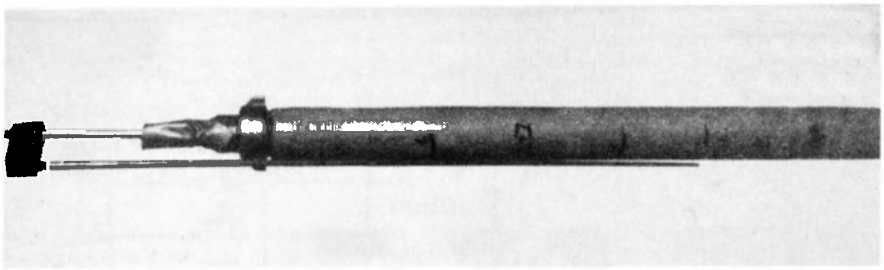
Whilst not exactly straight forward to construct, and initially some of the materials needed were difficult to obtain, it has been quite a challenge. With a working model in operation there are still many ideas and avenues to explore in order to produce the ultimate 3.5 to 30 MHz mobile antenna. Many of the components had to be made on a lathe so I enrolled myself in a metal machining course at the local TAFE college and, during the course, was able to make the parts required.

Essentially, the antenna has a loading coil which is just below centre and 25 millimetres in diameter. The top section is a piece of stainless rod, approximately one metre long (the bottom of a quarter-wave CB whip). Two contacts attached to the base of this stainless rod contact the loading coil from the inside through two slots cut in the PVC former. As the contacts are moved up the coil, loading is increased half a turn at a time and the top of the coil is, in turn, attached back to the stainless rod by a spring-contact so the overall length does also vary depending on the frequency in use at the time. As the frequency is lowered, the overall length increases as does the amount of loading coil in use and, after approximately 8 MHz is passed, a ferrite rod also begins to enter the coil from the bottom which helps keep the overall length of the coil down to 255 millimetres.

The impedance of the antenna does also vary depending on the frequency in use. 14, 10 and 7 MHz are around 15-20 ohms and 3.5 MHz is about 40 ohms. It appears the ferrite increases it!

From the solid PVC section, which is attached to the bottom of the stainless rod (it also supports the two contact points), a length of 16 millimetre





The Marker used to indicate which Frequency is in use.

UPVC is attached. This pushes or pulls the contacts up or down the loading coil. This is achieved by having a nylon nut glued to the bottom to accommodate a eight millimetre nylon threaded rod, which in turn is connected to the motor at the base.

The same piece of 16 millimetre UPVC also has the ferrite rod in it. The motor used is a window winder motor and reduction drive from a Mazda 929. The same antenna, without any ferrite rod, would operate from just below 7 MHz through to 30 MHz.

One problem encountered was to know what frequency it was last used on and whether it had to go up or down to achieve the required frequency. As a temporary measure a tip of a fishing rod was attached to the stainless rod and run down past the one inch diameter section. (It looks similar to a Gamma Match Rod!). This enabled making a mark for each band, which made tuning-up much easier and is so efficient that it is still being used.

ACTUAL CONSTRUCTION

Use 820 millimetres of 25 millimetre orange PVC and cut a shallow thread beginning 50 millimetres from one end. Make the thread to accommodate 18 SWG tinned copper wire at 1.75 millimetres pitch and 260 millimetres long. Next, cut two slots, 1.5 millimetres wide, opposite each other from the top through to the bottom of the windings. These are where the contacts run and contact the coil from the inside. They also stop the top section rotating when the motor is running. A 25 millimetre diameter brass tube, threaded from a plumbing shop — 70 millimetres goes on the base end and 25 millimetres length on the top of a piece of three-quarter UPVC is put inside to hold the slots open and glue on the brass ends. Next, solder the wire to the top brass fitting and wind the loading coil. Run the wire down the base and solder to a banana plug socket at 25 millimetres above the base of the orange PVC.

The next step is to run some glue onto the windings each side of the slots, ensuring none goes into the slots, then wrap some tape over each slot. It is now ready to fibreglass over the entire coil and the PVC and brass ends leaving 11 millimetres of thread out at the top and 28 millimetres at the bottom. Several layers of glass are required so the three-quarter PVC can be removed without the slots closing up.

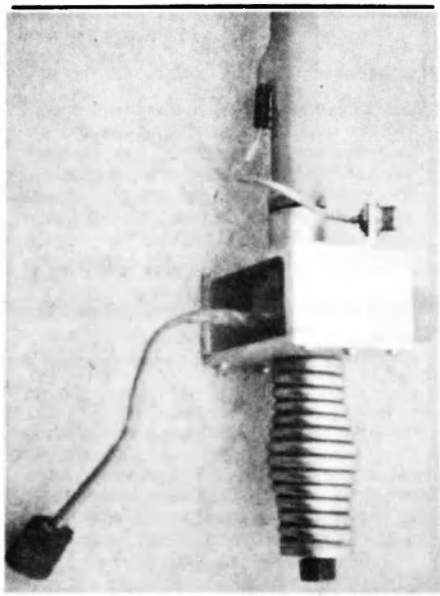
The ferrite rod is Type F14 and 12.5 by 200 millimetres. If only half the rod is used 3.5 MHz is reached and, on frequencies above approximately 8 MHz, there would be no ferrite in the loading coil. If the full rod is used, 1.8 MHz could possibly be achieved, but there would be ferrite in the coil from approximately 21 MHz down. How the rod would affect performance at those frequencies is unknown.

To fit the rod in the 16 millimetre UPVC it must be split lengthways, inserted, then glued up again.

The turned brass piece on the top, which the stainless rod slides through, is held in place by the ring off a three-quarter ring and tail used on a garden hose. The nylon threaded rod is bought in one metre lengths, also the nylon nuts. I used 8 millimetre diameter — only 340 millimetres is used.

The stainless rod is 1270 millimetres long, 30 millimetres of which fits in the solid piece of PVC which also holds the contacts under which is the piece of 16 millimetre UPVC with the drive nut on the bottom (520 millimetres long). The ferrite is 115 millimetres below the contact points and 100 millimetres long.

ar



The Base of the Antenna. Note the SO239 to connect the coaxial cable.

CW Five-Watt, One Valve QRP Transmitter

Peter Parker VK6NNN
Aged 15
C/- PO Witchcliffe, WA. 6288

Frequencies between 3.525 and 3.550 are more appropriate.

This transmitter uses a 6GV8 triode-pentode valve, is crystal controlled and has an output power of approximately five watts, which is sufficient for worthwhile results even with a G5RV antenna only four metres in height. It has very good keying characteristics and does not produce TVI if properly operated.

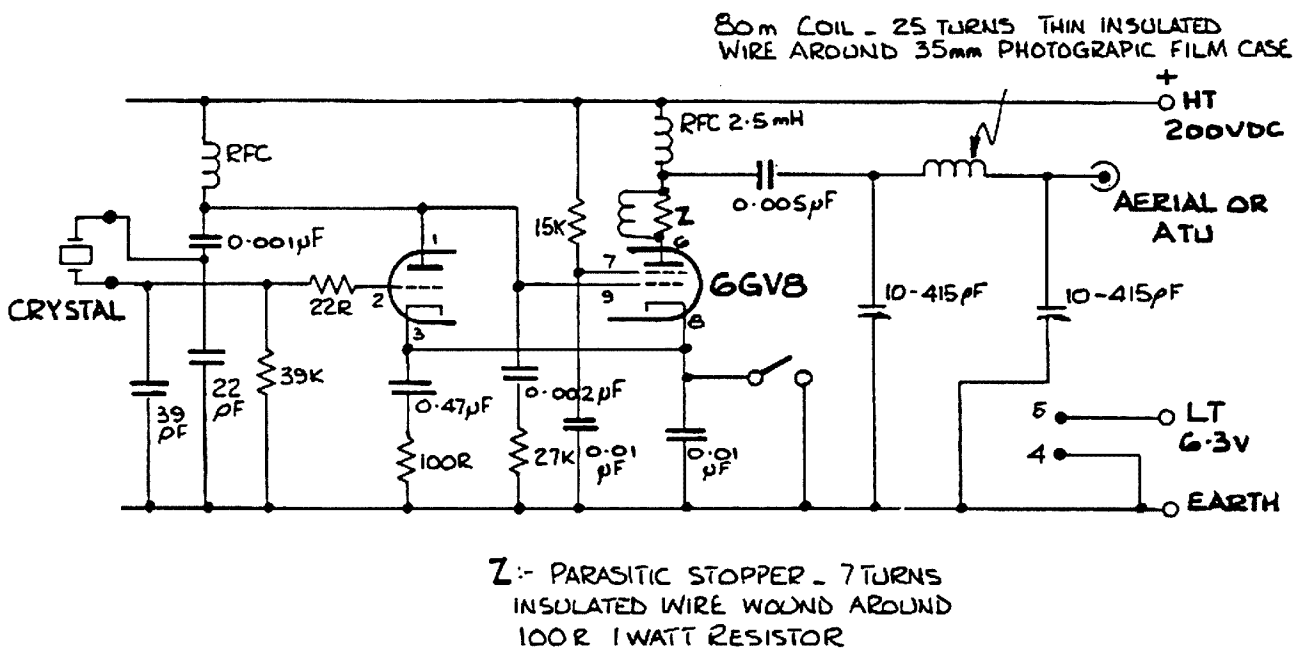
The original circuit was published in the 1973 *ARRL Handbook*, page 169, using a 6T9. It can be used from 160 to 20 metres by changing the coil in the pi-network. Other triode-pentodes, such as the 6GW8, 6DX8, and similar tubes could be used in the QRP transmitter provided the connections on the valve-holder are changed to suit the valve at hand.

This transmitter should not cost any more than about $5-10, if you have a few old televisions and radios for salvaging parts.

The 3.580 MHz crystals can be bought for abut $3, but other frequencies have to be obtained by asking around on-air.

You will receive very little response by calling CQ on 3.580 MHz with CW. Frequencies between 3.525 and 3.550 Mhz are more appropriate.

Figure 1: Circuit Diagram.



Continued from page 5

as they were all practically evaluated on a scope.

CONCLUSION

No building or adjusting filters, as is the case with RTTY.

LCT works immediately.

NOTE

The Author and Designer, Peter J Cox PA3DSX, has the following additional comments.

1 Instead of spending hours or days of trials and errors, begin with the time honoured method of "kitchen to shack" contacts, using two sets. This makes for easy adjustments. Then, extend the range.

2 Use "squelch IN" and do not talk if you use the method of inserting the computer output after the first audio stage. If you do talk or make other noises, unwanted pulses may occur.

TRANSLATOR'S COMMENTS

This inexpensive method should also allow different brands of computers to communicate by using BASICODE. This system, now in its second version, caters for most of the popular brands, even the local Microbee (for information, refer to Microbee Clubs). BASICODE was 'invented' by enthusiasts with Hobby Scope, a weekly program on Dutch radio. Programs are broadcast by this method on both the AM and FM broadcast stations in the Netherlands. Besides computers, Hobby Scope caters for other 'hobby disciplines.' Attempts to have the ABC interested in such a program fell on deaf ears, probably the suggestion came from Brisbane, not from Sydney. But that is my own impression.

For further information, send a SASE (ie with IRCs) to Radio Netherlands, Basicode Section, Hilversum, Holland. The price is reasonable, even considering the present dollar value.

—Translated from *Electron* June 1986, by John Aarsse VK4QA

TOPICAL TECHNICALITIES — 2

Lindsay Lawless VK3ANJ
Box 112, Lakes Entrance, Vic. 3909

Almost all coupling networks can be analysed.

Prompted by my "Lazy Pi" article in AR July 1986, Graham Ranft VK7ZO, wrote to me about another coupling circuit which has interesting possibilities. it is the 'Series Parallel' network described by Warren Bruene W5OLY, in *QST* June 1986.

The circuit is shown in Figure 1 as drawn by Warren. At Figure 1(a) and (b) I have redrawn the circuit to show that it can be regarded as two L- networks in tandem. Warren's analysis is, of course, correct but I prefer the tandem-L representation. As further proof of the adage 'nothing is new,' my 1937 vintage course notes name the arrangement the Tee-Pi network. Take your pick 'Series-Parallel', 'Tandem-L' or 'Tee-Pi'.

The 1937 notes provide additional information:
Referring again to Figure 1:

$$X_1 + X_2 + X_3 = 0 \text{ and}$$

$$X_1/X_3 = X_2/X_4 = -n \text{ so that} —$$

X_1 is opposite sign to X_3 and X_2 is opposite sign to X_4.

Almost all coupling networks can be analysed or designed using the basic L-network theory. At Figure 2(a) between the points a-a is a parallel combination of load resistance (eg aerial system) $R_a = nR_o$ and reactance X_b. There is an equivalent series circuit for this (Figure 2(b)) and there is a value for X_a which will cause the equivalent series resistance to equal the source resistance R_o (eg the required load for a transmitter or linear).

The equivalent series R is

$$R_a X_b^2/R_a^2 + X_b^2$$

and the equivalent series reactance is

$$\pm j(R_a^2 X_b/R_a^2 + X_b^2$$

$R_a = nR_o$ therefore,

$$nR_o X_b^2/n^2 R_o^2 + X_b^2 = R_o$$

Solve this for X_b

$$X_b = \pm nR_o/(n-1)^{1/2} \quad \ldots(1)$$

X_a has to resonate the circuit therefore:

$$X_a = \pm j[R_a^2 X_b/R_a^2 + X_b^2$$

and substituting nR_o for R_a:

$$X_a = \pm R_o(n-1)^{1/2} \quad \ldots(2)$$

If you want further proof of the power of maths try solving that circuit for the case $R_o = nR$.

A similar manipulation but transforming the series circuit Figure 2(c) to an equivalent parallel circuit and assuming $R_o = nR_a$ produces:

$$X_b = \pm R_o/(n-1)^{1/2} \quad \ldots(3)$$

$$\text{and } X_a = \pm (n-1)^{1/2} R_o/n \quad \ldots(4)$$

With the results (1), (2), (3) and (4) it is possible to design or analyse any coupling circuit configuration for any required impedances transformation by assuming that all are tandem-L networks.

Figure 2.

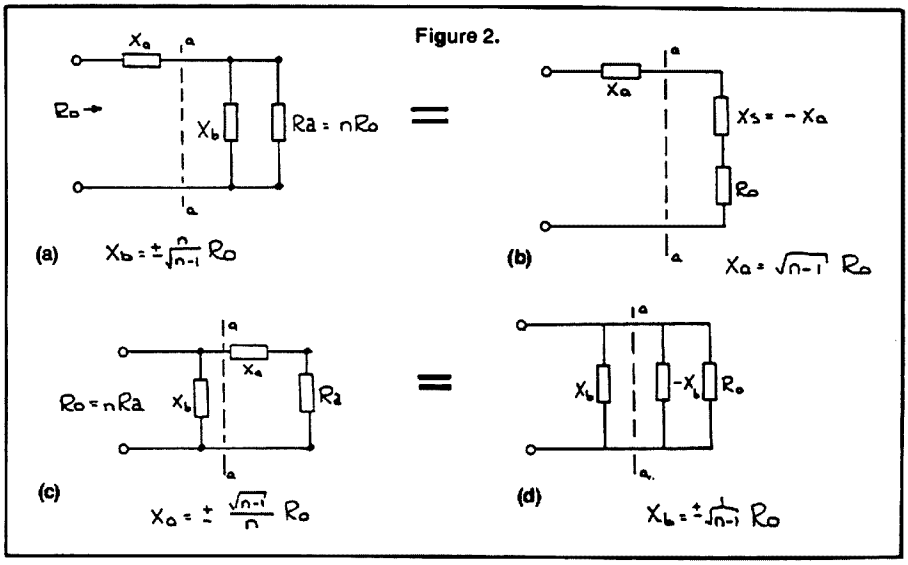
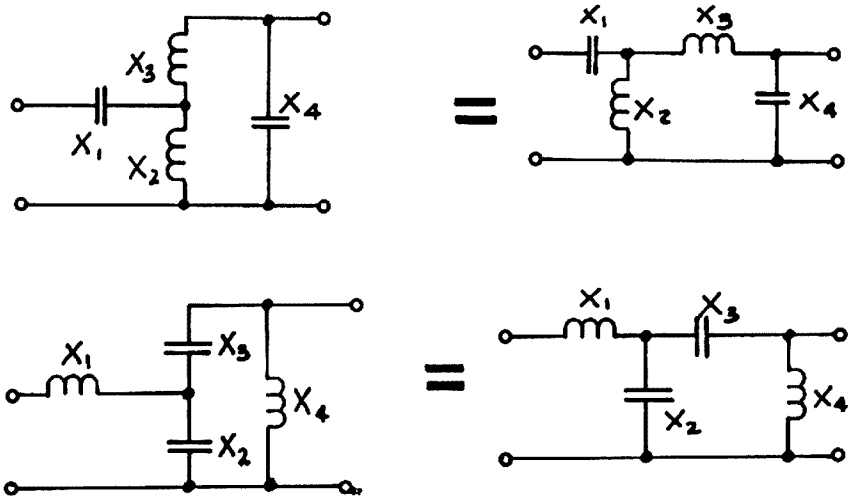


Figure 1.



(a) Series Parallel Network (See QST 6/86). (b) Tandem-L or T-π (Circa 1937).

The maths abbreviated above might not be attractive to many but it is the only way to obtain a proper understanding and thus be able to avoid the trap of buying black box couplers or constructing units from recipes, which are power absorbers as well as (and sometimes instead of) aerial coupling units (often wrongly called aerial tuning units).

Also, as a follow up to the 'Lazy Pi' article, Reg VK3CCE, told me about a method of choosing the best length feeder for 'tuned feeder' systems. The information comes from a letter to the QRP Club from Fred Bonavita W5OJM and also rates a mention in *CQ* July 1986, in the "This 'n' That" column by W8FX. The idea is to use lengths (in feet) of feeders plus half aerial length which, when divided by a specified divisor produce an answer which is not a whole number and preferably close to a number plus 0.5. The divisors are:

16 for 80, 40, 20 and 10 metres.
22 for 15 metres and
9 for 16 and 12 metres.

Reg uses a horizontal aerial half length 41 feet and feeder length 34 feet. Applying the divisors:

$75 \div 16 = 4.7$
$75 \div 22 = 3.4$
$75 \div 9 = 8.3$

The aerial passes the test for all bands and Reg says it works well.

HIGH VOLTAGE CAPACITOR CHECKER

Peter O'Connell VK2EMU
3A Algernon Street, Oatley, NSW. 2223

A simple capacitor checker from bits and pieces.

Recently, I had a high voltage power supply for a valve transceiver blow a capacitor. So what? — you may ask — except that it was less than 18 months old.

While looking around for a replacement, I heard some stories that the voltage rating on some capacitors are not to be trusted. It appears that 500 VW capacitors have been known to "blow-up" when as little as 350 volts has been applied to them.

I constructed the high voltage stepped power supply shown in Figure 1. The transformer was from an old black and white television which had been discarded with a neighbour's rubbish. The capacitors and resistors were from a bulk package bought at a trash and treasure sale. A single high voltage capacitor could also be used if available.

The supply has output voltages of 0, 25, 50, 75, 100, 200, 300, 400 and 500 volts. By connecting between two terminals, voltages from 0 to 500 volts can be obtained in 25 volt steps, ie by connecting between the 50 and 300 volt terminals, a voltage of 250 volts is obtained.

To test a capacitor, connect it to 25 volts and measure the leakage current flowing through the capacitor. Step the voltage up in 25 volt steps until the required rating is reached. If the leakage current has not increased greatly, or the capacitor has not gone BANG!!!, then it should be okay.

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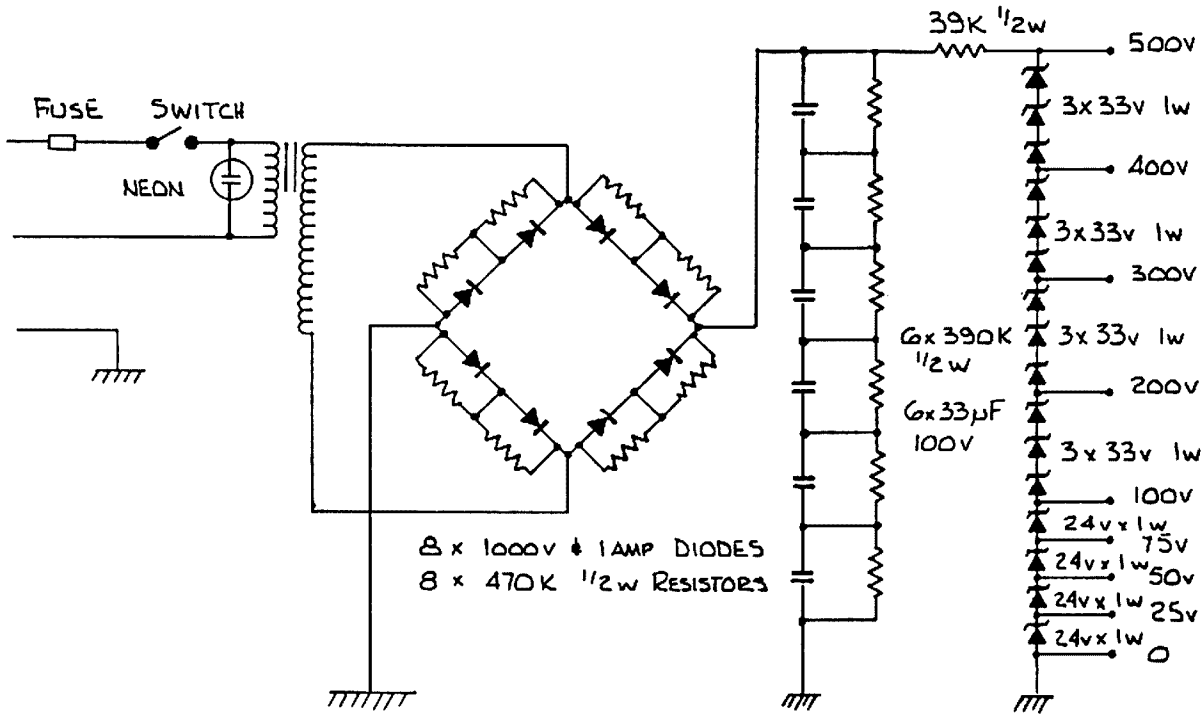
Figure 1 — Circuit of Capacitor Checker.



SIMPLE SIX-METRE VERTICAL

Peter O'Connell VK2EMU
3A Algernon Street, Oatley, NSW. 2223

Why pay a small fortune for an aerial for an old pre- loved car phone?

Having paid $5 for an old valve car phone, converted to 52.525 MHz, I was not going to spend a lot of time and effort building an antenna for it — I have modified a J-antenna from the *ARRL FM and Repeaters* book.

Whereas the original was a combined two and six metre aerial, this is only for six metres. I also decided to use 25 mm square aluminium tubing as it is easier to drill and screw. There are also little square lugs available that close off the ends.

The entire antenna is constructed with pop-rivets and self-tapping screws — including the coaxial cable! The only other materials required are some scrap aluminium plate and a piece of perspex. The SWR is about 1.1:1 at 52.525 MHz, and it works quite well.

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Figure 1.

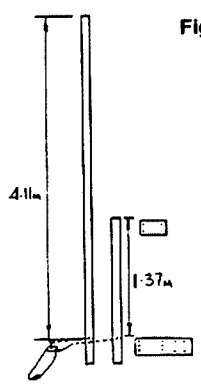


Figure 2.

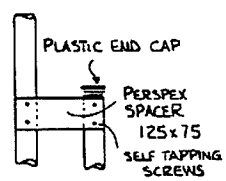
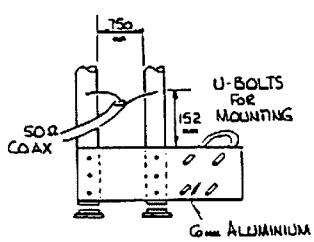
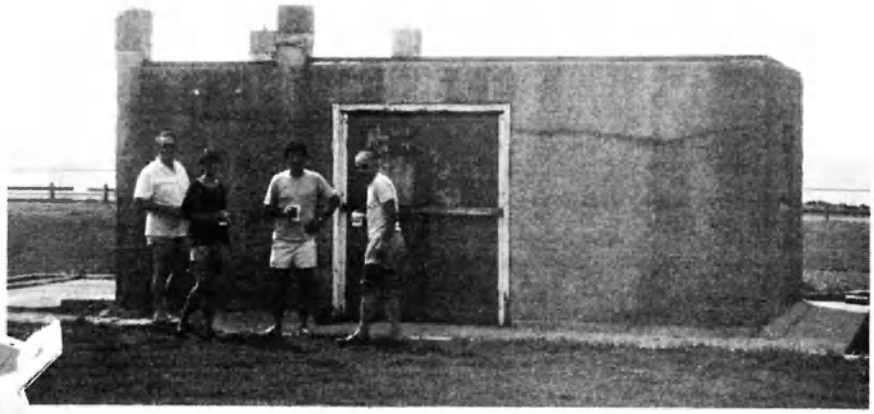


Figure 3.



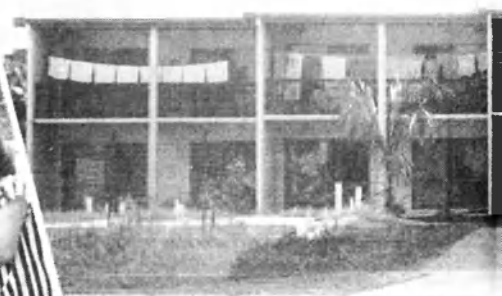
A PICTORIAL VIEW OF THE DAR
21ST BIRTHDAY

Visitor Doug VK3UM, cuts the Birthday Cake.



East Point Reserve — Site of the First Beacon, VK8VF.

Preparing for the "Mystery Bus Trip", from left: Frank VK8FT, Terry VK8TA, Doug VK3UM, Barry VK8DI, Ray VK8RB, Bill VK6AOD, Natham and Korin (harmonics of VK8BN and VK8YL), Garry VK8BN and Wendy VK8YL.



Site of the first meeting at Nightcliff (la Cyclone

RWIN AMATEUR RADIO CLUB'S CELEBRATIONS

Photographs courtesy Bill Murphy VK8ZWM

East Point Reserve — Old Meeting and Transmitting Site.

Barry VK8DI, Master of Ceremonies for the Celebration Dinner.

(late VK8BB). The building was rebuilt after e Tracey.

Saturday Barbeque — from left: John VK8KJJ, Doug VK3UM, Graham VK1BGG, Brian VK8UW, Adrian (son of VK8ZWM), Larry VK8LM.

Enjoying the Celebration Dinner: Janice and OM Garry VK8ZGT, Graham VK1BGG, Ruth and OM Henry VK8HA (partially hidden), Robin and OM Ray VK8RB, Ron VK3AUR, Jim VK8JJ and wife Gloria.

A Video Recorder TVI Case History

Karl Saville VK5AHK
2 Wood Street, Lobethal, SA. 5241

Maybe the interference was coming through the mains supply!

I recently purchased a video recorder after much soul- searching as to whether it was a waste of money. As there were many advantages to having a recorder — like being able to receive SBS on the UHF band without having to purchase a new television — the decision was made to go ahead, after the "Minister of the Interior" was convinced. A gleaming black video recorder was duly installed on top of the lounge room television.

Now it is law, in this complicated life of ours, that whenever something unusual happens, you can bet your bottom-dollar the cause will not be simple. Here was an excellent example of this law.

The very first night I was on air, after the installation, I received a stern memo from the "Minister of the Interior" to the shack protesting that I was interfering with the television. Not just the television, but *her* television. I closed the station down at once.

Previously there had been no complaints of any TVI. (One is very dependent on reports of this nature as it is very difficult to watch the lounge television from the shack and transmit at the same time!) Knowing the Minister as I do, any interference to the regular nightly serials would not be tolerated.

What made the problem more difficult was that, just prior to the delivery of the video recorder I had erected a new 80 metre antenna. I had managed to buy a large reel of surplus green plastic covered earth wire and though it was about time to put up a decent antenna system, instead of the multi- coloured house-wiring one which had served so well. At the same time, A balun and coaxial line feeder had been fitted instead of a figure eight twin feeder. Also, the old television VHF antenna was replaced with a new all- band antenna to receive the SBS UHF channel — which was now available with the new recorder. The new antenna was unfortunately only about two metres from the 80 metre antenna!

With all these variables, where did one begin? Was the interference due to the fitting of the coaxial cable? Was it the closeness of the television antenna to the 80 metre antenna? Was it the new video recorder that was at fault?

The next day the twin feeder was returned in place of the coaxial feeder — it made no difference. (Not that I really expected it to!).

Maybe the HF interference was coming into the television and recorder through the mains. There were a couple of television scanning coil yokes in the junk box — so with these two HF mains chokes were made up with the power leads to the television and video recorder.

Another test, but still plenty of interference on both sound and vision. Three large bands across the screen. The video recorder was very useful for carrying out interference tests. A tape recording can be made of a television channel while a HF transmission is made from the shack. Upon playing the tape back a study of the interference can be made!

Back to the TVI! Was the interference coming directly into the video recorder or was it coming from the antenna? As TVI had never been experienced before, the television antenna system was not a suspect!

The television antenna was disconnected from the video recorder and another tape recording test showed that there was no interference. Therefore the interference was not coming into the recorder through the casing, but through the antenna.

On connecting the antenna directly into the television and leaving the video recorder unconnected it was discovered, on test, that only the faintest trace if HF interference was evident on the television — a few swiggly lines were seen and these were not enough to cause any complaints.

What to do? Throw the video recorder away? The ARRL Handbook was consulted. In the interference section was a description of a high pass filter for TVI from HF transmitters. Three capacitors in series, 50 pF, 100 pF, 50 pF and two three-turn HF inductances connected from the junction of the capacitors to earth. Looked interesting!

The television antenna was cut about three inches from the terminating input plug and the filter was soldered in series with the feeder inner lead.

Wonder, upon wonders, it worked like a charm. No suggestion of any interference whatsoever. Now I can turn the wick up!

The problem could have been left at this stage, put down to being one of those rare complete success stories that one has in life. I could have rested on my laurels, as it were, but interest in filters had been aroused, so much so, in fact, that a computer program was made up from the data and formulae given in the ARRL Handbook, so that any two to 10 element high or low pass filter can be solved and the attenuation of any frequency from the design cutoff frequency given.

It was the attenuation aspect of the filters which caused a return to the video recorder problem.

Why had the video recorder given such a bad performance in the presence of HF, whereas the television on it own was quite satisfactory? There was not a circuit of the input of the recorder, but one could make an intelligent guess at what a block diagram would look like. Figure 1 gives a possible block diagram.

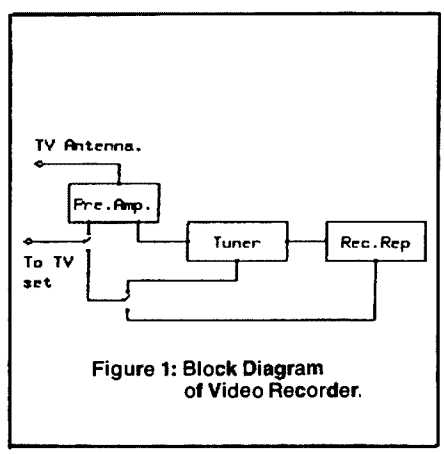


Figure 1: Block Diagram of Video Recorder.

Firstly, the antenna input was fed into the preamplifier. It had been noticed that the signal was stronger when fed through the video recorder than straight from the television antenna. The preamplifier would be a wideband amplifier. It must pass all the television channels from 0 VHF up to UHF.

By contrast, the front end of the average television would be fairly narrow band; ie each channel is tunable. This would tend to give better discrimination from interfering signals than a wideband input.

The output of the video preamplifier is connected to the video tuner and recorder. There are three possible modes that the television set can be used with this particular recorder.

1. Replay — Whatever is on the tape will appear on the television in this mode if the television set is switched to Channel 0.

2. Record — The video recorder records from its own tuner and the television is connected to a second outlet from the video recorder preamplifier if you wish to watch another channel.

3. Video Tuner — When connected to the video tuner, the television set is switched to Channel 0 and the station selection, VHF or UHF, is made on the recorder.

It seemed to be clear that the video recorder's preamplifier was the guilty party. Being wideband, the front end was being swamped by the excessive HF transmitting signal picked up from the amateur 80 metre antenna.

Television reception at Lobethal is not the best and the television signal could be anything from 100 to 500 microvolts.

If you are in a low television signal area and your amateur antenna is fairly close, say within 30 metres, to the television antenna, there could be just as much amateur signal appearing on the television screen as the television program.

A five element filter as recommended in the *ARRL Handbook* would have an attenuation of about 120 dB at 3.600 MHz, which is a ratio of 1 000 000. An interfering signal of one volt would be reduced to just over one microvolt. There should not be any interference with a television program from such a small signal even in a low television signal area.

The satisfactory conclusion to this interference problem has given the writer much confidence for an ability to cope with suspicious neighbours. The sight of an antenna farm does not bring out the best in neighbours and any interference is frequently blamed on the radio amateur next door. Until all television sets are fitted with adequate filtering in the input there are bound to be amateur signals picked up when antenna systems are too close together.

It is quite possible that neighbours to this QTH suffer from some interference on their television screens from amateur transmissions. It may be only a few lines over the picture or perhaps worse — and maybe they are prepared to tolerate it. Maybe they have not associated their interference with amateur transmissions. There have been no complaints yet but if there is I will, with the utmost of confidence, demonstrate the complete absence of interference on my own set. They will also be advised why there is no interference. . .

THREE FILTERS

R Schestavin VK5RC
48 Burlington Street, Walkerville, SA. 5081

The prices of integrated circuits being quite low, it is very cheap and convenient to use active filters for amateur audio applications.

After being out of school for many years, the algebra becomes a bit "rusty" and it takes considerable time to work out and check the formulae and results of calculations.

This is a simple BASIC program to work on a Microbee computer for three types of filters, namely: *Highpass, Lowpass* and *Narrow Bandpass.* These filters are very useful for RTTY, Packet Radio Speech Filters, etc.

Two-pole active filters have a gain of unity and the Q is taken as .707 as used in Butterworth filters which have the flattest response for the passband.

To realise a wide bandpass filter highpass and lowpass filters are connected in series. For a narrow band one, a two-pole filter is sufficient (say for 170 Hz shift and 200 Hz shift, or CW).

One should disregard the right-hand decimal places as produced by the computer, of course, and use the nearest available preferred values. During the tests the response can be "trimmed." If no measuring equipment is available, one should use components as near as possible to those calculated.

If linear amplifiers, with balanced supply, are used, the positive inputs *can be* grounded (no bias required), If a single sided power supply is used, the positive inputs have to be connected to a voltage divider.

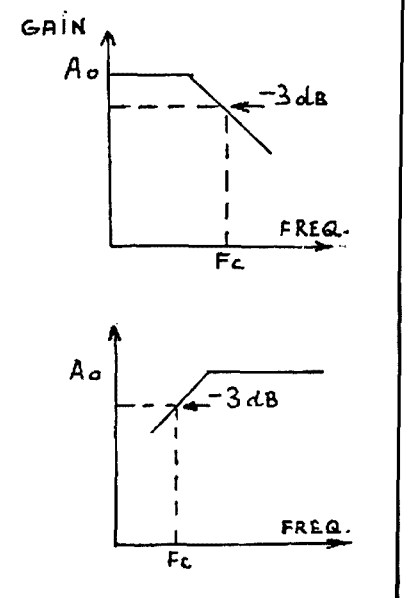


Figure 1.

```
00100 PRINT TAB10;"DESIGN OF 2 POLE ACTIVE FILTERS"
00110 PRINT TAB10;"=================================":PRINT
00120 REM:ASSEMBLED BY R.SCHESTAVIN VK5RC
00130 PRINT "WHICH FILTER?  Type H for HIGHPASS"
00140 PRINT TAB21;"L for LOWPASS"
00150 PRINT TAB21;"B for NARROW BANDPASS"
00160 A$=KEY$: IF A$="" THEN 160
00170 IF A$="H" OR A$="h" THEN 200
00180 IF A$="L" OR A$="l" THEN 480
00190 IF A$="B" OR A$="b" THEN 730
00200 PRINT:PRINT "Is printed copy req-d? Type Y (yes) or (no)"
00210 B$=KEY$: IF B$="" THEN 210
00220 IF B$="Y" OR B$="y" THEN 240
00230 IF B$="N" OR B$="n" THEN 250 ELSE 200
00240 OUT#1 ON
00250 PRINT
00260 PRINT TAB 25; "HIGHPASS FILTERS"
00270 PRINT TAB 25; "==============":PRINT
00280 PRINT "Q=.707 (BUTTERWORTH)"
00290 Q1=0.707
00300 PRINT "GAIN A0=1"
00310 PRINT "SELECT RJ=220000 Ohm": RJ=220000
00320 INPUT "SUPPLY VOLTAGE    ?";V1
00330 INPUT"CUT OFF FREQUENCY Fc    ?"; F1
00340 R2=((V1/2.6)-1)*RJ: PRINT "R2="; R2; " Ohm"
00350 INPUT "ENTER NEAREST PREFERED VALUE";R2
00360 PRINT "LET C1=C2"
00370 C1=.707*J/(6.28*F1*R2*(10^-12))
00380 PRINT "C1=C2=";C1; " pF"
00390 R1=1/(.707*6.28*F1*C1*3*10^-12)
00400 PRINT "R1=";R1; " Ohm"
00410 PRINT
00420 PRINT "SELECT NEAREST PREFERED VALUES":PRINT
00430 OUT#1 OFF: PRINT
00440 PRINT "Do you wish to repeat? Y or N"
00450 C$=KEY$: IF C$="" THEN 450
00460 IF C$="Y" OR C$="y" THEN 200
00470 IF C$="N" OR C$="n" THEN 1030
00480 PRINT:PRINT "Is printed copy req-d? Y (yes) or N (no)"
00490 D$=KEY$: IF D$="" THEN 490
00500 IF D$="Y" OR D$="y" THEN 520
00510 IF D$="N" OR D$="n" THEN 530 ELSE 480
00520 OUT#1 ON:PRINT
00530 PRINT TAB 30; "LOWPASS FILTERS"
00540 PRINT TAB 30; "==============":PRINT
00550 PRINT "Q=.707 (BUTTERWORTH), GAIN A0=1"
00560 Q1=.707:A0=1
00570 K1=1/4*Q1^2*(A0+1)
00580 INPUT "ENTER SUPPLY VOLTAGE?";V1
00590 INPUT "ENTER CUT OFF FREQUENCY F1";F1
00600 INPUT "Enter convinient value of C1, in pF?";C1
00610 PRINT "C1=" ;C1; " pF"
00620 C2=K1*C1:PRINT "C2="; C2; " pF"
00630 R2=1/(2*Q1*6.28*F1*C1*K1*(10^-12))
00640 PRINT "R2=" R2 ; " Ohm"
00650 R3=R2/2: PRINT "R3="; R3; " Ohm"
00660 R1=R2/1: PRINT "R1="; R1; " Ohm"
00670 R4=(R2+R3)/((V1/2.6)-1): PRINT "R4="; R4; " Ohm"
00680 OUT#1 OFF: PRINT
00690 PRINT TAB 25; "Do you wish to repeat? Type Y or N"
00700 F$=KEY$: IF F$="" THEN 700
00710 IF F$="Y" OR F$="y" THEN 100
00720 IF F$="N" OR F$="n" THEN 1030
00730 PRINT: PRINT TAB 15; "NARROW BANDPASS FILTERS"
00740 PRINT TAB 15; "====================":PRINT
00750 PRINT:PRINT "Is printed copy reuired?"
00760 PRINT "Type Y (yes) or N (no)"
00770 E0$=KEY$: IF E0$="" THEN 770
00780 IF E0$="Y" OR E0$="y" THEN 800
00790 IF E0$="N" OR E0$="n" THEN 810 ELSE 750
00800 OUT#1 ON: GOTO 810
00810 PRINT TAB 15; "NARROW BANDPASS FILTERS"
00820 PRINT TAB 15; "======================":PRINT
00830 PRINT "TO MINIMIZE LOADING EFFECT OF THE IC"
00840 PRINT "R4 SHOULD BE UNDER 24k - 22000 IS CHOSEN"
00850 R4=22000
00860 INPUT "ENTER F0 in Hz (CENTER FREQUENCY)?"; F0
00870 INPUT "ENTER BANDWIDTH REQUIRED in Hz?"; B0
00880 INPUT "ENTER SUPPLY VOLTAGE?"; V1
00890 Q1=F0/B0
00900 RJ=((V1/2.6)-1)*R4: PRINT "RJ="; RJ; " Ohm"
00910 R1=RJ/2: PRINT "R1="; R1; " Ohm"
00920 LET C1=C2
00930 C1=Q1/(6.28*F0*R1*10^-12):PRINT "C1=C2="; C1 ; " pF"
00940 R2=Q1/((2*Q1^2-1)*6.28*F0*C1*10^-12)
00950 PRINT "R2=" ;R2; " Ohm"
00960 PRINT "R4=22000 Ohm"
00970 OUT#1 OFF: PRINT
00980 PRINT "REPEAT BANDPASS FILTERS??"
00990 PRINT "Type Y (yes) or N (no)"
01000 A0$=KEY$: IF A0$="" THEN 1000
01010 IF A0$="Y" OR A0$="y" THEN 730
01020 IF A0$="N" OR A0$="n" THEN 1030: PRINT
01030 PRINT TAB20; "*** GOOD-BYE FOR NOW ***"
01040 END.
```

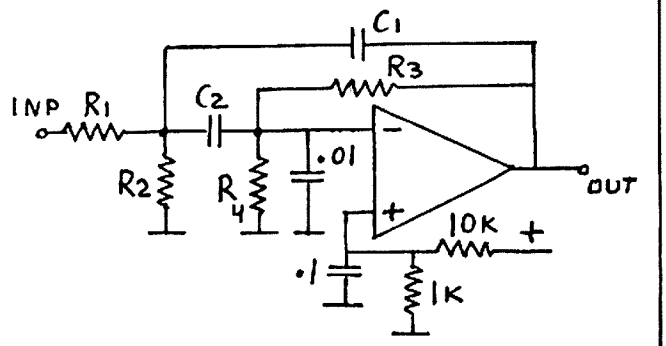


Figure 2: Narrow Passband Filter.

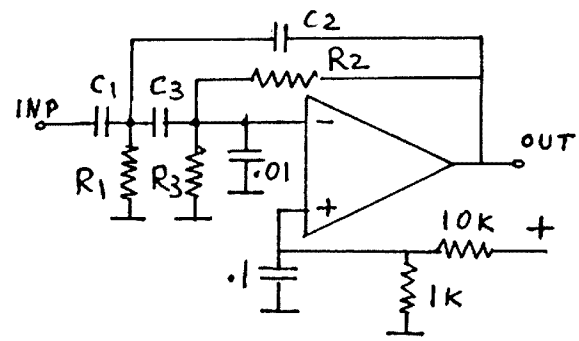


Figure 3: Highpass Filter.

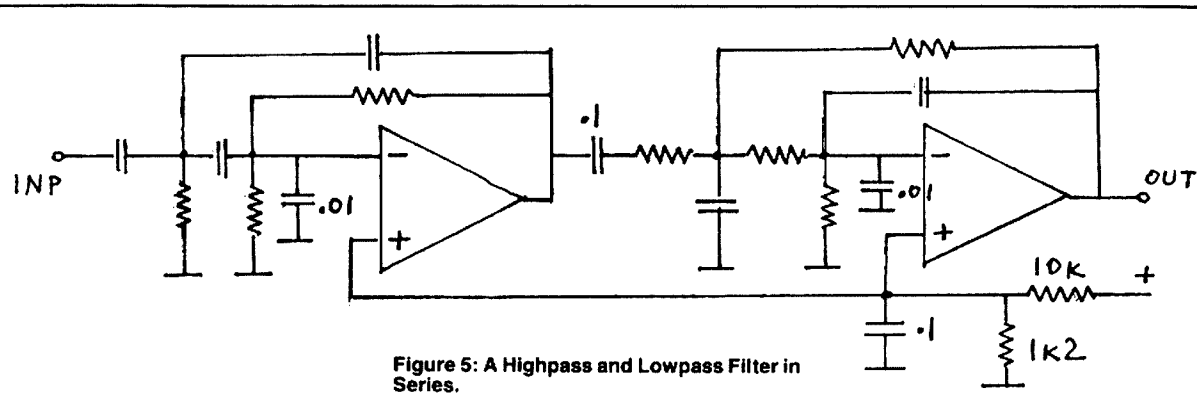


Figure 5: A Highpass and Lowpass Filter in Series.

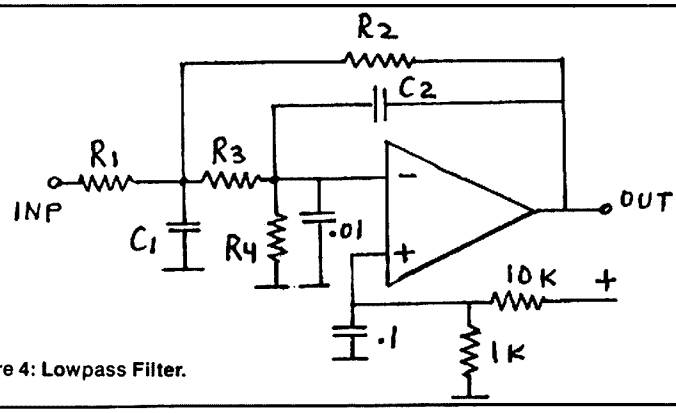


Figure 4: Lowpass Filter.

The bias on the positive input has to be adjusted, so that the DC on the output is equal to half the supply voltage. In practice, it will be found that the DC on the negative and positive inputs will be equal.

It should be pointed out to those who are unfamiliar with the terms used that, the corner or cut-off frequency is the frequency at which the gain is 3 dB down comparing to the passband gain. See Figure 1.

Uncompensated linear amplifiers often exhibit tendency to oscillate, .01 mF capacitor bypasses to ground the negative input pins to prevent it. These capacitors have a minimal effect on the frequency response of the filters.

Figure 2 shows a narrow passband filter, Figure 3, a highpass filter and Figure 4, a low pass filter.

Figure 5 represents two filters (high and low pass) in series.

The program listing in BASIC is for the Microbee computer, however, very little modifications are necessary for other types of computers.

REFERENCES:
Audio Handbook
National Semi Conductors 1977

ar

DEADLINE FOR MAY IS MARCH 21, 1988

QSP

SPECIAL CALL SIGN

The special prefix TP0 will be used for three activity periods in 1988 by the Council of Europe Radio Amateurs Club (CERAC) on the occasion of the 1988 European Campaign for North/South Solidarity.

The dates of the first two operations are as follows:

March 11 to 13, 1988
June 24 to 26, 1988

The date of the third operation is yet to be announced but it is hoped that it will coincide with the visit of His Holiness Pope John Paul II to the Council of Europe headquarters on October 8, 1988, and the call sign will be TP0PAX.

The QSL address is Francis Kremer F6FQK, Station Manager for TP2CE, 31 Rue Louis Pasteur, 67490 Dettwiller, France.

GETTING ON AIR — Part 2

A 80 Metre QRP Transmitter

Peter Parker VK6NNN
C/- Witchcliffe Post Office, WA. 6286

No clicks or chirps.

This simple one valve transmitter can be easily constructed by a beginner and can provide good results. The circuit comes from the *1973 ARRL Handbook* page 169.

Keying is very good with no clicks or chirps. The valve is a 6GV8 and high tension current consumption is about 100 mA.

The capacitor (22 pF) shown in dotted lines to the left of Figure 1, was not included in the original diagram, but was essential with a 6GV8.

Unfortunately, crystals for the CW portion of 80 metres are costly, but luckily a 3.580 MHz crystal is only around $3 from suppliers such as Altronics and Dick Smith Electronics.

Full call operators could possibly modify the transmitter to cover 160, 40, 30 and 20 metres.

This transmitter was built using a piece of plastic with holes cut in it at the appropriate places for the circuit board.

Other amateurs may wish to use tag-strips, matrix board or a PCB.

The capacitors subject to high voltages should be rated at 350 volts or better. The load capacitor can be a pre-set unit if available. High SWR will not damage the 6GV8. RF power output would be about 4-5 watts.

PARTS LIST

QT-Y	DESCRIPTION
1	6GV8 and 9-pin socket to suit
1	3.580 MHz Crystal
1	22 pF Disc Ceramic Capacitor
1	39 pF Disc Ceramic Capacitor
2	10-415 pF Variable Capacitor
1	0.001 uF Disc Ceramic Capacitor
1	0.002 uF Disc Ceramic Capacitor
1	0.005 uF Disc Ceramic Capacitor
2	0.01 uF 350V Capacitor
1	0.47 uF Polyester (Available from DSE)
1	22 ohm Carbon Resistor 0.5W
1	100 ohm Carbon Resistor 0.5W
1	15 kohm Carbon Resistor 0.5W
1	27 kohm Carbon Resistor 0.5W
1	39 kohm Carbon Resistor 0.5W
1	100 ohm 1W with 7-turns of wire wrapped around it
1	1 mH RFC (not critical)
1	2.5 mH RFC (not critical)
	Wire, key, case, nuts, bolts, sockets

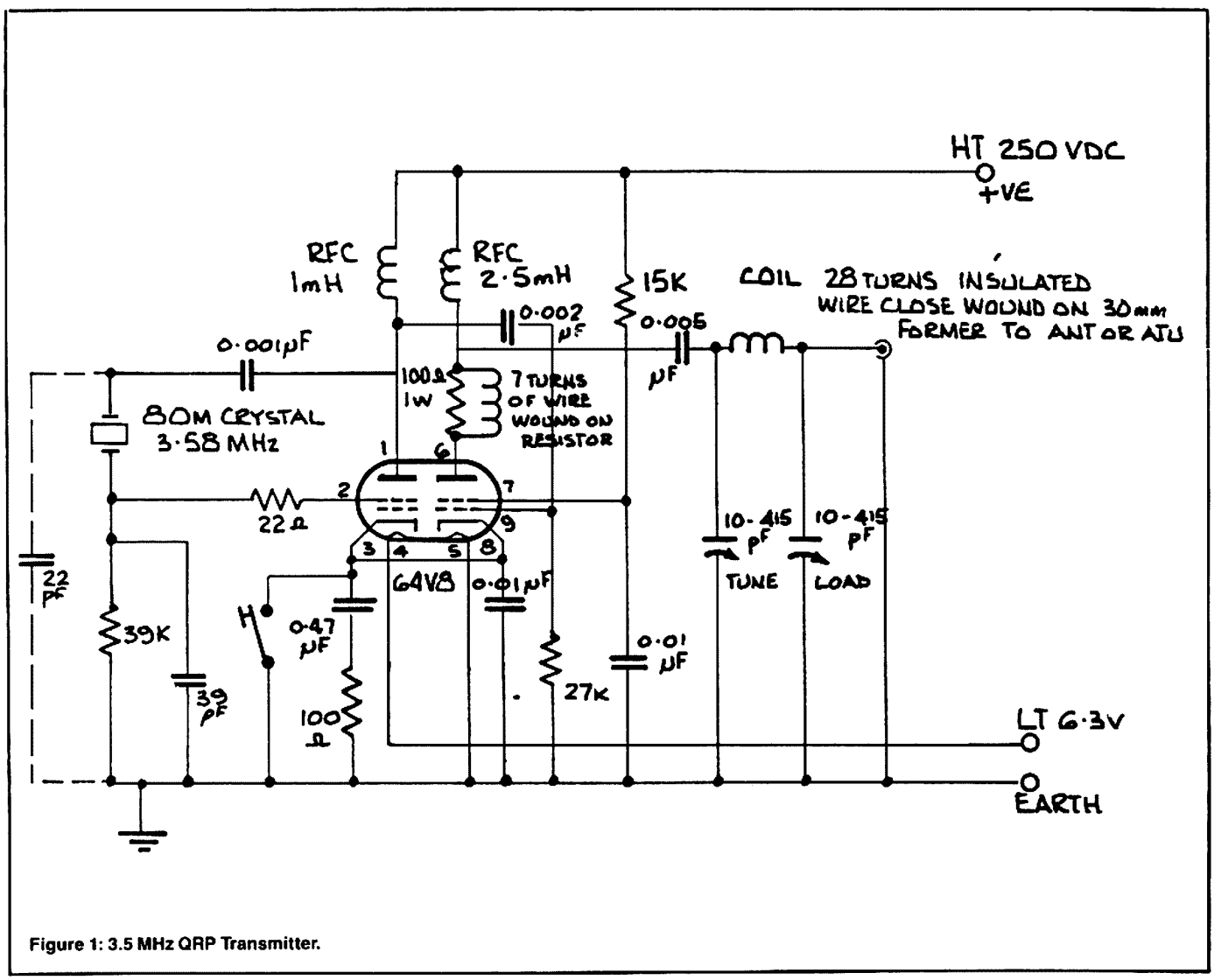


Figure 1: 3.5 MHz QRP Transmitter.

JOTA BY SATELLITE

Peter Hughes VK6HU
NATIONAL CO-ORDINATOR FOR JOTA
58 Preston Street, Como, WA. 6152

Jamboree on the Air (JOTA) in Australia continues to improve. The 1987 results had many reports of increase in quality of activity even though all statistics show an decrease in numbers.

Again this year there were comments of more meaningful contacts lasting up to an hour or more in the improving conditions.

The "quality" highlight if Australian activity was the commercial satellite link between Perth and Sydney.

About six weeks before JOTA, the owners of AUSSAT offered a free channel on 12.500 GHz to be connected to a two metre amateur ground repeater at each end. This had the support of the Wireless Institute of Australia, New South Wales Division and the Repeater Group of the Wireless Institute of Australia, Western Australia Division, but as the concept appeared to be in conflict with DOTC regulation prohibiting linking of terrestrial repeaters, special permission was sought to allow the facility.

As usual the high level of support for JOTA was evident from DOTC and permission was granted. The link would work as a "split" terrestrial repeater.

All concerned should note and acknowledge the consideration which DOTC has given JOTA and the various Jamboree, Venture, Moot and Guide stations has been of great value in putting Australia on the JOTA calendar as one of the world's leading countries over 30 years.

The result was highly successful. Amateurs at both ends were keen to test the facility and, while the Scouts and Guides who were fortunate enough to participate, appreciated the clear contact, it is probably only those leaders versed in the vagaries of recent propagation conditioned who fully understood (and marvelled) at the clean signal between Sydney and Perth. Amateurs involved found it quite intriguing to be able to communicate on a hand-held unit on two metres over a ground distance of nearly 3500 kilometres.

The link was established as shown in Figure 1. Spacecraft A1 is "geophysically stationary" in that it 'appears' to remain in the same position. Actually, it is travelling at about 11 000 km/h to maintain this position some 36 000 kilometres above the equator at Longitude 160 degrees east. It was placed in orbit by ejection from space shuttle *Discovery* on August 28, 1985, and is a spinning cylinder 2.2 metres diameter by 6.6 metres high and weighs 655 kilograms. T13 was the transponder used for this exercise.

Due to differences in transmissions from those previously experienced, there were a couple of interesting points of procedure for the junior (and some senior!) operators to learn — and follow!

Firstly, it is unusual for Scouts and Guides to use repeaters anyway, and those who had done so previously had to learn to wait for two repeater 'tails' (one from each) otherwise the automatic 'time out' devices were being retained to cut off a transmission before it finished. In fact, to avoid the situation where the repeaters would automatically 'access' each other and 'cycle' back and forth, a delay to the receive acknowledgment was built in to the Perth amateur repeater by Will VK6UU.

Secondly, although the speed of electomagnetic signal is not noticeable under regular contact conditions, for this system the 72 000 kilometre journey up and back, coupled with some delay in ground repeaters, became significant creating about one second delay. This provided a classic case for proper education and instruction of the junior operators to avoid the stereo-type "Hello / Hello / How are you? / Good" type of contact. Because of the delay the first "Hello" operator became exasperated with lack of answer so repeated the "Hello" in time to coincide with the "Hello" reply just arriving from the other end! For years JOTA organisers have been trying to eradicate such poor communication procedure and the 'name, rank and serial number' type of contact. This effort has now been amply vindicated.

Apparently the AUSSAT staff were also very keen to find out how the system would operate as they monitored the channel, and even took the trouble to telephone Scout Headquarters in Perth, from Sydney, to make some suggestions for procedure to better facilitate contacts. Their efforts were very much appreciated.

The VK2 Division of the WIA picked up the open address from VK1BP on HF on the Saturday afternoon and fed it into the AUSSAT channel so that all Perth and Sydney metropolitan JOTA stations had a magnificent two metre FM signal to enjoy the proceedings.

Special thanks to all responsible for the link and to all amateurs everywhere who make JOTA possible each year.

ar

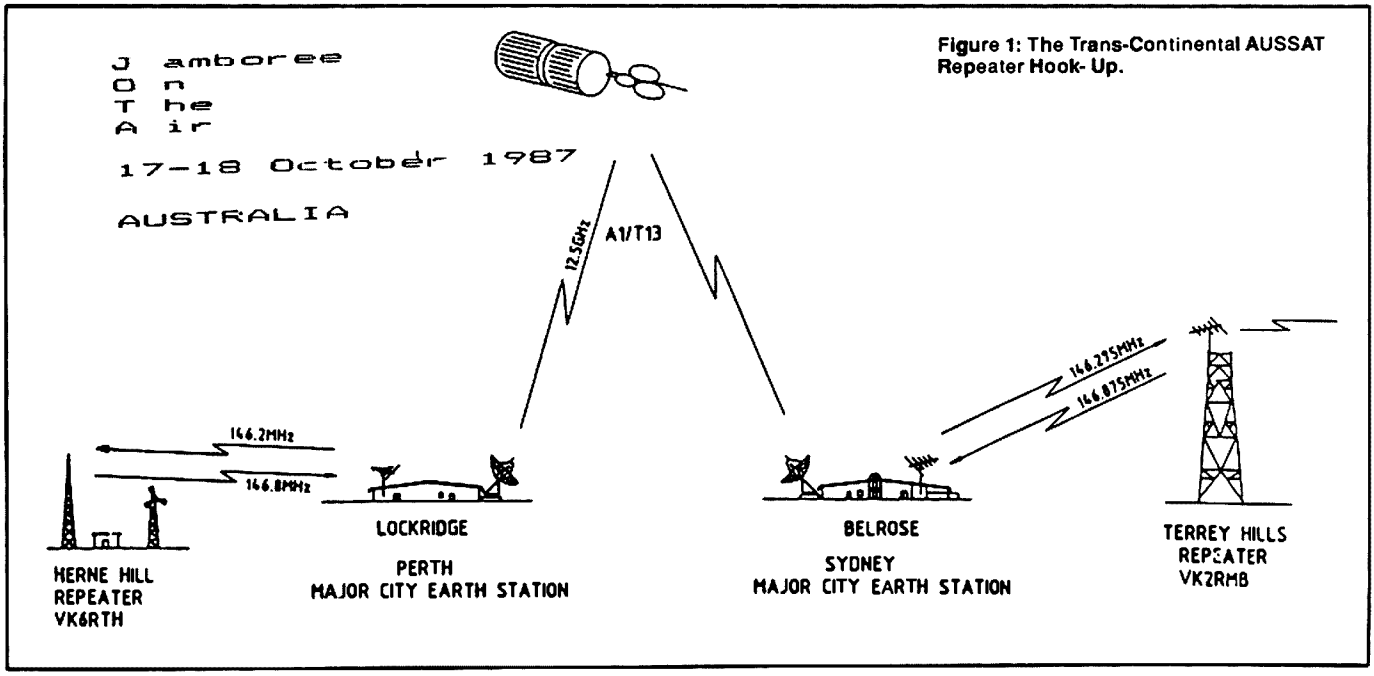


Figure 1: The Trans-Continental AUSSAT Repeater Hook-Up.

WIRELESS INSTITUTE OF AUSTRALIA

PAPER 5 — A SYNOPSIS OF MEMBERS COMMENTS

by the Future of Amateur Radio Working Party

The Working Party Membership includes:
Ron Henderson VK1RH
Gordon Bracewell VK3XX
John Aarsse VK4QA
Stephen Phillips VK3JY

BACKGROUND

Prior to preparation, during 1987, of four earlier papers [1] on the Future of Amateur Radio, the Working Party was involved in drafting a background paper [2] for the May 1987 Federal Convention and in compiling the Guidelines to Executive [3], arising from Councillors deliberations at that Convention. Of recent times the Working Party has been required to report to Executive on the surveys conducted by Divisions on the *Novices on Two-Metres* issue [4].

These activities have given rise to some feedback from the membership, consequently this paper is devoted to a synopsis of members comments.

AIMS

To provide a synopsis of members comments related to the Future of Amateur Radio and determine their effects on the conclusions of Future of Amateur Radio Working Party papers published to date.

SOURCE MATERIAL

The source material containing members comments has been arranged into six distinct categories as follows:

a Devolution of amateur examinations,
b Novices on two metres,
c General comments on the future of amateur radio,
d Specific submissions to the Future of Amateur Radio Working Party,
e ARA's second Readers Survey,
f Summary of Divisional surveys — novices on two metres debate.

As these sources are spread out over several years and contain in themselves separate subject oriented surveys, some inconsistencies in nomenclature and even double counting of results is inevitable. Nevertheless, they constitute the largest collection of members' views assembled to date and should not be lightly disregarded.

An earlier survey of WIA members, conducted by means of an *Amateur Radio* questionnaire in December 1984, was also consulted. That survey was directed principally towards members attitudes to AR magazine and none of the findings are applicable to this investigation.

DEVOLUTION OF AMATEUR EXAMINATIONS

In early 1987, when devolution of amateur examinations appeared a very likely action by DOTC, a member of the Working Party conducted a short survey of opinions on the future of amateur radio having an examination theme. The survey was based on letters to the editor of *Amateur Radio* (Over to You! column) and commenced at the May 1986 issue following publication of the first Harrison/Linton paper. Recently, that survey was extended to cover all issues of AR up to and including December 1987.

To facilitate comparisons, the original early 1987 survey aspects have been retained, suitably extended and enhanced to allow other source material to be added. Table 1 shows those aspects in the left column, with further columns devoted to each of the six sources identified above. The examination survey shows support for:

a the Harrison/Linton report,
b a digital class of licence,
c a need to attract youth to amateur radio,
d a desire not to reduce standards,
e marginal support for a VHF/UHF beginner/student licence grade,
f a desire to enhance novice licence privileges,
g a desire to increase promotion of amateur radio,
h concern as to equipment costs and a need for simpler projects, and
i several other lesser commented-upon items.

Whilst no precise record was kept of the number of letters published, an examination of the working tally sheets suggests a letter rate of two to three per month for almost two years.

NOVICES ON TWO METRES

Excluding Divisional surveys which are discussed later, and letters to the editor published in AR and considered earlier, there were a few letters on the subject of novices on two metres directed to the Federal Office. These showed a three to one wish to enhance the existing novice licence conditions with one lone plea to raise qualification levels and make amateur licences an elitist group.

GENERAL COMMENTS ON THE FUTURE OF AMATEUR RADIO

Excluding submissions and responses directed specifically to the Future of Amateur Radio Working Party, (which are reviewed in the next section), a number of letters were sent direct to the Federal Office, usually bypassing Federal Councillors and necessitating photocopying back to Divisions.

These responses, shown in Table 1, indicate:

a support for the Harrison/Linton report,
b a strong desire to enhance novice licence conditions,
c support for a common band,
d a desire to restructure amateur radio,
e a desire not to reduce standards, and
f some support for a VHF/UHF beginner/student licence grade.

SPECIFIC SUBMISSIONS TO THE WORKING PARTY

Despite a request for comments in the Working Party's very first paper; such comments to be channelled through Divisional Federal Councillors (whose names and addresses were given), very few submissions have been received. However, it should be borne in mind the last paper was published as this one is being drafted. As less than 25 percent came via Federal Councillors, this suggests members are generally unaware of the Divisional system of representation operating (?) within the WIA.

As shown in Table 1, the responses indicate:

a a wish not to reduce standards,
b a desire to enhance the novice licence grade,
c support for increased promotion of amateur radio, the need for a common band and a desire for simple projects,
d a wish to restructure the amateur licence system; this response now replaces the earlier support for the Harrison/Linton paper, and
e no support for elimination of CW proficiency, or an advanced class licence, or DOTC assigned digital modes sub-bands.

ARA'S SECOND READERS SURVEY

In the second half of 1986, ARA magazine conducted their second readers survey. The results, which were published in early 1987 [5], relate to almost 500 readers responses and contain several results which align with the items used in Table 1. Whilst not all respondents were WIA members (61 percent) their collective views are relevant. Specifically there was:

a support for the Harrison/Linton paper,
b no support for a VHF/UHF beginner/student licence grade,
c support for restructuring the amateur licence system,
d strong rejection of a proposal to drop CW from licence requirements, and
e equal support for ("added incentive") and rejection of ("deepens divisions") a higher licence class.

SUMMARY OF DIVISIONAL SURVEYS — NOVICES ON TWO METRES

The Working Party, in its report to Executive of October 1987, summarised the results of Divisional surveys on the issue of novices on two metres. The conclusions of that report are shown at Appendix 1 and appeared in AR [4]. The survey population was approximately 24 percent of total WIA membership. This is several times greater than the responses observed for the other sources and is very significant.

Five points from the survey summary align with items of Table 1 and are shown thereon. They are:

a no support for digital data transmission modes for novice licencees,
b no support for a VHF/UHF beginner/student licence grade,
c desire to enhance novice licence conditions,
d near unanimous support for a common band, and
e a desire to restructure the amateur licence system.

Table 1: Overall Comparison of Responses from all Sources.

ASPECT	DEVOLUTION OF AMATEUR EXAMS	NOVICES ON 2m CORRESPONDENCE	GENERAL COMMENTS ON FUTURE OF AMATEUR RADIO	SPECIFIC SUBMISSIONS TO WORKING PARTY	ARA'S SECOND READERS SURVEY (%)	SUMMARY OF DIVISIONAL SURVEYS ON NOVICES ON 2m
Support Harrison/Linton paper	9 for / 3 against		3/1		55/21	Two Divisions against
Introduce digital class licence	11/3		1			
Seek digital sub-bands assigned by DOTC	1		1	1 against		
Need to attract youth	10		1	1		
Reintroduce YRS	3					
Increase promotion of amateur radio	7		1	4		
Do not reduce standards	14		2	3		
Raise qualification levels	3	1	1	1		Two Divisions for
Restructure licence scheme				10	31/18	
Remove CW qualification				1 against	21/74	
Add a higher class of licence				1 against	36/33	
Increase power levels			1	1		
Need simpler run and cheaper examinations			1	1		Three Divisions against
Add a VHF/UHF beginner/student licence	9/6		2	1	20/48	Four Divisions for
Enhance novice licence	10/3	6/2	10/2	7		Seven Divisions for
Need a common band			3	5		
Restructure amateur radio completely			3	3		
Expect a quality magazine	1					
Cost of equipment a problem	4			1		
More construction and simpler projects	5		1	2		
TOTAL OBSERVATIONS/LETTERS/ RESPONSES	101	6	20	16	500	2000+

NOTES:
Composite entries 9/3 indicate 9 "for", 3 "against".
Single entries are "for" unless annotated "against" in the body of the Table.
Novices on 2m Survey numbers: VK1, 39; VK2, 57; VK3, 547; VK4, 1100; VK5, 167; VK6, not reported; VK7, 107.

One further point, viz not a majority support for novices on the whole of the two metre band, is at variance with a conclusion contained in an earlier Working Party paper. This revision will be reflected in the Working Party's final conclusions and recommendations paper.

CONCLUSIONS

The series of papers, produced by the Working Party and published in AR magazine, has provoked little in-depth debate. This could be due to the lead times involved with AR as the last paper has only recently appeared.

The members responses that have been generated have, to a large extent, bypassed Divisions and Federal Councillors suggesting the available channels for communication are either not understood or too cumbersome and time delaying.

The greatest response came from divisional "Novices on Two Metres" surveys, in total about 24 percent of the WIA membership responded by one means or another.

On the whole, there is a widespread desire for licence system restructuring without creating a lower grade than novice or a grade above unrestricted (AOCP). Within these bounds there is strong support for enhancing the novice licence grade and creating a common band for all licence classes.

RECOMMENDATIONS

It is recommended the Working Party's final paper, Paper 6 — Conclusions and Recommendations, to be prepared for adoption by the 1988 Federal Convention, reflect the members' views and comments identified in this paper.

It is further recommended the current series of home construction and simple projects being published in AR magazine be continued to satisfy the expressed demand.

The matter of WIA channels of communication needs examination and perhaps reorganisation if the current membership — division — federal system is confirmed cumbersome and inefficient.

REFERENCES

1 a) The Future of Amateur Radio, AR Sep 87.
b) Frequency Bands and Emissions, AR Nov 87.
c) A Proposal to Restructure Amateur Radio Licencing, AR Dec 87.
d) The Future of Amateur Radio — Options, AR Jan 88.
2 Federal Convention Agenda Item, The Future of Amateur Radio, AR Apr 87.
3 Future of Amateur Radio — Guidelines to Executive, AR Aug 87.
4 Summary "Novices on Two Metres" Surveys Conducted by Divisions. AR Feb 88.
5 Amateur Radio Opinion Poll, Amateur Radio Action, Vol 9 No 10 (Feb 87).

APPENDIX 1

CONCLUSIONS OF SUMMARY OF "NOVICES ON TWO METRES" SURVEYS CONDUCTED BY DIVISIONS

★ There is not a majority of Divisions supporting the 1987 Federal Convention motion.
★ The requirement for a common band is near unanimously supported.
★ Whilst there is not majority support for all of two metres to be the common band, there is majority support for part of that band.
★ There is also majority support for part of the 70 centimetre band, but not for part of the six metre band.
★ There is strong support for restructuring the amateur licence system.
★ There is not support for a licence grade below novice, nor for data modes transmission by novices.
★ The response to Divisional surveys constituted 24 percent of all WIA memberships.

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VK2BWI SLOW MORSE PRACTICE SESSIONS VK5AWI

AN URGENT AND ONGOING MESSAGE TO ALL . . .

The frequency of 3.550 MHz is used every evening from 0930 UTC onwards by the *Slow Morse Practice Stations VK2BWI and VK5AWI.*

VK2BWI and VK5AWI are official Institute call signs, used to identify Slow Morse Practice sessions to listeners studying for the Telegraphy sections LP (five words per minute), and NR (10 WPM), of amateur radio examinations.

The use of this frequency at these times by other stations is causing unnecessary, and often thoughtless interference, to students and upgrading amateurs, who are trying their hardest, often under difficult conditions of reception, to copy the Morse practice.

Please. . .do not make their task any more difficult by initiating, or encouraging, contacts on, or near, 3.550 MHz, from 0930 UTC onwards in the evenings.

—Contributed by Ross Wilson VK2BRC

WIA VIDEO TAPE PROGRAM TITLE LISTING

John Ingham VK5KG
FEDERAL VIDEOTAPE CO-ORDINATOR
37 Second Avenue, Sefton Park, SA. 5083

SEE NOTE	TITLE (in chronological order within each subject grouping)	LECTURER	PROD	APPROX TIME In MINS	COL/ B&W	YEAR MADE (19..)	DESCRIPTION & OTHER INFORMATION
GENERAL PROMOTIONAL FILMS							
—	The Ham's Wide World		ARRL	30	Colour	69	*Superseded by "The World of Amateur Radio"*
—	This Is Amateur Radio		ARRL	15	Colour	70	*Pitched at Teenagers*
—	Moving up to Amateur Radio		ARRL	15	Colour	75	*Pitched at CBers*
©	7J1RL DX-pedition		JARL	60	Colour	78	*General Amateur Radio Interest: LOAN ONLY*
—	This Week Hat Seven Days looks Into Amateur Radio		HSV7	25	Colour	78	*Pitched at Teenagers: includes some ARRL footage*
—	Amateur Radio — The National Resource of Every Nation		VK5KG	6	Colour	79	*Encapsulates AR: good for public exhibition*
—	The New World of Amateur Radio		ARRL	30	Colour	82	*Pitched at Adult Level*
HISTORIC INTEREST							
©	Wireless Telegraphy — circa 1910		?	10	B&W	10	*Archive Material courtesy David Wardlaw VK3ADW*
‡©	Amateur Radio (TV Pilot Program		WIA NSW	30	B&W	68	*Archive Material courtesy TEN Channel 10*
—	Opening of Burley Griffen Building — SA HQ		VK5KG	50	Colour	77	*Archive Material*
—	History of ATV in South Australia		VK5KG	30	Colour	80	*Archive Material, still building*
—	ATV in Australia 1978 — made for British ATV Club		VK5KG	30	Colour	78	*Archive Material*
—	ATV in United Kingdom 1978 — reply from BATC		G8CJS	30	Colour	78	*Archive Material*
‡	Port Macquarie Field Day — 1983		VK2BFM	25	Colour	83	*Archive Material*
‡	VK2 75th Anniversary Seminar Keynote Speeches		WIA NSW	135	Colour	83	*Dr David Wardlaw & State Manager DOC*
©	Heard Island DX-peditions		Ch 2,7,9&10	20	Colour	84	*Archive Material: No Loan or Copy Available*
‡	Heard Island DX-pedition	VK2BCC	WIA NSW	60	Colour	88	*Raw Unedited; from 1986 VK2 Seminar*
‡	Opening of Amateur Radio House — NSW HQ	VK2BCC	WIA NSW	102	Colour	83	*Archive Material*
ANTENNAS AND PROPAGATION							
©	G6CJs Aerial Circus	G6CJ	WIA	90	B&W	77	*The Definitive Antenna Lecture: Loan Only*
—	Wire Antennas	VK5RG	VK5KG	40	B&W	78	*Antennas for HF and Antenna Tuners*
—	Loaded Wire Antennas	VK5NN	VK5KG	50	Colour	80	*Using Inductive and Capacity Loaded Antennas*
—	Getting Started in Understanding the Ionosphere	VK5NX	VK5ZBD	50	Colour	83	*How the Ionosphere Aids HF Communication*
‡	VHF Signal Enhancement by Aircraft	VK2ZAB	WIA NSW	70	Colour	86	*Raw Unedited; from 1986 VK2 Seminar*
‡	Antennas and Directivity	Guy Fletcher	OTC	73	Colour	85	*Lecture given to a group of radio amateurs*
‡	Antenna Rotator Systems	VK5AIM	VK5KG	50	Colour	86	*Servicing the several different types*
‡	Broadband Antennas	VK5RG	VK5KG	62	Colour	86	*Includes terminated antennas*
SPACE — GENERAL INTEREST							
—	Apollo 13 Disaster	VK5JM	VK5KG	90	Colour	80	*Australian Tracking Procedure Saved Apollo 13*
—	SSTV Pictures from Space — Voyager		VK5KG	15	Colour	83	*SSTV Pictures Converted from Saturn Fly-Past*
—	AUSSAT — Australia's Domestic Communications Satellite	VK5JM	VK5KG	62	Colour	84	*Technical Description of Services Offered*
‡	Amateur Radios Newest Frontier		ARRL	26	Colour	85	*Amateur Radio in Space; General PR*
‡	Working W5LFL in Orbit from VK1ORR		Richard Elliot	23	Colour	86	*Raw Unedited Actuality Footage*
AMATEUR SATELLITES							
—	Getting Started in Amateur Satellites	VK5HI & VK5AGR	VK5KG	60	Colour	83	*Superseded (see below)*
—	An Introduction to Amateur Satellites (Part 1)	VK5AGR	VK5KG	60	Colour	84	*An Overview of Amateur Satellite Operation*
—	Micro-Computer Aids to Satellite Tracking (Part 2)	VK5AGR	VK5KG	30	Colour	84	*Programs for Tracking and Decoding Telemetry*
—	Using Phase 3 Amateur Satellites	VK5HI	VK5KG	90	Colour	84	*History, Construction and Use of High Orbit Satellites*
—	The AMSAT OSCAR Phase 3 Story	Dr Karl Meinzer DJ4ZC	VK5KG	60	Colour	85	*"The Father of OSCAR" includes film of the Launch*
‡	Antennas for Satellites	Dr Trevor Bird	WIA NSW	75	Colour	86	*Raw Unedited from 1986 VK2 Seminar*
DATA TRANSMISSION							
—	Getting Started in Amateur RTTY	VK5JM	VK5KG	85	Colour	83	*RTTY using Teleprinters and Micro-Computers*
—	Amateur Packet Radio	VK5AGR	VK5KG	60	Colour	84	*Theory and Demonstration*
‡	Packet Radio — 10 months on	VK2KYJ & VK2AAB	WIA NSW	65	Colour	85	*Raw Unedited from 1986 75th Anniversary VK2 Seminar*
‡	X.25 Protocols and Packet Switching	Barry News	OTC	47	Colour	88	*Lecture given to a group of radio amateurs*
AMATEUR COMPUTERS							
—	Demonstration of VKSRTVs Micro-Computer Controller # 1	VK5KG	VK5KG	10	Colour	79	*First Micro-Computer Controlled Repeater in Australia*
—	Understanding Micro-Processors	VK5PE	VK5KG	60	Colour	80	*A Somewhat Dated Technical Description*
—	An ATV Ham-Shack Micro-Computer	VK3AHJ	VK3AHJ	10	Colour	81	*Describes now unavailable Micro-Computer Kit*
—	Getting Started in Amateur Micro-Computers	VK5IF	VK5KG	33	Colour	83	*Demonstration of Hard and Software for Amateur Radio*
AMATEUR TELEVISION: Technical							
—	The Signal to Noise Story	VK3ATY	VK3AHJ	45	Colour	82	*Superseded by "UHF Pre-Amplifiers" (see below)*
—	UHF Pre-Amplifiers	VK3ATY	VK3AHJ	45	Colour	83	*Explanation and Demonstration of Low Noise Pre-Amplifiers*
—	Getting Started in Amateur Television	VK5KTV	VK5KG	55	Colour	83	*How to Set-Up an Amateur Television Station*
—	Testing Amateur Television Transmitters	VK5KG	VK5KG	50	Colour	83	*How to Correctly Measure Amateur Television Systems*
•	High Definition Television Tutorial	Don Fink	WB2LLB	60	B&W	83	*A Look at What is to Come in Broadcast Television*
•	ATV Hamfest, York Pennsylvania, September 1983	Various	WB2LLB	360	Colour	83	*Various ATV Technical Lectures from USA*
AMATEUR TELEVISION: Activity							
—	ATV in Australia 1980/81 — Made for British ATV Club		VK5KG	60	Colour	80	*Clips from ATV Groups in VKs 2, 3, 4, 5, and 7.*
—	ATV in United Kingdom 1978/81		G8CJS	30	Colour	81	*Re-make of their Previous Effort*
•	CQ ATV DX International 1983		WB2LLB	60	Colour	83	*ATV in USA and Europe*
	ATV in Victoria, 1984		VK3AHJ	54	Colour	84	*Courtesy of "The Roadshow Gang"*
AMATEUR TELEVISION: General Interest							
—	Low Definition Television	Chris Long	VK5KG	25	Colour	82	*Re-Creation of Television as Transmitted by Baird*
•	Overseas Television Clips about Amateur Television, etc		WB2LLB	60	Colour	83	*Broadcast Television Clips from USA and Europe*
—	Model Aero-Nautical Mobile ATV	VK5GO	VK5KG	6	Colour	83	*Amateur Television Camera and Transmitter Mounted in a Model Aeroplane*
‡	VK5RCN — Australia's First Wind Powered ATV Repeater	VK5KAU	VK5KG	61	Colour	88	*A Tour in and Around VK5RCN*

MISCELLANEOUS						
—	**An Auxiliary Battery Charger**	VK5NX	VK5KG	30	Colour	**81** *Charging a Second Mobile Battery*
—	**Lecture — Winning Fox-Hunts**	VK5TV	VK5KG	45	Colour	**81** *How to do it from one who has!*
—	**Getting Started in Amateur Construction**	VK5AIM	VK5KG	50	Colour	**83** *Mechanical Hints for Novice Constructors*
—	**Communication Consequences of Nuclear War**	Dr John Coulter	VK5ZBD	60	Colour	**83** *Why Your Gear May Not Survive, Even If You Do*
—	**The Far Eastern Broadcasting Company**		VK5KG	60	Colour	**84** *How a Shortwave Broadcaster Operates*
—	**The Australian "Over the Horizon Radar"**	Dr Paul Whitham	VK5KG	60	Colour	**84** *How the 'Australian Woodpecker" Works*
—	**What to Expect When the Radio Inspector Calls**	Geof Carter DOC	VK5KG	34	Colour	**84** *Geof is a Department of Communications Field Officer*
‡	**Doppler Direction Finding for Fox-hunters**	VK2BYY	WIA NSW	43	Colour	**85** *Raw Unedited from 75th Anniversary VK2 Seminar*
‡	**Fitting BNC Connectors**		OTC	7	Colour	**85** *Correct Assembly of Crimp Type BNC Plugs*
‡	**Handling Static Sensitive PCBs**	Paul Targent	OTC	6	Colour	**86** *Improving Reliability of Printed Circuits*
‡	**Extra License Grades**	VK2ZTB	WIA NSW	70	Colour	**86** *Raw Unedited; from 1986 VK2 Seminar*

NOTE:
© denotes Copyright: no copy service
‡ denotes New Addition
** denotes Optically Converted to PAL from NTSC by WB2LLB — noticeable flicker*
Standard Formats: Beta; Video 8 St & L Play; Dolby and Hi-Fi sound — please specify when ordering

Now every radio club can provide their members with quality technical lectures on subjects covering the whole range of amateur radio activities by taking advantage of the WIA Federal Videotape Library. You will find this a boon, particularly if yours is a country club which often has difficulty obtaining a variety of expert lecturers for regular meetings.

Individual amateurs and librarians should take note of the new Duplication Fees at the end of this article.

For radio clubs affiliated with the WIA, it is inexpensive and easy. Here is how it works:

Except for those titles for which the WIA does not hold a copyright licence, all you have to do is . . .
Supply the Videotape Co-ordinator with a video-cassette of an available format
Enclose another stamped, return-addressed padded mailbag and the program is free for you to use in support of amateur radio in your area . . . including copying and transmission over the air if you wish

Those programs which are copyright are available only on loan. To obtain any of them send with your request . . .

Information about your preferred VCR format

A statement signed by a responsible officer of your club that "I undertake that while (Program Title) is assigned to me, I will not allow it to be transmitted over the air, nor copied by any means whatsoever, and that I will return the same promptly after showing".

A stamped addressed padded mailbag suitable for cassettes of your preferred format.

The present available formats are . . .

U-MATIC — size 260 x 173 x 40mm, mass 900 grams (to institutions only). Standard play — one hour maximum only. Standard sound only on channel 2 (No Dolby).

VHS — size 200 x 110 x 30mm, mass 350 grams. *Standard play four hours maximum, or long play eight hours maximum as requested. * Standard Sound — Dolby On or Off as requested. Hi-Fi FM Sound also present on all VHS cassettes.

BETA — size 160 x 100 30mm, mass 300 grams. Standard play three and a quarter hours maximum only. Standard sound only (No Dolby).

VIDEO 6 — size 103 x 68 x 20mm, mass 80 grams. *Standard play one and a half hours maximum, or long play three hours maximum as requested. Hi-Fi FM sound is standard (No Dolby).

Obviously, the smaller and lighter the cassette, the less postage.

* NOTE: Be sure to request Standard or Long Play, Dolby On or Off.

NOTE TO INDIVIDUAL AMATEURS

Since the inception of the WIA Federal Video Service, cassettes have been made freely available to all comers, especially isolated amateurs. However, recently there has been a rapid rise in the number of requests from individual amateurs, some asking *for over* 10 hours of programs at one time.

Video duplication is a real-time, one-at-a-time operation for which the costs of maintenance of the equipment is not small. Obviously, the Service is much more economical if, say, one tape is seen by 30 members of a club than if each of the 30 members were to request their own personal copy. If every member of the WIA requested just one program, it would take about four years at 40 hours a week to service!

So, in an effort to encourage requests from groups of amateurs rather than individuals, from now-on a Duplication Fee of $2 per hour, or part thereof, will be payable in advance for all requests from individuals. All such fees will go towards upkeep of the duplication equipment.

NOTE TO LIBRARIANS

A number of educational institutions have already availed themselves of the technical lecture tapes from the WIA. While this service will continue to be available, from now-on a Duplication Fee of $10 per hour, or part thereof, will be payable in advance by all institutions not affiliated with the WIA. All such fees will go towards the production costs of future Technical Lectures.

NOTE RE TAPE CASSETTE QUALITY

The WIA Videotape Co-ordinator retains the right to refuse to copy onto inferior quality video tape. In the past such tape has caused many hours of wasted time through clogged video heads, and in future only reputable brands of video tape will be accepted.

75TH ANNIVERSARY YEAR OF THE RSGB

The Radio Society of Great Britain extends a warm welcome to readers to join in their special celebrations to mark their 75th Anniversary.

The main event will be a three-day Convention at the National Exhibition Centre near Birmingham on July 15/16/17, 1988. It is hoped that his Royal Highness, the Prince Philip, the Society's Patron, will be able to attend to open this Convention.

Anyone who would like to attend should write to The Secretary, RSGB Headquarters, Lambda House, Cranborne Road, Potters Bar, Hertfordshire, EN6 3JE, who will provide a special information pack giving details of accommodation, UK travel, and special 75th Anniversary call signs for overseas visitors. (Note: these must be applied for in advance via RSGB).

Provisional Program of Events — July 1988

July 15/16/17 — RSGB National Convention, National Exhibition Centre, near Birmingham.
July 19/20/21 — RSGB Headquarters at Potters Bar open to visitors between 10 am and 4 pm.
July 22/23 — Data Convention at the famous Harrow School near London (Packet Radio/RTTY/AMTOR).
July 28 — International Satellite Meeting hosted by RSGB near Guildford, Surrey.
July 29/30/31 — AMSAT UK Satellite Colloquium at the University of Surrey, Guildford (Information from G3AAJ, QTHR).

—Information supplied by Steve Pall VK2PS

The famous inventor Marconi demonstrating radio to the armed services and government officials on Salisbury Plain, England on September 2, 1896. Marconi was subsequently a member of the Radio Society of Great Britain.

—From an original painting by Stephen Spurrier ARA

VHF UHF — an expanding world

Eric Jamieson VK5LP
8 West Terrace, Meningie, SA. 5264

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.005	H44HIH	*Honiara*
50.005	ZS2SIX	*South Africa*
50.010	JA2IGY	*Mie*
50.022	ZS6PW	*Pretoria*
50.050	ZS6DN	*South Africa*
50.075	VS6SIX	*Hong Kong*
50.075	ZS4SA	*South Africa*
51.020	ZL1UHF	*Auckland* [1]
52.013	P298PL	*Port Moresby*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.418	VK0MA	*Mawson*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.445	VK4RIK	*Cairns*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
52.510	ZL2MHF	*Mount Climie* [2]
144.022	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.445	VK4RIK	*Cairns*
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
144.950	VK3RCW	*Melbourne*
145.000	VK8RPH	*Perth*
432.066	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK1RBC	*Canberra*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*MacLeod*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.198	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*
10445.000	VK4RIK	*Cairns*

1 The Auckland beacon ZL1UHF on 51.010 MHz has been included on the list as it has been heard in many places around Australia. The Hornby beacon on 52.310 MHz seems to be in doubt so it has been removed and ZL2MHF on Mount Climie listed in its place. This comes under notation (2).

2 Col VK5RO, as the result of contacts into South Africa on the HF bands, has come up with a list of active beacons in that area. They are included in the 50 MHz area so you may make a note of them, as I do not propose listing them all the time. (Incidentally, Col said active six metre operators in South Africa included ZS6WB, ZS6OB, ZS6LN, ZS5AV, ZS2BE, ZS2FM, ZS1LA, ZS2DA and ZS6HS).

Col made no mention of the earlier statement that the six metre beacon on 50.022 MHz was no longer transmitting to Australia due to TVI at their end and will try and ascertain what the exact position is in regard to operation.

THE BEACON SITUATION

As the result of much prodding, the Australian Beacon List is approaching a very high degree of accuracy regarding operational beacons. Those who have not sent in any information are VK8VF in Darwin, VK2RGB Gunnedah, VK3RTG Glen Waverley, VK6RPB Port Hedland, VK3RAI MacLeod, VK3RMB Mount Bunninyong, VK6RVF Roleystone. VK4ABP, in Longreach, also has not replied but the beacon has been consistently heard in VK5 for some time now so it is safe to list it as operational.

With the degree of activity on 144 and 432 MHz in the Melbourne area, it should surely be possible for someone there to let me have the status of their beacons in writing. In the meantime, when the next good tropo opening occurs across to Melbourne from my now rather good location at Meningie, I could be in a position to hear the Melbourne beacons on those bands. But it seems rather a different position when one looks at VK8VF as the Darwin path has been very poor for some years.

There is a need for my listing to be accurate as it is used by many organisations, both in Australia and overseas. I note the WIA Beacon Data Base list in the January issue of AR, includes a number of beacons I have never heard of; eg, 52.300 VK2RBH Broken Hill, 144.535 VK3RGI Gippsland, 576.753 VK6RPB South Hedland, 1296.695 VK6RPB South Hedland, 2304.420 VK2RSY Sydney. Some of these could be the result of applications to construct so may eventually become operational. If anyone has firm information regarding any of the above, I would appreciate a note please.

SPORADIC E SEASON

My closing comment last month was that at Meningie, at least, from December 21 to 23, there had been virtually no six metre activity. That subsequently proved to be a real understatement!

With the advent of one or more large solar flares around 19/12, so many holes were punched in the ionosphere that six metres collapsed and stayed collapsed right throughout the Christmas and New Year period. In fact, at the time of writing, 8/1, there has still been no real recovery. In my 27 years of six metre operating I have never known a year to be wiped out for so long. Something on a smaller scale took place around 1968 but nothing like the present situation. I received a number of phone calls from interstate operators asking if the poor conditions they were experiencing was common to other areas — they had to be told — yes!

It is unfortunate such a situation has arisen as we have not been thus able to adequately compare the two metre scene with the two previous glamour years! The 1987 season was shaping up to being another bumper one judging by the two metre Es contacts being made prior to the flare. Cases like David VK3AUU, working VK2 to VK8 inclusive in less than 24 hours, and trying valiantly to catch a VK1 he could hear to make it all States in that time. There were plenty of instances of five States being worked in the one day, even VK5LP struggling back on the air managed to work four States in one day! But all this quickly finished when six metres collapsed and so two metre Es became non-existent.

Fortunately, there have been some good tropospheric openings, particularly from VK5 to VK3 on 144 and 432 MHz as well as VK5 to VK6 at Albany. VK5NC at Mount Gambier contacted VK7JG on 25/12 on 144. David VK3AUU, has been very consistent with good signals as also has Les VK3ZBJ. Scattered amongst a variety of contacts have been some to Wally VK6WG, at Albany.

On 5/1/88, at 2342, VK5RO heard VK7JG on two metres but did not quite make a contact. Mick VK5ZDR, achieved a contact with Joe, as also did Roger VK5NY. Col VK5RO, also informed me that conditions were such at the time that Reg VK5QR, in Adelaide was able to contact Wally VK6WG, in Albany, on 3.3 GHz! Good going chaps. I have no other details but may be able to find out something for the next issue.

With the collapse of the Es there is little need for me to produce a map again this year showing the extent of two metre Es contacts. Suffice to say however, there is ample evidence such contacts were wide spread before the collapse and that all the Australian States were sharing in those contacts, as well as New Zealand.

I guess I was unfortunate for the Ross Hull Contest which this year, for the first time was using Locator Squares as part of the scoring procedure that such a collapse occurred as there will be very low scoring logs entered. Had I not been able to share in some of those tropo contacts, I would find my only six metre contact to Joe VK4JH on 24/12 decidedly lonely on the log sheet!

The West Australian VHF Group Bulletin tell a little of the story as it affected their end. Good two metre openings started on 4/12 (with six open, of course), at 0311 Peter VK6KXW and Tony VK6ATF established contact on six with P29PL, in Port Moresby who was running seven and a half watts. About six hours later VK6KXW heard Dave VK6YA, in Wickham (north-west Western Australia), working a gaggle of VK8s in Alice Springs and at 0934 he made contact with Mike VK8ZMA, and then VK8ZLX. Soon after, VK8ZMA heard the Perth Channel 2 television signal and VK8ZLX heard the Perth 96 FM broadcast station on his scanner.

At 1010, VK8ZLX heard VK6KXW's keyer and voice on 144.120 MHz. Each heard the other calling at times but propagation would not support a successful two-way contact. VK6KXW was running 100 watts into a DL6WU 11 element beam while VK8ZLX was using 25 watts into a stacked two by 12 element NBS Yagi.

THE HIGHER BANDS

144 and 432 MHz continues to provide excellent contacts across the southern part of the continent. On 8/1 around 0900 VK3UM and VK3NM from Melbourne were good copy as also was VK3AUU at Drouin, east of Melbourne. Several repeaters were available with Channel 1 at Naracoorte being accessible almost anytime from Meningie. A 5 x 9 contact between VK5LP and VK5CMV, on SSB at Naracoorte, resulted from the original repeater contact. Conditions continued good into Melbourne during the morning of 9/1. Later in the day VK5LP had a strange combination contact with Garry VK5ZK, at Goolwa, across the lake from Meningie. The distance of 55 kilometres was covered on Channel 50 FM by Eric and Garry came on 3.600 MHz! Not having an HF antenna at

the moment Eric coupled up the television antenna to the FT101B which was good enough to provide an S5 signal from Garry!

From 0900 the same evening Melbourne stations were again available mostly on 144 MHz. Trevor VK5NC, at Mount Gambier, was S9 on both 144 and 432 MHz, whilst Roy VK3AOS, was S9 on both bands. Roy lives 55 kilometres south of Horsham and has been a regular on the bands for many years. On the UTC morning of 9/1, whilst in contact with Roy again, VK5LP was called by a new call station with a very strong signal, VK3NA. This turned out to be Ray VK3ATN, who has both calls. Ray was extremely strong and is slowly getting back on the air after the upset of having his antenna factory destroyed by fire. The Hamilton beacon on 52.435 MHz continues to be audible every day and is a very good indicator of enhanced conditions. The hardest beacons to hear are in Melbourne.

Trevor VK5NC, reports excellent signals to Melbourne and Adelaide on the morning of Sunday 10/1. VK3BBB and VK3ZJC were mounting an expedition to some high spots not too far from Melbourne for the last day of the Ross Hull Contest, and from Mount Tassie there signals were good to VK5NC. Later they decided to shift to Wilson's Promontory and during the process Brian VK3BBB had problems with the differential of his vehicle and was unable to continue. However, VK3ZJC set up a station there and had a fair signal to VK5NC.

Late on Sunday night excellent conditions in the Adelaide direction again prevailed, with VK5VF, the Adelaide beacon on 144.800 MHz extremely strong. John VK5AEP, at Port Lincoln, was again able to work through the Mount Gambier repeater. Trevor was able to contact VK5s ZDR, RO, NY in the Adelaide area, and also VK5OH at Smokey Bay a long way west on the upper coastal regions of Eyre Peninsula. These enhanced signals continued through to Monday morning when more Adelaide and Melbourne contacts were made.

VK5LP has run into some problems with the overloading of a masthead amplifier on the Elderly Citizens Homes near the Meningie QTH on both 144 and 432 MHz so has decided to be prudent and restrict activities while the problems are sorted out, especially when relations are so cordial as they are at present. The main problem is simply that when I beam to the south-east, my main area of interest, I look right down the throat of the antenna at the Homes which points to Adelaide at north-west!

VK5RO reports the good conditions on 144 and 432 MHz have continued throughout the week ending 15/1. As Col says, this is a typical summer time situation and quite often shows a further improvement around the end of January through to mid-February.

Steve VK5AIM, says he wants to officially complain about the lack of Es this summer! But whom to complain is the problem. He has only eight QSOs between Christmas and New Year!

GENERAL NEWS

A few snippets of information from *Practical Wireless*, November 1987, courtesy Steve VK5AIM. One concerns the introduction of a certificate in the UK for the top scoring station using only a single antenna. One comment was "Not every group using one Yagi did so from choice, G4NYN/P intended using two 19 element Yagis, but on erection the structure collapsed — they salvaged enough elements to make one Yagi!"

Another piece concerns QRP operation. There seems an increased interest in portable operation using low power, many stations have been operating their hand-helds fed into a reasonable antenna with good results. Others have taken out their transceivers and used them barefoot for about 10 watts. Steve asks whether such a contest or field day might be considered in Australia. Any thoughts? Incidentally, some of the UK stations operating in the QRP contests have been using powers as low as five milliwatts, being lower power than the local oscillator in many receivers! G4AGQ tried some experiments, and four contacts were made using 250 microwatts, including one of over 60 kilometres, which is equivalent to 150 000 miles per watt! There used to be an award for 1000 miles per watt!

A letter from Joe VK7JG, says he has upgraded his antenna set up, with a pair of 48 element Jaybeams on 432 MHz while on two metres there are four 20 feet long quad driven Yagis to be erected in the new year and as he said "a new large rotator under the Christmas tree!" On 1296 there is a 10 watt base station and a pair of 28 element loop Yagis. A new tilt over tower is under construction. Everything will be in place around Easter so schedules can be maintained.

Will be pleased to hear some results from you Joe.

CLOSURE

I hope March and April will see the start of some transequatorial propagation or signals across the Pacific as we slowly rise out of the low part of the sun cycle. Keep an ear on six metres around the equinoxial periods in particular and don't overlook using 10 metres as an indicator of a rising MUF.

Thoughts for the month: Woman to friend: "I'm of English descent. My husband's half Scotch and half soda!" and "When a man points a finger at someone else, he should remember that three of his fingers are pointing at himself!"

73. The Voice by the Lake

OLD EXAMINATION PAPERS

The following papers are published courtesy of DOC. They are some of a series of yesteryear papers which are published so readers may test themselves. Would the OTs still be able to pass with flying colours? How would the newcomers go with this type of exam?

COMMONWEALTH OF AUSTRALIA
POSTMASTER-GENERAL'S DEPARTMENT
AMATEUR OPERATOR'S CERTIFICATES OF PROFICIENCY

SECTION M (ii) Regulations — **Time allowed — 30 minutes**

NOTE — Three questions only to be attempted.

1 (a) What precautions should be observed by experimental licensees in regard to interference?
(b) Should you be aware that your transmissions were causing interference to the reception of broadcast programmes, what action would you take?

2 What provision should be made by experimental licensees to enable power measurements to be readily obtained.

3 Give, by example, the procedure to be followed when a station hears his own call sign but is unable to read the call sign of the calling station.

4 For what period and at what intervals is one station allowed to call another station?

5 (a) Explain how the Distress Call is signalled — (i) telegraphically, and (ii) telephonically.
(b) In the event of the Distress Call being heard, what action would you take?

COMMONWEALTH OF AUSTRALIA
POSTMASTER-GENERAL'S DEPARTMENT
AMATEUR OPERATORS' CERTIFICATES OF PROFICIENCY

SECTION K (Regulations) — **OCTOBER 1963**

Time allowed — 30 minutes

NOTE — Three questions only to be attempted. Credit will not be given for more than three answers. All questions carry equal marks.

1 (a) What restrictions are placed on the temporary operation of an amateur wireless station as a portable or mobile unit?
(b) What frequency measuring apparatus must be maintained by the licensee of an amateur station?

2 State regulation requirements concerning:
(a) restrictions imposed on the transmission of an unmodulated carrier wave from an amateur station; and
(b) the documents which must be available for inspection at an amateur wireless station.

3 (a) What precautions should be taken by the operator of an amateur station before he commences to transmit?
(b) During a period of working with another station or stations, what procedure must be adopted concerning announcement of call signs?

4 Give the "Q" code signals for the following —
(a) Send each word or group twice.
(b) Stop sending.
(c) Who is calling me?
(d) Shall I send a series of Vs?
(e) Your frequency varies.

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

ALARA CONTEST RESULTS

This year saw the finalisation of the Five-Year Trophy, the winner being Kim VK3CYL, with an aggregate score of 4382 points. Kim has been presented with the Trophy (a gold cup, suitably inscribed), and we would all like to congratulate her on an outstanding achievement.

The Florence McKenzie Trophy has been awarded this year to Liz VK3PSG, who scored 212 points on CW. Congratulations to Liz on her very proficient use of the key.

WARO members photographed at the ALARA-meet.
From left: Joy VK2EBX, Joan VK3NLO, Poppy VK6YF, Maria VK5BNT, Vicki ZL1OC, Muriel May, Margaret VK3DML, Jenny VK5ANW.

SEVENTH ALARA CONTEST — November 1987

Name & Call	Points	Comments — Certificates
1. Kim VK3CYL	881	Top score overall. VK3 ALARA member Cert. Five Year Trophy.
2. Jan VK3HD	678	
3. Liz VK3PSG	521	Top VK YL Novice. Florence McKenzie Trophy.
4. Joy VK2EBX	396	VK2 ALARA Member Cert
5. Bev VK6DE	357	VK6 ALARA Member Cert
6. Gwen VK3DYL	354	
7. Vlada VK3DVT	257	
8. Marilyn VK3DMS	230	
9. Elva ZL1BIZ	224	ZL ALARA Member Cert
10. Val VK4VR	217	VK4 ALARA Member Cert
11. Celia ZL1ALK	176	
12. Helene VK7HD	173	VK7 ALARA Member Cert
13. Alan VK8AV	169	VK OM Cert
14. Josie VK4VG	164	
15. Diana G4EZI	152	G ALARA Member Cert
16. Les VK3XF	135	
17. Poppy VK6YF	134	
18. Elizabeth VE7YL	117	VE ALARA Member Cert
19. Lindsay VK5GZ	110	
20. Darleen WD5FQX	104	US ALARA Member Cert
21. Margaret VK4AOE	86	
22. Jim VK2AKE	65	
23. Bron VK3DYF	55	
24. Mimi ZS5YO	38	ZS ALARA Member Cert
25. Jock VK1LF	35	
26. Richard G4DZI	34	G OM Cert
27. Kari OF3GD	17	Europe OM Cert
28. Len VK3ALD	15	
29. Mavis VK3KS		Check Log
30. Ivor VK3XB		Check Log
31. Denise VK5YL		Check Log
32. Marlene VK3JAW		Check Log

Scores generally were well down on 1986, with 19 fewer logs being received. Of the 32 logs, 23 were from ALARA members, and nine from OMs.

Considering the poor conditions on the day of the contest, this is a satisfactory result.

Congratulations to all certificate winners, and our thanks to all participants for their interest and support.

The Contest Manager was Marlene VK3JAW (ex-VK2KFQ).

BICENTENNIAL TROPHY

An ALARA life member offers a trophy to the YL or OM who contacts the greatest number of ALARA members, on HF bands only, during the Bicentennial Year 1988.

A complete extract of log, certified as true and correct by two other amateurs, will be required. The certification must read as follows:

"We, the undersigned, hereby certify that the above extract is a true and correct copy of the log of.....

Signed:.....

Signed:.....

The log extract must also be signed by the operator who submits it. In the event of a tie, the Trophy will be awarded to the entrant who gains his/her total in the shortest time.

Contacts on the official ALARA Net do not count.

Logs must be forwarded to reach the ALARA Awards Custodian, Mavis Stafford VK3KS, 16 Byron Street, Box Hill South, Vic. 3128, by January 31, 1989.

BICENTENNIAL STICKERS

During 1988, Australia's Bicentennial Year, special commemorative stickers will be attached to each ALARA Award issued.

Anyone applying for an endorsement of their award (10 additional members) will also receive a commemorative sticker.

These attractive stickers have been designed by Valda VK3DVT.

SILENT KEY

Our sympathy is extended to the family of Eleanor VK4BEM, who became a silent key on December 31, 1987.

BITS AND PIECES

Everyone on the 220 YL Net was pleasantly surprised on December 28, when Zdena OK2BBI, called in from the QTH of Barry VK7GE. Zdena was visiting her brother in Tasmania.

Mary KB6CLL, was involved in a motor accident on Christmas Day. We hope she is now fully recovered.

ALARA received a lovely Christmas Card from Eeva OH3ST, our only member in Finland.

Congratulations to Bobbie VK6MH, a licensed amateur for 50 years.

Maria VK5BMT, has been appointed ALARA-meet Co-ordinator, and if her organisation of last year's ALARA-meet is anything to go by, we can expect great things of the next one in 1990.

NEW MEMBERS

A warm welcome to the following new members: Janet VK6PJL, Ree VK2CAK, Kay Bennetts, Heather ZL1BBT, and Jean GW0ARP.

That's it for this month.

73/33, Joy VK2EBX

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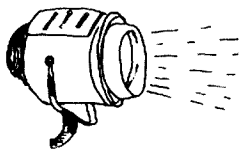
Some of the OMs who attended the ALARA-meet in South Australia, September 1987.
From left (Back): George VK3AGM, Geoffrey VK5TY, David VK5OV, Les VK6EB, Dale Baker, Geoff VK3ACZ.
(Centre): Neil VK3KNM, Treva VK5ZIS, Dan Collis, Graeme VK3AGS.
(Front): Bill VK5AWM, Doug VK5PDT, Colin ZL1CS, Ervon Schwerin.

DEADLINE FOR MAY IS MARCH 21, 1988



Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

I am writing this in mid-January, in the heat and humidity, but as you are reading this now, the weather is cooler and the Equinox is upon you. This is a time when there are many changes made to frequencies by HF users, to take account of the propagational fluctuations. The M-88 period commences on Sunday, March 6, at 0100 UTC, but further alterations will be made on March 27, when Europe and the USSR commence Summer Time. This is a week after Australia reverts to Standard Time.

Broadcasts directed to European audiences will be heard one hour earlier from March 27, whilst other target areas will remain largely unaffected. Although I did notice that international stations, broadcasting in Chinese, also altered the timing of their programs, to allow for daylight saving within the PRC. I don't believe I have the actual date when the Chinese change-over occurs, but I think it is usually early in April. Incidentally, North America begins Daylight Saving on April 24.

It is interesting to note the improvement in HF reception conditions at this location, yet, with the improvement comes the prospect of increased ionospheric disturbances, particularly on high latitude circuits. It has been interesting on 15 metres, especially during the early evening hours. Signals from Europe and the Middle East come in well with broadcasts targeted to these areas. There is almost no activity on the 11 metre broadcasting allocation (25.600 to 26.100 MHz) yet I expect that this should slowly pick-up as the number of sunspots increase.

UPDATES ON DX PROGRAMS

Radio Australia has changed the title of their DX program from "Talkback" to "Communicator". There has been alteration to some releases, but the pleasing news is that the weekly program has been increased in time from 15 minutes to 27 minutes. The release times are 0230, 0730, 1230, 1630 and 2030 UTC. Incidentally, the 1630 release will be transmitted on ABC Radio National, when they relay RA between midnight and dawn locally. "Communicator" is only heard on Sundays!

The VOA has also changed the time-slot for their communications magazine from an insert in the Tuesday evening magazine show to a Saturday evening release. It lasts for 20 minutes, although I have a feeling that it may be a monthly program.

Radio KTWRon Agana, Guam, has a weekly DX program on Fridays at 0945 UTC, 11.805 MHz, directed to Australia. It often has segments from Australian DX clubs.

Listening on the marine allocations over the holiday period has been very rewarding and sometimes exciting. Listening on 2.182, 2.524, 4.125 and 4.485 MHz was interesting with competing yachts in the Sydney to Hobart and Melbourne to Hobart races reporting in on these channels, as well as routine maritime traffic. At the time I am writing this the Bicentennial Tall Ships Race from Hobart to Sydney can be heard. All of this radio activity must have given the OTC operators at the various coast Commstats quite a headache!

At long last I received the D-87 issue of the International Listing Guide just around Christmas time. They have has a few publication problems but should have them ironed out by now. I am also ordering their manual *International Broadcasting Handbook 1988*, so I can compare it with its competitor *World Radio TV Handbook*.

Well, that ends my contribution for this month. Until next time, the very best of DXing and 73!
—Robin VK7RH.

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Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

Over these few weeks of so-called holidays I have had cause to consider some philosophical points arising from three separate events.

Firstly, my son made moves towards sorting and reducing the accumulation of parts and equipment which had been collected as of potential value, or put aside for minor or major repairs at some time.

Secondly, I had some dealing with the Taxation Department.

Thirdly, I found a shop which sells the round wall plaques which are labelled *This is a Round Tuit* for those (like me) who have a long list of things they will do when they get "Around Tuit."

I began to wonder about how we set our valuations on the things we keep or throw away, and how we fill in our time.

Some of the old equipment may be still in working order, but is too cumbersome or simply old-fashioned. Much of it would only need minor work by one familiar with the type to make it operable. But, most of it is unlikely to ever be worth spending time or money on when the new modern items are so much more attractive.

What is the time spent on such repairs (and building new equipment) worth?

Some can calculate it in terms of potential income from other activities. Others may look at it as their contribution to the history of amateur radio and the education of future recruits. Others again may simply enjoy the challenge and the satisfaction of success. But, even if all the out-dated rigs are in working order, is there any value in having a shelf full of them? When does a particular piece of equipment go from being an old piece of junk to being a valuable historic artifact? And who will take custody of it until then? Perhaps we need a National Trust of Historic Equipment!

On another aspect of costs, consider the value that the Institute is getting from its volunteer workers. My employer considers my time to be worth about $14 per hour. Many other office-bearers are worth (or are paid) much more than that.

Over the year I would probably average five hours per week on Institute business. Am I contributing $3640 value to the Institute in a year? If we calculate similarly for all our honorary office bearers, we find that members are receiving service worth hundreds of thousands of dollars at no cost to them. Little recognition, however, goes to most of the volunteers unless they hold a fairly high position.

What about the Round Tuit?

May I suggest that you do not wait until you get one. Most of our regular readers have in mind a comment they will commit to paper, an article or short note for AR, or an idea for contribution to Division or Executive "someday." Be assured that all of these are welcome at all times. The Institute can only function on the input from members.

With the 1988 Federal Convention coming closer, it is important for all members to contribute to the discussion of items which will be raised at the Convention, so that your councillors will know your views. Too often we hear complaints that "They should have asked us. . ." when what is really meant is "I didn't listen to the earlier discussion about. . ." or "I didn't bother to answer. . ."

Your contribution of time or ideas may not be tax deductible, but it is these contributions that keep the Institute functioning in your interest.

We look forward to hearing from you.
73 Brenda VK3KT

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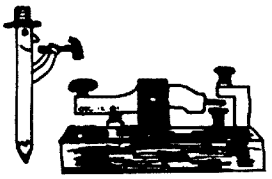
DEADLINE FOR MAY IS MARCH 21, 1988



Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

Welcome back . . . Now that we have had a month to brush up on our operating technique, we should be almost ready for the coming DX season. Hopefully the 80 metre band will also reflect a tidying up of operations, too.

If you have not already looked, check-out last month's column for some hints on operating technique. Apart from my own enthusiasm, my only qualifications are a vivid recollection of the mistakes I made only three years ago when I was learning. And a lot of reading, both manuals and contributor's letters, together with a few hundred hours on air.

This month I want to cover some of the better known operating practices. They are covered in the Call Book, the Amateur Operator's Handbook, and overseas handbooks as well, so I will be referring to them most of the time.

Real "on-air" operating is actually *easier* than the examinations. Everyone gets "butterflies" at first, but there is not the fear of failing hanging over our heads. The rules are available to you at any time, even while you are on-air, and a little practise will soon get rid of the butterflies. You can go on air and use plain English if you like, but it will waste a lot of time. Some amateurs may not work you because of this, as their operating time may be restricted and they will want to make the best of it by using abbreviations, full QSK, etc. Most amateurs use abbreviations so you can copy down the ones you hear, making a list that you can pin in front of you while operating. You can even write down some of the things you want to say, as it is easier at first, to send from 'copy'.

Here is the recognised *form of* CQ call — it is called the three by three call.

CQ CQ CQ DE VK3CQ VK3CQ VK3CQ AR K

Many operators have their own preferences, some will call CQ 10 or even 20 times, then their call a few times and may even repeat that before sending K. This is okay if they are using full break in (OSK) so that you can interrupt them, but unfortunately most are not using break in and you have to wait.

If you are in a hurry, you can shorten the call to something like CQ DE VK3CQ K, especially if you think someone is listening on the frequency.

If you hear calls like CQ RD . . . CQ TEST, CQ N, CQ FD, etc, these are people who are competing in contests. They will only send you a RST report followed by some more digits and they will expect you to do the same. Have a good listen beforehand to find out what is going on, they will usually slow down for you.

Okay, now that you have sent CQ, here is what a reply should sound like.

VK3CQ DE VK3CDU VK3CDU VK3CDU KN

Your own call is sent once only, you are expected to know it well enough. The other call is a new one for you so it is sent three times. The prosign KN means that only the station called should answer.

AR means 'end of message'. At the end of the contact you will hear something like,

. . .73 ES CUL AR VK3CQ DE VK3CDU SK E E

AR (end of message) is usually put before the call signs, and SK is the abbreviation for 'end of work'. E E can be likened to a wave and is answered by a single dit.

Another ending you can send in place of SK is the prosign CL, this stands for CLosing down. It tells listeners that you are switching off so that, if they call you, they will not be heard. This can be helpful on a net as the other operators will know you are not listening.

The character you had to learn for the examination, ie NK, is not normally used on-air by amateurs so don't worry if you forget it.

Following is a list of a few of the most used abbreviations, keep the list handy until you are proficient with them. It won't take long.

GE	Good Evening
GA	Good Afternoon
GM	Good Morning
FER	For
UR	Your, You Are
ES	And
CPI	Copy
RX	Receiver
ANT	Antenna
TU	Thank You
CUL	See You Later
OM	Old Man
YL	Young Lady
TNX	Thanks
U	You
FB	Fine Business
HW	How
RIG	Transmitter
TX	Transmitter
WX	Weather
GL	Good Luck
BCNU	Be Seeing You

See your Call Book for many more abbreviations and keep a copy on the shack wall.

IN SUMMARY:
Listen
Three by Three calls or shorter
Call CQ slightly slower than you can copy
Use Q codes and abbreviations (learning will come with use)
Identify every 10 minutes, at the start and end of every over is unnecessary
Keep overs short
Wait a few seconds between overs

MORSUM MAGNIFICAT

Owing to the serious illness of Rinus PA0BFN, the Dutch end of MM will cease operation after the winter issue. Tony Smith G4FAI, is currently arranging to continue the English edition from London. For the moment, all inquiries and subscriptions for MM should be sent to Tony at 1 Tash Place, London, N11 1PA.

FROM NEW ZEALAND

Gary ZL1AN, who writes *The Morseman* for *Break In* tells me he will be investigating the teaching of Morse during this year with a captive stage three Psychology class at the University. He will be using a program called *Teach*, which teaches Morse from scratch using an adaptive algorithm geared to the progress of the student. The program runs in Basic on the Commodore C64 and IBM clones. If you are interested in the program, let me know and I will se if I can get a copy.

73. . .Gil VK3CQ

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Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW 2077

Further to the news in this column (AR February, 1988) the Radio Pakistan had vacated 7.100 MHz; apparently Radio Tirana (Albania) has now ensconced itself there. Their second harmonic is being reported in Europe on 14.200 MHz. ***You loss one, you gain one ! ! !***

The broadcast being heard last October on 14.025 MHz was Radio Algiers. One of their engineers seemed to have confused 14.025 with 15.205? ! ? !

Please let me know if you hear AXM (Royal Australian Navy) sending FAX and RTTY (50 baud, 850 Hz shift) on 14.002 MHz. This is a spurious coming up from 13 MHz.

Reports were received last November from:
VK2s AWA, EYI; VK3XB; VK4s AKX, BHJ, BTW, DA; VK5s GZ, MX, TL; VK6RO; VK7RH; VK8s HA and JF

Thanks for your support.

There were 86 broadcast mode intruders reported; 228 using CW, 156 using RTTY, 118 using other modes, and 35 intruders identified themselves on-air. The frequencies of 14.070 and 14.100 MHz seemed to be the most abused section of our 20 metre band for the month.

My own good news is that I have acquired a RTTY system. I can now send and receive RTTY (and CW, ASCII) and generally snoop around and see what is happening on yet another mode. Good fun, but I must admit it was a bit of a chore to get it up and running. Naturally, of course, Murphy came with the equipment . . . talk about RF in the shack! But it is mostly fixed now, and I am having a lot of fun with it. So far I have missed QSOs with seven different countries!

MODE FOR THE MONTH — B9W

And, on to the mode for the month, which is B9W.

Like the R7B mode, B9W is now a mode that can be used legally by radio amateurs. B9W is phase modulated pulse multi-channel transmission. It has a whining sound, a little like a distant jet aircraft. Often it is accompanied by two guard carriers, usually 3 kHz apart.

B9W signals can be considered intruders on the following frequencies:

On the 80 metre band	between 3.500 and 3.700 MHz;
On the 40 metre band	between 7.000 and 7.300 MHz;
On the 20 metre band	between 14.000 and 14.250 MHz;
On the 10 metre band	between 21.000 and 21.450 MHz;
On the 10 metre band	between 28.000 and 29.700 MHz.

See you next month, when we will talk a little about facsimile (FAX), which is R3C or F3C.

73 de VK2COP

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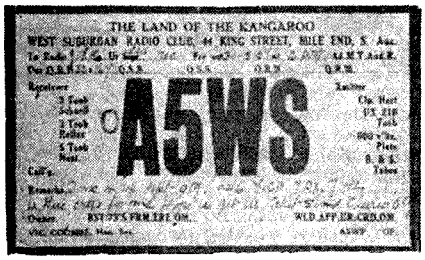
QSLs from the WIA Collection

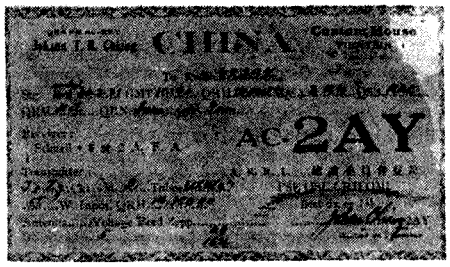
Ken Matchett VK3TL
HONORARY CURATOR
PO Box 1, Seville, Vic. 3139

The QSL, OA5WS, dated March 1927, is an example of one of the oldest Australian OA prefixes.



In the earliest days of radio transmission, QSOs were local affairs and consequently there was no need for QSLs to indicate the country of origin. The call, 5WS, could be on a QSL card from Australia, USA or Great Britain. Later, in about 1923, when DX was really starting and transmissions were being made between different countries, there arose a need for better identification. Thus letters of the alphabet were used to indicate the country, A for Australia, U for USA, G for Great Britain and so on. This DX success was due to the commercial availability of the wireless valve in the early 20s and the use of far shorter wave lengths than had previously been the case. (Spark transmissions were more efficient at long wave lengths).

Still later, in early 1927, the Australian prefix A was changed to OA. Similarly, New Zealand changed from Z to OZ. This QSL is interesting in that the licencee has added an "O" to the A with a rubber stamp to make the OA prefix. The shortwave listener's report dated March 30, 1927 was just a couple of months after the new call sign prefix was adopted. The QSL is made out to the initials of the shortwave listener, SWL reports being very welcome by radio licencees in those early days.



The QSL, AC2AY, dated March 1931, is an example of one of the older Chinese prefixes. Before the recognition of amateurs (as distinct from the licencees of experimental stations), a system of so-called internations "intermediates" was used between the amateurs of one country and another. A set of two letters in the call indicated both the continent (eg O = Oceania, A = Asia, etc) and the country. Thus China's prefix was AC, just as Australia's was OA.

This call was then followed by the "intermediate" de (from) followed in turn by the call sign of the transmitting station. In 1929, following the Washington International Radiotelegraph Convention these intermediates (used by member nations of the International Amateur Radio Union (IARU) were replaced by internationally agreed prefixes, the allocation for China being XGA-XUZ. It was then up to the individual Government body to decide on the actual amateur prefix (or prefixes) to be used from this allocation. Although the government of China did assign the prefix XU at a later data, radio amateurs in China continued to use the old intermediate of AC. Johann Chiang of the Custom House, in Tientsin, was one such example.

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Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

G — General
C — Constructional
P — Practical without detailed constructional information
T — Theoretical
N — Of particular interest to the Novice
X — Computer program

QST — August 1987. 435 MHz Amplifier (C). Radio Emergency Service (G). Tour through Britain (G).

BREAK IN — December 1987. 60th Anniversary Issue (G).

CQ-TV — No 140, November 1987. British Amateur Television Club. News, Circuits, Reviews, Contest, etc (G).

AMSAT-UK OSCAR NEWS — No 68, December 1987. General Satellite News, Tables, Information, etc (G).

CQ MAGAZINE — November 1987. Packet Radio (G). Ideas for Cheap Antennas (P N). Satellite Update (G).

CQ MAGAZINE — December 1987. 40 metre, three element Beam (G). Coaxial Link Antenna (P N).

RADIO ELECTRONICS — December 1987. Index for 1987. (G). Early Days of Radio (G). Using an Oscilloscope (G N). Strain Gauge Transducers (G).

73 MAGAZINE — November 1987. Tesla High Voltage Transformer (C). VIC-20 Beam Rotor Interface (P X).

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HAMADS

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.*** Please remember your STD code with telephone numbers

AMSAT Australia

SATELLITE ACTIVITY FOR THE MONTHS OF OCTOBER/ NOVEMBER 1987.

1 *LAUNCHES*

The following launching announcements have been received:

INTL NO 1987	SATELLITE	DATE	NATION	PERIOD min	APS km	PRG km	INC deg
086A	USA 27	Oct 26	USA			NA	
091A	Cosmos 1894	Oct 28	USSR	24hr02m	35920		1.3
092A	Cosmos 1895	Nov 11	USSR	90.4	402	217	70.4
093A	Cosmos 1896	Nov 14	USSR	89.4	319	203	64.8
096A	Progress 33	Nov 21	USSR	88.8	288	193	51.6
096A	TV-SAT 1	Nov 21	Germany			NA	

2 *RETURNS*

During the period 58 objects decayed including the following satellites:

1987-059A	Cosmos 1866	Nov 06
1987-081A	Cosmos 1886	Nov 02
1987-082A	Progress 32	Nov 19
1987-085A	Cosmos 1889	Oct 23

3 *NOTES*

1987-095A TV-Sat 1 was launched by an Ariane 2 rocket from the Kourou European Space Station. It is the first German direct receivable broadcasting satellite.

Updated information on spacecraft with essentially continuous radio beacons on frequencies less than 150 MHz:

1966-110A ATS 1	38.5 deg W	136.46 & 137.35 MHz
1987-111A ATS 3	105.30 deg W	136.47 & 137.35 MHz
1975-100A GOES 1	125.40 deg W	138.38 & 125.40 MHz
1977-014A ETS 2	129.90 deg W	136.11 MHz
1977-048A OOES 2	113.40 deg W	136.38 MHz
1978-062A GOES 3	129.80 deg W	136.38 & 137.19 MHz

—Contributed by Bob Arnold VK3ZBB

ar

AMSAT-UK

A note from Ron Broadbent G3AAJ, Honorary Secretary of AMSAT-UK, includes the information that AMSAT—UK will pay the costs involved (£stg13 500) in transport of the Phase IIIC satellite from Germany to French Guyana. The launch of OSCAR 13 is planned for May 20, 1988.

Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7251

CONTEST CALENDAR

MARCH 1988

5 — 6 ARRL DX Phone Contest
12 — 13 QCWA Phone QSO Party
12 — 13 RSGB Commonwealth CW Contest (Rules December AR)
19 — 20 WIA John Moyle Memorial National Field Day Contest (Rules February issue)
19 — 20 NZART National Field Day
19 — 20 ISSB Phone QSO Party
19 — 20 BARTG Spring RTTY Contest (Rules February issue)
26 — 27 CQ magazine WW WPX SSB Contest

APRIL 1988

9 — Israel ARC Contest

Steve VK2PS, was the highest scoring VK station in the 1987 HA Hungarian CW Contest with his 14 MHz single band entry. This is a good contest for those of you who like this mode and can provide a lot of hard-to-get CW countries. Look out for it on the third weekend of January each year.

Rules for the Russian CQ M Contest will be published next month and this is another good contest for those who are looking for the more rare Russian call areas.

Remembrance Day Contest 1987; some States did better and some did not do as well as they did in 1986. The Queensland Division pulled out all stops this year and have reaped the reward. I have received quite a lot of correspondence regarding the rules as laid down for the RD Contest and will study it after the paperwork involved with the 1987 contest is filed away. I was surprised at the number of amateurs who used more than one call sign during this contest, a few put in two entries and some even four! This is what I meant by the term "spirit of the contest" in my column in January's AR. The call sign is issued for the identification of a radio station, not an individual who is identified by his or her name. At least, that is how I interpret the rules. It follows, I think, that a range of apparatus being used by an amateur in a contest cannot be station XXX and station YYY and ZZZ. Surely, if a club cannot find a licenced amateur to operate a club station exclusively in a contest, there must be something lacking with the membership. Please, *one station, one call sign!*

An amateur who has sent in his log for the Ross Hull VHF Contest has informed me that a number of people cannot understand the reasoning behind the daily start of contest serial numbers in this rather long contest. This rule change was inserted to try to hide the performance of stations during the contest, you all know the feeling of getting the station on the air a few hours after the start and of hearing someone in VK10 with a serial number up in the hundreds. Well, this minor rule change was to try and encourage a few more to "give it a go."

COMMENTS ON THE RD CONTEST

Once again I enjoyed the contest . . . I did find the going very slow at times. I think that I had worked just about all that could be worked. The 80 metre band was terrific on the Saturday evening, and 40 was also good. 20 metres was nowhere near as active as in past years and 15 was useless whilst I did not even bother to look at 10 metres. Maybe I missed out there, however I doubt it. One of the highlights of the contest was being called in the middle of same by an FR5 on Reunion Island on the 80 metre band . . . About my only criticism of operators during the contest is that of those who do not use the standard phonetics. Using the phonetics from the internationally recognised phonetic alphabet makes it so much easier to get the call signs through the QRM and cross modulation . . . Right throughout the contest I found nothing but courtesy. From this point of view I probably enjoyed the 1987 contest more than any others previously. VK5QX.

Thanks for the letter Ian, glad you now have time to enjoy the contests these logs sure do keep a person off the air! . . . FCM.

Please find enclosed the VK3SCD log for the 1987 RD Contest. VK3SCD is the club call sign of the Cheltenham District of the Scout Association. As you will see from the declaration on the log, three of us operated the station during the contest. Equipment on HF was an FT102 and dipoles while on VHF an FT290R with 25 watt linear and a Slim Jim antenna were used. Logging was done on my IBM clone using software written by Geoff VK3CGH. I was of the belief that the primary contest objective of the RD was to assist your State to win. Unfortunately, the current rules encourage an operator to channel his efforts into only one section. This certainly maximises the opportunity of gaining a certificate, but detracts from the State's overall score. I would prefer to see the sections scrapped. Perhaps offering a multiplier for CW and other more exotic modes might also encourage their use . . . Despite what I've just written, I enjoyed the contest very much. Activity on HF was excellent, although the number of two metre operators seemed very poor compared to previous years . . . VK3CRA.

I would like to see a VK version of the Commonwealth *CW Contest* . . . FCM.

My score is down this year because of enforced retirement early on Saturday night due to a "force majeure" at the time. I estimate that this probably cost me 200 contacts . . . Goodwill seemed again to be the tenor of the contest. Things were very quiet toward the end though, and it was hard to really justify the last two or three hours effort in the score. Quite clearly Saturday night is when it all happens . . . VK5ATN.

This was my third contest though I have given out numbers in others. I was late in starting on Saturday night as I had a short in my power supply and I'm also re-wiring my shack, so my time is limited. My favourite contest is the sprints although I enjoy all of them. I have realised why I have not done well in the contests, as I made contact with every station I could hear. (In the Sprints), but I only have access to the novice bands, and that is where I am losing out . . . VK2LEE.

Yes Lee, the novice entries are very few, however in VK7 we appear to have an above average number of novice entries for which we down in the Apple Isle are very grateful . . . FCM.

Just a note to say how much I enjoyed the contest, it is only my second time around, but I believe the RD has all the ingredients of a successful and rewarding contest, namely;

1. The significance of the day.
2. The simplicity of the rules.
3. The spirit in which it is held.

And there is still enough for the serious contester . . . VK4BAY.

This was the first contest that I had been able to put in a few very enjoyable hours, (previously weekend work commitments had prevented this). The small amount of time that I was able to spend exchanging numbers led to some very friendly contacts. Even the "big score" stations had time for pleasantries and the general on-air manners of my fellow amateurs made me feel proud to be a part of this great hobby of ours. The RD Contest certainly lived up to its other name — "The Friendly Contest". Catch you next year . . . VK2MT.

This years Remembrance Day Contest went very well. Band conditions were good at my QTH, lots of activity (and QRM) on all bands, and great to see 15 metres open. I had to take breaks Saturday night to check on cows calving, and Sunday to milk and feed out hay, etc. Standard contest operating procedure here . . . VK3YH.

After missing last years RD Contest, I was looking forward to "going bush" again this year and getting stuck into it. Apart from no opening on 10 metres at all into central VK7 and only working four VK6 stations on 15, I consider the 1987 RD was the most enjoyable from the manner in which fellow amateurs conducted the contest. It rated as the most gentlemanly conducted RD I have taken part in. I only hope that future contests are as enjoyable and the old practice of frequency jumping and stealing is a thing of the past. (I did not experience this at all this year). . . . VK7KZ.

Thank you for an enjoyable RD contest. Band conditions were better this year and attracted more station to the contest. The stations I worked on CW were the familiar call signs I remember over the few RD Contests I have entered. It looks like CW is out with novices and K calls, I only worked three out of my 102 QSOs on CW. I will be looking forward to next years contest . . . VK2DQP.

Thanks for taking on the FCM job, it will keep you busy as I've done it years ago, however contests allow us to QSO so many old friends we only hear once in a while. Particularly RD Contests. I've not missed too many RDs since inception, now an old Returned Soldier, 71 years of age. Wonder if I will stand the pace of having 500 plus contacts for many more years but will keep trying. VK4LT. PS. Conditions here not very good on 40 and hopeless still on 10 metres but the cycle is on the way back.

Participation in the RD Contest has always been a pleasurable experience and was my introduction to contesting. I have entered the HF transmitting phone and CW segments and the VHF phone segment. The old "Open" section was more fun to operate in as there were more stations competing and the tactics required were a real challenge. The checking of logs and totalling of scores would have been easier too. Still, I am not one to pull out because the rules are not exactly to my liking so I have operated within the current rules and the spirit of the contest . . . VK3VT.

Conditions here on Saturday night were poor due to the high static level. I was surprised at the lack of use of the 160 metre band, thought there would be greater activity. The use of CW was disappointing, I was amazed at the few novices who used CW, particularly on 80 metres, perhaps the inclusion of an "Open" section may encourage this mode, keeping a separate log deterred me from as much CW as I would have liked . . . You asked for details of any of the call signs of those who died in WWII. I was closely associated with C A Ives VK5AF. Cec, a commercial artist, was licensed in 1936 and was operating at Glenelg pre-war. As a member of the RAAF Wireless Reserve, Cec, together with Ross Harris VK5FL, a neighbour left for Melbourne on the Tuesday after war was declared and went to Point Cook for their initial training, then to Victoria Barracks for service as a WT op. Unfortunately, in early 1941, Cec contracted viral Pneumonia for which there wasn't much cure in those days and passed away. Cec was an excellent CW operator and helped me a lot during my struggle for the exam in 1938 . . . VK2BO.

1987 REMEMBRANCE DAY CONTEST RESULTS

— Congratulations to VK4 — The Sunshine State

The formula for determination of results for each Division is:

Number of Logs/Number of Licencees (participation) X Total Points X Weighting Factor (average of last four weighting factors).

VK1 57/352 X 6245 X 1.05 = 1061.827
VK2 120/5117 X 13144 X 7.04 = 2170.027
VK3 74/4872 X 9086 X 5.41 = 746.609
VK4 117/2834 X 13670 X 5.58 = 3149.116
VK5 104/1779 X 13913 X 1.36 = 1106.157
VK6 142/1513 X 16608 X 1.6 = 2493.942
VK7 52/617 X 5495 X 2.23 = 1032.738
VK8 8/185 X 564 X 9.56 = 233.160

Unfortunately, logs from all States except VK5 and VK7 did not adhere to the criteria and were used as check logs. These are not listed.

The standard of logs presented was generally very good and the vast majority arrived at this QTH well inside the closing deadline. Some of the entries like the computer printout in the form of a seven metre log paper roll are not funny. One or two are very untidy and many hours had to be spent on them and these almost entered the file of disqualified entries. However, the very high standard of the vast majority made the process of checking the entries a hard but pleasurable task.

DIVISIONAL SCORES

VK1	
HF Phone	4186
VHF Phone	2025
VHF CW	34
Total	6245

VK2	
HF Phone	11124
HF CW	1510
VHF Phone	510
Total	13144
VK9NP 344	

VK3	
HF Phone	6251
HF CW	1061
VHF Phone	1774
Total	9086

VK4	
HF Phone	10320
HF CW	1096
VHF Phone	2254
Total	13670

VK5	
HF Phone	9840
HF CW	688
VHF Phone	3385
Total	13913

VK6	
HF Phone	6205
HF CW	640
VHF Phone	9704
VHF CW	59
Total	16608

VK7	
HF Phone	4713
HF CW	120
VHF Phone	662
Total	5495

VK8	
HF Phone	408
HF CW	156
Total	564

OFFSHORE SCORES

VK9NP	HF Phone	344
P29KRP	HF Phone	106
ZL1ADN	HF Phone	160

VK9NP This score is added to the VK2 Divisional total.

LICENSEES PER DIVISION ARE.

VK1	352
VK2	5117
VK3	4872
VK4	2834
VK5	1779
VK6	1513
VK7	617
VK8	185

INDIVIDUAL SCORES BY DIVISION

VK1 HF Phone

1PJ	520	1TD	209	1VE	83	1KV	26
1WI	431	1HZ	185	1DW	81	1DE	24
1GB	431	1RH	120	1LF	81	1NDV	20
1RJ	427	1GN	116	1NEB	62	1VP	16
1BEB	356	1KL	94	1KCM	56	1KRH	14
1ZL	280	1MX	93	1VB	44	1BBA	10
1WX	270	1BH	84	1PP	43	1BAT	10

POINTS SUB-TOTAL 4186

VK1 VHF Phone

1KRH	258	1WI	100	1MX	71	1DE	27
1ZAH	143	1GL	95	1RH	55	1PP	21
1HZ	121	1PJ	90	1BAT	46	1KV	20
1GN	121	1TD	90	1ZAH	45	2ZZX/1	17
1WX	120	1ZL	87	1LF	43	1VP	10
1ACC	120	1ZJR	85	1ZQR	29		
1GB	100	1DW	83	1BBA	28		

POINTS SUB-TOTAL 2025

VHF CW

1RH	13
1UE	11
1MX	10

Sub,Total 34

TOTAL POINTS VK1 DIVISION -------- 6245

VK2 HF Phone

2KL	578	2CKW	178	2IV	81	2OH	41
2ZL	543	2EXA	170	2BTZ	80	2PC	38
2DCL	515	2DQP	165	2ALZ	80	2NCE	37
2DYW	489	2DUA	160	2DLB	79	2KGX	36
2BO	459	2APP	150	2CDP	77	2AL	33
2DH	426	2CFH	140	2VR	74	2DDW	33
2AOA	422	2AGF	139	2AJO	70	2ENX	33
2MB	386	2BQS	127	2AZS	61	2KUR	33
2BTP/P	300	2MUZ	120	2FJ	60	2XF	29
2NW	288	2PN	112	2END/P	56	2RX	26
2PS	264	2PU	112	2PY	53	2BVU	25
2EAR/P	252	2CN	111	2SP	52	2NV	25
2ANO	243	2RE	110	2BHX	51	2CU	20
2ECF	233	2UC	105	2BDT	50	2AAB	19
2EAG	226	2CDD	101	2AYF	49	2AIM	15
2WI	219	2CJH	100	2KW	48	2XT	14
2PD	217	2FEI/qrp	99	2GV	47	2LA	12
2DWT	200	2DBB	86	2EY	47	2AKX/P	12
2ELB	184	2AIC	84	2LEE	45	2WT	11
2DFL	180	2MT	82	2HT	42	2ED	11

POINTS SUB-TOTAL VK9NP 344 11124

VK2 HF CW

2KM	146	2EJW	72	2AIC	43
2AQF	113	2EL	71	2SU	32
211	104	2QL	63	2BO	29
2BO	103	2GT	63	2CWS	29
2DQP	102	2AZR	56	2AAB	18
2DID	100	2CDG	51	2EMU	16
2BRA	84	2BLK	50	2FNR	15
2BQQ	74	2EXN	50	2RJ	14
				2BQS	12

POINTS SUB-TOTAL 1510

VK2 VHF Phone

2HT	75	2XDW	44	2EY	35
2AKY	60	2CDD	40	2ELB	27
2JGH	52	2ZZX	38	2WI	16
2FGV/P	50	2APP	36	2BUT	15
				2AIC	14

POINTS SUB-TOTAL 510

TOTAL POINTS VK2 DIVISION ------13144

VK3 HF Phone

3BSH	511	3AXE	238	3CAY	109	3BGY	50
3YH	486	3AYF	230	3DVT	103	3BSR	41
3AJU	402	3CX	228	3DNC	102	3KAV	40
3ZI	379	3VT	225	3PW	101	3PTR	31
3CUH	357	3AGJ	180	3ZJ	100	3WW	31
3ADW	357	3BRZ	176	3KCT	83	3ARO	27
3SCD	339	3ABP	147	3BQU	78	3ALD	26
3AKK	338	3SM	134	3BMV	57	3DNY	22
3KU	297	2FII/3	126	3NV	50	3CLS	20
						3BCZ	20
						3PSG	10

POINTS SUB-TOTAL 6251

VK3 HF CW

3CQ	175	3XB	68	3AMD	35	3PSG	18
3XF	162	3KS	65	3BOH	33	3AJG	17
3FC	107	3CUH	53	3OA	31		
3KF	89	3BDU	38	3XF	30		
3DG	73	3VT	37	3DNC	30		

POINTS SUB-TOTAL 1061

VK3 VHF Phone

3BGS	208	3CWT	119	3KST	69	3AOM	21
3VT	190	3XMW	114	3AVV	61	3CLS	18
3DS1	188	3KPQ	110	3SM	60	3ADW	18
3XNG	151	3SCD	95	3DNY	60		
3BMV	140	3XH	76	3KCT	46		

POINTS SUB-TOTAL 1744

TOTAL POINTS VK3 division -----9086

VK4 HF Phone

4YB	655	4BTW	201	4NFE	79	4NVI	31
4WIQ	539	4CI	189	4ABX	65	4ADY	31
4LT	520	4AOE	178	4BG	64	4ALM	30
4BTB	518	4OX	153	4BNL	63	4AIX	26
4ARR	514	4BIF	149	4SAA	57	4FVM	25
4WIS	482	4ASF	141	4CMH	56	4NLV	25
4AEV	452	4AEM	131	4QI	55	4NWX	24
4AKB	398	3ACW	123	4AMH	54	4BCH	23
4BAY	312	4PJ	122	4WY	52	4AGS	23
4BKM	311	4RM	121	4BKW	51	4IS	23
4YG	275	4AVC	120	4RF	51	4LP	20
40L	262	4RT	120	4PU	50	4CF	16
4AQD	252	4JCR	115	4FBA	48	4ZN	15
4BCS	250	4NEF	111	4CZ	40	4AVR	15
4AOH	246	4RL	110	4BGT	33	4NYE	12
4WIZ	242	4NMA	108	4ALQ	32	4EV	11
4MWZ	232	4CPA	99	4YX	31		
4JM	227	4NVI	80	4HAZ	31		

POINTS SUB-TOTAL 10320

VK4 HF CW

4XA	194	4YG	66	4QY	40	4RE	25
4CAG	166	4BRZ	59	4XY	38	4APZ	18
4XW	165	4QI	55	4GD	38	4CF	15
4JH	137	4XJ	45	4SF	25	4EV	10

POINTS SUB-TOTAL 1096

VK4 VHF Phone

4WIZ	326	4KCA	87	4YAN	53	4EV	29
4ZBV	166	4KAP	86	4KZA	50	41Y	25
4AG	138	4ZXZ	77	4BNL	47	4GT	20
4ZGQ	122	4AHD	77	4PJ	45	4AIZ	19
4YJF	118	4KZS	74	4ADB	36	4AVR	17
4AVC	116	4ZML	62	4YAF	35	4VS	16
4KLA	107	4ANN	59	4SAA	34	4RF	10
4KJE	105	4ABX	55	4ZDV	33	4KU	10

POINTS SUB-TOTAL 2254

TOTAL POINTS VK4 DIVISION -----13670

VK5 HF Phone

5QX	788	5GZ	194	5RV	94	5RK	42
5AYD	667	5OV	176	5BWG	86	5NVW	41
5ADD	574	5ALM	167	5ST	77	5BWF	37
5RI	447	5AJW	154	5SS	71	5TY	36
5SG	444	5AX	150	5TP	70	5QW	33
5ATN	441	5BMT	149	5ANW	67	5ZJ	33
5ATU	404	5NF	111	5PC	67	5EJ	30
5XY	328	5KV	109	5AO	66	5TC	27
5ALL	298	5NTX	108	5KMH	65	5ZQ	25
5NX	257	5IT	108	5UE	59	5AOV	25
5DJT	238	5GV	106	5AAJ	56	5PWF	20
5APR	232	5AH	104	5AGB	56	5KJT	15
5GW	230	5XC	104	5NDA	52	5LC	15
5AAC	228	5SG	104	5NGH	52	5SW	27
5KO	215	5ANI	103	5BVJ	50		
5NOD	211	5AJK	101	5ZA	50		
5AIB	200	5BFB	97	5NID	49		

POINTS SUB-TOTAL 9840

VK5 HF CW

5AGX	186	5TL	30
5UM	174	5SP	27
5GZ	91	5JG	26
5FX	76	5ALM	20
5HO	31	5PDH	17
		5KL	10

POINTS SUB-TOTAL 688

VK5 VHF Phone

5KCX	365	5RR	153	5BMT	104	5ZTJ	52
5AKK	305	5TC	150	5XY	96	5ZHV	47
5GR	212	5KLH	139	5OR	77	5SS	38
5FK	206	5ACC	139	5NX	73	5ZKK	32
5ZDJ	205	5OZ	128	5PC	68	5OU	30
5KIA	192	5ANW	119	5KEM	66	5ACW	28
5AH	161	5RV	109	5ZCQ	64	5TY	27

POINTS SUB-TOTAL 3385

TOTAL POINTS VK5 DIVISION---------13913

VK6 HF Phone

6ED	442	6HT	170	6UX	60	6ANT/P	25
6ABP	424	6RU	166	6QN	60	6ARD	25
6AVO	416	6UF	126	6NRN	55	6BO	25
6DA	374	6XC	109	6APK	50	6JO	24
6AO	286	6FC	106	6CZ	42	6NE	23
6AMB	250	6AP	101	6CX	41	6ABR	22
6LW	234	6SAA	97	6UT	40	6SA	21
6RG	233	6FP	94	6SH	38	6CJ	20
6ACN	231	6XQ	92	6YF	36	6RO	19
6NTJ	215	6NBF	88	6AV	35	6NBG	19
6ANC	209	6NWD	86	[illegible]	[illegible]	6ABL	18
6YS	201	6HU	82	6AN	28	6OE	14
60D	200	6DE	81	6KH	27	6XZ	10
6JP	190	61W	69	6PF	25		

POINTS SUB-TOTAL 6205

VK6 HF CW

6AFW	144	6SM	64
6HQ	125	6BE	39
6ABP	122	6LW	30
6AJ	71	6RU	28
		6WT	17

POINTS SUB-TOTAL 640

VK6 VHF Phone

6XZ	557	6AD	188	6ARD	116	6ZLT	65	6ZTL	35
6YS	535	6JP	185	6SO	114	6ABD	64	6NS	34
60D	439	6YJ	175	6AP	111	6AWE	63	6UV	34
6CX	390	6ACN	174	6ZPP	105	6ABL	61	6BO	33
6ZLZ	342	6QX	174	6VF/P	105	6NE	61	6MB	29
6ASR	286	6WH/P	158	6KWN	105	6DY	60	6ON	25
6RG	252	6ARO	152	6BD	100	6RU	60	6ZES	20
6AR	250	6RO	152	6HU	99	6AN	57	6JY	18
6WI	242	6AO	142	6KBL	89	6UT	55	6ZGP	17
6ABR	239	6FC	141	6SAA	87	6QN	55	6GK	17
6ANC	236	6XV	136	6EB	86	60TN	48	6ZAG	12
6LZ	229	6RRG	133	[illegible]	86	6RZ	44		
6ZIC	229	6WZ	131	[illegible]	76	6JX/P	38		
6YF	226	6WT	130	6AMB	68	61W	38		
6APK	223	6YL	121			6GA	37		
6XC	191	6SH	119						

VK6 VHF Phone POINTS SUB-TOTAL 9704

VK6 VHF CW

6WI	18
6AR	15
6YS	14
6FC	12

POINTS SUB-TOTAL 59

TOTAL POINTS VK6 DIVISION -------16608

VK7 HF Phone

7KZ	499	7NGC	211	7KDR	71	7BC	47	7FD	20
7FM	432	7NXA	205	7NWR	69	7NDO	35	7AK	20
7GG	391	7XR	200	7JK	62	7GB	29	7NBF	22
7XC	386	7KDV	149	7LS	60	71Y	23	7DT	27
7YP	284	7JU	122	7NIM	60	7BH	23		
7RN	268	7CK	118	7RH	56	7NPA	23		
7NRR	246	7AL	88	7EB	56	7NYW	25		
7HW	237	7BJ	80	7NGH	49	7JP	20		

POINTS SUB-TOTAL 4713

VK7 HF CW

7RY	76
71Y	24
7AK	10
7NXA	10

POINTS SUB-TOTAL 120

VK7 VHF Phone

7ZBX	150	7JK	49
7RY	76	7ZRP	47
7RM	63	7ZBW	41
7FB	59	7LS	36
6EB	54	7AL	19
7ZJG	51	7GD	17

POINTS SUB-TOTAL 662

TOTAL POINTS VK7 DIVISION ---------5495

VK8 HF Phone

8AV	211
8NOD	101
8NPL	39
8NW	30
8NGP	27

POINTS SUB-TOTAL 408

VK8 HF CW

8AV	106
8HA	38
5HS/8	12

POINTS SUB-TOTAL 156.

TOTAL POINTS VK8 DIVISION -----564

RECEIVING SECTION RESULTS

Seven entries received in this section so I have listed them in order of score

HF SECTION

K Hartley (WA)	442
VK2PXC	324
L60228	265
L60036	247
L60068	184
L30477	170

VHF SECTION

L60036	78

RADIATION THREAT FROM THE CATHODE RAY TUBE SCREEN

Also including: Projects — build a patch bay, speech controller, voltmeter; Optical Fibre Measurements; Sydney's Bicentennial Power House Museum; Circuits; News; Kilohertz Comment; Videotex News; latest Products; and incorporating Australia's highest circulating Hi-Fi Magazine.

OUT NOW MARCH

Electronics Today INTERNATIONAL

eti

WIN A MODEM . . . COMPUTER!

Electro-Magnetic Compatibility Report

BREAKTHROUGH

Advice pamphlet for RSGB Members

Compiled by the Society's EMC Committee

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

The Radio Society of Great Britain has drawn up a list of important measures which will help deal, to a greater degree than before, with the on-going problems of EMC (electro-magnetic compatibility). Three aspects of the situation need special attention.

The first is the inadequate standard of immunity of electrical equipment in general. This problem is already being addressed by the Society, the DTI and manufacturers. The Society's long-term aim is to make the manufacturers aware of the growing requirement for proper RF immunity and the consequent need to educate the relevant design departments. There should be a recognisable and substantial improvement in this area.

The second aspect is that we, as users of transmitters in what is often an urban environment, must ensure that we are 'whiter than white' before becoming involved in neighbourhood disputes. This means our installations must be 'clean' and that our own radio/television/hi-fi equipment does not suffer from RFI.

Thirdly, the shortcomings of a *few* radio amateurs do little to further the cause of harmonious relations with neighbours, retailers and even in some cases, manufacturers. This social aspect is most important.

This article goes some way to indicating those areas which are directly controllable by radio amateurs. It will hopefully enable us to eliminate most 'in-house' problems as well as providing some social directives.

If we can be seen to be putting *our* house in order, it will go a long way to encouraging the manufacturers to do the same. Much of the advice may appear to be common-sense, but it does no harm to repeat it.

ARE YOU TAKING THE RIGHT STEPS?

Tread carefully when talking to your neighbours about the problem of EMC. Try not to use the word 'interference' as this suggests an anti-social activity. It is far better to use the word 'breakthrough' instead.

All amateurs should strive to live in peace with their neighbours. From the outset, it is good policy to make friends with the people in closest proximity to your QTH. If relationships are amicable there is less chance of a dramatic change of heart if problems of breakthrough occur.

Sometimes a confrontation is unavoidable. When this happens, try to find a solution by co-operative means. Taking the attitude that "I'm allowed to run full legal power and therefore I'm going to, no matter what", will get you nowhere.

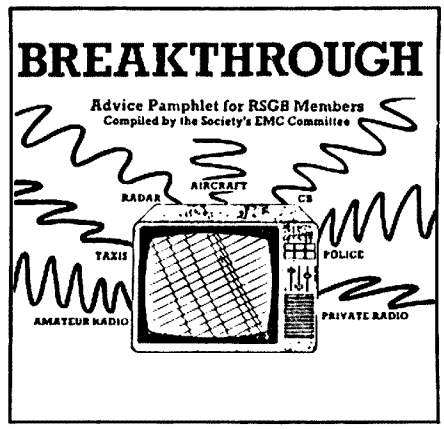
On the other hand, not going on the air for fear of upsetting your neighbours is almost tantamount to admitting that you are at fault.

When entering into discussions with your neighbours do not attempt to blind them with science. Your use of technical and baffling phrases could create further resentment.

It might be helpful to rehearse your procedure with a friend so you can work out an acceptable approach. You will then both know what to do, is and when you hear that dreaded knock on the door in the middle of your sched on 3.5 MHz!

If you are running a reasonable amount of power for the conditions prevailing and the problem still exists, do not avoid the problem but approach it in a diagnostic manner. Solving the problem often turns out to be a fairly simple affair. You do not need a degree in electronics, but merely be able to work in a reasoned logical manner.

Is your equipment blameless? Could you show a



neighbour that your transmissions do not interfere with your television, etc, which is in closer proximity? If you can show that:

a) transmission to your television = no breakthrough

b) transmission to his television = breakthrough,

then the logic should not be lost on him.

There is no single stock solution for all breakthrough but with patience and trial and error you can solve most of the problems.

So much for the social side of things; now read on for the more practical 'nuts and bolts' approach to the business of breakthrough.

Is your station designed for good EMC?

The chances are that, when you designed your amateur radio station (if in fact you did), the last thing on your mind was minimising breakthrough problems that might occur. Your licence includes a clause which requires that stations "shall not cause undue interference" to other wireless telegraphy (this somewhat dated phrase includes both radio and television).

The following guidelines explain how your station can be designed to reduce the chances of neighbours suffering breakthrough problems.

Take sensible precautions

These precautions will not guarantee freedom from breakthrough problems. However, if you carry them out, you can demonstrate to the authorities that at least you have taken the "undue interference" clause seriously. These steps are a good insurance policy for the future.

Take these precautions now, and you will not have the hassle of modifying your station in a hurry with a 'live' breakthrough case on your hands. It wouldn't look too good if you solve a problem by modifying your own station.

STATION LOCATION

Keep your station away from the neighbour's property

By your 'station' we mean the place where your transmitter is located. Every part of your installation will radiate some signals apart from those you expect from the antenna. Some signals may be harmonics or other spurii that your neighbour doesn't want nearby. Lengthen the odds against breakthrough and interference by keeping the station as far away from his property as possible.

Remember — doubling the distance from your transmitter to his television or radio will halve the strength of any unwanted radiation that he receives. Brick walls are almost transparent at RF, so even if your neighbour's equipment is not just the other side of the party wall, there is plenty of house wiring to carry your unwanted signals around his property.

Keep your HF station close to ground level

Many parts of your installation may need effective grounding. Keeping the ground connection leads short is easier if you put your HF station closer to the ground. This might also reduce the problem of RF feedback.

IMPROVE YOUR STATION DESIGN

Use an independent RF ground on your station

It is almost impossible to design a station that doesn't produce some unwanted RF signals on the case of the transmitter. These signals may find their way into the mains supply. You can give these signals a "good home" by grounding your station with an independent earth connection.

Any part of your station which handles RF signals at a high level will benefit from being well grounded. This ground will, however, only be as good as the lead connecting it to your station. The lead should be less than one-tenth of a wavelength to be effective. This means that even at 14 MHz the lead length needs to be less than seven feet.

Generally, this sort of grounding is ineffective above 30 MHz and so mains supply isolation will be needed. NB: Special precautions need to be taken if the mains electricity supply uses protective multiple earthing (PME). Consult your electricity board for further details.

Isolate or filter the station mains supply at RF

Even with an effective station ground, isolating the mains supply at RF with a filter is still worthwhile. Apart from keeping your RF signals out of the supply, it will also help to keep mains-borne interference out of your station.

Usually, a conventional mains filter (often called a hash filter) only filters the live and neutral conductors of the supply. The mains safety earth comes straight through, allowing most of the RF signals to bypass the filter altogether.

Effective isolation requires the use of a special mains filter which filters all three conductors. They are special in that the earth line is designed to carry fault currents of 100 amps should a short circuit develop on the station side.

A simple but effective filter can be made by winding the station's incoming mains supply cable through a number of ferrite rings. Make sure that all three conductors (L, N, and E) are wound through the rings together.

Screen all your equipment that carries high level RF signals

All this isolation and grounding will not do much good if any part of your station carrying high level RF signals is unscreened. Every such item should be well screened; this includes the transmitter, linear amplifier, power meter, output filter, and antenna tuning unit. Leaving the screening off any one of them could spoil the whole effect.

The internal fields within these items will be very high. Even if they did not contain any unwanted harmonics, the fundamental signal will still leap into anything nearby if you let it out. Apart from stray RF radiation being a potential health hazard, you might also produce unwanted RF feedback problems.

Use good quality coaxial cable within the house

Poor quality coaxial cable leaks RF signals! Try

putting a dummy load on the far end of one of your antenna feeders and fire up your transmitter. If you hold a sensitive field strength meter near the cable you should not be able to detect any signal. If you can, then the chances are that the cable leaks.

If your feeder runs indoors close to any equipment or house wiring, then this leakage could pass next door regardless of where your antenna is. (See also 'Where and when to use a balun').

Always monitor your output power with a reliable power meter.

If you can't monitor your output power whilst transmitting, then you can't be sure that you are no overdriving the transmitter. An over-driven transmitter will produce more harmonics and sometimes extra spurious signals, as well as extra splatter in-band.

If you are using SSB or CW then the power meter should respond to the peak envelope power level being the same as that selected during tune-up.

While operating, the peak power will always be higher than the steady state power, because all transmitter ALC systems are less than perfect (some much less perfect than others). Remember also that a VSWR meter may generate harmonics and should always be placed *before* any output filters.

Using a bandpass or low-pass output filter

On some commercial HF transmitters, the level of the harmonic output may still be high enough to cause interference to Band II FM radio. On VHF, the level of the harmonic output from 144 MHz can also cause problems to Band IV television transmissions.

All commercial transmitters produce some unwanted output signals. Although the level of these signals may be low enough not to cause trouble in most cases, use a good output filter unless you are sure that your transmitter is above reproach.

Select the right transmitter power for your QTH

Apart from being very bad value for money, running a few hundred watts to an antenna that is either indoors or below roof level is asking for trouble.

If you don't have the space or money to locate your station and your antennas away from your neighbour's property, then don't bank on being able to run high power on any band. If you expect the impossible from your QTH, then be prepared for the impossible neighbour!

CARE IN LOCATING YOUR ANTENNA

Locate your antenna as high as possible

Remember, the higher your antenna, the lower the chance of a signal finding its way into your neighbour's home (and the greater the chance that it will arrive at your contact's receiver). This is especially true when beam antennas are in use. Even small changes in height will sometimes place your neighbour's property outside the main lobe of the antenna.

Site your antenna well away from buildings

Whatever antenna you use, you should site it well away from buildings. This will minimise the signal strength inside the property.

Remember, the distance that matters is that from the nearest point of the antenna to the building. Make this distance as great as possible.

In any case, the increased distance may significantly reduce the interference *you* receive as well.

CARE IN CHOOSING YOUR ANTENNA

Choose the right size of antenna for your QTH

Select an antenna system that suits your property. Unless you live in a large detached property, fitting a large HF antenna into a small QTH will involve draping it over the house itself.

If this also brings the antenna close to your neighbour's house, then you may cause breakthrough even when using quite low transmitter powers.

Try using a smaller HF antenna sited away from the house. Although it may be slightly less efficient you may find the higher power you can use will give you an overall advantage.

Don't bring long wire feeds into the house

The long wire antenna is sometimes a poor choice. For good EMC, it could be disastrous as it brings radiated RF signals right into the building and picks up radiation from house wiring. Inevitably, the feed-point is too far from the earth connection, even if the earth is a good one, and the transmitter will be 'hot' with RF signals.

Often, most of the radiation takes place from the portion nearest the feed-point, which is generally far too low down. If you must use a long wire, move its feed-point well away from the house, and feed it with 50 ohm coaxial cable.

Provided the VSWR is less than 3:1 you may still be able to match the system with an ATU at the transmitter end. Alternatively, move the ATU to the far end of the feeder, and tune the ATU by remote control.

Use only screened antenna feeders near to buildings

A screened feeder helps you ensure that only your antenna radiates or receives signals. Although coaxial cable is the obvious choice for screened feeders, some balanced antenna feeders can be screened too. For instance, you can make a screened balanced feeder by tuning two 75 ohm coaxial cables side by side.

Join the screens together at both ends, and connect the two 'live' conductors to the antenna at one end and to the ATU at the other. Leave the screen at the antenna end floating, but connect the screens at the ATU end to the station ground.

If an antenna system design demands 600 ohm open wire feeder, you can use an ATU directly below the antenna with coaxial cable entering the house.

Where and when to use a balun

If you feed a balanced antenna (eg a dipole) from an unbalanced feeder (eg coaxial cable) then use a balun between the two.

We know it seems to work alright without a balun, but omit one and all sorts of things can go wrong; the two legs of the dipole will radiate unequal amounts of power, and the outer of the coaxial cable will radiate up to 30 percent of the power.

Not only will this distort the beam pattern of the antenna, but it will bring RF signals back into the house, just where you don't want them. In any case, leaving out the balun will allow the coaxial cable to pick up all sorts of radiation from the house wiring, and pipe them straight into your receiver.

Ground the screens of all coaxial cables before they enter the house

Even if you follow all the good practice guidelines, you may still end up with RF currents on the outside of feeder cables, where these currents result from direct pickup of the radiated signal.

You can prevent this RF entering the house by grounding the screens of the feeders with short leads, to an independent earth, before they enter the building.

PUT YOUR OWN HOUSE IN ORDER

Cure all major breakthrough in your home

You should cure all major cases of breakthrough in your own home prior to any lengthy transmissions. After all, if you cannot solve your own problems, you can hardly expect your neighbour to cure his!

A household free from breakthrough can be a powerful tool for dealing with an upset neighbour, and solving the problems will provide some useful practice. If your household is free from breakthrough, your own television and radio can give you an early warning if anything does go wrong with the transmitter.

Install your own television and radio efficiently

The equipment in your household should be a model of good practice. Use outdoor antennas for FM radio and television and ground their feeders where they enter the house.

If the signal is small, use larger antennas instead of masthead amplifiers. Buy a hi-fi system which is well decoupled. If you feel you cannot do these things, then you cannot expect your neighbour to do them either.

KEEP A GOOD FIRST AID BOX

Collect knowledge on EMC

Your shack library should contain at least one book on EMC. If you are conscientious then buy them all. Remember — they won't be much help unless you read and try to understand them. Knowledge is a most powerful weapon when dealing with EMC problems.

Keep a good stock of filters

Your neighbour will be much happier if you react to his breakthrough problem immediately. You don't have to provide him with any cures if you don't want to, but you should have a sample of each type of filter to show him exactly what he needs.

A minimum kit for the HF operator should be a braid-breaker, at least four ferrite rings, a high pass filter for Band II radio and a high pass filter for Band IV/V television. The VHF operator should keep at least four ferrite rings, and a selection of coaxial notch filters, one for each band he uses.

Keep an auto CW key and/or a two tone oscillator handy

Ideally, two people are required to investigate a breakthrough problem — one to operate the transmitter, while you visit the neighbour. You will sometimes need to investigate a case on your own. Driving the transmitter with an auto CW key or a two tone oscillator as appropriate, will allow you to do this.

Apart from the need for frequency identification, you should monitor the band at regular intervals to ensure that your signals are not causing trouble to other radio amateurs.

FURTHER HELP

If this article has inspired you to further action, it is important to know where to go and who to ask for additional advice.

Chapter 17 of the *RSGB Radio Communications Handbook* gives quite comprehensive coverage of EMC. This coupled with Chapter 40 of the *ARRL Handbook* could well form a basis of your background reading.

This EMC Report is a reprint of a very informative paper published by the RSGB in *Radio Communication* April 1987. It was contributed by Norman Burton for the interest of AR readers.

AR

QSP

HSC—SCHWEIZ Amateur-Radio-Telegrafie High Speed Club HSC-Schweiz

The High Speed Club of Schweiz was formed in 1980 with the intention to cultivate harmonic co-operation with all people interested in amateur radio telegraphy. Club rules are written in five languages — German, French, Italian, Roman and English, a copy of which may be obtained by writing to the address at the bottom of this column.

The club is an entirely independent association with four types of membership — Honorary, Regular, Youth and Supporting members.

Further information write to:
Herm Gunther Eichhorn
Hofackerstr. 39 Sulz
8544 Rickenbach-Attikon

Club Corner

EASTERN ZONE CONVENTION

"About 30 members of the WIA were present at the meeting, which was the first meeting of the newly formed Eastern Zone. The above number included eight Zone members, Chairman of the Victorian Divisional Council, President of the Victorian Division and two other members of the COuncil; also the President and a member of the Northern Zone.

"Election of Office Bearers: Moved by Mr Giddings VK3DG, and seconded by Mr Scott VK3SS, that Mr Williams VK3WE, was duly elected. Mr Jardine VK3PR, was nominated by the President for the position of Secretary and was duly elected."

The above is an extract from the minutes of the inaugural meeting of the Eastern Zone held at the Railway Hotel, Warragul, on Saturday, May 14, 1938.

This year, the Eastern Zone celebrates its 50th anniversary. To mark this historic event, the zone is organising a convention which will be held at Moondarra from May 13-15, 1988. Accommodation will be provided for up to 100 people and meals will be supplied from lunch on Saturday through to lunch on Sunday, inclusive. It will be a family occasion with activities planned for everyone including the children. Moondarra is a scenic area between Moe and Walhalla and is only two hours drive from Melbourne.

(Please mark this weekend in your diary now).

It is also of interest to note in the minutes of the first meeting that VK3WG, VK3UK and VK3XZ were conducting some experimental Ultra High Frequency work on five metres. They informed the meeting that spot frequency crystals would be available shortly for use on the five metre band.

More details and registration forms will be available in April AR. For further information please contact Chris VK3KME, Ph (051) 27 5656 or Bill VK3KBM, Ph (051) 27 7616.

—Contributed by Chris Morley VK3KME

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AUSTRALIAN AMATEUR PACKET RADIO ASSOCIATION

Packet radio is expanding rapidly in Australia, as it is world-wide. This would be apparent to all packet operators whether they are using the mode on the VHF or HF bands.

In promoting the use of the packet mode, the Australian Amateur Packet Radio Association is in the forefront of many new developments which are already in use and others which are projected in the future. Although the headquarters of the Association is in Sydney, it's 370 members come from all Australian States and from overseas.

The proliferation of Packet Bulletin Boards and Digipeaters, which must of necessity share a common frequency, produces chaotic conditions during peak operating times in metropolitan areas. However, at the same time, the spread of digipeaters has provided a new interest for country operators and has enabled long distance connects on VHF during "quiet" periods. Connects have been achieved between Sydney and Melbourne on 144 MHz, utilising digipeaters at Mittagong, Tumut, Wodonga and Shepparton. This network has since expanded to include Canberra, Wollongong, Orange, Newcastle, Tamworth and Coffs Harbour with other digipeaters in between. Similar expansion has occurred in other States and under favourable propagation conditions, Queensland, Victoria and South Australia have been connected with New South Wales on 144 MHz via chains of digipeaters.

On HF there is no limit to the distances which can be covered. There have been problems associated with packet radio operations on 14 MHz due to the problem of finding "space" there. However, other HF bands are now being used with dual frequency modems making this simple and convenient.

As with the creation of the world, when order eventually emerged from chaos, it is hoped and expected that the same thing will occur with packet radio but much more rapidly! Just as Gentlemen's Agreements have been adopted for other amateur operating modes, it is to be hoped that packet operators will adopt some form of self-discipline to improve the situation on the popular VHF packet frequencies. There would appear to be no need for more than two Bulletin Boards to share the same VHF frequency in a particular area. Operators who persist in down-loading long files, messages and listings during peak operating periods are quite entitled to do so but they must expect to lose friends and annoy people — particularly if it is suspected that they have the opportunity of doing so at slack periods.

Meanwhile many of the congestion problems on 144 MHz will be overcome by the introduction of UHF "data highways" connecting Local Area Nets (LAN). Other techniques can be introduced to avoid most of the problems which arise from the need to use multi-station digipeating for long distance connects on VHF.

AAPRA is playing an active part in introducing these techniques, but unfortunately it all takes time. Much work and effort is needed to test digipeater sites obtain site approvals and licences as well as to prepare and install packet equipment and antennas. Local radio clubs and individuals do much of the site work but AAPRA Committee members are kept busy in a supporting and co-ordinating role.

Another AAPRA activity has involved the supply of kits and software for the XR modem to run on the Commodore series of computers. A number of amateurs, both in Australia and overseas, have taken advantage of this. Improved models of the modem to suit not only the Commodore, but also other popular personal computers are being developed.

The Association publishes a regular newsletter *Digipeat* and is expanding it's membership quite rapidly which is most encouraging in it's efforts to promote and co-ordinate the development of Packet Radio in Australia.

ar

REMEMBER

When inquiring about products published in AR, always mention where you read of the product!

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED IN NOVEMBER AND DECEMBER

WAVKCA (VHF) 52 MHz
29 VK2JEW
30 Peter Cosway VK3DU

WAS (VHF) 52 MHz
174 VK2JEW

WAVKCA
1561 Findlay Baxter GM3VEY
1562 Yuki Hishino JJ1KUV

DXCC
Phone
361 W J Matthews VK3WJ

CW
131 Ian C Fisher VK4FB

UPDATES
VK2AKP 281/283 ph, 281/283 op
VK2PU 183 ph
VK3DP 199 op
VK3DU 285/290 ph
VK4LC 308/343 ph
VK5WO 201/208 CW

FIELD AWARD
The Swedish Amateur Radio Society will issue the Field Award diploma to licenced radio amateurs and shortwave listeners for verified contacts with *fields*, as defined by the locator system adopted as from January 1 1985, (Maidenhead locator). Contacts on or later than this date are valid for the diploma.

The Field Award is issued in four classes:

BRONZE (basic award)	100 fields verified
SILVER (sticker)	200 fields verified
GOLD (sticker)	300 fields verified
PLATINUM (sticker)	All 324 fields verified

All amateur radio bands and modes are permitted. Endorsements will not be issued.

All contacts shall be made with stations on the surface of the earth.

Contacts shall be verified by QSL cards or their equivalent, on which the field or position is clearly stated with such accuracy that the field can be determined. The term "position" refers to latitude and longitude or to a place name.

If there is any uncertainty about a field, SSA may demand further information before approving the contact. If the uncertainty remains, then the contact will not be approved.

A random sample of individual QSL cards will be made, which must be sent in for checking.

The application shall be made on a GCR list. containing the information from each QSL card which is required for approval. The GCR list shall be verified by the applicant's national diploma manager or other official in the applicant's national amateur radio society.

The fee is SEK 30, 10 IRCs or US$4.

Application address is: Field Award Manager, SSA, Ostmarksgatan 43, S-123 42 Farsta, Sweden.

A world atlas, showing the new locator grid, has been produced by SM5AGM, which can normally be purchased from every National Amateur Radio Society.

The atlas can also be ordered from SSA by sending a SAE and six IRCs.

A record book for this award can also be obtained for $2 or five IRCs.

SCANDINAVIAN CW ACTIVITY GROUP
To support and encourage amateur radio CW

WORKED SCANDINAVIA ON CW: This new award with a beautiful Scandinavian landscape is issued in a limited number (500) by the Scandinavian CW Activity Group (SCAG), on the occasion of its 10th jubilee.

To qualify, non-European stations are required to work 50 different Scandinavian CW stations including LA, OH, OY, OZ, SM and TF Of these, at least five should be SCAG members.

Only contacts after January 1, 1988, are valid. No contest contacts will be permitted.

Application lists should be confirmed by two other licenced amateurs and show calls worked, date, time (UTC), band, QTH, name and SCAG membership numbers (ask for this during the QSO — no QSL cards are required).

The awards manager will check the lists and the first 500 applicants will receive their award by air mail. Upon receipt, please send the fee, US$7 or 17 IRCs.

Postal address is R Meilstrup OZ5RM, Bavnestien 6, DK-2850, Denmark.

WORKED BERLIN WEST AWARD (WBW)

To encourage the activity of amateur radio stations in the Berlin West area, the Ortsverband Schoeneberg DOK DO5 of the DARC is issuing the Worked Berlin West (WBW) Diploma.

The WBW is available to all licensed radio amateur stations (and SWLs on a 'heard' basis) fulfilling the following conditions:
Count confirmed QSOs with licensed radio amateurs working from the different 'Postal Delivery Districts' (PDD) of Berlin West. The PDD is a two-digit number following the name of the city of Berlin as apart from the address printed on the QSL card. For example: D — 1000 Berlin 37 denotes the PDD 37.

The WBW is issued in two categories:
GENERAL — OSOs in all allowed classes of emission
2 x CW — All QSOs in two-way CW

The WBW is issued in three classes:
CLASS C (Champion) — 30 PDDs confirmed
CLASS S (Senior) — 20 PDDs confirmed
CLASS J (Junior) — 10 PDDs confirmed

All QSOs after January 1, 1970 are valid for the WBW. No charges will be made for the WBW Class Champion in either Category, but a fee for the WBW in either Category is DM 5 or five IRCs. Stickers are available for all Classes in the same Category. For the first application the sticker will not be charged, for later applications the fee for the stickers will be DM 1 or one IRC. For Class Champion, the sticker will be free of charge. Send no QSL cards. A GCR list should be submitted, certified by two other licensed amateurs, signed by the applicant, and containing data about call, date, GTR, class of emission and PDD. The GCR list and fee should be sent to the WBW Award Manager, Detlef G Liebe DH7ACG, Zinnowweg 4, D-1000 Berlin 37, West Germany FRG.

REPEATERS & BEACONS

Tim Mills VK2ZTM
FTAC BEACON CO-ORDINATOR

A six metre repeater has become operational in VK2. Installed by the Newcastle UHF and ATV Group. VK2RSN will be on channel 3625 (53.625 MHz). It will use a minus 1 MHz offset. The area served is the Newcastle/Hunter Region. The other VK2 system is on channel 3850, as yet not be completed, will serve Sydney from VK2RWI.

It should be noted that two offsets are currently in use with six metre repeaters. The original band plan was based on a 600 kHz offset but this was amended a couple of years ago when the world chose 1 MHz. Systems with 600 offset will change in due course. That decision rests with the system controllers. Repeater outputs are between 53.600 and 53.975 MHz. Inputs are between 52.600 and 53.375 MHz, depending on the offset. The existing band plan has 16 channels with two per call area on a single use basis. The problem has arisen where a call area requires more than two systems. If suitable geographical and skip spacing occurs within the same call area it may be practical to re-use the same channel. The alternative is to use channels with the best skip isolation and put up with the co-channel interference that may occur during band openings. Commercial systems (repeaters) now operate at 40 MHz with quite close geographical separation with suitable tone access.

FTAC will continue to investigate the six metre planning.

Two metre repeater, VK2RDX 6650, in the Western Blue Mountains is out of service while its host support tower is replaced due to its age.

Has your repeater group found any corrections/additions to the list in January AR? If so, please send them to FTAC at the Federal Office.

ar

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

Jim VK4ZML and Bob VK4BAW (at the keyboard), in a determined effort during the 1987 RD Contest. The location was at VK4AHO's shack, Brisbane, and the call sign was VK4WIZ, of the Radio Amateurs Group.

The Host and Chef, David VK4NLV.

Left Top:

At a Christmas Barbeque for VK4 councillors and helpers, From left: Murray Kelly VK4AOK, Brian Rickaby VK4RK, Theo Marks VK4MU, John Aarsse VK4QA, Bud Pounsett VK4QY, Guy Minter VK4ZXZ, Val Rickaby VK4VR, Harry Standfast VK4ASF, Ann Minter VK4ANN, Ross Mutzelburg VK4IY, David Jerome VK4YAN and David Jones VK4NLV.

Centre:

Four 1987 Councillors: Bud VK4QY, John VK4QA, Theo VK4MU and Harry VK4ASF.

Left:

Three of the VK4WIA News Team: Theo VK4MU, (the 20 metre relay operator), John VK4QA (a major contributor to the news) with Bonnie VK4WIA News Reader.

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

COUNCIL NOMINATIONS

A reminder to members that nominations for the Council of 1988/89 close at the registered office of the Division, 109 Wigram Street, Parramatta, at 2 pm on Tuesday, March 15, 1988. Nomination forms are available from the office or in the form prescribed in the Articles. Agenda Items for the Annual General Meeting close at the same time. The AGM is set down for Saturday, April 30, 1988, at 109 Wigram Street, Parramatta, NSW, starting at 2 pm.

VK2 AWARDS

Details of the various awards introduced into VK2 have been given on the recent Divisional Broadcasts. Details will be published in the Awards Column of AR and elsewhere or leaflets are available at the Divisional Office. Send a self addressed stamped 230 x 110 envelope to PO Box 1066, Parramatta, NSW. 2150, for copies.

FORUMS

It is planned to conduct three or four forums at Amateur Radio House during 1988. If you have a subject you would like discussed or a lecture given on, please advise the Council via the office.

CONFERENCE OF CLUBS

This will be held on Saturday, April 16, and if the business requires it, it will continue on Sunday, April 17. Host will be the Fishers Ghost ARC. Close of club agenda items must reach the Divisional Office by the beginning of March. Any agenda items for the Federal Convention must also be received at the office by Friday, March 11. (The Federal Convention will be held in Melbourne over the weekend April 23/25).

Trash and Treasure in the Parramatta car park — 2 pm on Sunday, March 27. The Postcode Contest for this month will be on Friday, March 9, to 11 pm. Logs must be received by April 6. Further details are on the AX2WI Broadcast.

BAND OPENINGS ACROSS THE TASMAN

During January there were several openings to New Zealand. Around January 13/14, the opening extended up to at least 1296 MHz. At the time these notes were prepared, at least Dick VK2BDN and Ross VK2ZRU, had worked Brian ZL1AVZ on 23 cm. The VK2RSY 1296.420 MHz beacon was also heard by ZL1AVZ.

VK2AWI BBS

A digipeater is to be installed at Dural to provide a better service area. VK2AWI operates on Channel 4850, which is shared with VK2 WICEN.

PARRAMATTA BICENTENARY

Celebrations will be observed during November and the Division will be mounting a station to work from the various historic sites within Parramatta City. Aub VK2AXT, is co-ordinating the operation.

WICEN

This month there are several operations. The Bungonia Cave rescue exercise is on the 12/13. The car rally, refer to January AR and Taree WICEN has the Great Lakes Triathlon at the end of the month. Incorporation for WICEN is still proceeding slowly.

BLANK QSL CARDS

A new range of blank QSL cards are available for purchase from the Divisional Office. They have been redesigned to include the Bicentenary logo.

ADVANCE PUBLICITY

If your club or group is holding a field day or some other event and you require publicity in AR, then do not forget the lead times. Send your material to Club Corner. If required in the May issue copy should be at the Federal Office by March 20. (Deadlines are always listed below the index on page 1 and at the beginning of Hamads of each issue of AR).

NEW MEMBERS

A warm welcome is extended to the following new members who were in the January intake.

B J Barton VK2MDV	Fishermans Paradise
E L Collett VK2FGC	Coal Point
T M Craig VK2FHF	Glebe
L K Fanning VK2DOJ	Greenwich
R J Freedman VK2MCU	Merewether
L T I Hansson Assoc	Turramurra
D E Havinden Assoc	Belrose
O L Holmwood VK2AEJ	North Sydney
K H Miller VK2XKM	Kotaea South
C Mlynarik VK2CMK	West Pymble
E N Napper VK2VMP/FIN	Emerald Beach
C F Needham VK2XGV	Mount Pritchard
P Ofner Assoc	Mosman
V N Stafford Assoc	Copacabana
D J Wade VK2XIT	Penrith
R C Wallace VK2XFR	Warringah Mall

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WA Bulletin

Fred Parsonage
VK6 HONORARY SECRETARY
PO Box 10, West Perth, WA. 6005

NOTICE OF AGM

It is hereby notified that the Annual General Meeting of the Western Australian Division of the Wireless Institute of Australia will be held on April 19, 1988, following the General Meeting, which commences at 2000. The meeting will be held at the Westrail Centre, West Perth.

AGENDA

1. Consideration of the Council's Annual Report.
2. Consideration of the Financial Report.
3. Consideration of other reports.
4. Election of office bearers, viz: President and Vice-President of the Division and seven other councillors.
5. Election of two auditors.
6. Appointment of a patron.
7. General business which has been duly notified.

Notices of motion for the AGM must be received by the Secretary not less than 42 days prior to the meeting and must be signed by at least three members.

Nomination of a candidate for election to Council must be received by the Secretary in writing not less than 42 days prior to the meeting with an intimation that such candidates are willing to act. A candidate may submit a statement not exceeding 200 words outlining his or her case for election and experience. Each nomination shall be signed by two members proposing the candidate. Candidates must possess a current amateur licence.

PROXIES

Any financial member entitled to vote may appoint a proxy, who must also be a financial member entitled to vote, to speak and vote on his/her behalf. Each such proxy must be in the hands of the Secretary prior to the meeting and be in the following form:

I, ... a member of the Institute hereby appoint . . . . . also a member of the Institute to act for me as my proxy and in my name to do all things which I myself being present could do at the meeting of the Institute held on . ./. ./. . . .
Signed: .....

Witness: .....
Date: .....

GENERAL MEETINGS

All members please note that General Meetings of the Division are held on the third Tuesday of each month in the Westrail Centre, East Perth.

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QSP

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REDUCE QSL CARD COSTS
Can we do it in VK?

As QSL cards become more expensive every time you purchase them, wouldn't you like to be able to make your own and eliminate the need to purchase expensive printed cards.

This may not be as difficult as it sounds . . . Several hobby shops in Canada are now marketing a Do-It-Yourself, silk screening kit which is especially made for posters, greeting cards, and QSL cards. You design the artwork, sensitise a piece of silk stretched across a wooden frame, with a liquid supplied, place your artwork over this silk and expose to light.

Then dip the silk and frame in solvent and you get a negative of our artwork. With a sponge ink is then forces through the silk onto your cardboard blank — and there you have a distinctive QSL card for a fraction the cost of a commercially printed card.

—Contributed by SEQTG RTTY News Bulletin

QRM from VK7!

John Rogers VK7JK
VK7 BROADCAST OFFICER
1 Darville Court, Blackman's Bay, Hobart, Tas. 7052

The first part of this month's QRM has a decidedly nautical flavour because, just as this was being written, one group of amateurs have been discussing the outcome of the radio communications support they provided to the Westcoaster Melbourne to Hobart Yacht Race. This appeared to have been a very successful service and congratulation were forthcoming from the Commodore of each yacht club involved and from the skipper of one of the participating yachts.

There were 18 amateur operators fully taken up with the communications system, and although they were based at the Derwent Sailing Squadron Headquarters, in Hobart, they were drawn from all over the State. Not only were they concerned with the safety and positioning contacts, but with ATV coverage, information displays (on VDU), and computerised graphics to keep everyone (including the media) up to date. If it is deemed necessary, we hope to repeat the exercise next year. In the meantime, any amateur wishing to prepare for that task, and wanting to obtain a Restricted Maritime Operator's Certificate, should contact the co-ordinator of the local branch for a Study Guide Book.

The second point with a nautical emphasis is that of the Tall Ships Event which took Hobart completely under its spell for the duration of its stay. Not only the professional broadcasters were talking about it day and night, but the amateur airwaves were full of it too. Anyone who had access to a boat was out on the water — the number of MMs was quite phenomenal! A never to be forgotten episode, even for those who turn green at the thought of being water-borne.

The International Orienteering Exercise was covered by the southern WICEN group last January and it gave us the chance to put into serious practice the lessons we had learned in earlier "dummy runs".

The Bicentenary Vintage Car Rally was due to thread its way through Devonport on March 10 and 11, and traffic for this event has to be passed back to WICEN Headquarters in Canberra, so it is clear that involvement in these communication support activities is becoming more and more frequent, and thus needs more and more participants. Your local co-ordinator would appreciate an offer from you of some form of active support. Short instruction sessions are included in most weekly broadcasts.

WIA MEETINGS IN MARCH

IN THE NORTH-WEST: at the Penguin High School, at 8 pm, Tuesday, March 8.
IN THE NORTH: at the Launceston Maritime College, at 7.30 pm, Friday, March 11.
IN THE SOUTH: at the Activity Centre, 105 Newtown Road, Hobart, at 8.15 m, Wednesday, March 2.

Please do not forget the Divisional AGM to be held on March 19, at Rutherglen, at 1400 hours.

Interested parties should now be keeping a watch on the 145.825 MHz frequency of the Nordskicomm Ski Trek across the North Pole from Russia to Canada.

The new broadcast roster is now in use and will last through to the end of May. A total of 30 amateurs is now involved, which means that the load on any one operator is much reduced. Five relay frequencies are used each Sunday morning, and the broadcast is repeated on 3.590 MHz only on Tuesdays at 1930 local time. No call-backs are taken to this repeat because, on completion, it transfers directly on to the Devil Net with Bob VK7NBF. However, reports have been received from VK1, VK2 and VK3 of good signals, so the experiment appears to be working successfully. Information on the actual frequencies has been published elsewhere in AR.

You may remember that last month, we mentioned that the southern area is to be responsible for the 1988 Tasmanian Amateur Radio Convention. Well, this is the month in which the TARC Committee is to present its planning brief, and from here on, right through to the Bicentennial TARC itself, action, not talk, will be the order of the day. A detailed update will be forthcoming in next month's AR.

WICEN (South) Co-ordinator, Alan VK7CI says: "The recent outbreak of bushfires in the south of the island must serve as a timely reminder that this form of natural disaster is still the most likely to threaten our population centres during the summer months. With this thought in mind, urgent attention has been given to finalising the call-out procedure for the Southern Group." As a result of the experience gained in the exercises conducted during the past two years, this group has been divided into four sections:

1. Headquarters section: Base stations and the link to SES. Also responsible for setting up a roster of relief operators.
2. Satellite section: Mobiles with HF and VHF capability. Self-sufficient in power, rations and accommodation for several days. These vehicles would be the first WICEN units in the field and would establish early contact with the Base Stations.
3. VHF mobiles: Vehicles to operate in advanced positions and communicate with Base Stations via satellite units if necessary. The outstanding feature of this section is its mobility.
4. VHF special section: Has the expertise to set up special VHF links and repeaters where necessary and to meet unusual communication needs in the case of a protracted emergency.

Each section has a co-ordinator responsible for its mobilisation. In the meantime, let us keep our batteries charged, our equipment in a good state of serviceability and our fingers crossed in the hope that it will not happen.

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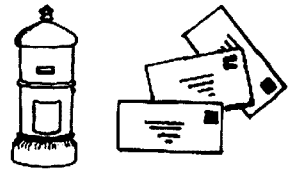
Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Over to You!



CORRECTION

I was reading the discussion paper by John Anderson VK5ZFO, with some interest until I choked on the phrase, "The USA amateurs have just lost two megahertz of their 220 MHz band . . ."

I would like to inform the WIA membership that this statement is most emphatically not correct. We have not, as of this date, lost anything at 220 MHz, nor do we intend to do without exhausting every available avenue for its defence.

This in no way detracts from the point John was trying to make; indeed, the reason we have been able to mount a rigorous and, I believe, an ultimately successful defence of the band is because we have a strong national organisation, and a large body of members willing to respond when their help is needed on an important issue.

Collaborating with VK amateurs has been among the bright spots in my amateur radio career. From this experience, I'm confident that the WIA will emerge from its self-analysis with even greater vigour than before.

73,

Sincerely,

David Sumner K1ZZ
Executive Vice-President
The American Radio Relay League, Inc
Newington, Connecticut, USA. 06111

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FEW TRICKS

Many thanks for the excellent presentation, in the January 1988 issue of AR, of my article about the two metre beam tilting device.

Unfortunately, the Printer's Devil has played a few tricks, some of which might warrant a correction:

1. "was" has been inserted between "vice-versa" and "most" at the end of Para 2 — does not make sense.
2. In Para 4 the capacitors are stated to be in the -ve line. They should be in the +ve line — where they obviously belong.
3. In Para 7 there should have been a "the" between "to" and "exact".
4. In Figure 2 a line connecting pins 4 and 8 of the 555 has been added — there was one already, and now there are two!
5. In the Appendix, line 3, the α is missing from cos α.
6. In Para 3 of the Appendix it says "La must be two times Lm". This should be $\sqrt{2}$.
7. In the next line the square-root line should not be over the entire equation but only the 2.

In the Appendix, Table 1, the figures for **B** for the angles 150° and 165° should read 10° less, ie 82.76 and 88.08 respectively.

However, I appreciate the generous space given my article and the, as usual, excellent reproduction of the drawings.

Yours sincerely, with 73

George Cranby VK3GI
PO Box 22
Woodend, Vic. 3442

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STAY WITHIN. . .

With reference to the letter by Arthur Oliver VK6ART, in the December issue of AR, the Band Plan mentioned does, in fact, not permit Packet Radio above 14.100 MHz. For a long, long time the RTTY operators have respected the use of *their* part of the band; ie 14.070 to 14.099 MHz, and the CW and SSB users have likewise not invaded that area. Within the past month it has become patently obvious that packet operators are intent on spreading themselves over a much larger portion of 14 MHz. Stations have been heard operating from 14.052 to 14.125 MHz with no respect for frequencies already in use.

The once sacrosanct frequency of 14.100 MHz is now, for much of the time, useless for the monitoring of beacons.

The Traveller's Net, run by Art, has been providing an important link with amateurs in remote areas of the country and with maritime mobile stations in the Indian, Pacific and Arafura Oceans, and has, on countless occasions, given emergency aid to people who may, otherwise, not be around to tell the tale! The frequency 14.106 MHz is known world-wide by all who travel and has been respected by *all* other amateurs — until now.

Packet radio has its place just as much as any other mode, but it, like SSB, CW and RTTY, etc, should abide by international allocations and stay within the area set aside for narrow band transmissions.

Yours faithfully,

Barry Clarke VK5BS
17 Sycamore Avenue
Novar Gardens, SA. 5040

ar

* * *

CONTEST

If there has been a lot of thought put into the 1987-88 Ross Hull Contest format and rules, as implied by the new contest manager, one must seriously question the quality of that thought.

Sure, the format and rules are markedly different from those in the past but mere change was not what was required. It has to make sense. This lot doesn't even come close to that goal. Let us look at a few of the minor anomalies:

1. In some cases, eg Melbourne, the border between the Maidenhead squares run through the city thus permitting stations located there to collect up to 3 x 22 = 66 points per station pair for working over their back fence. This is supposed to even things up across the whole country?
2. Suppose a station in QF56 can work several stations in QF21 on a particular band but a particular station in QF21 can only work that one station in QF56. A very common situation on the two metre band. Suppose further that, during the contest, the QF56 station has worked several in QF21, but not that particular one in question, until on the last day both have notched up the same number of points.

On this day the QF56 station hears the QF21 station calling CQ and knows that a contact is possible. Does he answer? Not if he has his wits about him. That contact would only be worth one point to him but it would be worth 51 points to the QF21 fellow, wouldn't it? What are we playing? Amateur radio or Strategy? Surely it is a fundamental rule that a contact must be worth the same points to both parties at all times.

3. Contacts via repeaters are not permitted. Makes sense maybe, but contacts via satellites are permitted. What is the difference? Are we having a contest or seeking to satisfy someone's idea of what should or should not be encouraged this year? Perhaps next year someone will decide to encourage the use of quad antennas over Yagis and so contacts between stations so equipped will be worth more points. Surely we must decide just what precisely is the object of the exercise and stick to it. The object certainly is not to encourage this or that group of your mates this time around.

The fundamental thing wrong with the Ross Hull Contest is that it is ***too long*** and following from this comes the realisation that it is held at the wrong time of the year. It is ***not*** a VHF/UHF contest's bootlace! The essence of VHF/UHF competition is distance worked without assistance from outside influences and, until such time as that fundamental fact is recognised and catered for, the Ross Hull Contest will continue to go downhill. Come to think of it, that is also the essence of amateur radio as a whole and the same prediction applies in that wider sense also.

73,

Gordon McDonald VK2ZAB
59 Wideview Road
Berowra Heights, NSW. 2082

ar

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AMATEUR RADIO? YOU MUST BE JOKING!

As I recall, the current debate on the future of amateur radio started when someone came up with the statistical evidence that indicated that amateur radio ranks were not being filled at the same rate as the increase in population as a whole and that, seen from this aspect, amateur radio was declining in popularity as a hobby.

Since that time we have witnessed the publication of umpteen letters and articles telling us how to rectify the situation or else questioning whether or not it needs rectification.

All of these suggestions have come from amateurs or near-amateurs and it seems to me that these people are not really in a position to know much about the best way to change the situation.

If you were going to try to market something you would not rely on the opinions of your immediate family as to whether or not this or that feature of the product would sell, would you? Of course not; you would do a market survey to try to determine what features prospective buyers wanted so that you may be able to fill those requirements, increase sales and maximise profits. Elementary!

We are trying to market amateur radio as a hobby so instead of forming committees to incestuously pontificate about it we should be trying to determine why those groups of people who have traditionally supplied recruits to amateur radio are not doing it any more. We can so this be asking them.

One such group of people are those who are already associated with radio and/or electronics, either as hobbyists or because they work in the industry, or both. I know that these people do not become amateurs at anywhere near the rate that they did in the past because I have read the findings of surveys conducted among RF engineers in the USA and because I work at AWA where amateurs were once "thick on the ground" and where they are now as "scarce as hen's teeth." There is also other evidence which I can supply to anyone who is interested, however I would be surprised if anyone doubted that these people are largely giving amateur radio a miss.

Over the past few years I have asked many people where I work and in components stores, both here and in the USA, why they don't take out a licence and get on the air.

The reasons given are varied, of course, but the general theme is that amateur radio is seen to be somewhat out of touch with the latest technology and that amateurs are quaint old fellows locked away in shacks playing with Morse keys. Who would want to be associated with them? Sure, it may be interesting to get on the air and make contact with people around the world whilst conducting experiments, but in order to do that you have to learn Morse code. You have to be joking, we are not that interested.

Contrary to the idea expressed by many amateurs, Morse code is not seen as an interesting

challenge at all. It is seen as a demeaning chore imposed on prospective acolytes so that they may gain access to the inner sanctum and thereby associate with . . .'er . . .'er . . .what? It is like the condition imposed on the ambassador of a major power that he must enter the throne room of some irrelevant petty despot through a low opening so that he will arrive in the exalted presence in a suitably cowed attitude. No one with grit would consider it.

There is absolutely no doubt that the continued retention of the compulsory Morse code requirement is the main reason why amateur radio is seen to be an anachronism of no relevance to present day radio enthusiasts and the main reason why those people do not become amateurs.

The compulsory Morse requirement should be discontinued immediately, not after 1992. It would not come as a surprise to me to find that a survey of other groups of prospective amateurs indicated the same thing. Over to you!

73,
Gordon McDonald VK2ZAB
59 Wideview Road
Berowra Heights, NSW. 2082

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* * *

WIA HANDBOOK

After reading the Editorial in the November 1987 issue of *Amateur Radio*, I offer a late suggestion for an Australian Radio Amateur Handbook based on the style of the DIY Pro-File series of magazines on sale through newsagents at the moment. It would require an alteration to the size or layout of AR by way of a wider margin on the binder side of the pages and a series of holes punched down that edge.

I agree that an Australian Handbook is needed and should be published. I feel that by changing AR we can have the best of both worlds at a sensible price. You only have to look at recent issues of AR to realise what a wealth of information is included in every issue; VHF/UHF Building Blocks, Safety Around the Shack, and the EMC Report are only examples from one issue.

If all of this could be easily filed in one or more good quality binders, then it would only take several years to build up a comprehensive, up-to-date, perpetual handbook rather than have the situation of buying a book today and have a new version (at great cost) hit the news-stands in 12 months time.

Following are requirements for implementation:
* change the size or layout of AR
* wide margin down binder edge
* filing holes punched into binder edge
* second page numbering system; ie section, page number, version/issue to suit handbook
* possibly a loose leaf style with plastic binding as on the DIY Pro-File series or even stapled
* change layout of AR, so articles start on odd-numbered pages only
* use non-handbook items, or relevant fillers, to fill pages and not mix items from different sections of the handbook, particularly on the even-numbered pages
* provide binders and section separators for handbook (at extra cost)
* provide an annual index that covers many years and is fully cross-referenced (separate section in handbook)

Advantages are:
* no or minimal cost penalty to the WIA
* very little extra cost to members
* no duplication of articles/effort between AR and the handbook
* an Australian handbook which is easily updated/amended and which is relevant

Disadvantages are:
* it could take several years to build up a worthwhile handbook
* AR as we know it will disappear to become a monthly series of handbook articles

I cannot comment on costing to implement the necessary changes to AR to achieve this proposed handbook, but feel very little would be involved. After all, the main changes required are in layout and the choice of filler articles. The only question mark is the widening of the binder margin and the provision of filing holes and I do not know what is possible or required here.

I too am waiting for the arrival of an Australian handbook and have set up a file of articles similar to my proposal outlined above but using A4 sized "refillable display books". These are available in several colours from several manufactures and contain 20 clear pockets with refills of 10 pockets also available. It requires that I cut up each issue of AR and even photocopy some pages and then file them. A list of contents has been worked out to suit the binders and work will have to be done on writing out a cross-referenced index based on the annual index from AR.

This method suits me at this stage as it also allows the filing of articles from other sources as well but cannot hope to replace a well indexed, planned handbook. It is more than likely that the ideas outlined above have already been expounded and considered by the WIA, but I offer them for what they are worth. In the meantime I will continue with my temporary handbook! Thanks to all concerned for all the great articles so far, keep up the good work and don't drop your standards. I am prepared, and indeed expect, to pay more for quality.

For interest, this is the the layout of my temporary handbook:
1. (Green) — Principles; components; interference; operating techniques
2. (Black) — Modulation systems; RTTY; SSB; propagation; packet
3. (Maroon) — Power; safety; regulations
4. (Brown) — HF equipment; VHF; UHF; TV; mobile
5. (Yellow) — Test equipment; measurements; station layout; workshop practices
6. (Blue) — Aerials; transmission lines; data and tables; index.

The list is always subject to change and each binder has its own expanded contents list. I hope the above may be of some assistance.

Yours sincerely,
Colin Hay VK2ZHC
6 Noamunga Street
Boat Harbour, via Anna Bay, NSW. 2301

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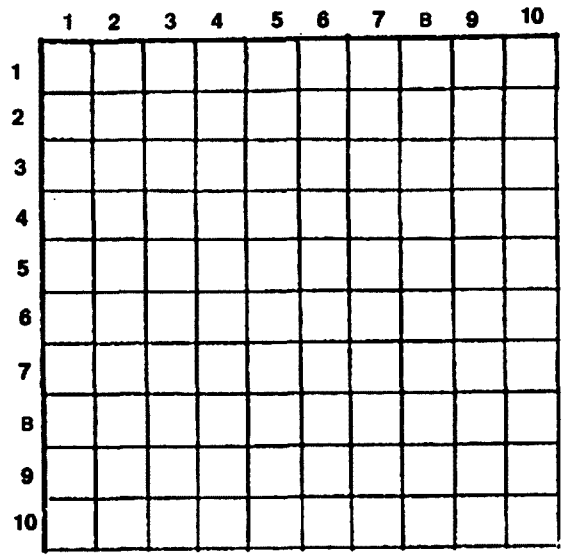
MORSEWORD© 13

Compiled by Audrey Ryan

30 Starling Street, Montmorency, Vic. 3094

ACROSS		DOWN	
1	Verse	1	Magician's Rod
2	Throw off	2	Powder
3	Dog	3	Change position
4	Ward off	4	Skin
5	Review (abbr)	5	Strap
6	Innards	6	Mouth (colloq)
7	Type of sauce	7	Prison
8	Melt	8	Sight
9	Blaze	9	What cows chew
10	Sudden attack	10	Combine



Solution see page 63. . .

Silent Key

It is with deep regret we record the passing of:

MR I A R POLSON VK5UT

Obituaries

LEO S MEYERS VK2KS

Well-known and longstanding member of the amateur fraternity, Leo VK2KS, passed away on December 15, 1987, after a short illness.

Leo was licensed as VK2KS on January 2, 1935, and became an active DXer on both CW and 'fone. His call sign became well-known throughout the amateur world. A member of the WIA from those early days, Leo retained his interest in the Institute's activities and remained a member through the years.

As a fellow member of the old Lakemba Radio Club, the writer, along with other prospective amateurs of the day, was introduced to the practicalities of amateur radio, particularly by Leo.

At the outbreak of war in 1939, Leo, who had been an active member of the RAN Reserve, was soon on active service with the Royal Navy. He served in the Navy from 1939 until 1946, initially in the Atlantic zone and later with the RAN Naval Commandos in the Western Pacific, serving at such places as Morotai and taking part in the D-Day Landings at Tarakan (where our paths again crossed) and Balik Papan.

Apprenticed as an Electrical Mechanic to the New South Wales Railways in pre-war days, he resumed his career in that service after his discharge from the Navy. At the time of his retirement some nine years ago, Leo had advanced to the position of Telecommunication Design Engineer and had been responsible for many innovations in two-way radio communications and the application of microwave links and various electronic facilities within the NSW Railway system.

In their retirement to the Blue Mountains, Leo and his wife, Sybil, lived in close proximity to their daughter, son-in-law, and grandchildren. Here, while building a fine garden around their new home, Leo maintained an active interest in VHF and HF amateur operation, including CW.

Sincere condolences are extended to Leo's wife Sybil, daughter Karyl-Lee, son-in-law Alex, grandchildren Damien and Larissa, and brothers Frank and Bernie.

Keith Sherlock VK2WQ
ar

RAYMOND JOHN FOXWELL VK5ZEF

Some six months have passed since the untimely passing of Raymond John Foxwell VK5ZEF, Amateur Television Operator and publisher of *The ATVer*. Whilst the following does not claim to be definite, I wish to put on record something about the contribution that Ray made to the Australian amateur television fraternity.

My first encounter with Ray was upon my return to the VK5 ATV scene in 1974 after an absence of some six years. During that time Ray had become the undisputed mentor of the (as yet informal) SA ATV Group which consisted of a handful of ATV experimenters on what was then the new 70 cm amateur band.

In the years that followed, I got to know Ray as a colleague, a man with the common touch, and one who was always ready with an offer to help a fellow ATVer. There was never enough hours in the day for Ray, not in the sense of his being in a hurry, but that he always had more plans afoot (both of his own and to help others) than any mortal could possible hope to accomplish. Indeed, he often used to joke that his middle name should have been "Gunner" because he was always "gunner do this, that or the other"!

Ray was very self-sufficient; he would tackle all of his projects single-handedly from go to whoa. For instance, he established his own printed circuit board manufacturing facility; for *The ATVer* he acquired a photocopier and duplicator and carried out all the writing, editing, layout, printing, collating and posting himself. He designed and laid out both RF and Video ATV circuit projects and he made his printed circuit boards available, to whoever wanted them, for next to nothing.

Over the years, Ray made significant contributions to the first Australian ATV Repeater, VK5RTV, by way of receiver preamplifiers, converters, IF strips, and antennas. And, I think it quite likely that there would scarcely be a VK5 ATVer who has not been materially assisted by Ray over the years. And by means of *The ATVer* even ATVers outside South Australia were served as well.

I must confess that, at times, I felt frustration waiting for a promised PC board, or the next edition of *The ATVer* to come out, but the delay would invariably be because of the impossible load that Ray had set himself. Indeed, if Ray had a fault, it was that he just could not say "No" to anyone who asked of his time!

ATV was the richer because of Ray Foxwell VK5ZEF, and it has been made the poorer by his passing. His name will be remembered as long as one of his ATV circuits is still in use, and that will be a very long time!

John Ingham VK5KG
for the SA ATV Group
ar

CHITARY MORIYAMA JH6THP

All who met Chitary, either in person or on the air, will be saddened to learn that he died last December.

Chitary became interested in amateur radio soon after being to the Kawatana National Hospital. He was suffering from progressive muscular dystrophy and the disease was so far advanced that he was unable to walk, had no use of his arms and his life expectancy was very limited. Despite these severe handicaps, Chitary studied for the licence which he obtained in 1974 and began operating on 15 metres sideband using a rotary beam, tower and transceiver installed by local amateurs. In 1978, he graduated to a higher grade of licence which enabled him to use 20 metres and higher power. With his cheerful manner and excellent idiomatic English he made many friends. Several VK amateurs who visited Chitary at the hospital near Nagasaki found the experience deeply moving.

He founded the hospital club station, JA6ZCY, and the Pacific Amateur Radio Society.

Arising from his many contacts with Australian amateurs Chitary became very interested in visiting this country. His dream was realised in 1981 with the assistance of the Australia-Japan Foundation and Rotary International of Japan during the Year of the Disabled. Ably supported and tended by his brother, Mashio, he visited Sydney, Canberra and Melbourne and enjoyed sightseeing, attending club functions and visiting private homes.

Chitary was the subject of AR articles in 1977, 1981 and 1982.

Perhaps it was because of his indomitable spirit and keen interests Chitary's lifespan of 37 years was a little longer than most PMD sufferers reach.

Sayonara Chitary. You were a fine ambassador for your country and for amateur radio and an inspiration to all who met you.

Alan Elliott VK3AL
ar

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SOLUTION TO MORSEWORD© 13

Across: 1 poem 2 cast 3 cur 4 fend 5 crit 6 guts 7 soy 8 thaw 9 fire 10 raid.

Down: 1 wand 2 dust 3 move 4 hide 5 belt 6 gob 7 cage 8 view 9 cud 10 merge

	1	2	3	4	5	6	7	8	9	10
1	•	—	—	•	—	—	—	•	—	—
2	—	•	—	•	•	—	•	•	•	—
3	—	•	—	•	•	•	—	•	—	•
4	•	•	—	•	•	—	•	—	•	•
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9	•	•	—	•	•	•	•	—	•	•
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All copy for inclusion in the May 1988 issue of *Amateur Radio*, including regular columns and Hamads, must arrive at **PO Box 300**, Caulfield South, Vic. 3162, at the latest, by 9 am, March 21, 1988.

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

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AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS**, Box 157, Mortdale, NSW. 2223. (No inquiries at office please . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

COMPONENTS: Wide range of parts for receiver, transmitter and other electronic equipment. Semiconductors, valve, plate bypass capacitors, coaxial connectors and many more. Mail inquiries welcome. Sorry, no catalogue available. D Dauner Electronic Sales, 51 Georges Crescent, Georges Hall, NSW. 2198. Telephone: (02) 724 6982.

WANTED — ACT

KENWOOD AT-230 ANTENNA TUNER: (consider AT-250 or AT-130). FM-430 FM board, YK-68C or YK-88CN filter, SP-430 speaker, MS-1 mobile stand for TR-2500, MC-60A or similar scanning desk top mic. VK1ZVR. Ph: (062) 58 9333.

QSL CARDS: for WIA QSL collection. Rare DX, uncommon & commemorative prefixes, pre-war & excellent pictorial designs especially appreciated. Please write to the Curator, VK3TL, Box 1, Seville, Vic. 3139, or ph (059) 64 3721 & cards will be picked up from your home if you live in the metropolitan area. For country & interstate readers, arrangements for pick-up can be made by contacting the Curator.

WANTED — NSW

FT-101 or TS-520 TCVR: Only complete unit performing at or near spec considered. Pay to round $450 for good clean unit. Max VK2CMS, QTHR. Ph: (050) 30 2464 (Let it ring out).

KENWOOD TR-7400A: 2 metre transceiver in good working order. Contact Herb VK2UJ, QTHR.

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WINCH-UP MAST: around 10 metres. No towers. All calls welcome. Contact Bob L20059, QTHR. Ph: (02) 609 4618.

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B2, MCR OR SIMILAR RADIOS: Gary Cain W8MFL, 1775 Grand #302, St Paul, Minn, 55105, USA.

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FOR SALE — ACT

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COPPER WIRE: 6mm, 6 strand, approx 100m on wood reel. $70. Portable National Panasonic Radio. Battery, medium wave, 530-1600 kHz, shortwave 5-18 MHz. $25. Ex cond. Ph: (055) 62 6016.

HF TRANSCEIVER: Kenwood TS-180S including CW and SSB filters as well as memory board DC V. Output power can be varied from 10 to 100 watts. Ex cond. $950 ONO. 16 element 2m Yagi $150. Frequency counter up to 150 MHz. $150. Ph: (03) 726 7137 after 8H.

FOR SALE — TAS

ANTENNAS: Mini-multi 3 band, 3 element Yagi. $120. Quad kit complete, aluminium spider hub, fibreglass spreaders, 3 band, 2 element $170. VK7JY. Ph: (003) 27 2011.

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The other features on these all-new marvels of technology include: built-in 99-channel large memory capacity; advanced remote control system; easy-read soft orange LCD display; memory scan, programmed scan, selected mode memory scan and skip scan, for absolute scanning versatility; full break-in function; and a high sensitivity, high dynamic range RF amplifier.

The new dual bander IC575A/H also comes with a built-in RF pre-amplifier. And options such as an EX-20 automatic antenna selector; CT-17 CI-V level converter; AH-610 28 MHz/50 MHz dual band antenna; and a CT-16 satellite interface unit which is also available for the single band units.

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Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL. 56, No 4, APRIL 1988

KENWOOD

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Amateur Radio

Maria VK5BNT, organiser of the 1987 ALARA-meet.

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DEADLINE

All copy for inclusion in the June 1988 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, April 18, 1988.

Amateur Radio

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Inquiries and material to:
The Editor,
PO Box 300,
Caulfield South, Vic. 3162.

Material should be sent direct to **PO Box 300, Caulfield South, Vic. 3162,** by the 20th day of the second month preceding publication. **Note:** Some months are a few days earlier due to the way the days fall. Check page 1 for deadline dates. **Phone: (03) 528 5962.**

HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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Editor's Comment

THE NEAR AND DISTANT FUTURE

To begin in the immediate past, it is with some reluctance (there are people who would call it laziness!) that I allow myself to be pushed back into the hurly-burly of editorial life. Our month in New Zealand was very enjoyable, although somewhat tiring, and it seems appropriate not to jump straight back in with both feet, but take it easy for a while!

Only three days after posting my last "Comment" (at Westport, on the South Island) we had the great pleasure of renewing acquaintance with Terry Carrell ZL3QL, who is President of the NZART. It turned out that he was heading for Queenstown for a few days break, and arriving on the only night that we were there. This was gleaned via the Queenstown repeater (the highest in New Zealand at 2286 metres) and Terry and Russ ZL4JW were with us at our camper-van not long after. We were delighted to accept Terry's invitation to his home at Christchurch just a week later, together with Craig Crawford ZL3TLB, editor of *Break In*. Both our magazines share a number of problems, probably the greatest being high costs and relatively small circulation, and the possibility of in some way sharing some of these costs is being considered. As has been custom for some years, each of our Societies invites representatives from the other to its annual Convention, and Terry will be with us later this month. Trans-Tasman co-operation will certainly develop even more.

Organisational changes at home are also on the Convention agenda. There is a motion from VK3 to bring about a referendum of all members on a proposal to disband the Divisions and convert the Institute into a unified national body (as NZART, and for that matter most of the world's amateur societies, already are).

Much further into the future, I was intrigued to hear of a reply by an un-named VK4 to my editorial question in February as to whether amateur radio will still exist in 2188. So far, I have only heard his letter read on a Divisional broadcast, and have not seen a copy, but after talking about gravitational waves he goes on to suggest that neutrino flux may be a future communication medium. It may even be that by this means we (or rather, our descendants) could be able to communicate instantaneously over interstellar distances with intelligent aliens! I wonder whether any of them will be readers of Volume 256 of *Amateur Neutrino* (formerly *Amateur Radio*)? If it is imaginable, it will happen. Even if it is unimaginable it is still a possibility. Or is it?

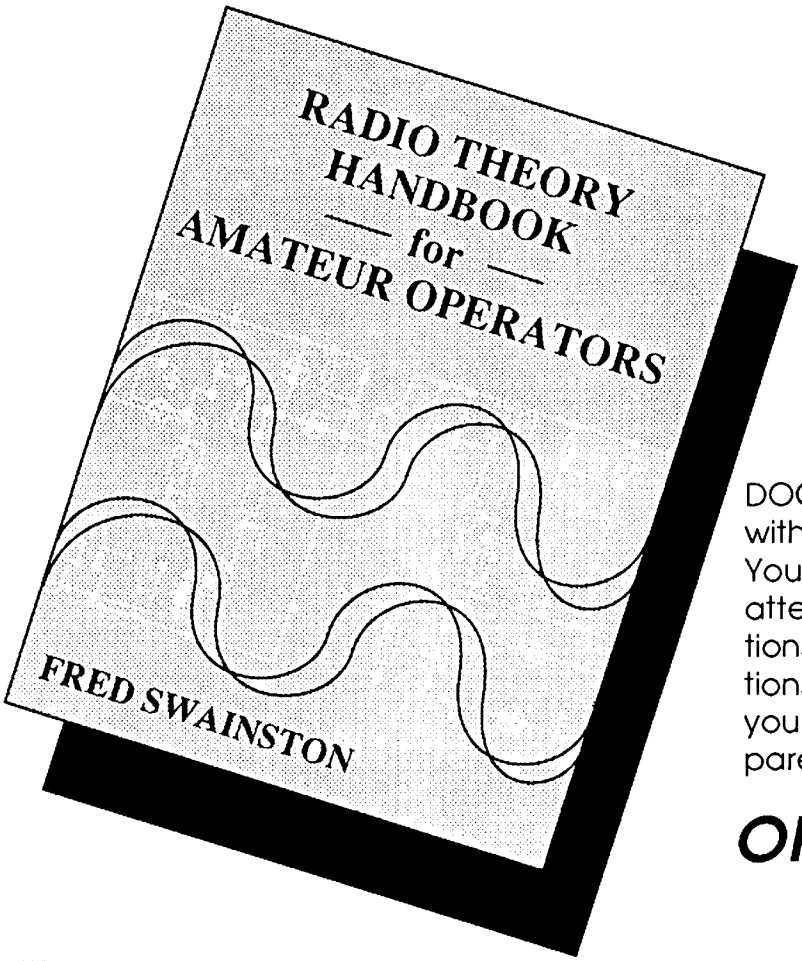
Bill Rice VK3ABP
Editor

INSATIABLE APPETITE

Amateur Radio Is always in need of a steady supply of articles for publication, whether they be short technical tips or long technical articles; even interesting anecdotes. Whilst articles on advanced and new techniques are needed, it must not be forgotten that new amateurs and novices are always interested in good basic items which the "seasoned amateur" may class as too basic for AR. So, write-up that project that has worked for you, as *Amateur Radio* has an enormous appetite for a well-balanced and varied diet.

Preparing an article for *Amateur Radio* is very simple. Just commit your thoughts to paper as you would when explaining to a friend over the air. Manuscripts may be clearly handwritten or typed **original** copies (*no photocopies please as the photocopier invariably prints blank in a crucial portion of a technical explanation or mathematical formula*). Include circuit diagrams if applicable — they do not have to be ready for publication (clear sketches are adequate). Don't overlook a photograph too, but please be careful when labelling them — many good photographs have been damaged by heavy ball-point pen marks coming through from the back or felt-tip pens smudging from the back of one to the front of another!

The essential "hams" reference



Written specifically to cover the Department of Communications syllabus for the Novice and Amateur Operator Certificate of Proficiency, this new book will be invaluable whether you are preparing for the exam, or an "old hand".

This book treats all topics in the DOC syllabus, explaining each topic with numerous worked examples. You can test your understanding by attempting the multitude of questions in each chapter. Many questions are from past DOC exams, so you can be sure this book will prepare you to pass!

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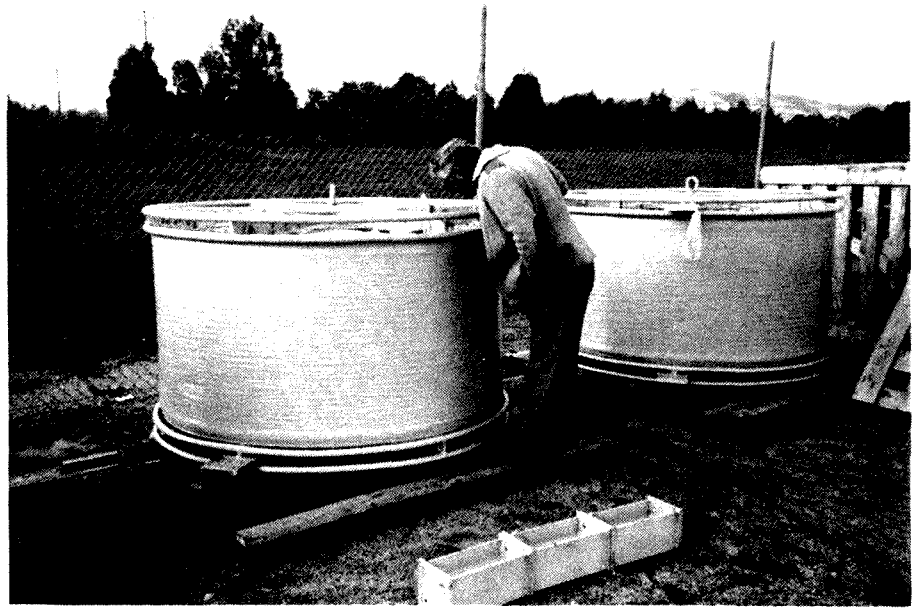


A new form of communication? No! It is a method of employing power transmission lines to serve a dual purpose in conveying power and the transmission of pertinent information concerning the demand factors and other pertinent information. Read on for a detailed description of how it works!

Power Line Carrier is the name of a means of communication over a High Voltage Power transmission Line.

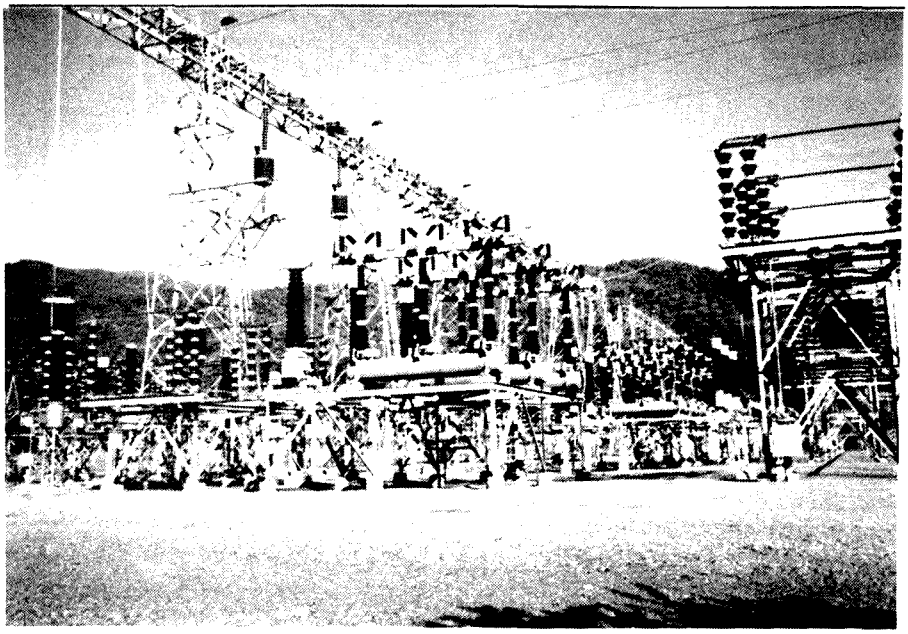
The communications channel uses a much higher frequency signal than the AC mains frequency of 50 Hz. This high frequency signal is superimposed on the transmission line and is known as a carrier wave. Hence the name Power Line Carrier.

The transmission line used to move AC power from the point of generation to the point of use is of necessity a low loss transmission line. While it is primarily designed for AC power transmission it has low loss properties to quite high frequencies. The low loss properties extend up to at least the region of the medium Frequency Broadcast Band.

The loss in the region below the Broadcast Band is very small. There is little chance of interference with other services from the small amount of signal lost by radiation.

Frequencies used are co-ordinated with other users of the Frequency Spectrum to minimise problems. The band used is from 80 to 480 kHz. The bottom end of the band used is sufficiently removed from the power frequency to allow the use of relatively simple filters to separate the AC mains and the carrier frequency. Losses must be kept very low at the power frequency. A very minor and insignificant loss in decibels represents a surprisingly large amount of heat. A loss of 0.1 decibel at a megawatt power level is a loss of nearly 23 kilowatts. A lot of heat to dissipate!

The transmission line is isolated at carrier frequencies from the power equipment by large RF chokes. These are called line traps. They must carry the normal current of the power



Line Traps — both Pedestal and Suspension Mounting.

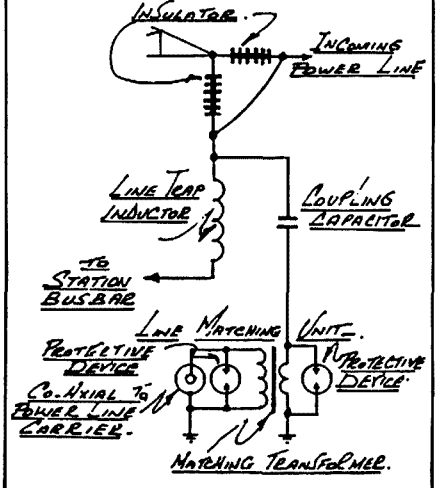
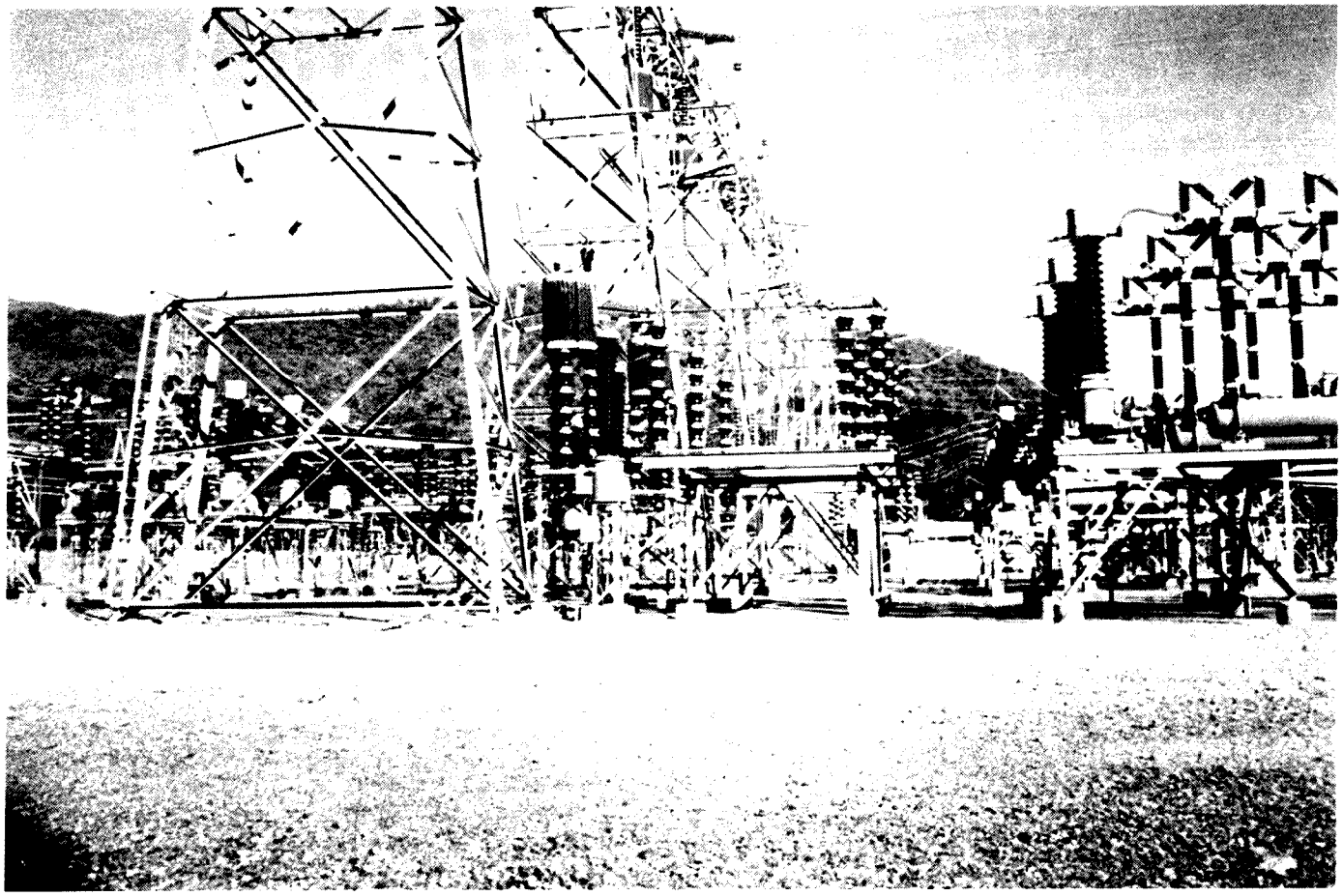


Figure 1: A Typical Communications Installation.



Power Line Carrier Traps and CTVs.

system and be capable of withstanding fault currents. The fault current when a 220 kV or 330 kV line is shorted, is very high. The forces generated by such currents are enormous. The line-trap is designed to accept and survive such currents and forces.

The signals are coupled onto the power-line by coupling capacitors. These are large oil filled capacitors. They look to the uninitiated like large insulators. They must withstand the High Voltage Line voltage of 220 to 500 kV. These capacitors must also be designed to withstand surges due to lightning and transients on the power system.

The Line Traps are designed to have an impedance of between 600 and 1000 ohms at the carrier frequency. This means an inductance of around one millihenry. Other components are used within the trap to ensure operation between 80 kHz and 480 kHz. This broadbanding means that the Line Traps can be used for any carrier frequency within the band.

The Coupling Capacitors have a capacitance of between 1000 pF and 10 000 pF. They are often combined with a capacitive voltage transformer which is used to measure the line voltage. They are then known as a CVT.

Both the Line Traps and the Coupling Capacitors or CVTs are physically large and expensive items of equipment. They are items of an electrical plant found in the switchyard of a large power station or substation. They are represented quite simply on a block diagram.

The final plant item is a coupling transformer, which together with voltage surge limiting components, is housed at the base of the CVTs or coupling capacitors. The transformer matches the impedance seen at this point to a coaxial cable to the power line carrier equipment. It is called the Line Matching Unit.

The circuit, comprising the power line and the coupling apparatus is shown in the diagram, see Figure 1.

Several stages of over voltage protection are used. This is to prevent surges and transients being impressed on the electronic equipment in the Power Line Carrier. More important than the equipment is the safety of the telephone user.

The power line carrier is essentially a single channel Single Sideband transmitter and receiver. The transmit and receive directions are separated by filters and a hybrid. Thus separation is adequate to allow adjacent transmit and receive frequency blocks. For example Transmit 144 kHz to 148 kHz with Receive from 152 kHz to 148 kHz. Thus a whole channel occupies an 8 kHz block.

The transmitted level is around one watt or 30 dBm with the received level around 0 dBm or one mW

Due to the many sources of noise in the system the signal-to-noise ratio is not as good as for normal carrier telephone systems. However, it is adequate for Data transmission or speech. Speech circuits are often processed through Compandors to enhance the apparent signal to noise ratio.

The systems are used for the control of the system. This may be by means of telephone calls by electrical operators. However, both Data and control signals are passed over the power line carrier circuit.

The control signals control the operation of circuit breakers which can isolate the fault are allowed to trip. This limits the extent of the power system disturbance.

These control signals and power-line carrier systems should not be confused with the tones which are sometimes used in the distribution system. These tones are audio frequencies used to control domestic water heaters and the like.

A similar technique is used on a small scale in some domestic intercoms. These work at low levels on the power wiring in your house. They are using the same principle but on a much more limited scale.

mr

QSP

WHAT'S NEWS?

A definition of "news" is something that is new and of interest. In the diverse hobby of amateur radio things are happening all the time that would fit that definition — but we need to learn about it before it can become published news.

Just spend a minute and give thought to whether you know of some news. Then pass it on to the WIA journal, *Amateur Radio* magazine.

Even just a news tip-off or an accurate snippet could lead to a worthwhile article. Maybe something has been printed in your local newspaper about our hobby — take a clipping and put it in the post without delay.

Send your material to the Editor, AR Magazine, Wireless Institute of Australia, PO Box 300, Caulfield South, Vic. 3162.

AN ANTENNA CALCULATION PROGRAM IN BASIC

Dean Probert VK5LB
RMD Verral Road, Hope Forest, SA. 5172

A simple program written in very basic BASIC will enable the user to quickly compare the sizes of booms, elements and spacing between quads and Yagis, etc.

The writer found a need to design and compare both Yagi and quad antennas for his QTH. Being tired of "number crunching" on a calculator, it was decided to write a program in little bits, adding to it as required. Eventually, the program fitted all requirements but it can by easily modified by readers to their requirements.

It was written on a VIC 20, but will operate equally well on the C-64 as no memory locations are used. To use it on other machines it will be necessary to substitute the reversed heart symbol (an instruction to clear the screen) and the reversed Q symbol (which clears any calculations in memory which are not wanted). Incidentally, the reversed heart is made by using the shift and CLR/HOME keys together and the reversed Q is the ↑ key.

The original program was in pretty colours and also contained a clock program. However, these bits have been deleted for brevity. Also, a 4:1 coaxial balun was needed to feed a folded dipole driven element and back to open wire feeder as the tower is about 500 feet from the shack, so a long run of coaxial cable was out of the question, in dollars and dB terms. Have fun!

```
10 PRINT"■QQQ ANTENNA CALCULATION PROGRAM":PRINT:PRINT"BY VK5LB"
11 FOR T=1TO2000:NEXT:PRINT"■QQ":GOSUB109
13 PRINT"■"
14INPUT"FREQUENCY?";FQ
15 INPUT"SPACING FOR A";SP
16 INPUT"SPACING FOR B";TU
17 INPUT"SPACING FOR C";EG
18 INPUT"SPACING FOR D";XY
19 PRINT" "
22 WL=INT(((492/FQ)*2)*100+.5)/100
30 R=INT(500/FQ*100+.5)/100
31 A=WL*SP
40 DE=INT(475/FQ*100+.5)/100
41 B=WL*TU
50 D1=INT(455/FQ*100+.5)/100
51 C=WL*EG
60 D2=INT(450/FQ*100+.5)/100
61 D=WL*XY
70 D3=INT(448/FQ*100+.5)/100
```

```
75 PRINT"R= ";R: PRINT"A= ";A: PRINT"DE= ";DE: PRINT"B= ";B: PRINT"D1= ";D1:
   PRINT"C= ";C:

8Ø              PRINT"D2= ";D2: PRINT"D= ";D: PRINT"D3= ";D3:

85 PRINT"WL= ";WL:

87 PRINT" "

9Ø PRINT"1=YAGI 2=MAIN PROGRAM 3=QUAD"

92 PRINT" "

94 INPUT"YOUR SELECTION";G

96 ONGGOTO 13,1Ø9,19Ø

1ØØ PRINT" "

1Ø1 PRINT"THIS PROGRAM IS FOR GENERAL ANTENNA DIMENSIONS"

1Ø2 PRINT" "

1Ø3 PRINT"1 = YAGI 2 = QUAD 3 = DIPOLE 4 = G/PLANE 5 = COAXIAL BALUN"

1Ø4 PRINT" "

1Ø5 INPUT"YOUR SELECTION";G

1Ø6 ONGGOTO 13,19Ø,3ØØ,4ØØ,5ØØ

1Ø9 PRINT"■"

11Ø PRINT"R= REFLECTOR
          DE= DRIVEN ELEMENT
          D1= DIRECTOR 1"

12Ø PRINT"D2= DIRECTOR 2
          D3= DIRECTOR 3
           A= R TO DE
           B= DE TO D1"

13Ø PRINT" C= D1 TO D2
           D= D2 TO D3
          WL= WAVELENGTH IN FEET":GOTO1ØØ

19Ø PRINT"■"

2ØØ INPUT"FREQUENCY?";FQ

2Ø2 INPUT"SPACING FOR A";SP

2Ø4 INPUT"SPACING FOR B";TU

2Ø6 INPUT"SPACING FOR C";EG
```

```
208 INPUT"SPACING FOR D";XY
220 WL=INT(((492/FQ)*2)*100+.5)/100
230 R=INT(103/FQ*100+.5)/100
231 A=WL*SP
240 DE=INT(1005/FQ*100+.5)/100
241 B=WL*TU
250 D1=INT(975/FQ*100+.5)/100
251 C=WL*EG
260 D2=INT(975/FQ*100+.5)/100
261 D=WL*XY
270 D3=INT(975/FQ*100+.5)/100
271 PRINT" "
273 H=INT(((R/4)/SQR(2))*100+.5)/100
274 PRINT"SPIDER ARM-BOOM TO TIP LENGTH IS ";H
278 GOTO75
300     PRINT "■"
310     INPUT "FREQUENCY"; FQ
320     PRINT " "
330     DP=INT((468/FQ)*100+.5)/100
350     PRINT "DIPOLE=";DP
360     PRINT " "
370     PRINT "1=MORE  2=MAIN PROGRAM"
375     PRINT " "
380     INPUT "YOUR SELECTION";G
385     ONGGOTO 300,390
390     PRINT "■":GOTO100
400     PRINT "■"
410     INPUT "FREQUENCY";FQ
420     PRINT "  "
430     GP=INT((234/FQ)*100+.5)/100
440     RD=INT((GP*1.025)*100+.5)/100
```

```
45Ø     PRINT "G/PLANE=";GP
46Ø     PRINT "RADIALS=";RD
47Ø     PRINT "  "
475     PRINT "1=MORE  2=MAIN PROGRAM"
48Ø     PRINT "  "
485     INPUT "YOUR SELECTION";G
49Ø     ONGGOTO 4ØØ,495
495     PRINT "■":GOTO1ØØ
5ØØ     PRINT "■■■■"
51Ø     PRINT "DIMENSIONS FOR 4:1 COAXIAL BALUN"
515     PRINT "  "
517     PRINT "NOTE THAT THIS DIMENSION REFERS TO THE
          LOOP OF THE BALUN"
52Ø     PRINT "  "
53Ø     INPUT "FREQUENCY FOR BALUN";FQ
54Ø     PRINT "  "
55Ø     PRINT "VELOCITY FACTOR OF COAX?"
551     PRINT "  "
552     PRINT "SOLID DIELECTRIC = .66"
553     PRINT "FOAM DIELECTRIC = .80"
554     PRINT "  "
555     INPUT "ENTER FOR YOUR CABLE";V
56Ø     L=INT((492/FQ*V)*1ØØ+.5)/1ØØ
565     PRINT "  "
57Ø     PRINT "LENGTH=";L
58Ø     PRINT "  "
59Ø     PRINT "1=MORE  2=MAIN PROGRAM"
591     PRINT "  "
592     INPUT "YOUR SELECTION";G
593     ONGGOTO 5ØØ,595
595     PRINT "■" GOTO1ØØ
```

COMPUTER PROGRAMS

Due to the length and quality of some computer program printouts, it is frequently impossible to reproduce them effectively for others to copy. Members interested in particular programs are advised to contact the author for an original copy of the relevant program. (Please include an SASE).

Authors of computer program articles, please remember to send a copy of your program on disc or cassette when sending an article for evaluation.

ONE PLUS ONE EQUALS DISASTER

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3078

This story involves two electrical faults, each relatively harmless in itself but which, in combination, present a highly lethal situation.

THE FIRST FAULT was in a small horizontal griller. It had been working faultlessly as long as anyone could remember. A simple check with a test lamp showed that the metal frame was grounded with the switch at the power point on or off. The fault which did not show up under these conditions was the fact that the ground and neutral connections were transposed. But since the ground and neutral are normally connected at the fuse box the transposition had no practical effect. It is worth noting that if a core balanced circuit breaker as described in AR, September 1987, had been used it would have picked up the incorrect wiring immediately since the return was through the earth wire.

In due course the family, complete with griller, went on holiday, staying at various caravan parks. Everything went well until the return trip. At a caravan park where they had stayed a couple of weeks previously they found the griller was not working. It seemed obvious that the element had gone open circuit but since a multimeter was available a confirmatory check was made. It was only then that the fault mentioned above was discovered. But the griller had worked at another site at that same caravan park only a couple of weeks before. Consideration led to a frightening thought. What if the live and neutral at that particular power box had been transposed? The frightening thought became an even more frightening reality and the lethal situation which resulted is shown In Figure 1.

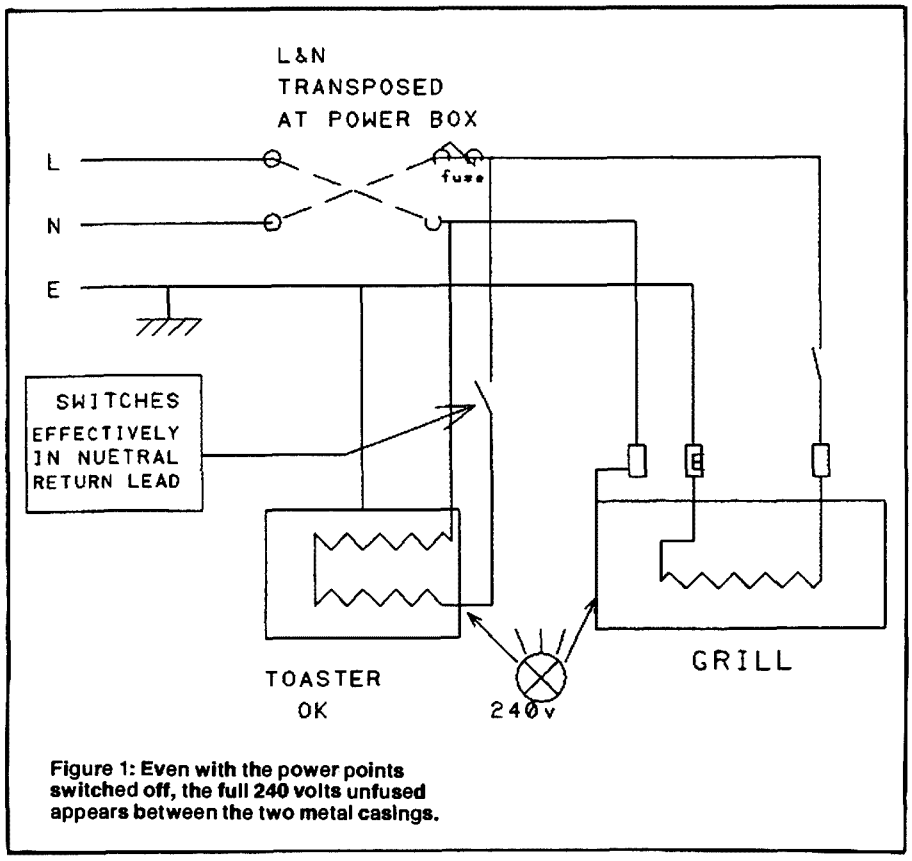


Figure 1: Even with the power points switched off, the full 240 volts unfused appears between the two metal casings.

Since all the power points in the caravan were correctly wired the switches were in what was now the neutral.

Before getting the owner of the park, a little demonstration was set up. A toaster was plugged into one side of the twin power point and the griller very cautiously plugged into the other. It was really frightening to see a test lamp light to full 240 volt brilliance when connected between the metal casing of the griller and the metal casing of the toaster. It made no difference whether the switches at the power outlet were off or on! It certainly impressed the owner of the park!

How would a situation like this arise? I do not believe it is entirely random or accidental. Some years ago I had a radio and electrical business in Scotland. No restrictions were placed on electrical work and the authority was not interested in who did the job, but only whether it was properly done. On being notified that the work was completed an inspector came around. If he was satisfied, the final connection was made. If not, the person who did the work had to put it right and pay the full cost for the next inspection.

In Victoria however, one can have all the qualifications in the world but only an approved electrical contractor can do any electrical wiring. The practical result of this is that jobs (to save money) are sometimes done by incompetent people and inspected by nobody? Consequently, there are more shoddy jobs than I ever saw in Scotland where it was possible for anyone to have their work checked openly and legally. One wonders how the job in the caravan park was done.

The situation regarding the griller also seems rather peculiar. I assumed that someone had transposed the leads out of ignorance. To my surprise I found the green wire was connected to a terminal differing from the other two and clearly stamped with an "E". The only trouble was that this terminal did not go to the frame but to one end of the element. Close examination seemed to indicate that it had been wired that way when it was originally made. Another case of non-inspection? I hope there are not a number of these quietly waiting for a potentially lethal disaster.

(Roy's "shocking" discovery suggests that if you have one of those little three-pin neon testers it could be worth taking on holiday. Also, the supply authority would appreciate being informed of dangerous installations. Ed).

ar

MEMORY EXPANSION FOR THE VZ200/VZ300 COMPUTERS

Lloyd Butler VK5BR
18 Ottawa Avenue, Panorama, SA. 5041

The unit described extends the memory of the VZ200 by 20 k bytes and the VZ300 by 18 k bytes.

IF YOU OWN a VZ200 or VZ300 computer, you could be interested in extending the memory to run larger programs. To do this, you may choose to visit the nearest Dick Smith store and purchase a memory expansion module. Alternatively, you may take the second option and build one yourself.

The writer decided on the second option and designed the unit described in this article. Making use of the 8 k static RAM packages, now readily available, assembly of the unit was a straightforward task.

DESCRIPTION

Two 8 k static RAM packages, Type 6264, provide 16 k bytes of additional memory. To simplify decoding of memory chip selection, the start locations of the 8 k RAM packages are connected at precise 8 k (or 2000 H) address multiples within the address range. Because the in-built memories of the VZ200/VZ300 do not end just prior to such locations, one additional 2 k RAM Type 6116 is used to fill in the gap at the end of the VZ300 internal memory and two at the end of the VZ200 internal memory. For the VZ300, the memory is therefore extended by 18 k bytes. (This, with the in-built system ROM and in-built RAM, utilises all of the 64 k address range of the VZ300 computer). For the VZ200, the memory is extended by an additional 20 k bytes.

The wiring diagram for the expansion unit is shown in Figure 1. The 8 k RAM packages (28 pin DIL) are shown as N3 and N4 and the 2 k RAM packages (24 pin DIL) as N5 and N6. Chip select decoding is carried out by two 74LS138 decoder packages (16 pin DIL) shown as N1 and N2. A five volt regulator, N7, is included in the unit to supply power to the IC packages. This was thought desirable as total loading on the internal five volt supply might have been marginal with the extra load of the expansion unit.

A three pole, two position, switch (S1) is provided to select decoding for either VZ200 or VZ300. (The switch used was a four pole unit with one redundant section). If only the VZ300 facility had been required without the VZ200, the 2 k RAM (N6), resistor R1 and the switch, could have been omitted. In this case, switch connections S1A and S1B for the VZ300 would be bridged.

The hexadecimal start addresses for the RAM packages are shown in the following table with the decimal addresses, as identified by the BASIC interpreter, shown in brackets.

PACKAGE	VZ200	VZ300
N5 (2 k)	9000 H (-28672)	8800 H (-18432)
N6 (2 k)	9800 H (-26624)	not used
N3 (8 k)	C000 H (-16384)	C000 H (-16384
N4 (8 k)	A000 H (-24574)	E000 H (-8192)

The complete memory map, with expansion unit included, is illustrated in Figure 2.

A further option for the VZ200 (but not used by the writer) could be to parallel up the buses for a third 8 k 6264 RAM to be started at E000H. This would then extend the VZ200 also to the full 64 k capacity. All that would be required for additional chip selection would be to connect the RAM chip select (pin 20) via a switch circuit (similar to S1C) to pin 7 on decoder N1.

ASSEMBLY

The assembled module card is shown in Figure 3. A general purpose circuit board was used to mount the IC sockets and other components. There are various types of board, with printed circuit pads for solder connections, which can be used to do the job. Another method would be to make use of wire-wrap with wire-wrap type IC sockets.

The card was cut to the dimensions 145 by 92 millimetres. It could have been made smaller but allowance was made for components to be added had they been needed. (This is a practice which often pays off on a first attempt at a design).

A 69.5 millimetre length of 0.1 inch (2.54 millimetres) pin spacing edge connector was fitted to the card. The edge connector was carefully cut so that the 22 pairs of pins used are centred to mate with the printed circuit edge pins on the VZ memory expansion connector and so that the edge connector is correctly guided by the recess in the VZ case. The fitting of the edge connector to the circuit board is offset so that it clears the I/O expansion entry. The method of assembly is similar to that previously used by the writer in the RTTY/Morse module described in *Amateur Radio*, September 1985 and January 1986.

A light aluminium box, 96 by 156 by 24 millimetres, was constructed and fitted around the card for protection. The connector protruded through the end of the box so that it could project into the VZ connector recess.

CHECKOUT

Having made sure all the wiring was correctly routed by carrying out a continuity check, the next step was to devise a functional check routine and a program in BASIC was prepared to check out the additional RAM. This is listed in the Appendix.

For each memory address, the program write zeros into all bits and then reads the address to check for concurrence. The process is repeated for ones in each bit and then again for zeros. The memory is accessed sequentially over the whole extended range and, if an address does not read as written, the sequence is stopped and the address identified. The option is then given whether to proceed or escape from the routine. If all memory addresses check out, the memory is flagged as "OK".

At the start of the program there are POKE statements which shift the location of the top of the memory pointer and the stack pointer to within the internal memory. This is necessary as, at power up, the inbuilt VZ monitor automatically searches for the top of memory and references to these pointers to the top part of the expansion memory about to be accessed. If not relocated, the program will "crash" when it gets near the top. Actually there are two separate routines. The first one, which resets the pointers, is started by a RUN command. At its end, this routine requests a RUN 20 command which is used to start the next routine containing the memory scanning process. One might think that it could all be done in the one routine but the writer could not get it to work that way!

The inbuilt BASIC interpreter is comparatively slow and to run this program through the full 20 k bytes of additional memory takes about three-quarters of an hour. (It is a good plan to go away and make a cup of coffee while it is all going on!). Preparation of an object deck would have speeded up the process but this was not considered warranted for the few times the program was to be used.

CONCLUSION

Use of the 8 k static RAMs provides a simpler circuit design than that of the stock dynamic RAM expansion unit published in the VZ200 Technical Reference Manual. The static RAMs are expensive but, providing one does not mind spending a little time on construction, the unit described can be considered to be reasonably cost effective as well as providing a little more memory than the stock unit.

APPENDIX

Expansion RAM Test Program

```
10  REM EXTENSION MEMORY RAM
    CHECK
14  POKE 30880,255:POKE 30881,141
```

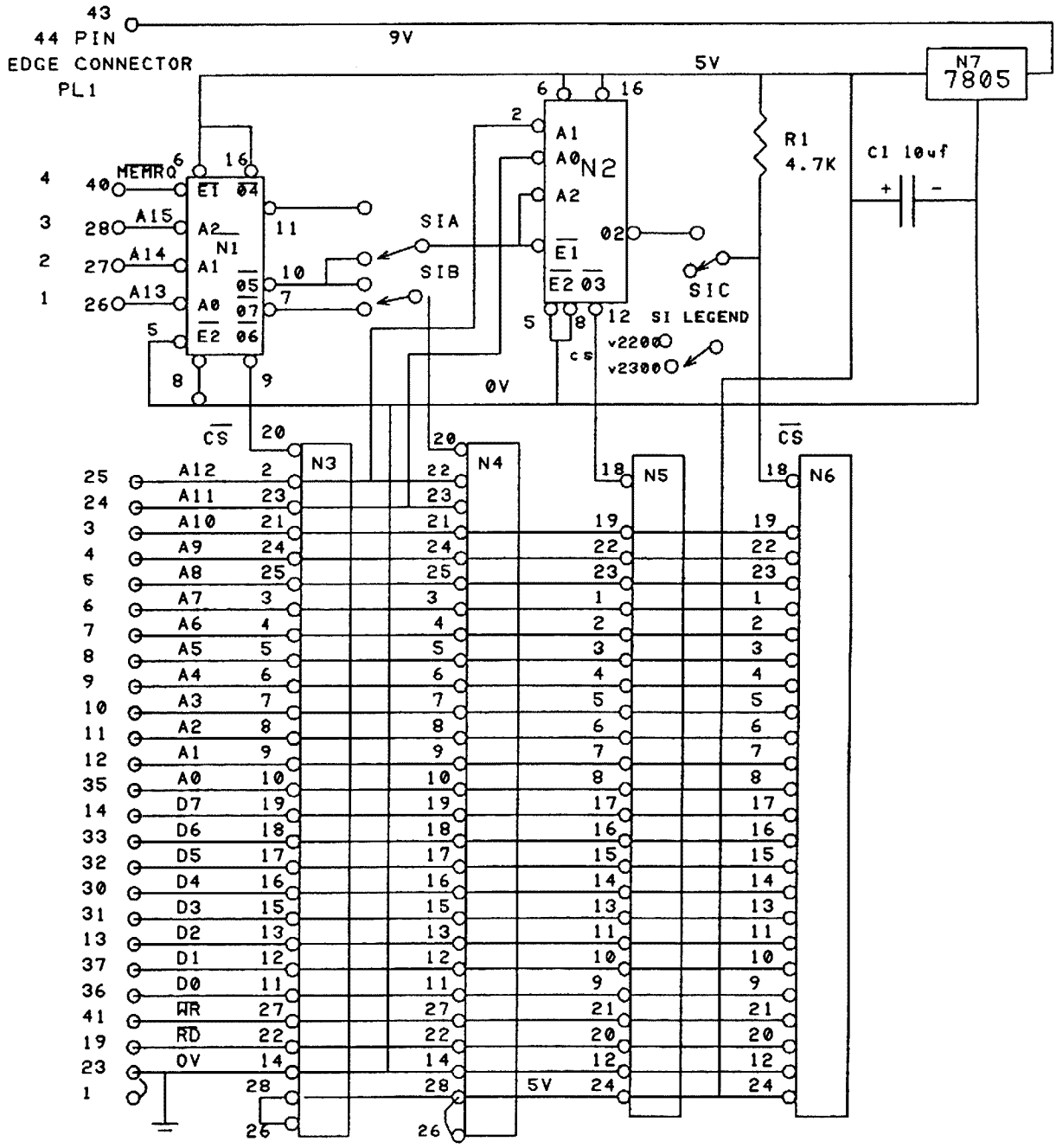
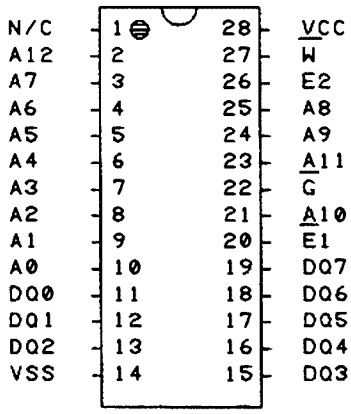
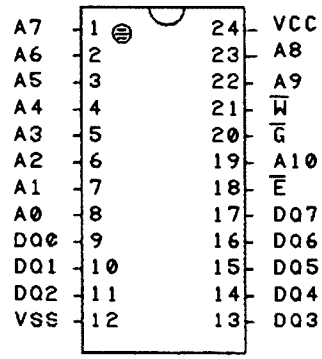


Figure 1: VZ200/VZ300 Expansion Module — Wiring Diagram.





PIN NAMES	
A0-A12	ADDRESS
W	WRITE ENABLE
E1.E2	CHIP ENABLE
DQ0-DQ7	DATA INPUT/OUTPUT
VCC	+ 5V POWER SUPPLY
VSS	GROUND
G	OUTPUT ENABLE

6264

PIN NAMES	
A0-A10	ADDRESS INPUT
DQ0-DQ7	DATA INPUT/OUTPUT
W	WRITE ENABLE
G	OUTPUT ENABLE
E	CHIP ENABLE
VCC	POWER +5V
VSS	GROUND

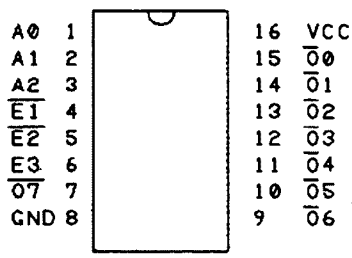
6116

N1-N2 74LSI38
DECODER

N3-N4 6264
8K*8RAM

N5-N6 6116
2K*8RAM

C2-C7 0.1uF
CONNECTED ACROSS
5V RAILS AT EACH
I/C N1-N6



PIN NAMES	DESCRIPTION
A0-A2	ADDRESS INPUTS
E1.E2	ENABLE INPUTS (ACTIVE LOW)
E3	ENABLE INPUTS (ACTIVE HIGH)
O0-O7	OUTPUTS (ACTIVE HIGH)

74LS138

FIGURE 1

V2200/VZ300 EXPANSION
MODULE WIRING DIAGRAM

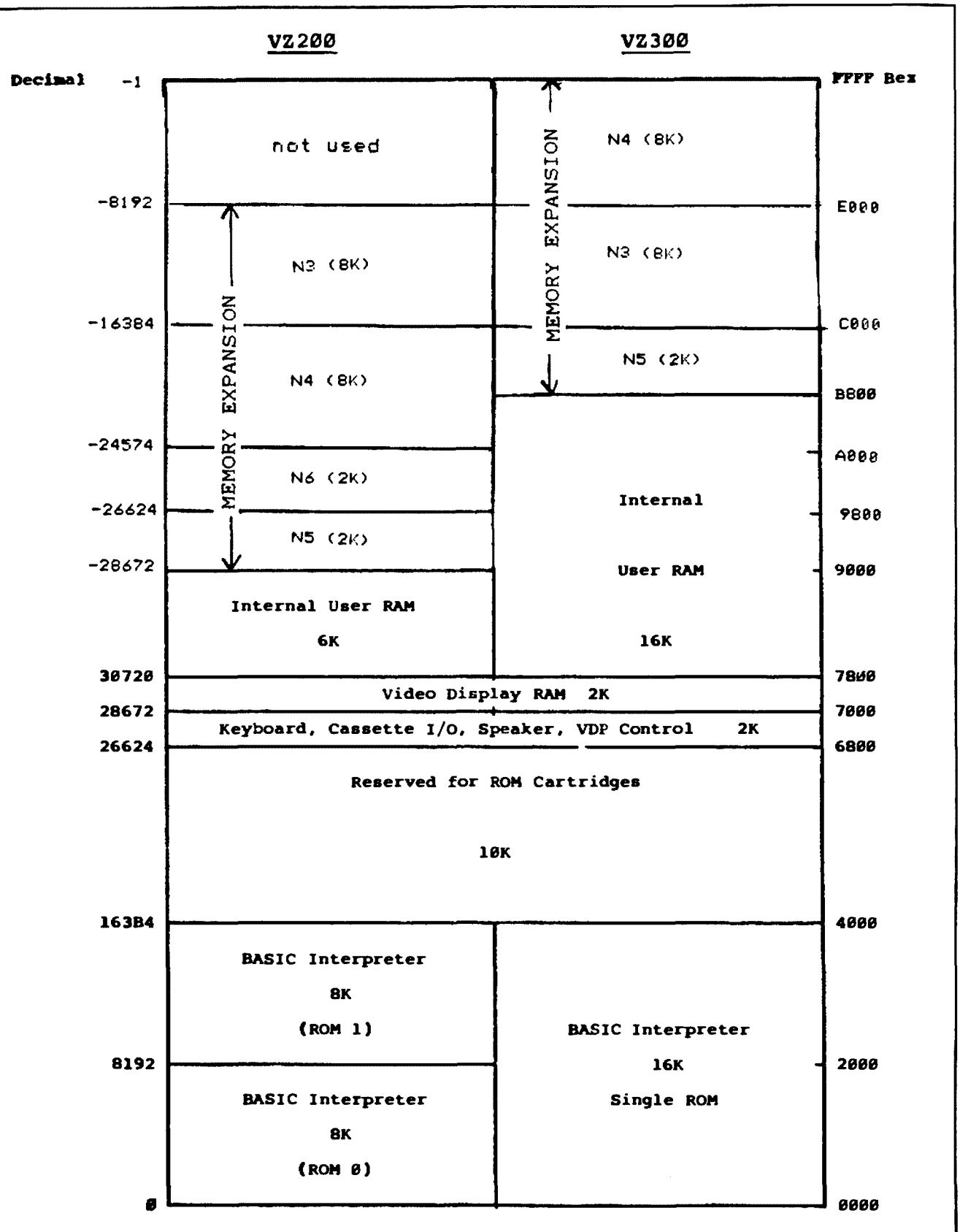


Figure 2: Memory Map showing Expansion RAM.

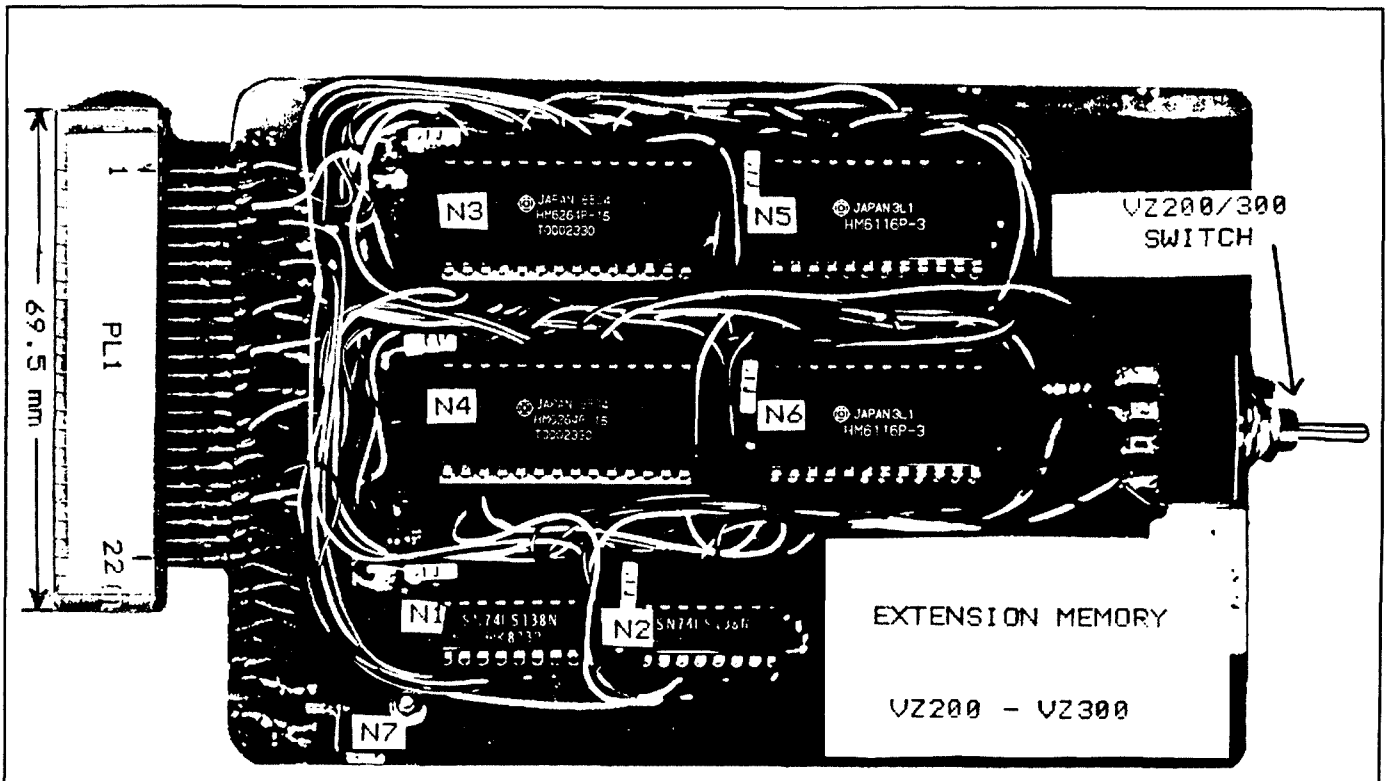


Figure 3: Card Layout.

```
15   POKE 30897,255:POKE 30898,143
16   PRINT "ENTER RUN 20"
17   END
20   PRINT "EXTENSION MEMORY TEST"
30   PRINT "ENTER 200 FOR VZ200 OR 300
     FOR VZ300
40   INPUT A
50   IF A = 200 THEN S = -28672 ELSE S =
     -18432
60   IF A = 200 THEN F = -8193 ELSE F =
     -1
70   L = 0
80   FOR X = S TO F
90   I = 0
100  FOR Y = 1 TO 3
110  IF Y = 2 THEN K = 255 ELSE K = 0
120  POKE X,K
130  B = PEEK(X)
140  IF B < > K THEN I = 1
150  NEXT Y
160  PRINT X
170  IF I = 0 THEN GOTO 230
180  L = 1
190  PRINT "RAM FAULT AT "; X
200  PRINT "ENTER C TO CONTINUE
     CHECKS OR E TO END"
210  INPUT Z$
220  IF Z$ = "E" THEN GOTO 250
230  NEXT X
240  IF L = 0 THEN PRINT "EXTENSION
     RAM OK"
250  END
```

ar

"CQ DX — New Countries only, please!"

—VK2COP

A Discussion on Mixers

Lloyd Butler VK5BR
18 Ottawa Avenue, Panorama, SA. 5041

One only has to examine the output of a mixer on a spectrum analyser to realise that it is a complex device. Here we examine some of the principles of mixing and mixing devices.

NUMEROUS MIXER STAGES are found in modern transmitters and receivers. These are well-known as devices which produce, from two initial frequencies, additional frequency components equal to the sum and difference of the others. One of these new components is separated from the others by selective tuning or bandpass filters. Actually, a multitude of other frequency components is generated and these must also be considered in the transmitter and receiver design.

All kinds of problems can occur from the mixing process and, if you are interested in experimenting with your own equipment designs, an "in-depth" study of the mixing process is well worthwhile. In the following paragraphs an attempt is made to study some of the basic principles involved.

MIXING PRINCIPLE

If two signals of different frequency are fed through a linear device, they will appear at the device output as the same two frequencies. To mix two signals we require a curved or non-linear characteristic such as shown in **Figure 1.** The diagram shows a low-level signal f1 with the operating point set for two positions, A and B. Observe that the output level of f1 is much higher when the operating point is set to B than when set to A. Now, examine **Figure 2.** In this diagram, we sweep the operating point between point A and B with a second high level signal f0 modulating the amplitude of f1. The word "modulating" has been deliberately used here to demonstrate that if f1 were a carrier frequency and f0 an audio frequency, we would call it amplitude modulation. The point being made is that amplitude modulation is the same process as mixing, the sum and difference components being the sideband components referred to in modulation.

The next observation to be made concerns the levels of f1 and f0. Signal f0 is at high level resulting in a high proportion of harmonics if f0 being generated owing to the curvature of the device characteristic. Signal f1 is kept low so that the position of the curve used is small and reasonably straight, ensuring that the levels of harmonics from f1 are low. This is the normal way to operate a receiver mixer where f1 is the incoming signal and f0 is the local oscillator. The level at the input is kept low to minimise the generation of intermodulation products from other signal sources and harmonics if f1, encouraged by the curvature. This will be discussed further in following paragraphs.

MULTIPLICATION

Referring again to the discussion **Figure 2,** the process of mixing is mathematically one of multiplication. The instantaneous amplitude of f1 is multiplied by the instantaneous amplitude of f0, hence the resultant components are called products. *This is all very confusing as* we know that the frequencies formed are equal to sums and differences. It must be understood that it is the instantaneous amplitudes which are multiplied, not the frequencies and the phenomenon can be explained by using one of the well-known trigonometric identities:

$$\text{SIN (A) SIN (B)} = \tfrac{1}{2}\,\text{COS(A+B)} - \tfrac{1}{2}\,\text{COS(A-B)} \quad \ldots(1)$$

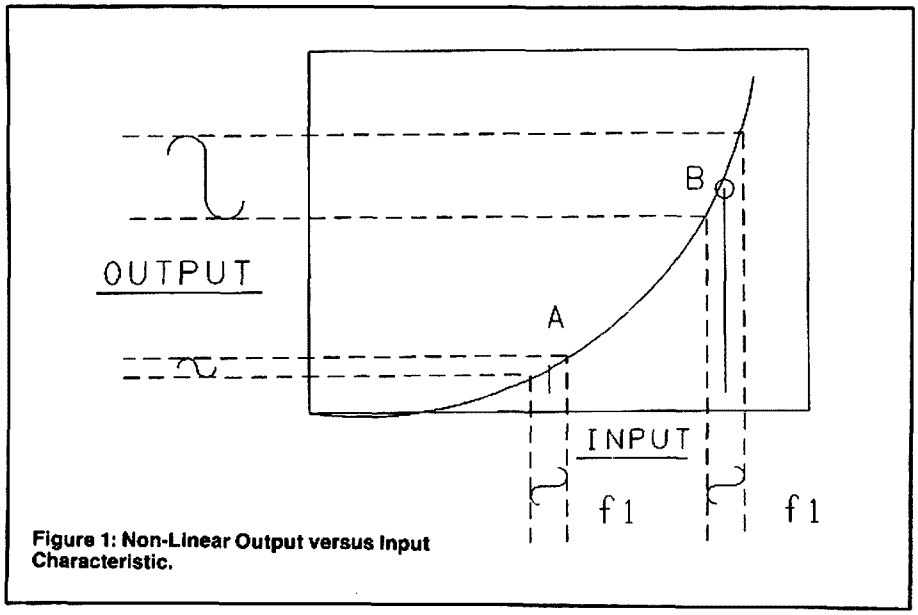


Figure 1: Non-Linear Output versus Input Characteristic.

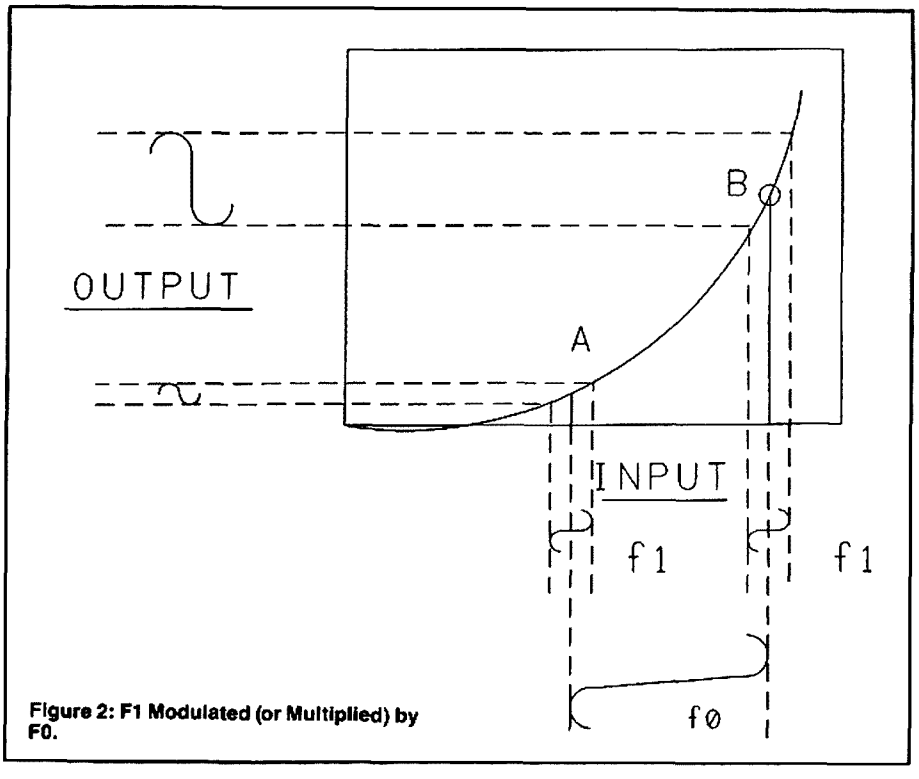


Figure 2: F1 Modulated (or Multiplied) by F0.

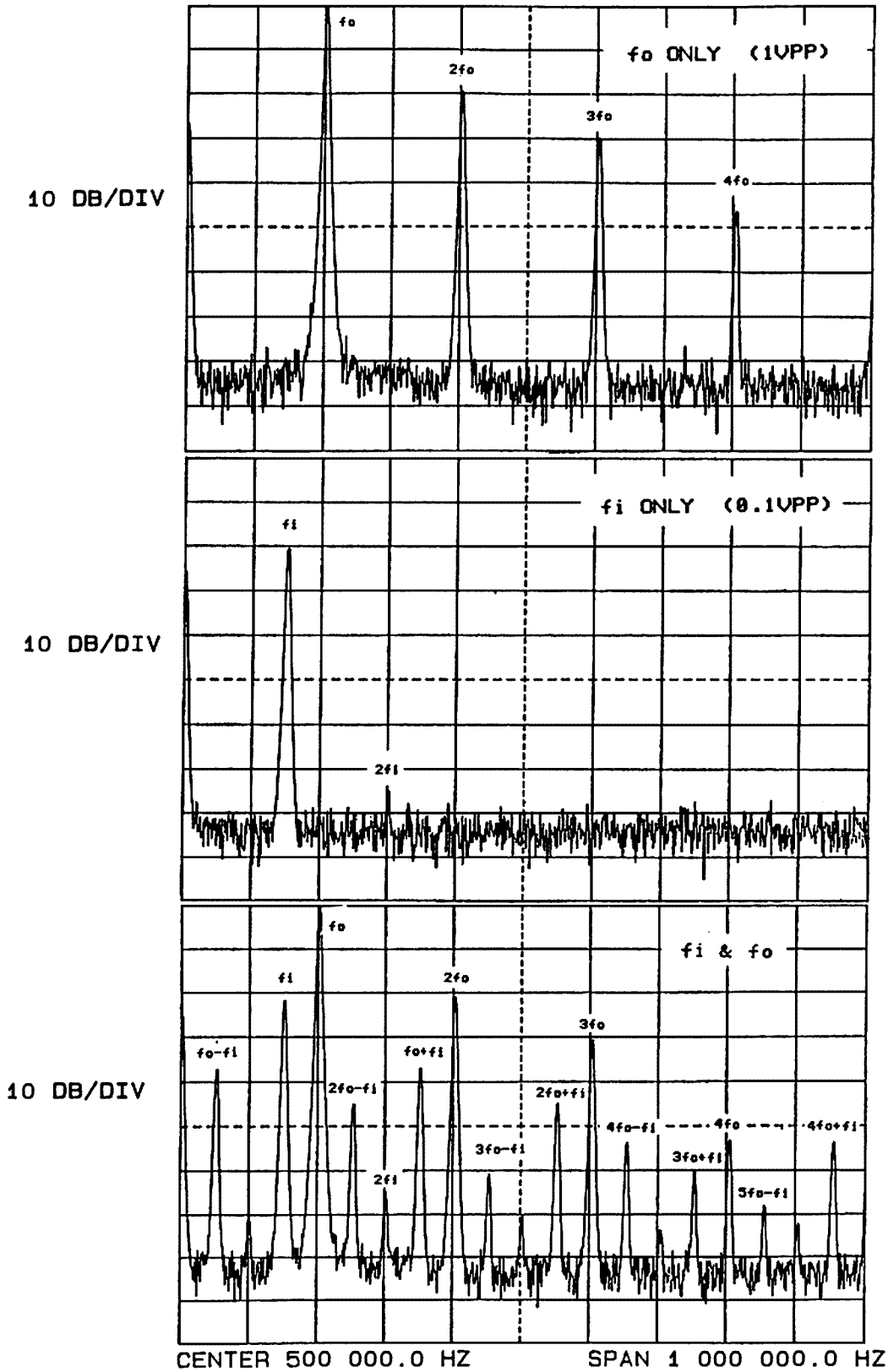


Figure 4: Frequency Spectrum Simple Diode Mixer. (Voltages across diode — f0 = 1 VPP, f1 = 0.1 VPP).

We can express the instantaneous amplitude of f1 and f0 as follows:

$$Ai \sin(2\pi f1\, t) \text{ and } Ao \sin(2\pi f0\, t)$$

where Ai and Ao are their respective amplitudes and t = time.

Multiplying them together by substitution in the identity (1), we get the following:

$$AiSIN(2\pi f1t).AoSIN(2\pi f0t)$$

$$= \tfrac{1}{2}AiAo|\cos(2\pi t(f0tf1)) - \cos(2\pi t(f0-f1))|$$

We can see that two new cosine functions of (f0+f1) and (f0-f1) are normal which represent our sum and difference frequencies. Of course, a cosine wave is the same as a sine wave, with the time scale simply shifted by 90 degrees.

MIXING PRODUCTS

At the output of a mixer, there are many more components than the sum and difference of the input frequencies. To illustrate these on a spectrum analyser, a simple mixing circuit, using a germanium, diode, was set up as shown in **Figure 3.** Signal f0 was set at 1 VPP across the diodes, just sufficient to sweep the operating point of the diode over the curvature of its voltage versus current characteristic and signal f1 was set lower at 0.1 VPP The two frequencies of 150 kHz and 200 kHz, used for f1 and f0 respectively, are of no particular significance other than to demonstrate the effects.

Figure 4, three parts, shows the mixer output when either f0 or f1 is on its own and then when both are combined for mixing. Observe the high level of harmonics of f0 compared with f1. Harmonic 2f0 is only 20 dB below f0 whereas harmonic 2f1 is 45 dB below f1 and higher order harmonics of f1 are even less significant. Observe, also, that the mixer result shows not only

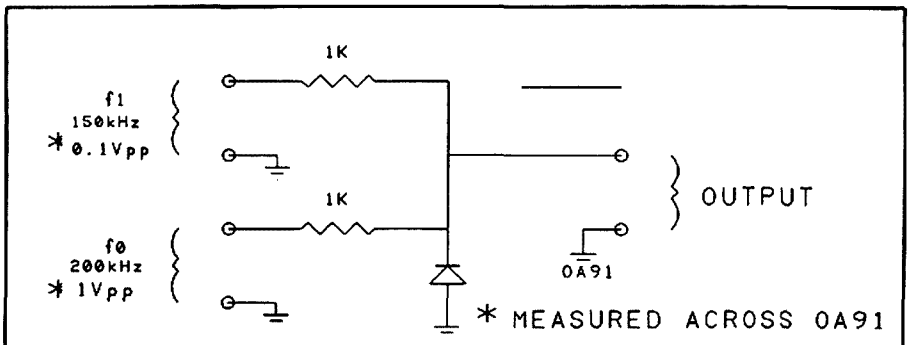


Figure 3: Simple Diode Mixer.

sum and difference products of f1 and f0, but sum and difference products relative to the harmonics of f0.

Whether these additional products are of concern depends on how close they are to the sum or difference frequency to be used, their relative level and the sharpness of the tuning or filter system following the mixer. Suppose we were to use (f0 + f1) as our output frequency, then our nearest higher order products would be (2f0 - f1) and (3f0 - f1). Considering their low level, these products would not be much of a problem. What is of concern is the high level of f0, 36 dB above (f0 + f1) and 2f0, adjacent to (f0 + f1) and 16 dB above it.

Figure 5 shows what happens when we increase f1 to the same level as f0. The levels of desired products (f0 + f1) and (f0 - f1) have increased, together with all the other products, plus new components embracing sum and difference products of the harmonics of f1.

Because of the particular frequencies of 200 kHz and 150 kHz, chosen for f0 and f1, some of the harmonics and products work out to be on the same frequency and there are more components than are apparent from **Figure 5.** (For example, 2f0 and (4f1 - f0) coincide at 400 kHz). This is illustrated in **Figure 6** where f1 has been shifted down to 115 kHz revealing many more components including (4f1 - f0), now on 260 kHz.

Considering again the problem of signal f0 at the mixer output, 35 dB above the desired output frequency of (f0 + f1), one solution is to use a balanced mixer to cancel out f0. To demonstrate this a commercial double balanced mixer package, Type CM1, shown in **Figure 7,** was set up with the same frequencies of 200 kHz for f0 and 150 kHz for f1. The spectrum was recorded as

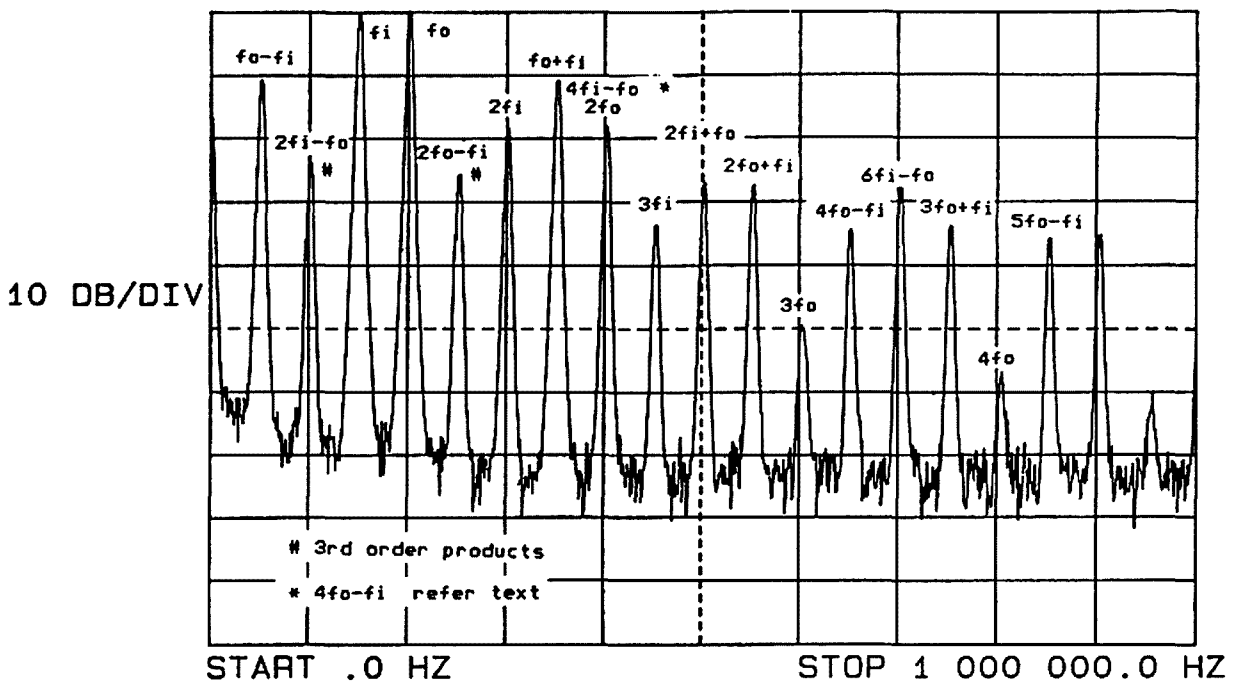


Figure 5: Simple Diode Mixer. (Voltages across diode f0 = 1 VPP, f1 = 1 VPP).

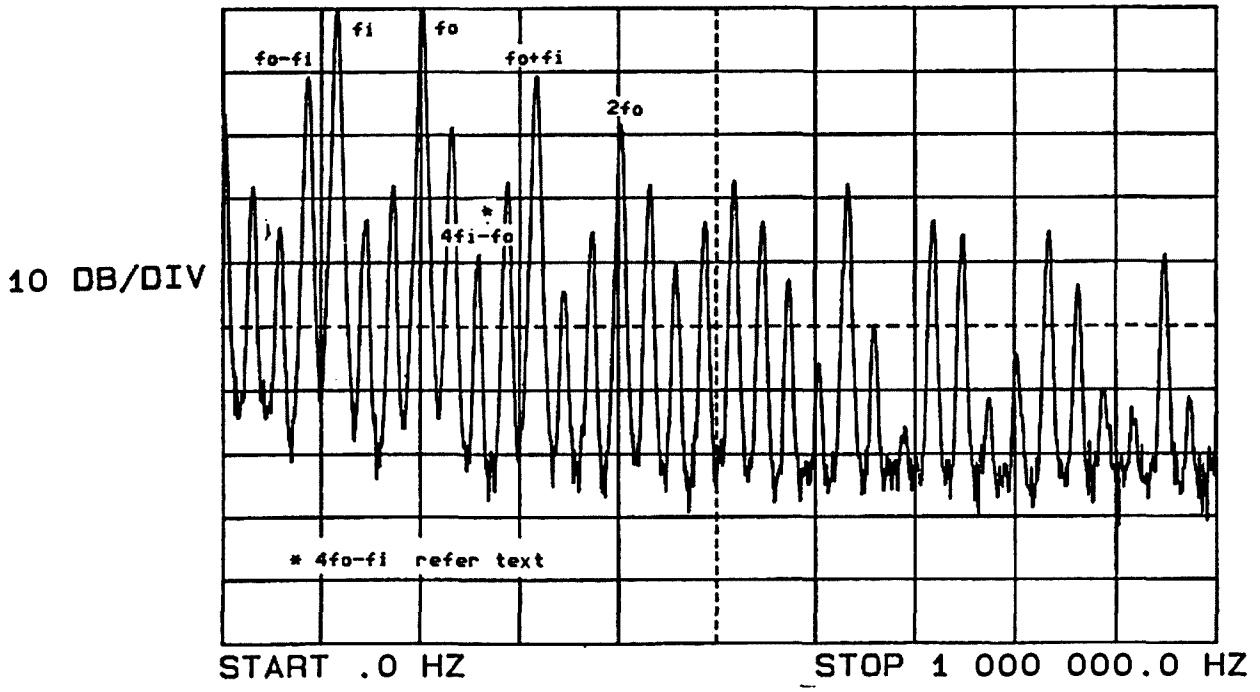


Figure 6: Simple Diode Mixer. (Voltages across diode f0 = 1 VPP, f1 = 1 VPP and f1 changed to 115 kHz).

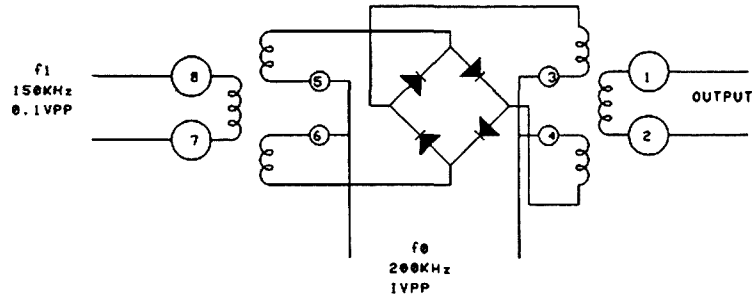


Figure 7: Doubler Balanced Mixer Type-CMI Full Ring.

shown in **Figure 8.** It can be seen that both the input signals f1 and f0 are now 35 dB below the summed frequency (f0 + f1). Balanced mixers will be discussed further in following paragraphs.

MIXING MODES

Mixers can be classified as those which operate in a continuous non-linear mode, as shown in **Figure 2,** or as those which operate in the switching mode.

A typical continuous non-linear mode mixer is the dual gate MosFET circuit as illustrated in **Figure 9.** The MosFET has a square law characteristic which is particularly good for mixing purposes. Because of its high gate impedance it requires little power to drive it and the separate gates provide good isolation between the two signals being mixed.

Most bipolar transistor and vacuum tube type mixers operate in the continuous non-linear mode. By comparison to the square law of the MosFET, the bipolar transistor and the semiconductor diode have an experimental characteristic and the vacuum tube has a 3/2 power law.

The square law of the MosFET is good because harmonic generation is theoretically limited to second order. This can be demonstrated using another common trigonometric identity:

$$\cos(2A) = 1 - 2\sin^2 A$$

and

$$\sin^2 A = \tfrac{1}{2}(1 + \cos(2A))$$

Hence, if we square an input component f, expressed as $A\sin(2\pi ft)$ we get:

$$(A\sin(2\pi ft))^2 = \tfrac{1}{2}A^2(1 + \cos(2\pi 2ft))$$

We now have a frequency 2f (the second harmonic) but no other order harmonics. It also means that in our square law mixer, higher order products are limited to third order (2f0 ± f1) and 2f1 ± f0).

To make a comparison using the exponential law of the bipolar transistor or diode, we can expand an exponential function using the Taylor series:

$$e^x = 1 + x + x^2/2 + x^3/3 + x^4/4 \ldots \text{etc.}$$

If we put $x = \sin(2\pi ft)$ we get terms containing the following:

$\sin(2\pi ft)$, $\sin^2(2\pi ft)$, $\sin^3(2\pi ft)$, $\sin^4(2\pi ft)$, and, in fact, all powers of $\sin(2\pi ft)$.

We have seen that sine squared component gives second harmonics, so let us now examine sine cubed. For this, we use a third trigonometric identity.

$$\sin(3A) = 3\sin A - 4\sin^3 A$$

Rearranging the form gives:

$$\sin^3 A = \tfrac{3}{4}\sin A - \tfrac{1}{4}\sin(3A)$$

Putting $2\pi ft = A$, we get $\sin[3(2\pi ft)]$ from within the sine cubed term of the exponential function implying that a third harmonic is generated.

Without going any further with mathematics we might well predict that a pattern follows in which each incremented power of $\sin(2\pi ft)$ produces a corresponding incremented order of harmonic. Assuming this to be correct, a conclusion can be drawn that the exponential characteristic of the bipolar transistor or semiconductor diode, generates all orders of harmonics, compared with the square law of the MosFET transistor which generates only second harmonics.

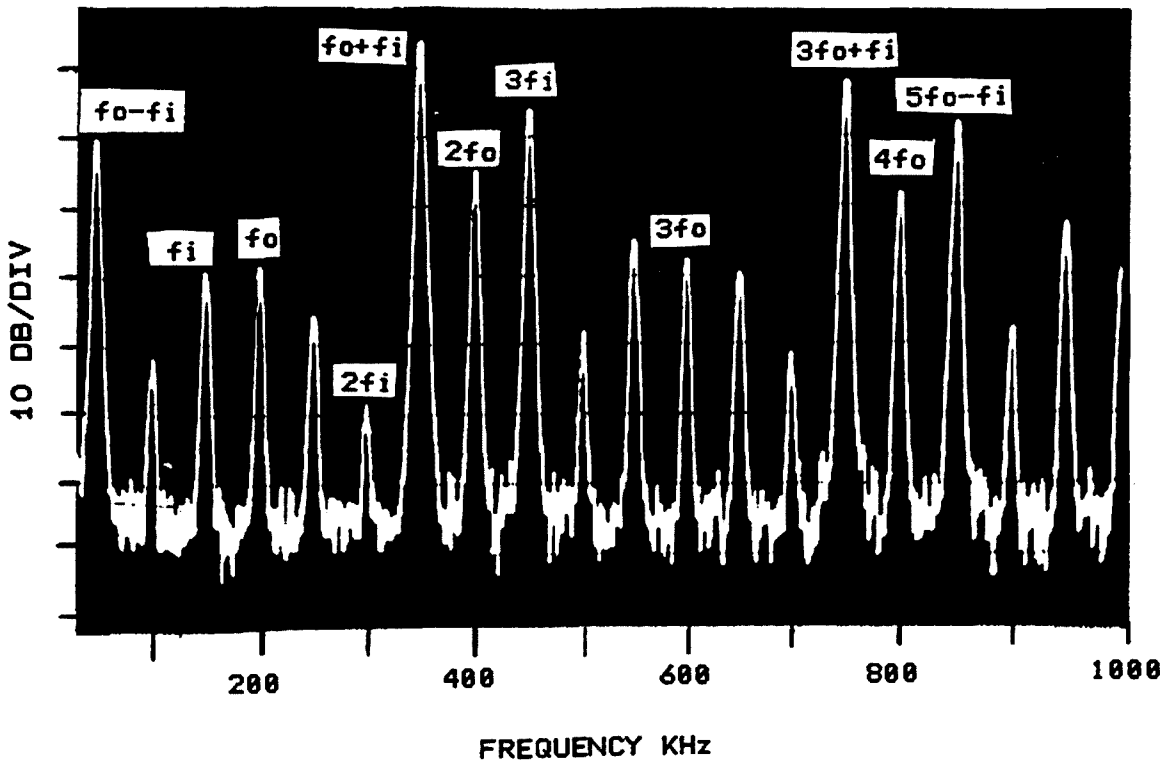


Figure 8: Frequency Spectrum of Double Balanced Mixer.

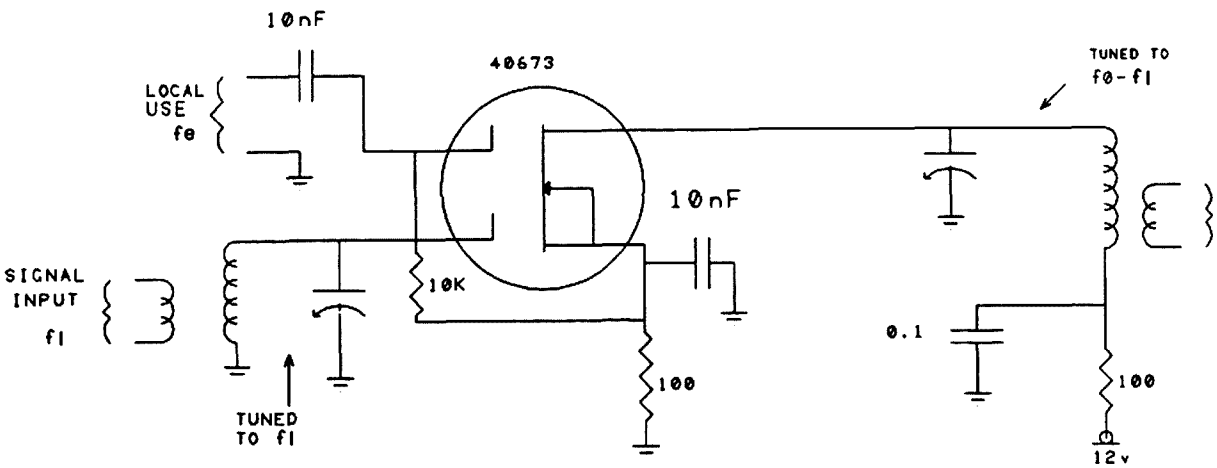


Figure 9: Dual Gate MosFET Mixer Operating In the Continuous non-Linear Mode.

SWITCHING MODE MIXERS

The second classification of mixer to be discussed refers to those which operate in the switching mode. These mixers operate by switching one input signal (f1) between two states at each half cycle of the second signal (f0). Figure 7 illustrates a double balanced switching mode mixer in which diodes act as switches. Pairs of diodes are biased on alternately each time the polarity of f0 reverses and this reverses the phase of f1. The switching process is illustrated in Figures 10 and 11. the first showing f1 a higher frequency than f0 and the second showing f1 lower than f0. The signal ft is actually multiplied by a square wave of frequency f0, an amplitude equal to one and comprising a fundamental and harmonic component as follows:

$$4/\pi(\cos(2\pi f0\,t) - \tfrac{1}{3}\cos(2\pi 3f0\,t) + \tfrac{1}{5}\cos(2\pi 5f0\,t) \ldots \text{etc}$$

that is, f1 is multiplied by the fundamental of f0 and all its odd harmonics. (Note that a perfect square wave has no even harmonics).

It is significant that the square wave has only two states, one and minus one, so that to multiply with f1 it is only necessary to multiply f1 alternately by one and minus one, that is, reverse the phase of f1 at each f0 polarity transition.

This mixer is defined as double balanced because both input signals are balanced because both input signals are balanced out from the output. The reduction of the level of these in the output was previously referred to and illustrated in Figure 8.

Another type of diode switching mixer is the

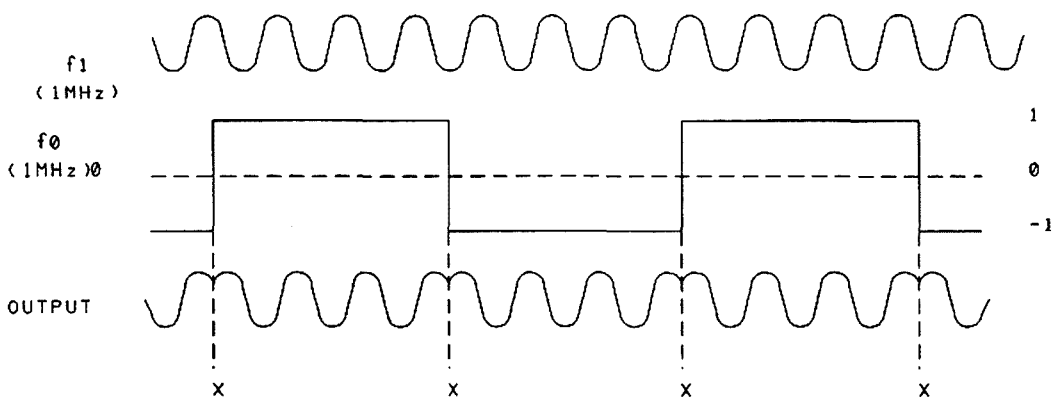


Figure 10: Double Balanced Mixer Commutation of f1 by f0, f1 higher than f0.

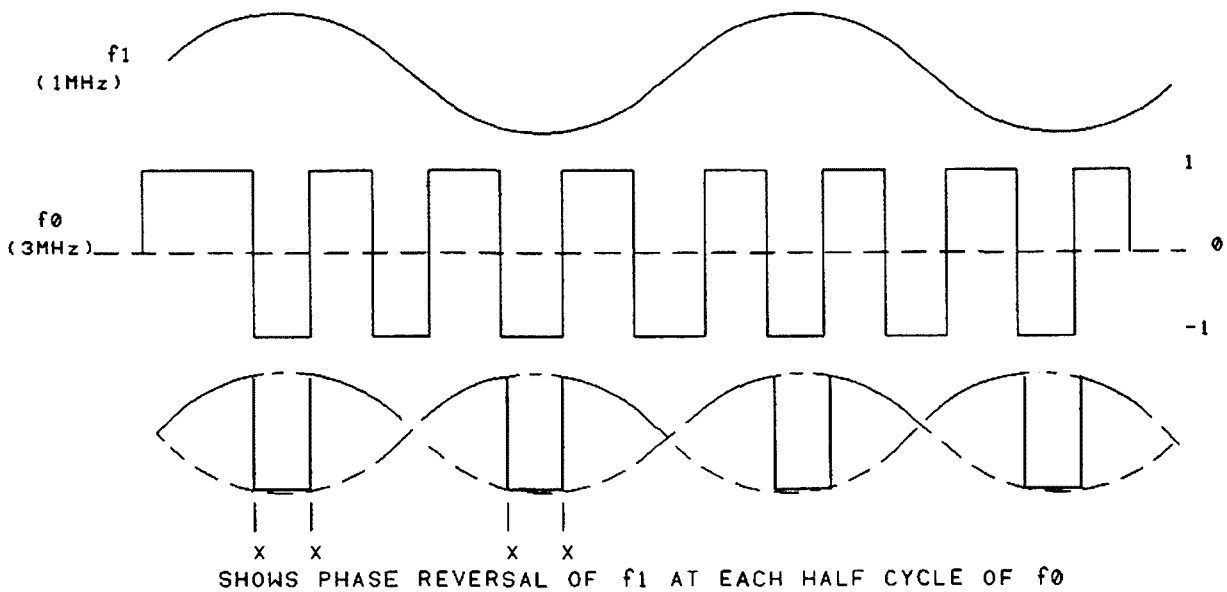


Figure 11: Double Balanced Diode Mixer Commutation of f1 by f0, f1 lower than f0.

single balanced half ring type shown in **Figure 12.** In this circuit, the diodes are switched on and off by alternate half cycles of f0 as shown in **Figure 13.** In this case we can consider f1 to be multiplied by a square wave of frequency f0 and amplitude of one but with a DC offset of amplitude one. Multiplying these together our product is now as follows:

$$A1\ SIN(s\pi f1\ t).(1 + 4/\pi COS(2\pi f0\ t) - 4/3\pi COS(2\pi 3f0\ t) \ldots etc$$

$$= A1\ SIN(s\pi f1\ t) + 4A1/\pi\ SIN(2\pi f1\ t).COS(2\pi f0\ t) \ldots etc$$

The DC offset is represented by the one and, in multiplying this by A1SIN (2πf1 t), representing signal f1, we still get the same frequency f1, that is, our signal f1 is not balanced out in this mixer. Switching frequency f0 is still balanced out however, hence the name single-balanced mixer.

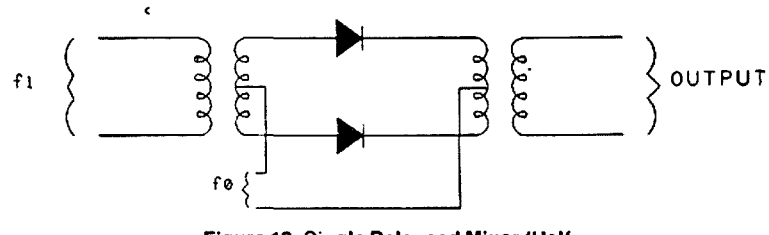


Figure 12: Single Balanced Mixer (Half Ring).

The degree of input signal isolation in the balanced mixer is determined by the accuracy of transformer balance and the degree of matching of the diodes. Before the solid state era, some carrier telephone systems used copper oxide metal rectifiers. Modern balanced mixer modules, suitable for VHF and UHF, use hot carrier diodes which are characterised by low conduction voltage, low reverse current, low capacitance and very high frequency performance.

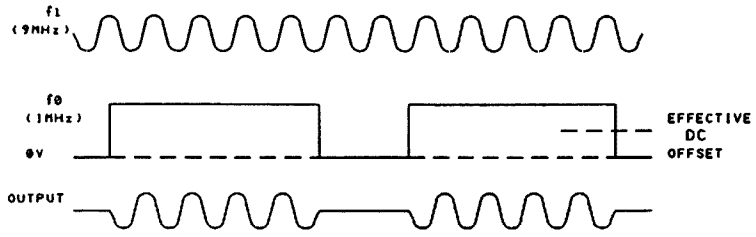


Figure 13: Single Balanced Diode Mixer. (f1 is multiplied by switching wave f0 and a DC offset equal in amplitude to the switching wave).

Diodes of all types have a current turn-on characteristic and unless driven hard by signal f0, will operate in a partial continuous non-linear mode. In the balanced mixer spectrum, shown in **Figure 8,** even harmonics of f0 are evident indicating that perfect square wave switching is not taking place.

Diode balanced mixers work very well but have conversion loss rather than gain. They are also low impedance devices and require low source impedance circuits to drive them. Because of these characteristics, active balanced mixers, using bipolar or field effect transistors, are often used. These have conversion gain and can be driven by higher source impedance circuits.

An active balanced mixer, built by the author for use in a transceiver, is shown in **Figure 14.** In this application, a 4 MHz SSB signal was upmixed to 17 MHz by beating with a 21 MHz carrier. The spectrum for this mixer is illustrated in **Figure 15.** This mixer works in continuous non-linear mode with signal f0 swinging the gate voltage over a large section of the drain current versus gate voltage characteristic. Fine balance of transistor gain is achieved by differential adjustment of drain current with the bias adjustment potentiometer in the source circuit.

Active balanced mixers can also operate in the switching mode by increasing the level of signal f0 to the point where the output current is switched between zero current and the saturated current state. Whether the operation is continuous non-linear or switching mode is determined by the level f0 and to some degree the setting of input bias.

UP MIXING AND DOWN MIXING

The question can be asked, when does one use a balanced mixer in preference to a non-balanced type? One answer lies in how difficult it is to remove the reference carrier with tuning or filtering. In the case of **Figure 14,** the 21 MHz carrier is very close in frequency to the 17 MHz product required and the balanced circuit was built in after some difficulty was experienced with the high residual carrier level at the output.

The same frequency conversion, in reverse, was required in the receiver where conversion was from 17 MHz down to 4 MHz using the same 21 MHz carrier. In this case the 21 MHz is well removed in frequency from 4 MHz and no problem was experienced in using an ordinary dual gate MOSFET mixer similar to **Figure 9.**

The point being emphasised is that a balanced mixer is more likely to be required when up mixing, as required in an SSB transmitter, than when down mixing in the matching receiver.

Another use of the balanced mixer is that of an amplitude modulator which generates double sideband suppressed carrier signals. Signal f1 is then the speech input and the carrier f0 is balanced out. In this application the mixer is normally called a balanced modulator. Remember that we have already said that mixing and amplitude modulation is the same process. The balanced modulator is the first stage in our single sideband transmitter to generate two sidebands, one of which is removed by a selective filter.

INTERMODULATION PRODUCTS

Because our mixing device operates in a non-linear mode to carry out its function as a mixer, it can also generate intermodulation products from unwanted signals at its input. The products might result from mixing our signal f1 with some other signal f2 or from mixing together two entirely different signals f2 and f3. The most troublesome of these are what are called the third order products (2f1-f2) or (2f2-f1). These are troublesome because they are normally the closest intermodulation products to our desired signal f1.

Suppose our desired signal f1 is 14.200 MHz and another signal f2 is present on 14.300 MHz. In this case, our third order products are at 14.100 MHz and 14.400 MHz. Suppose there were a third signal f3 on 14.400 MHz and we calculate the third order products from f2 and f3, that is (2f2-f3) and (2f3-f2). From these we get 14.200 MHz and 14.500 MHz the first of which is the same frequency as our desired signal f1 and a cause of interference.

Clearly, interference from intermodulation products can be a serious problem and one measure of performance of a mixer is the level of its third order products at the output relative to the desired sum or difference product.

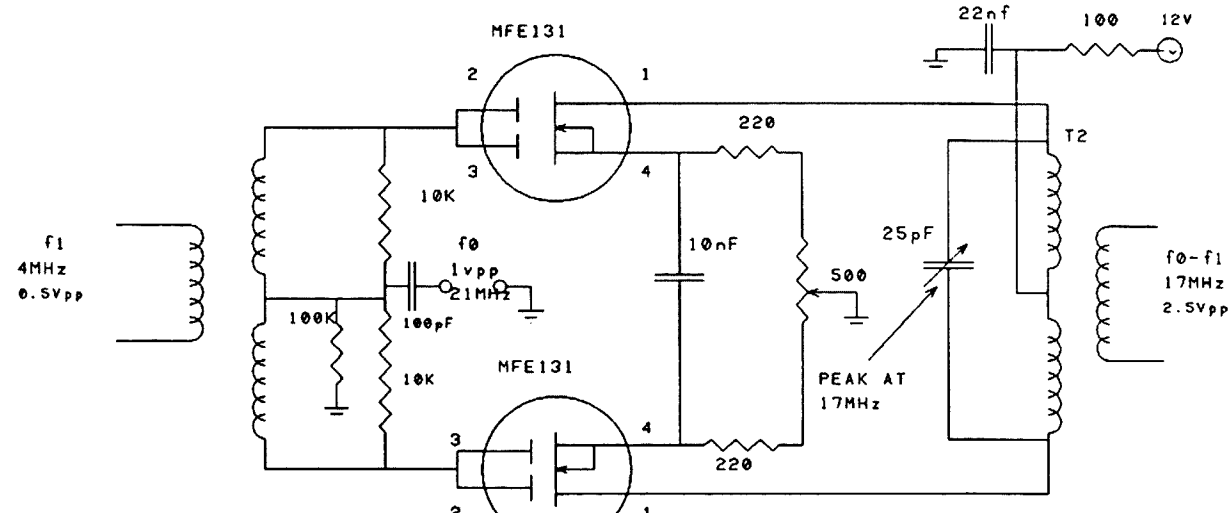


Figure 14: MosFET Balanced Mixer.
NOTE:
T1 — 10 turns trifilar wound Philips toroid 97120 μ = 2300
T2 — 8 turns trifilar wound Philips toroid 97160 μ = 120

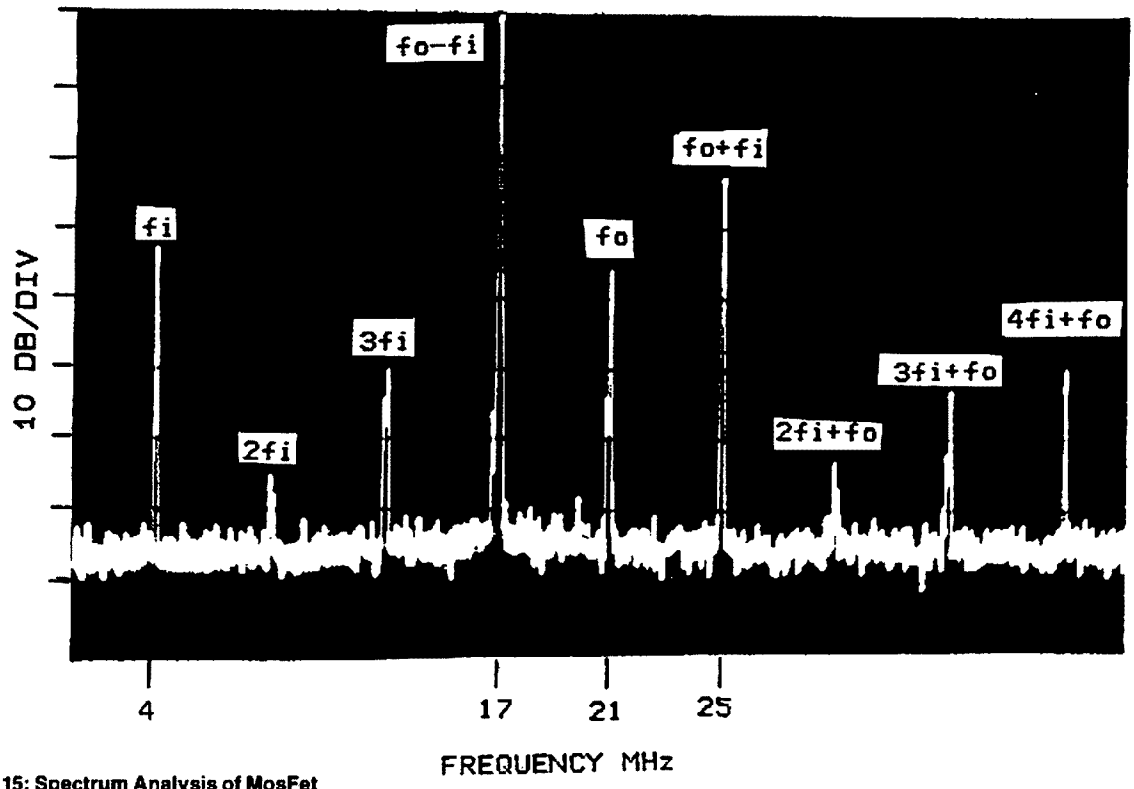


Figure 15: Spectrum Analysis of MosFet Balanced Mixer.

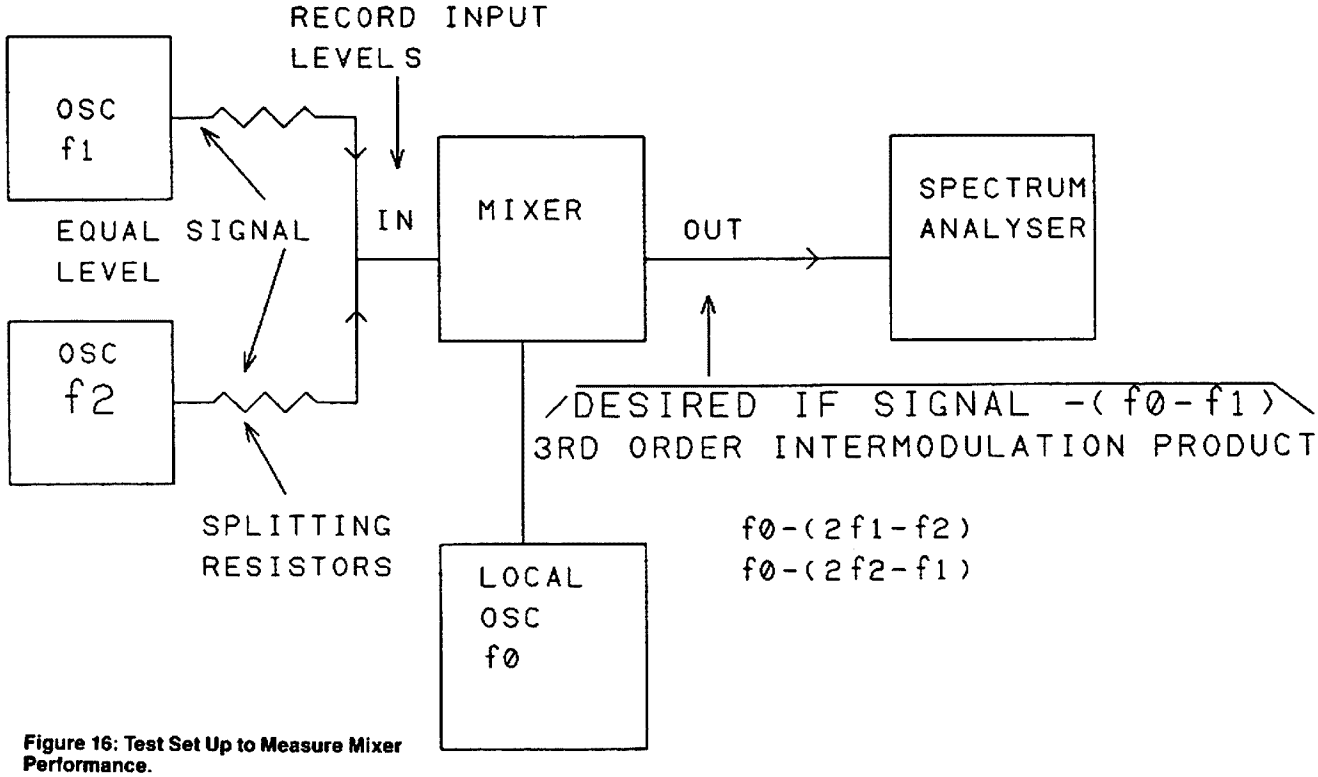


Figure 16: Test Set Up to Measure Mixer Performance.

THIRD ORDER INTERCEPT

It was suggested in earlier paragraphs that to keep intermodulation products low, it was necessary to operate the input signal f1 at low level. We will now examine the reason for this.

Suppose we feed two sine wave signals of equal amplitude to the input of a non-linear device. We take note of the level and then increase the level by a factor of 3.16, that is 10 dB. Because of the non-linearity, the change in output level will not be the same as the change in input level, however the output can be resolved into components consisting of the two fundamental frequencies f1 and f2 and other components which can all be examined separately. The fundamental frequencies must increase linearly otherwise they would not be fundamentals and hence their outputs increase by the same factor as the input (ie 3.16). The other components will follow some other law.

In previous paragraphs we referred to the trigonometry identity $COS(2A) = 1-2SIN^2A$ and showed that second harmonic components are associated with a sine-squared function, hence we can conclude that second harmonic components 2f1 and 2f2 follow a square law function of the input level. Of course what we are really interested in, at this stage are the third-order products, the results of multiplying 2f2 by f1 and 2f1 by f2. The result is, that with f1 and f2 equal in amplitude, our third order products (2f2 - f1) and (2f1 - f2) follow a cube law relationship with the input level. Tabbing our input change of 3.16 in decibels, we get the following:

Change in input level = 20 LOG 3.16 = 10 dB
Change in output at fundamental = 20 LOG 3.16 = 10 dB

Change in output of third order products = 20 LOG 3.16^3 = 30 dB

Because the third order intermodulation products increase with the cube of the Input change, as compared to the linear change for the fundamentals, the higher the signal level input, then the higher the ratio of intermodulation products to fundamental. There is also a theoretical point where the output level of intermodulation products equals the output level of the fundamental. This point is called the Third Order Intercept Point and this is often specified to define the third order intermodulation performance of a mixer.

To measure the intercept point we set up the equipment as shown in **Figure 16.** Two calibrated signal generators of equal signal level are fed to the inputs of the mixer and the output monitored with a calibrated spectrum analyser. As the device is a mixer, both fundamental and third order products are shifted in frequency by a value f0 (the local oscillator frequency). In the case of **Figure 16,** the relevant output components are:

Desired Signal f0 - f1
Third Order Components f0 - (2f1 - f2)
f0 - (2f2 - f1)

Figure 17, shows curves for a 3N140 mixer produced from the test of **Figure 16.** To carry out the test, the input level is set so that the third order modulation products are the same level as the noise floor. The spectrum analyser is used to separate the various components and measure individual levels. All that has to be recorded is the input and output levels of the desired signal and intermodulation products. It is a simple matter to extend the curves based on linear law and cube law respectively. By plotting a decibel form, two straight lines of different slopes are formed. The desired signal output increases by 10 dB for a 10 dB increase in input. The third order intermodulation products (IMD) increase 30 dB for a 10 dB increase in input. The curves can be confirmed by recording several different signal levels.

At some point the curves must cross defining the third order intercept. It is emphasised that this point is theoretical and can never be achieved in practice as the mixer would be driven into compression before the point could be reached. Specification of this point could be reached. Specification of this point is useful because the two curves can be re-established from it using the linear and cube laws.

NOISE LEVEL AND DYNAMIC RANGE

Using the test equipment, **Figure 16,** another important measurement is the level of the noise floor at the output. As previously discussed, the lower the input signal level the lower the level of intermodulation products. However, the lower the signal level, the lower the signal to noise ratio.

In **Figure 17,** the noise floor is recorded as 0 dB output and this information, together with levels of signal and intermodulation products, is transferred to a different form in **Figure 18.** Here we show the signal to noise ratio as a function of input signal level on one curve and the ratio of signal to intermodulation products as a function of input signal level on the other. Observe that there is an optimum operating level where the curves cross and where the output signal is 50 dB above both the noise and the IMD products.

For signal levels below the crossover point, the IMD products are below the noise floor. This is

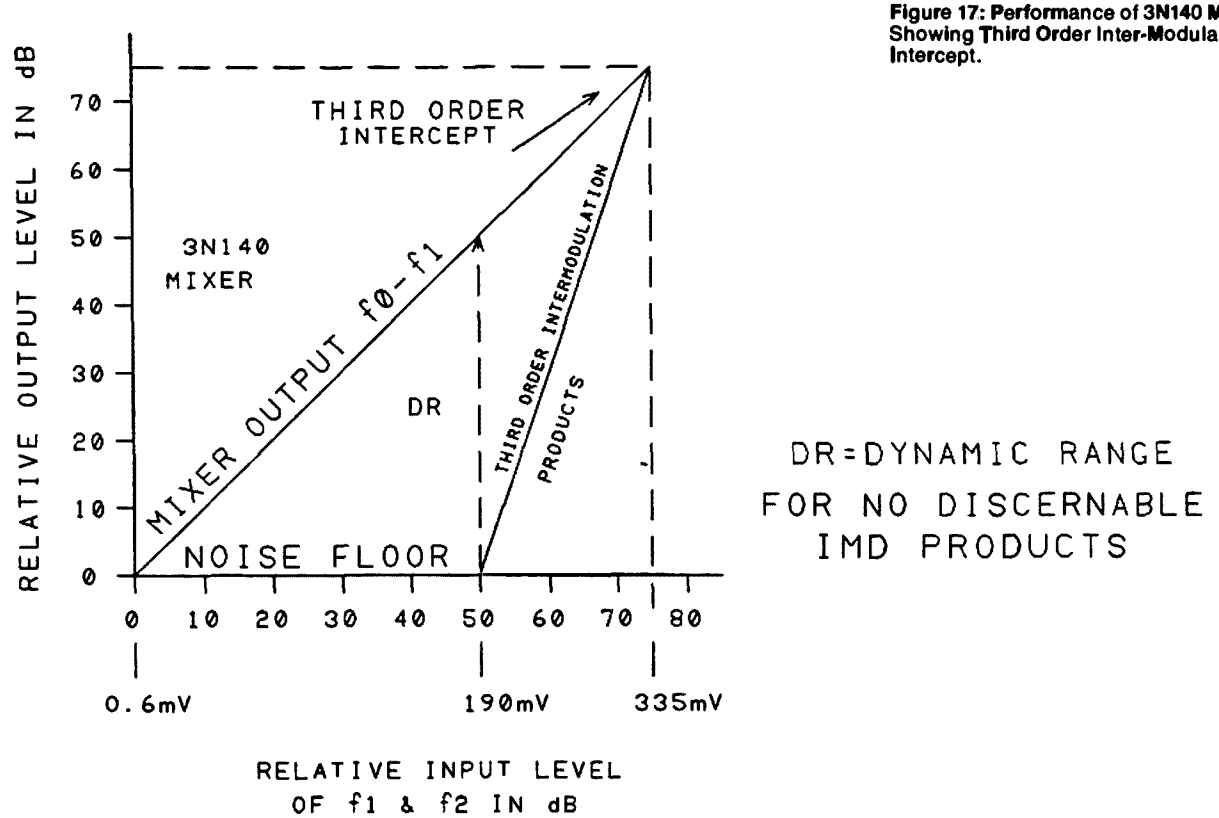


Figure 17: Performance of 3N140 Mixer Showing Third Order Inter-Modulation Intercept.

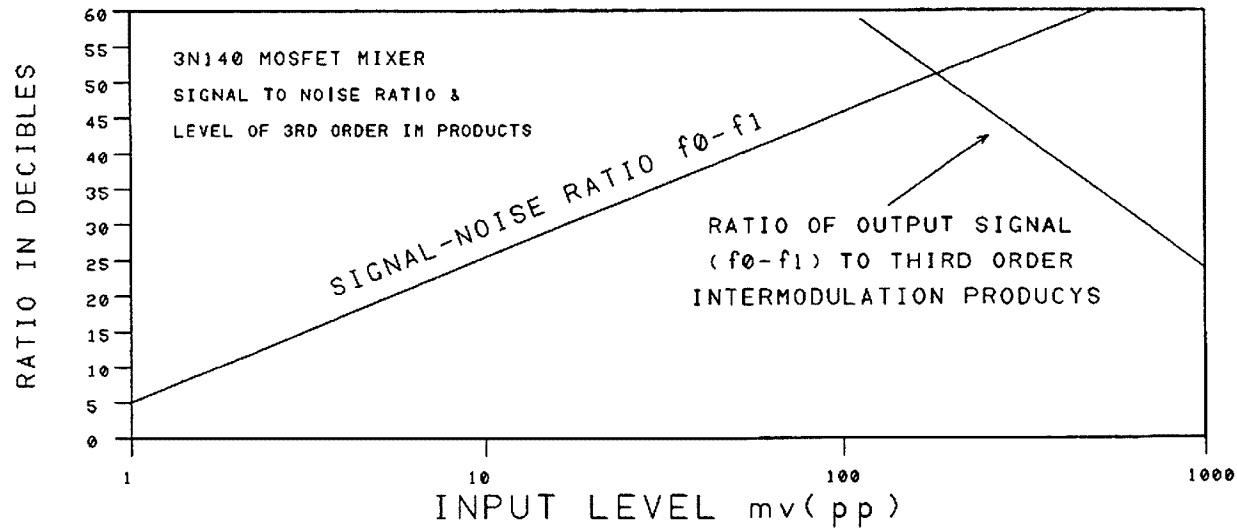


Figure 18: 3N140 Mixer. Comparison of signal to noise ratio and signal to intermodulation products.

also shown by the dotted line in **Figure 17.** The length of this line is also the dynamic range (DR) of the mixer, for which we cannot detect the IMD products. Observe that this figure is 50 dB and two thirds of the difference between the third order intercept point and the noise floor (75 dB). Because of the linear and cubed law of the two curves respectively, the dynamic range (in dB) can always be worked out as two thirds of the decibel margin between the intercept point and the noise floor.

A high dynamic range is particularly important when the mixer is used in a superheterodyne receiver which must cope with a wide range of signal input levels. For satisfactory operation the least signal level must be raised by RF amplification to a level into the mixer well above its noise floor, but not too much, so that IMD products from stronger signals are encouraged. Hopefully, the maximum level from unwanted signals will be within the dynamic range. If not, we can expect them to cause interference components. For higher input signal levels less RF gain is desirable and hence there is a need for some type of RF gain control in the receiver.

One other point worth mentioning is that noise power is proportional to bandwidth and hence the noise floor level and the dynamic range are also functions of the system bandwidth. In reference to **Figures** 17 and 18, the measurements were carried out on the basis of an FM bandwidth of 15 kHz. Had the noise floor been measured for a 3 kHz SSB bandwidth, it would have been 7 dB lower and the dynamic range 7 dB greater.

SUMMARY

Mixers can be categorised in the following ways:

1 Operation in a continuous non-linear mode or operation in the switching mode.
2 Unbalanced operation or balanced operation in which one or both input signals are balanced out at the output.
3 Mixers which have conversion gain and mixers which have conversion loss.

Mixers are usually best operated by sweeping the reference signal (f0) over the full non-linear region of the mixer characteristic curve but operating the input signal (f1) at a lower level, sufficient to give good signal to noise ratio but low enough to minimise intermodulation products.

Third order mixer products rise in proportion to the cube of the input signal level (and output signal level). Mixer performance as a function of signal input level can be defined by the third order intercept point and the noise floor level.

What we have presented here is an exploration of how mixers work and a few ideas on how they should be operated. Further information on the practical application of these devices can be found in handbooks such as published by the American Radio Relay League (ARRL).

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GETTING ON AIR — Part 3
A Tune-up Indicator

Peter Parker VK6NNN
C/- Witchcliffe Post Office, WA. 6286

This device indicates the amount of power emitting from an antenna. It is especially useful for tuning up. If a coil is difficult to wind around the antenna, a parallel wire, in place of the coil, will work if a more sensitive meter or high power is used.

Although not tried, it could possibly monitor AM by connecting a 1 kohm to 8 ohm transformer and headphones connected across the 20k potentiometer.

High impedance headphones could also be used.

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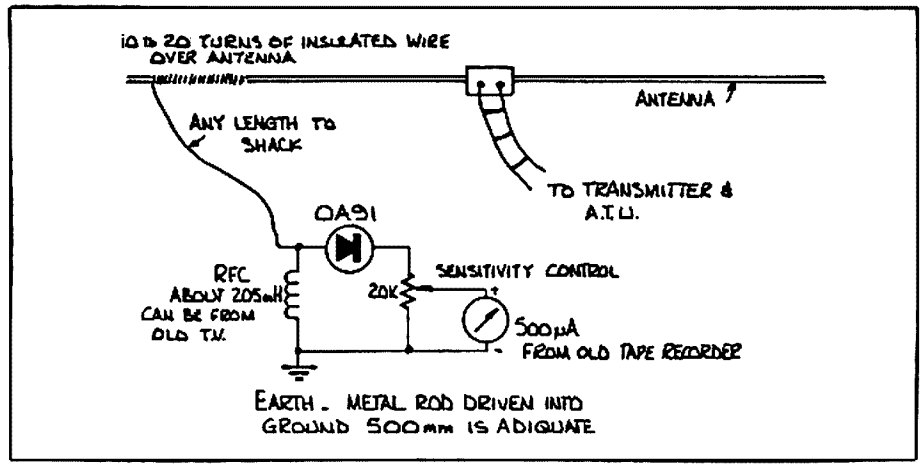


Figure 1: Earth — Metal Rod Driven into the Ground. 50 cm is adequate.

TIME DIVISION MULTIPLEXING THE 1920s WAY!

THE BULL TRANSMITTER

A selective system of wireless telegraphy based on mechanical principles, developed by Anders Bull. This device worked on a synchronised system, includes both transmitter and receiver. The transmitter consists of an open-circuit oscillator supplied with energy by the usual transformer or spark coil, which operates through an apparatus termed the disperser. The receiver had, in the original form, an open circuit resonator actuating a number of registers through a collecting mechanism.

The disperser is shown in Figure 1. A is connected by gearing with the motor B, which is in series with a variable resistance for regulating the speed. An electro-magnet, D, automatically controls a disk making a specific number of contacts and sending out a similar and predetermined number of waves or oscillations. When it is desired to send a message, the key L is depressed and closes the circuit, which includes the battery and the electro-magnet 2, which in turn attracts an armature attached to a clutch carrying a pin.

The function of the armature, magnet, and switch is shown more clearly in Figure 2, which is a sectional view of Figure 1. When the armature is drawn to the magnet, 2, disk 3 is released by the clutch, 4, and then revolves at a speed of about five revolutions per second. At every revolution of the disk contact is made by the springs, 6, and the circuit, which includes the battery, 7, and electro-magnet, 8, is closed. The disperser itself consists of 400 steel springs, 9, attached at right angles to the disk and near its periphery. These long vertical springs have their ends free and pass through slots in a stationary upper disk, 10. The springs are thus able to move in a radial direction only. A brass ring forming a groove, 11 (shown in part in Figure 1), is attached to the framework, and guides the springs so that with each revolution of the disk, which occurs once every second, they either slide in the groove, 12, or within its inner circumference.

The bronze arc, 13, takes the place of a section of the brass ring, 11 and has a finger projecting toward the centre of the disk; as the vertical steel springs come in contact with it they are forced towards the magnet, 14. Attracted by this magnet, the springs then slide along until released at the edge of 15, where they are again drawn into the groove or return to the inner part of the ring by their own elasticity, according to whether the magnet is energised or not.

When it is required to send a dot signal, the key is depressed for less than one-fifth of a second, which is the time required for disk 3 to complete one cycle, and the current flows through the circuit as a single impulse. When transmitting a dash signal, the key is held in contact long enough for disk 3 to revolve a number of times, consequently a corresponding number of electric impulses, at intervals of one-fifth of a second, flow through the circuit, causing the springs to make contact at regular intervals by means of the contact points, 18, and thus closing the circuit in which the battery, 19, and magnet coil, 20, form a part.

As there are a number of these contact points arranged round the frame at prescribed intervals, it is clear that the number of series of electric waves emitted will be equal to the number of contact points, and by varying the distance between these points, any combination or series of waves may be sent out through the medium of the electro-magnet key, 200, battery, 21, spark coil, 22, and oscillator circuit, 23.

The collector is similar to the disperser, except that receptive devices are employed instead of emitting devices in the circuit. Figure 3 is a plan view of a receiver. The coherer is connected in the open circuit resonator in the usual manner, while the relay, 23, in series with a battery, is included in a local circuit with the coherer. The tapper, 24, is in parallel with an auxiliary circuit formed by the armature of the relay in series with the magnet, 25.

For every series of electric waves that impinge upon the resonator system one of the vertical springs slides into the groove, 26, of the ring. The revolving disks of the transmitter and the receiver, or, as they would be termed, disperser and collector, revolve synchronously so that the angular distances of the springs sliding in the grooves will be proportional to the time constant between the series of waves impinging on the aerial.

Since the points are arranged in the same relative positions in both transmitter and receiver and are operated synchronously, contact in both is made simultaneously. The points, 27, are connected in series with the morse printing register, 28. A prearranged series of electric waves will cause the springs to make contact at the same instant when the local collector battery operates the register.

In Bull's experiments one disperser and one collector were used, and these were arranged with three sets of contact points, thus permitting any one of three Morse registers to be operated at will. In Figure 4, three series of waves are shown, by the dotted lines S', S'', and S''', the horizontal line being taken as time and the wave series by the

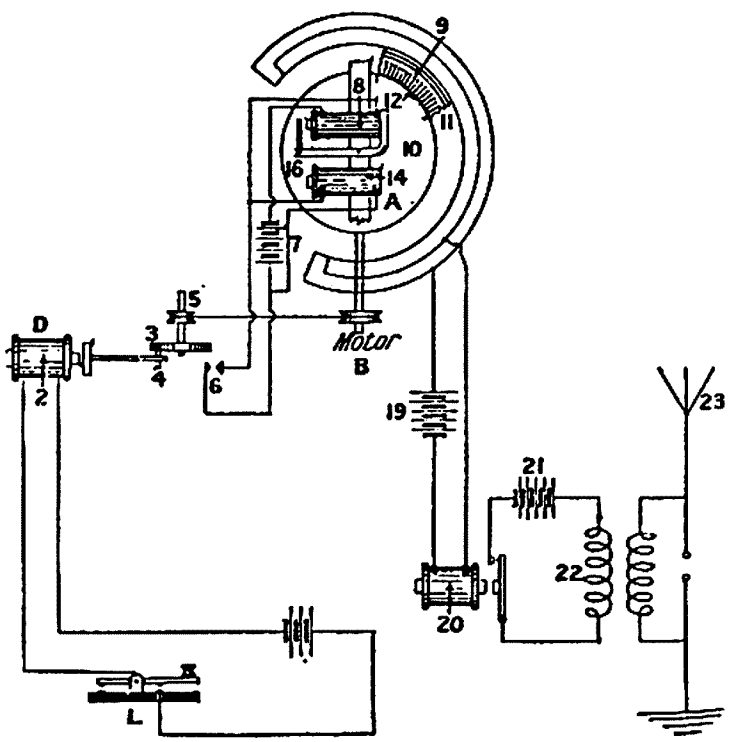
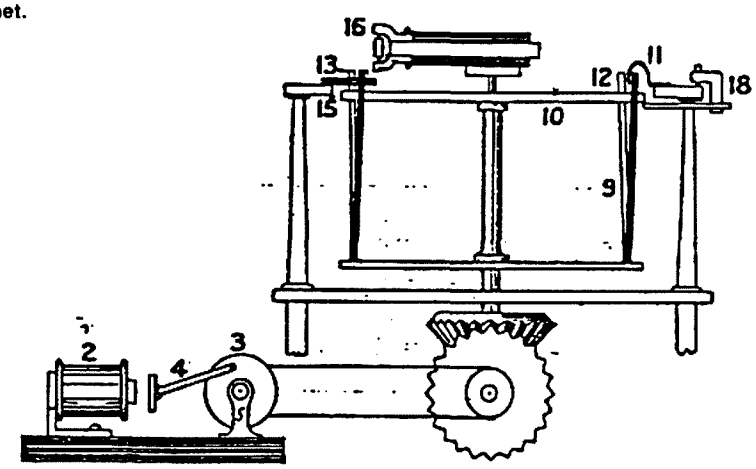


Figure 1: Bull Transmitter worked on Mechanical Principles.

Operation of the spark coil in the old Bull transmitter was conducted through a disperser, the arrangement of which is seen in the above diagram.

Figure 2: Details of Bull Transmitter. Sectional view of Figure 1. From this will be seen more clearly the function of the armature, magnet and switch. The magnet is at 2, disk at 3, and clutch at 4. The disk revolves when the armature is drawn to the magnet.



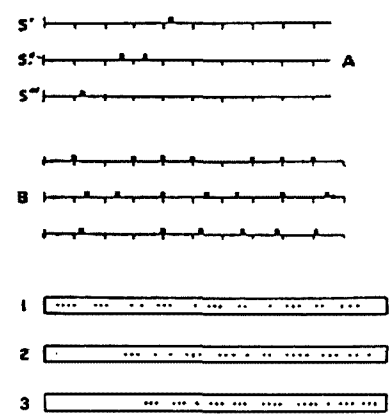


Figure 4: Recording Tape from Bull Receiver.
Three Morse registers were operated in Bull's experiments, and examples of the three methods of recording are given. These represent the result of early experiments to obtain selective reception.

heavy vertical strokes. In Figure 4, B, is represented the way in which the wave series is registered when the key of the transmitter is kept closed; 1m 2m and 3 are the type from three Morse registers operated independently of one another. The transmitters and receivers may be set up in different localities and at varying distances with equally good results. This system was a serious attempt to obtain selective reception.

The above is a reprint of *The Bull Transmitter* from the *Harmsworth Wireless Encyclopedia 1923* contributed by Lloyd Butler VK5BR

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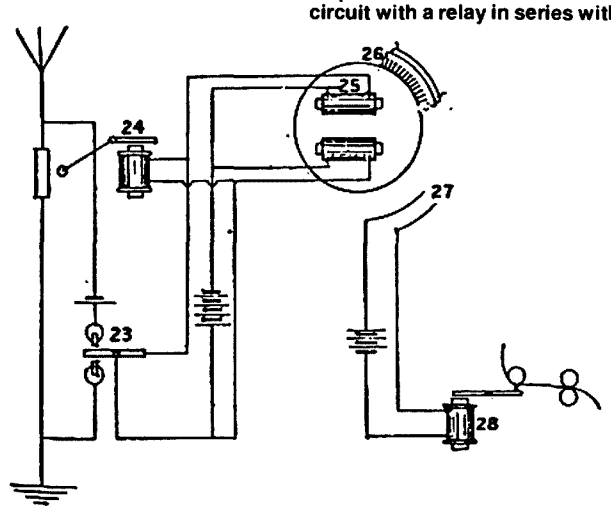
Figure 3: Bull Collector Circuit.

Except that, instead of emitting devices, receptive devices are used in the above circuit, the collector is similar to the disperser. A coherer was included in a local circuit with a relay in series with a battery.



HAMADS

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write *each* on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. *Please do not use scraps of paper.* Please remember your STD code with telephone numbers

BUILD A SWAILER

Its wails can help you tune up your rig and antenna tuner.

The SWAILER is a tune-up aid for blind amateurs that provides an audible indication of RF output and indicates SWR, offering White Cane Operators a simple method of operating antenna tuners.

Operation

As an RF output indicator, the Swailer functions like many existing audible relative power indicators, in that the transmitter is tuned up to obtain that highest possible tonal pitch from the built-in speaker, without losing the tone altogether.

When maximum output has been achieved, press the SWR push button S2. A change in tone indicates the presence of a reflected wave. With the button depressed, adjust the antenna tuner until the tonal pitch is closer to the original tone. Alternatively touch up the transmitter output (with the button released) and the antenna tuner (with the button depressed) until the two tones are as nearly matched as possible. Identical tones indicate an SWR of 1:1.

Adjust R4 to establish a comfortable tonal range. The setting of R4 is an operating convenience only, and has no effect on the function of the system.

For initial setup, install an additional SWR meter ahead of the tuner to check things out, because the SWR button on the Swailer, being normally to ground, may ground the meter in the pickup unit when switched to read reflected power. When everything has been checked out, remove the temporary meter, and leave the meter in the pickup unit switched to the forward position.

Circuit Description

U1 (Figures 1 and 2) is a differential amplifier driving U2, a voltage-to-audio frequency converter. Q1, Q2 and Q3 function as a current mirror, necessary for the unit to produce a usable range of audible tones.

U1 amplifies the difference between input 3 (Forward voltage) and input 2 (Zero volts when S2 is normally closed, or reflected voltage when S2 is held open). Thus, when all reflected power has been tuned out, the output of U1 will be the same with S2 open as with S2 closed, resulting in identical tones being produced by U2.

R4 is a 'set-and-forget' control to obtain a workable tonal range.

Input Signals

The Swailer requires samples of both the forward and reflected DC voltages from the transmission line between the rig and antenna tuner. If there is room in the SWR meter, the Swailer could be built in.

Install a ⅛ inch stereo jack in the SWR bridge. Ground the sleeve, connect the tip contact to the reflected power diode, meter side, the third contact to the forward power diode, meter side.

Make up a cable from two-wire shielded cable with a ⅛ inch stereo plug on each end to connect the Swailer to the SWR bridge or tuner.

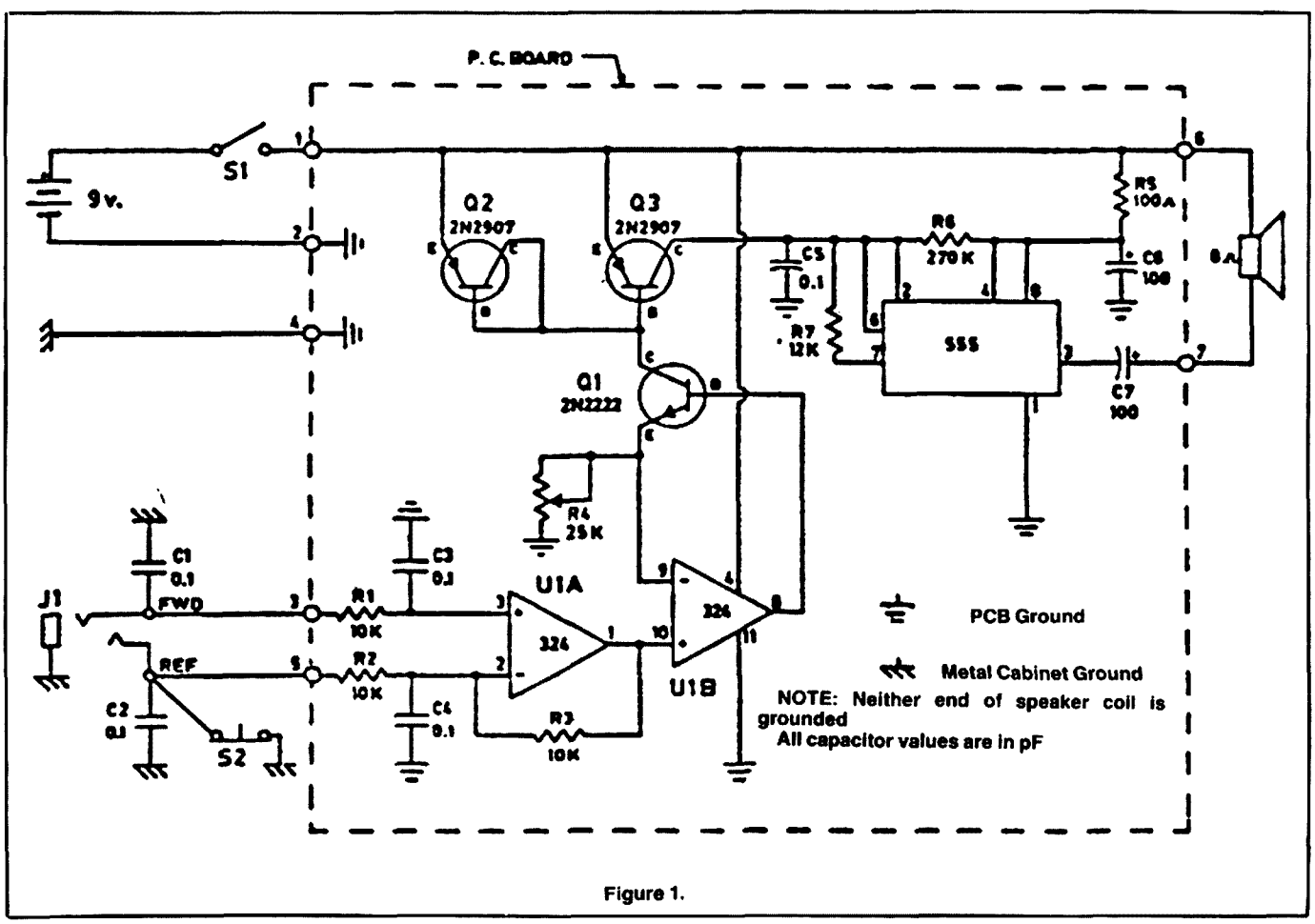
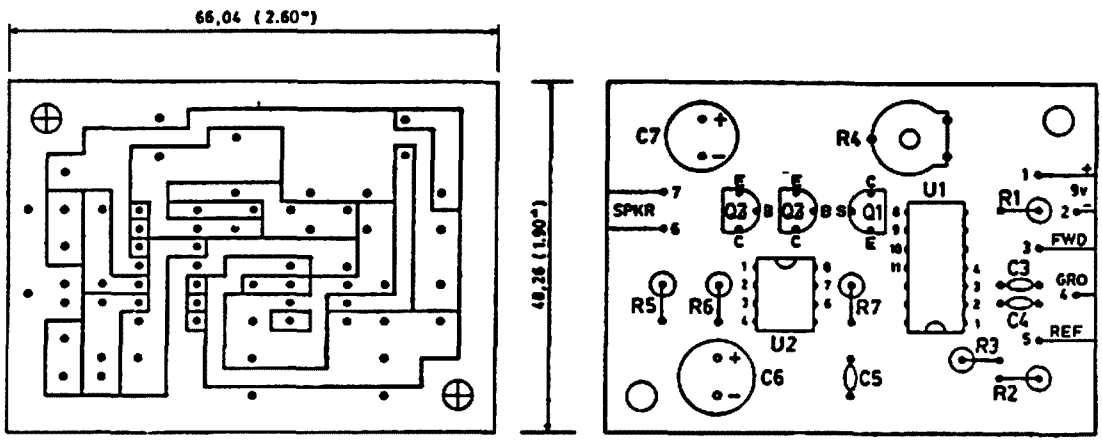


Figure 1.



Foil Side of Board — Remove foil where shown in black.

Parts Placement — Plain side of board.

Actual Size.

Figure 2: Standing Wave Audible Indicator and Level of Effective Radiation (SWAILER).

Construction Notes

The Swailer can be installed in any small metal enclosure (the shielding is vital). Drill a few holes in the rear panel and epoxy-glue the speaker over the holes. Ground the cabinet carefully.

There is nothing critical about parts placement, except for RF bypass capacitors C1 and C2, which should be soldered directly across J1, with leads as short as possible. When laying out the enclosure, do not forget to leave room to tuck in the nine-volt battery.

Conclusion

Even if you are a sighted amateur you might like to try using a Swailer. Listening to its gentle voice is a lot easier than trying to watch the antics of several meter dials at the same time.

Most of the credit for developing the Swailer belongs to Jim Swail VE3KF and Lloyd McSheffrey at the National Research Council in Ottawa, who took my original design (which did not work very well), refined it, redesigned it, and made it come to life.

Reprinted from *TCA* July/August 1985, Technical Section by Frank Hughes VE3DQB.

SWAILER PARTS LIST

5	C1, C2, C3, C4, 0.1 uF disc ceramic C5*	
2	C6, C7	100 uF electrolytic
3	R1, R2, R3	10 k
1	R4	25 k Potentiometer
1	R5	100 ohm
1	R6	270 k
1	R7	12 k
1	U1	LM324 Op Amp Quad
1	U2	555 Timer
1	-	14 pin DIP socket
1	-	8 pin DIP socket
1	Q1	2N2222 NPN transistor
2	Q2, Q3	2N2907 PNP transistor
1	S1	SPST switch
1	S2	NC push-button
1	-	2 inch 8 ohm speaker
1	-	Cabinet
2	J1	⅛ inch stereo jack
1	-	Battery snap
8	-	Push-in terminals
		2-wire shielded cable
2		⅛ inch stereo plug
1		SWR meter (if required)

* Note: C3, C4 and C5 can be printed circuit type capacitors. Disc ceramics may be found to be a little too large to fit the circuit board layout without a bit of crowding.

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QRZ WYOMING OR DELAWARE?

Chasing awards can be fun, and at times frustrating. Trying to work all US States is difficult, and the latest licence figures show why two Sates are extremely hard to find on air.

The two smallest States are Wyoming with 938 radio amateurs, and Delaware has 991.

California is the most populated State wit 59 644, followed by Florida with 26 242, New York 26 001 and Texas 25 495.

US CONSTITUTION CALL SIGNS

Special 200 call signs have been issued to celebrate the bicentennial of the United States Constitution.

Listen for the special event stations with prefixes including Whisky 200 and Kilo 200 on air as part of activities associated with the National Bicentennial of the Constitution.

WIRELESS INSTITUTE OF AUSTRALIA

PAPER 6 — CONCLUSIONS AND RECOMMENDATIONS

by The Future of Amateur Radio Working Party
The Working Party Membership includes:
Ron Henderson VK1RH
Gordon Bracewell VK3XX
John Aarsse VK4QA
Stephen Phillips VK3JY

BACKGROUND

The Future of Amateur Radio Working Party was set up by the 1986 Federal Convention and directed by the Executive to, amongst other things, report on "the operating and technical requirements of amateur radio in the near future (next five years) and more distant future (out to say 15 years)."

Following the 1987 Federal Convention where guidance was given to the Executive on the Future of Amateur Radio, the Executive further requested the Working Party "to produce a number of discussion papers, coupled with a general review of licensing grades and operating privileges existing in the Amateur Radio Service". The Working Party's terms of reference are attached in Appendix 1.

The Working Party has produced five discussion papers to date, namely:

The Future of Amateur Radio (AR, September 1986)
Frequency Bands and Emissions (AR, November 1986)
A Proposal to Restructure Amateur Radio Licensing (AR, December 1987)
A Synopsis of Members Comments (AR, March 1988)

These papers have explored many facets of amateur radio and have provided the Working Party with a basis for this sixth and final paper containing the aggregated conclusions and specific recommendations.

AIM

To present concise conclusions and a series of recommendations for consideration and adoption by Divisions at the 1988 Federal Convention.

WORKING PARTY CONSIDERATIONS

Assumptions

Part way through its deliberations, the Working Party was faced with criticism in another amateur radio publication, that it had not examined the basic reason for existence of the Amateur Radio Service. The Working Party had agreed earlier that such examination of grass roots was not necessary, hence there are implied assumptions in its deliberations.

It is useful to set down now those assumptions which can be interpreted as:

a. There are no major disagreements with the aims and objectives of the Amateur Radio Service.

b. Being a part time interest activity, the qualifications to be a radio amateur should be pitched low enough to permit their achievement by the average enthusiast after a short period of instruction. Qualifications may be graded with associated graded privileges.

c. The amateur requires small band segments spread across the whole frequency spectrum from long wave to microwave. Spectrum allocations must permit the commonly used modes to be employed without undue congestion.

d. Amateur radio will attract people from all walks of life and all age groups. However, financial constraints and available leisure time are recognised as recruitment influences.

e. Radio amateurs generally wish to practice their interests free from constraints, obstructions, bureaucracy, harassment and nuisance. They will usually give a little of their free time to administration of their hobby.

The Working Party's approach has been to identify points which need to be considered and group them up into like aspects. Papers have been produced on those aspects and an open style adopted with all papers staffed to all Working Party members, revised and then published in *Amateur Radio* magazine for comment from the membership of the Institute.

Paper 5 — A Synopsis of Members Comments was published to acquaint members of frequently recurring comments and re-assure them of incorporation of their contributions. These collective views have been used to modify the conclusions and recommendations of the earlier papers for incorporation in this final summary paper.

Incidental Actions by the Working Party

The Working Party was called upon by the Executive to produce a report on the surveys conducted by the Divisions into the "Novices on Two Metres" topic (AR, February 1988). That action was invaluable to the Working Party for the surveys were generally cast wider than just the prime issue under consideration and contributed significant membership opinion.

Feedback from Members

The feedback arising from members, though small at first appearance, is now recognised by the Working Party to be realistic. The Working Party's actions have been responsive to previously expressed thoughts and opinions, that is we have been on the whole reactive rather than innovative. Hence, seen in the broad, the membership input has been considerable, but disguised by being spread out over almost two years and directed towards specific topics of concern.

We trust members reactions to this final paper will arise in the form of opinions expressed to Federal Councillors in preparation for the Federal Convention in April 1988.

CONCLUSIONS

The Working Party has finished its work as directed and concluded that the general feeling from the membership is one of a need for change.

The Working Party has published its approach and solicited comments from members through their Federal Councillors. Ample time has been allowed for members inputs.

We believe there will be little change in amateur frequency allocations over the next 15 years. New bands are unlikely except perhaps at VLF or to replace existing temporary UHF allocations. A matter for consideration by the WIA is the trade-off between wide shared allocations, or narrow exclusive segments at UHF

A range of options is open to the Amateur Radio Service, extending from a highly regulated, highly qualified, elitist extreme to a virtual no qualification scheme, not unlike CB.

Arising from consideration of options, a detailed amateur radio licence restructuring proposal has been defined. This satisfies all perceived constraining factors in that it is simple, has a minimum number of grades, yet progression is clear and substantial incentives are provided for upgrading.

The Working Party's papers have provided little depth debate. Members responses have to, a large extent, bypassed Divisions and Federal Councillors suggesting a lack of awareness of the WIA's method of government.

The "Novices on Two Metres" issue provided the greatest response from Divisions with about 24 percent of WIA membership responding by one means or another. The consensus was to seek portions of the two metre and 70 centimetre band for novice use.

On the whole there is a widespread desire for a licence system restructuring without creating a lower grade than novice or a grade above unrestricted. Within these bounds there is strong support for enhancing the novice licence grade and creating a common band for all licence classes.

RECOMMENDATIONS

It is recommended the WIA adopt the following:

1. Note these recommendations are based upon members opinions and comments as expressed directly or indirectly to the Working Party.
2. Agree the Amateur Radio Service must begin detailed planning soon, both nationally and internationally for WARC 92 and face the IARU Region 3 Conference in Seoul with definite proposals.
3. Note the Australian radio amateur is permitted a wide range of emission modes, specified on his licence as permitted occupied bandwidths. This approach permits considerable flexibility for the user, both now and in the future and agree this should be retained. Furthermore, note there is a direct relationship between the demonstrated theoretical knowledge level of an amateur licensee and the complexity of authorised emission modes.

4. Agree the WIA initiate no change to the amateur Morse code proficiency requirements until after WARC 92 when the outcome of that Conference may be implemented.
5. Endorse the WIA policy to press activity for an amateur licence currency in excess of one year with commensurately reduced fees. The longer term goal is an internationally accepted licence along the lines of the European CEPT scheme.
6. Agree the WIA position for frequency allocations for WARC 92 and convey that position to IARU members at the Region 3 Conference at Seoul 1988.
7. Agree the Japan/Australia reciprocal licence agreement be examined for possible bias against Australian amateurs, more specifically the amateur novices and, if confirmed, redress sought.
8. Agree the formation of WIA/DOTC joint committees be encouraged to facilitate communications with the Department and promote self-regulation of amateur radio.
9. Endorse the licence option for an additional entry point within the existing novice to unlimited licence range and represent it to DOTC.
10. Endorse the preferred option for amateur licence restructuring and seek its implementation at the earliest opportunity by DOTC.
11. Endorse the editorial policy of *Amateur Radio* magazine in publishing the current series of home construction and simple projects which are satisfying an expressed demand.
12. Agree the matter of WIA channels of communication needs examination and perhaps reorganisation if the current membership to Division and/or Division to Federal system is confirmed cumbersome and inefficient.
13. Note the Working Party has completed its duties as directed and task it with implementing these recommendations.

February 1988

APPENDIX 1 — TERMS OP REFERENCE

1 The Future of Amateur Radio Working Party (FARWP) is appointed as a committee of the Federal Executive in response to 1986 Federal Convention motions to report to the 1987 Federal Convention on the Future of Amateur Radio.

2 a) the operating and technical requirements of amateur radio in the near future (next five years) and more distant future (out to say 15 years);
b) the qualification for amateur licences, having regard to:
i. the need to maintain a standard, identifying the standard seen to be appropriate, and
ii. the desirability of establishing a standard appropriate to attract new entrants, identifying a standard and the factors seen as relevant thereto.
c) the frequency bands, emission types and powers to be associated with the Certificates of Proficiency above (ie "licence conditions").

3 The following assumptions should be examined, together with any other matters seen to be relevant —
a) Australia is bound by International agreements, in particular the ITU Radio Regulations, particularly in relation to frequency bands.
b) available frequencies are as determined at WARC 79 and duly modified in the Australian Table of Frequency Allocations, and will be modified by future conferences.
c) current government attitudes on "the user pays" principle and DOTC actions on self-regulation and devolution of examinations.

4 FARWP is to be composed of —
Working Party Chairman — resident in Victoria
Up to four Working Party members — resident in Victoria
A member of Federal Executive
The Federal President (ex officio)
Six Communicating members, one appointed by each Division

5 FARWP will report progress monthly to Federal Executive through their FE member. The final report of the WP will be provided to Federal Executive and Federal Councillors in time for publication in the March 1987 edition of *Amateur Radio* (AR deadline date — 19/1/1987). The Report will be received and recommendations adopted, as appropriate, at the 1987 Federal Convention (May 1-3, 1987). The Working Party will be dissolved after reporting.

6 The following references are applicable:
a) Federal Convention motions:
86.15.02 — Future AR
86.12.01 — Six Metres
86.09.01/1 76.20.02 77A 76.082/2 — Novices
82/092/1 07 — Policy Statements
80.09.02/1 — Common Band
82.091 — Forward Planning
b) *Amateur Radio* articles:
February 1986, page 14 — Amateur Radio — Future Direction by J Linton and R Harrison
August 1986, page 27 — Novice Licencing into the 21st Century by G Bracewell
c) Overseas Articles:
ARRL proposals to FCC re novice licencing QST
DOC Canada licencing revisions proposals QST December 1985, page 75. CRRL-CARF Joint Comments
d) DOC Communications:
Proposals re novice frequencies
Proposals re examinations

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TOPICAL TECHNICALITIES — 3

Lindsay Lawless VK3ANJ
Box 112, Lakes Entrance, Vic. 3909

Please note: Substitute pi for ¶.

Technical name dropping among radio amateurs has always been popular and I don't mind that, but when there are many names which mean the same thing I get very confused. Take for example these:

'Capture area' (very popular,
'Effective area',
'Absorption cross section' and
'Effective aperture'.

Those terms are all used when referring to the effectiveness of a receiving aerial and I believe they have the same meaning. I have heard a mobile antenna salesman claiming superior 'capture area' for his product and recently a technical author claimed that his favoured aerial had a capture area which was independent of wavelength. Both, I believe, are misrepresenting the facts.

I prefer 'absorption cross cross-section' because of the definition; Absorption cross section' is the area from which energy would have to be extracted from an incident radiation to equal the energy removed and absorbed in the aerial load. It is very important to include the words 'absorbed in the aerial load' because a receiving aerial situated in a radio wave field delivers power to a receiver (load) and its own radiation resistance, ie portion is absorbed and portion re- radiated. The portion absorbed by the receiver is the important bit and to make this maximum it is necessary to 'match' the load and the radiation resistance, when these are equal half the power input is re-radiated and half absorbed. The following is a quantitative derivation.

The field intensity of a radio wave is specified as 0 watts per square metre. If the source is isotropic (radiates equally in all directions) with a total radiated power output of P_i watts the intensity at the surface of an enclosing sphere with a large radius r is,

$$\phi = P_i/4\P r \text{ watts per square metre}$$

A receiving aerial located in this field will absorb P_r watts and

$$P_r = A_a\phi = P_iA_a/4\P r \text{ watts therefore}$$

$$A_a = 4\P rP_r/P_i \text{ square metres}$$

A_a is the absorption cross section (area) or any of those other names.

Receiving aerials also have gain G and it can be shown that G and A_a are related

$$A_{a(max)} = G\lambda/4\P$$

G for a halfwave dipole is 1.64 therefore

$$A_a = 1.64\lambda/4\P = 0.13\lambda \text{ square metres}$$

when the dipole is oriented for maximum reception.

Note: the general expression for A_a includes spherical co-ordinate factors to allow for orientation.

Obviously a dipole end on to the transmitter, for example, will have a much smaller absorption cross section than when oriented for maximum.

The concept of area as a measure of an aerials effectiveness as a receiving aerial originates with the early work of physicists who sought similarities with their existing concepts. A surface exposed to radiant heat, for example, absorbs energy proportionally to its projected area, it is reasonable to assume that aerials might also have an effective absorption area, but it transpires that this area is not the physical area. A halfwave 30 MHz dipole, for example, has an absorption cross section of 13 square metres, its actual area is usually much less than this. There is a radiant heat analogy: an opaque surface in the path of radiant heat will reach an equilibrium state where the total of energy absorbed and radiated equals the incident energy. Similar to aerials, good absorbers are also good radiators, the best absorb the same amount as they radiate.

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1988 FEDERAL CONVENTION AGENDA ITEMS

MOTION PROPOSED BY VK1: That this Council review existing policy relating to amateur radio bands and produce an updated and concise policy in preparation for the IARU Region 3 Conference in Seoul 1988.

PROPOSER'S COMMENTS: The Future of Amateur Radio Working Party's Paper 2, Frequency Bands and Emissions, provided a resume of the current situation and extant WIA policy with regard to amateur frequency bands. These matters are summarised in the accompanying table.

PREAMBLE: In the present structure of the Wireless Institute, the Executive can become very remote from the membership as a whole. Where a group feel that the Council or the Executive are in error in a decision, there should be a means of calling for a poll of all Divisional members. Conducting such a poll through the normal process of motions on notice to each Division is hopelessly unwieldy, and therefore the only way to conduct such a poll is through the Federal body. The following proposal is intended to apply to matters directly affecting the hobby, in particular, proposed changed to the regulations.

MOTION PROPOSED BY VK3: That the Executive prepare a motion for a special resolution to amend the Federal Constitution or prepare a motion of policy to embody the intent of the following points:

1. Any two Federal Councillors may call for a poll on any proposed motion or resolution of the Council or any decision of the Executive the result of which directly affects the hobby of amateur radio.
2. The details of the proposed poll should be sent in writing to the Federal Secretary.
3. On receiving such a request any action on any move in the Federal body relating to the intent of the poll shall immediately cease.
4. At the earliest possible opportunity the details of the poll shall either be posted to all members or be placed in the national magazine as an insert.
5. The maximum time lapse between the proposal being received by the Secretary will be based on the following — the time between receiving the proposal and the next publication of the magazine plus two weeks (two weeks for preparation) plus one month to receive the results of the poll. (The intent of this proposed period is to allow a reasonable time to carry out the necessary administrative work.)
6. Any Division may appoint scrutineers to supervise the counting.
7. If the poll included more than one alternative, the voting will be preferential.
8. The results of the poll will be indicated by a majority vote for a particular Item taken as a majority of the total number of persons voting after distribution of preferences. (Since the vote is possibly intended to over-rule a Federal decision, a safeguard could be built into the procedure by requiring a two-thirds majority for a final decision.)
9. The result of the poll will be binding on the Federal body and will supersede any resolution or intent directly relevant, but not yet finalised.
10. If the Federal body does not prepare the survey within the time required, the originating Division may issue the survey and all costs will be charged to the Federal body.

MOTION PROPOSED BY VK3: Restructure of the WIA Federal body.

PROPOSER'S COMMENTS: a. That the Federal Executive take immediate action to conduct a referendum to ascertain the individual views of the members of all Divisions on restructuring the Institute and that the appropriate form/s be inserted in AR magazine together with an addressed reply-paid envelope.

b. Proposed Restructure:

i. A new National Organisation be constituted and the Divisions be disbanded.

ii. The National Organisation, have as members, both individuals and affiliated clubs and these members and clubs should be represented by a "Committee of Management".

iii. The "Committee of Management" should be responsible for the direction of salaried staff to perform all functions associated with membership services.

iv. All members should have equal voting rights.

c. If the survey result indicates that a majority is in favour of the proposal, immediate action should be taken to restructure the WIA.

MOTION PROPOSED BY VK3: That the six metre FM Repeater Band Plan be expanded to include two general use channels for repeaters and that these channels are available in each State.

PROPOSER'S COMMENTS: State band planning on six metres is being delayed because exclusive state channels are reserved for large service area repeaters, thus not allowing groups to develop small local service area repeaters.

SUGGESTED BAND PLAN

REPEATERS

State	Status	Input MHz	Output MHz	SIMPLEX
ALL STATES		52.550	53.550	
SECONDARY USE		52.575	53.575	
VK8	Prim	52.600	53.600	53.400
VK2	Sec	52.625	53.625	53.425
VK7	Prim	52.650	53.650	53.450
VK3	Sec	52.675	53.675	53.475
VK1	Prim	52.700	53.700	53.500 National calling
VK4	Sec	53.725	53.725	53.525
VK5	Prim	52.750	53.750	53.550
VK8	Sec	52.755	53.755	53.575
VK6	Prim	52.800	53.800	
VK7	Sec	52.625	53.825	
VK2	Prim	52.850	53.850	
VK1	Sec	52.875	53.875	
VK3	Prim	52.900	53.900	
VK5	Sec	52.925	53.925	
VK4	Prim	52.950	53.950	
VK6	Sec	52.975	53.975	

MOTION PROPOSED BY VK3: That the agenda for the WIA Federal Convention be published in Amateur Radio *magazine prior to the Convention.*

PROPOSER'S COMMENTS: The publication of the Federal Convention agenda will allow:

1. viewing and discussion of Federal Convention agenda items from various States by WIA members
2. WIA members to have an input to the Federal Convention items via their Federal Councillor so that the opinions expressed at the Federal Convention are those of the members
3. WIA members to keep abreast of proposed changes to WIA policy.

MOTION PROPOSED BY VK3: That within 90 days after the Federal Convention that the decisions made at the Federal Convention be published in Amateur Radio *magazine.*

PROPOSER'S COMMENTS: The publication, in *Amateur Radio* magazine, of the results of the motions moved at the Federal Convention will allow WIA members and others to:

1. be informed of changes to WIA policy
2. promote discussion which will allow WIA members to formulate motions for future Federal Conventions thus allowing the members of the WIA to guide the direction of WIA policy.

MOTION: That in preparing the WIA submission for the 1992 WARC, the WIA strive to preserve all existing band allocations, the existing amateur position within the bands and to enhance the amateur band position with regard to status within the bands.

PROPOSER'S COMMENTS: 1. With the exception of the 80 metre band that the WIA position at the next WARC be one of consolidation within the bands in preference to extension.
2. That where appropriate amateur secondary service and/or temporary status be upgraded to primary user status.

MOTION PROPOSED BY FEDERAL EXECUTIVE: That Divisions present their recruiting plans aimed to raise WIA membership by 500 in 1988 and a co-ordinated plan be adopted.

ANTENNA DESIGN IN AR MAGAZINE FIRST

A technical article "Mis-matching for Extended Bandwidth" by Bill McLeod VK3MI, in AR magazine, April 1986, has been picked up by overseas publications.

The article tackled the problem of obtaining an acceptable SWR over the wider 3.5 MHz band (3 500 to 4 000 kHz) available in some parts of the world.

The novel idea of deliberately mis-matching a 50 ohm dipole by feeding it with 72 ohm cable and then providing capacitance compensation attracted attention in the UK and USA.

The RSGB journal, *Radio Communication* was quick to run with an adaption of the article in its June 1986 edition. *Ham Radio* magazine came out with its version in October 1987.

Both magazines gave credit to Bill for his antenna design and mentioned it had been in the journal of the Wireless Institute of Australia.

Congratulations Bill, you can rightly be proud of your article getting international recognition.

Table 1 — WARC 92 Planning

BAND	PRE-WARC 79 GUIDANCE	IARU GUIDANCE
VLF 190 kHz	Nil 1984 — seek a narrow band or spot frequency	Region 3 — left to national societies initiatives
1.8 MHz (1.8-1.825 amateur primary 1.825-1.875 secondary)	Extend band to 1.8-2.0 MHz	Region 3 — Raise 1.85-2.00 MHz to primary equally shared status
3.5 MHz (3.5-3.7 amateur primary 3.794-3.800 secondary)	Seek 3.5-4.0 MHz, revised in 1981 to 3.5-3.9 MHz	Region 3 — Raise 3.750-4.000 to primary equally shared status
7 MHz (7.0-7.1 amateur and amateur satellite primary 7.1-7.3 amateur secondary)	Seek 7.0-7.5 and eliminate sharing. Revised in 1982 to 7.0-7.3 MHz	Region 3 — 7.0-7.15 amateur exclusive and 7.15-7.3 MHz amateur primary equally shared.
10 MHz (10.10-10.15 MHz secondary)	Seek an allocation	Region 3 — Extend to 10.3 on equally shared status
14 MHz (14.00-14.25 MHz amateur and amateur satellite primary, 14.25-14.35 MHz amateur primary)	Seek extension to 14.5 MHz	Region 3 — Seek extension to 14.400 MHz amateur exclusive
18 MHz (18.068-18.168 MHz amateur and amateur satellite secondary, primary July 1, 1989	Seek an allocation	Region 3 — Seek extension to 18.3 MHz amateur exclusive
21 MHz (21.00-21.45 MHz amateur and amateur satellite primary)	Seek extension to 21.5 MHz	Region 3 — Seek extension to 21.5 MHz amateur exclusive
24 MHz (24.89-24.99 MHz amateur and amateur satellite secondary, primary July 1, 1989)	Seek an allocation	Region 3 — Seek extension down to 24.8 MHz amateur exclusive
28 MHz (28.0-29.7 MHz amateur and amateur satellite primary)	Nil	Region 3 — Seek extension to 30.0 MHz amateur exclusive
50 MHz (50-52 MHz secondary, 52-54 MHz amateur primary)	Seek return of 50-52 MHz	Region 3 — Seek 50-54 MHz amateur exclusive
144 MHz (144-148 MHz amateur primary, 144-146 MHz amateur satellite primary)	Nil	Region 3 — Seek 144-148 MHz amateur exclusive world-wide
220 MHz (no Australian allocation)	Seek an allocation	Region 3 — Nil
420 MHz	Nil	Region 3 — Satellite segment 435-440 MHz amateur exclusive, remainder amateur equally shared status
(420-450 MHz amateur secondary, 435-438 MHz amateur satellite secondary)		
576 (576-585 MHz amateur primary)	Nil 1984 — Seek a permanent ATV channel	Region 3 — nil, not a regional allocation
900 MHz (No Australian allocation	Nil	Region 3 — Seek an exclusive amateur segment around 902-928 MHz
1298 MHz (1240-1300 Mhz amateur secondary. 1260-1270 MHz amateur satellite secondary)	Nil	Region 3 — Nil
2300 MHz (2300-2450 MHz amateur secondary, 2400-2450 MHz amateur satellite secondary)	Nil	Region 3 — Seek amateur primary status for 2400-2450 MHz
3300 MHz 3300-3600 MHz amateur secondary, 3400-3410 MHz amateur satellite secondary)	Nil	Region 3 — Seek amateur primary 3400-3420 MHz and pnmary equal shared 3420-2475 MHz
5650 MHz (5650-5850 MHz amateur secondary 5650-5670 MHz amateur satellite secondary)	Nil	Region 3 — Seek primary 5640-5670 MHz and primary equal shared 5830-5850 MHz
10 GHz (10.0-10.5 GHz amateur secondary, 10.45-10.50 GHz amateur satellite secondary)	Nil	Region 3 — Seek amateur primary status 10.45-10.50 GHz
24 GHz (24.00-24.05 GHz amateur and amateur satellite primary, 24.05-24.25 GHz amateur secondary)	Nil	Region 3 — Seek amateur primary exclusive 24.00-24.05 GHz
76 GHz (75.5-76.0 GHz amateur and amateur satellite primary, 76-81 GHz amateur secondary	Nil	Region 3 — Seek amateur primary equal shared 76-81 GHz
120 GHz (119.98-120.02 GHz amateur secondary)	Nil	Region 3 — Seek amateur primary exclusive 119-121 GHz
150 GHz 142-144 GHz amateur and amateur satellite primary, 144-149 GHz amateur and amateur satellite secondary)	Nil	Region 3 — Seek primary amateur equally shared 144-149 GHz
240 GHz (241-248 GHz amateur and amateur satellite secondary, 248-250 GHz amateur and amateur satellite primary)	Nil	Region 3 — Seek primary amateur equally shared 241-248 GHz

VHF UHF — an expanding world

Eric Jamieson VK5LP
8 West Terrace, Meningie, SA. 5264

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.005	H44HIR	*Honiara*
50.005	ZS2SIX	*South Africa*
50.010	JA2IGY	*Mie*
50.022	ZS6PW	*Pretoria*
50.050	ZS6DN	*South Africa*
50.075	VS6SIX	*Hong Kong*
50.075	ZS4SA	*South Africa*
51.020	ZL1UHF	*Auckland*
52.013	P29BPL	*Port Moresby*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.432	VK0MA	*Mawson*
52.435	VX3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.445	VK4RIK	*Cairns*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
52.510	ZL2MHF	*Mount Climie*
144.022	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.445	VK4RIK	*Cairns*
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VKSVF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VKSRSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
144.950	VK3RCW	*Melbourne*
145.000	VK6RPH	*Perth*
432.066	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK1RBC	*Canberra*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*Macleod*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.198	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*
10445.000	VK4RIK	*Cairns*

The only change to the beacon structure this month is the change in frequency of VK0MA, at Mawson. A letter from Mark VK0AQ, says the rise in summer temperatures (!) have not altered the frequency as he had hoped. He said the beacon has been very reliable with very little time off the air.

If Mark's plans work out as expected, he should be on board ship making his way home as I prepare these notes (17/2), after his second stint at Mawson. Mark advised me of this during a recent radio telephone call. Also coming home with him should be David VK0CK, who has been spending his time at Davis Base.

AROUND THE PACIFIC

Neville VK4ZNC, (ex VK9LC, ZK2AZ, 5W1GA, 3D2AR, C21NI, T30DD, T20AR), has written with an outline of his last Pacific DXpedition, and says:

"On 13/11/87, I flew from Brisbane to Sydney where I caught the plane to Nauru C21. On arrival at about 10 pm that night, I checked in at the Menen Hotel which is one of the two hotels on the island.

"The next day I met Reuben Kun C21RK, who is the Minister for Health and Education, and he took me around to the other side of the island to show me their club house. Reuben is the highest authority as far as radio licensing is concerned, and he explained they do not issue *temporary* amateur licenses to visitors to the island. However, he said I was quite welcome to use the club call sign, C21NI, on all bands, but he would prefer me to operate from the club house.

"A couple of days later when the time came to erect the six metre beam, Reuben advised me he would send someone around to help me. He wasn't kidding. Three men and a cherry picker arrived just to erect my small beam!

"During my two week stay on Nauru as C21NI, I worked 63 JAs most at good strength on 50 MHz. The openings were on 21/11, 22/11 and 23/11 around 0500 each day. Nothing was heard from VK or elsewhere.

"The following stations are active on Nauru: Ken C21KH, Frank C21FS (most active), Reuben C21RK, Det C21BD, Dumas C21DD (mainly CW), Vassal C21VG, and Vince C21VC, all operating on the HF bands.

"On 21/11, I left for Tarawa T30, where I stayed at the Kiribati Hotel on the atoll of Betio. There is one other hotel, the Otintai, which is closer to the airport, but to erect an antenna there would be somewhat difficult. A licence is easy to obtain in Kiribati (pronounced Kiribas) and, as in most of the other Pacific Islands, a limited licencee is given full operating privileges on all bands.

"Unfortunately, I had no contacts on six metres from Tarawa as T30DD, but I did hear Channel O, Brisbane peaking to S9 on 9/12 at 0500. It started coming in at 0252 and did not go out until 0530. Despite constant calling with my 100 watt amplifier and five element Yagi at 28 feet, I could not raise anyone from Brisbane, yet they assured me later they were all listening that day. The H44 beacon was heard in Tarawa several times but no sign of any H44s, even after I made an ISD phone call to alert them of the openings.

"The following stations are operational on HF in West Kiribati: Ritite T30BY, Willie T30AC, Henry T30BC (active on Abemama Island), as is T30AB, and Koborl T30AX. I did meet Ritite and Kobori (an MP) while I was there. I think Ritite would make good use of a six metre transceiver if it were sent over to him.

"I left Tarawa on 14/12 for Tuvalu T20. Here I stayed at the only hotel, the Vaiaku Lagi. Again I was issued with a full call, T20AR, and during the week I was there I worked the following stations: 15/12 1040 to 1156 three VK2s and three VK4s. Most signals were from S1 to S5. There is only one active station in Tuvalu, Ian Anderson T20AA. I left my six metre equipment and antenna with *him*, so let us hope he puts it to good use. As a matter of interest, Funafuti, the capital, has only a grass airstrip and children play on the strip when no planes are around!

"I had to return to Brisbane via Suva, Fiji, so, with my licence arranged well in advance, I operated from the Coral Coast as 3D2AR for about four days. I worked eight VK2s, one VK3, three VK4s, seven ZLs and one FK.

"Whilst in Suva, I looked up Raj 3D2ER, and found him a little shaken from the recent events in Fiji.

"Before I left on this expedition I had a bad feeling that we were overdue for a poor Es season, and sure enough that is exactly what happened. Future Es type expeditions might be best left until the bottom of the coming Cycle 22."

Thanks Neville for your interesting letter. Both you and K-land in general were unfortunate to have the Es collapse so dramatically — no one from VK5 reported any sign of you during your stay in the Pacific.

SIX METRES

John VK4ZJB, sends a short letter with a copy of his QSL from Nev T20AR, for his contact with him on 15/12 at 1156 UTC. As John says, not the time. Almost midnight at Tuvalu! Perhaps we were all listening at the wrong time.

John also worked VK9NS, on 11/2 during the morning whilst he was mobile in Brisbane. Signals were 5 x 9 both ways. He said no sign of TEP yet but maybe soon.

He was also pleased to work VK5LP on two metres on 16/12 at 2331, something we had both been wanting to do for many years but never seemed to be around at the same time.

Tom VK4ZAL, also sent a copy of his QSL from T20AR which was on 16/12 at 0926 which is a new country for him as well.

Another letter came from Vince VK2VC, also for his contact with Neville T20AR on 15/12 at 1104. Vince also mentioned Don VK2BXM, was at the time of writing at Cape Hallett in Antarctica as VK0AT. It would make Don feel the effort was worthwhile if he was able to work someone on six metres whilst there.

Whilst still on six metres, Steve VK4KHQ/3D2SJ, says that since transferring within Mount Isa Mines, he has settled into his new daytime job and finds he can now use his six metre keyer most nights on 52.050 and 52.060 MHz from 0700 to 0630 UTC with some occasional operating at the weekends.

Steve said the Ross Hull Contest was a disappointment with only two contacts to VK5ZAH and VK3YZV, and heard the Darwin beacon once but could find no one to work. He said it was fortunate really, as conditions just before the contest were really good, with two way SSB contacts on 17/12 to VK4ZJB, VK4FXX, VK2YVG, VK5ZCF, VK5ACY, and VK5ZAH. Also had two way RTTY contact with Paul VK2YVG, in Broken Hill on the same date. Is this some mode/distance record, he asks? Does anyone know?

Steve ran his keyer for a total of 96 hours 44 minutes during the contest so he thinks he was unlikely to have missed many openings, they just were not there!

TWO METRES

Ray VK3LK, at Heywood, mentions the following as being his Es contacts for December 1987. 10/12: 0541 VK4ZAZ 5x9; 0543 VK4BE 5x8; 0547 VK4KJL 5x7; 0555 VK4TN 5x9. On 11/12: 0920 VK5OH signals heard both ways but no full contact; 16/12: 2310 VK4AGQ 5x9; 2345 VK4ZWH 5x8. On 18/12: 0233 VK8ZLX 5x9 with Peter being audible for a full hour; 20/12: 0044 VK4BRP 5x4. January 1988 — nil! The final comment says it all.

John VK4KJL, sends a short note to say that, on two metres, on 11/1 at 1000 UTC he worked Gordon VK2ZAB 5x7; 12/1 VK2ZAB 0945 5x5; VK2DOV 0800 5x1; 13/1 ZL2TPY 1745 5x8; and ZL2TPY again at 1110 5x9. John would be happy with those last two contacts.

On 14/1/88, John worked ZL1AVZ at 1930 5x3 on 432 MHz! (Even better. . .5LP). Bill VK4LC, worked Brian ZL1AVZ first at 5x6. They were the only two VK4s to work Brian. Both John and Bill were pleased to have Brian come to Queensland where Bill met him personally on 1/2 and John spoke to him by telephone on 4/2.

John VK4KJL, said he heard VK4ZSH having "a QSO of sorts" with ZL2TPY from some portable location on 432 MHz. Unable to confirm. Also, John said there had been no six metre contacts since 23/12.

Matthew VK3TAY, writes to report an unusual occurrence on two metres on 15/1. Whilst at his holiday house at Wye River, western Victoria (16 kilometres SW of Lorne), at 2300 a huge sea-fog rolled over the hill and blocked the view of the ocean about 200 metres away. Thinking this may enhance propagation, he turned on the IC-290H with a five element beam and heard VK7REC on 146.900 MHz, at S9+ which he said is not that rare. But when he put out a call, VK2DVZ in Taree (300 kilometres north of Sydney) came back with full quieting and maintained the contact for an hour, when VK2YHX at Newcastle broke in at 0000. Their signals were strong with very little fading. VK2XKE, in Sydney, also broke in but was not able to make proper contact. Matthew looked on reverse several times but could not hear anything until at 2323 he could just hear VK2DVZ, at S1, but not good enough for a contact. Later Russell VK7ZAC, could hear VK2YHX on reverse at S3 to S5. The propagation folded at 0100.

On 12/1, VK3TAY was able to work Ian VK7QF, at Burnie, using their handbags with 10 watts, signals to S3 which is good for a rubber duckie antenna both ends!

FROM JAPAN

Hat JA1VOK, reports in his *World VHF News* column of the Japanese magazine *Five-Nine* that DX had been rather quiet in JA during December though ZL television was being heard from time to time. And, according to KH6IAA there was Es between KH6 and W5/6 on 14/12. 5W1GP will be operational on six metres until August 1989. His manager is Satoji Someya JA6QCF 22Han, Fujiwaraku, Saiki City, Oita 876, Japan. The name of 5W1GP is Yama and his home call sign is JA6HOR.

The column also reports LU3EX, in Argentina, had some good contacts last equinox when in October he worked YS1ECB, OA4/8, HK1BAU, KP4EOR, FM3AG, FM3BY, PYs, FY7THF PY2AA and HC2FG. On 27/10 he worked NE8Z/VP2, WZ6Z/VP2, KP2A and in November YV4APR. Whilst a number of these are in South America it still represents a good coverage as the distances involved can be considerable. Those in Peru, Ecuador, Colombia, Puerto Rico are getting to be some distance away and all north of the equator and at that time of the year some TEP may have been involved as well as double hop Es. If this can be taken as any indicator, stations in VK and ZL and the Pacific islands should watch the equinoxial periods closely for the next few years as these will be the best periods for TEP and F2 contacts on six metres.

NEW CALEDONIA

Phillip Hardstaff FK1TS, sent me two very interesting letters which arrived just too late for inclusion in last month's notes. He writes:

"It is now the day after Christmas and I have just sat through two of the worst days this month on six metres. On Christmas Day I worked Nev 3D2AR, today I worked ZL1MQ and ZL3NE as the result of ZL television being in for 10 minutes. Nothing else.

"During November and early December I worked five countries — VK, ZL, FK, JA and 3D2. Have worked lots of VK1, 2, 3, 4 and VK5RO, ZL1, 2, 3, 4, JA1, 2, 3, 4, 6, 7 and 9, heard but not worked VK6, VK8, VK9N, JA5, JA8, JA0, no VK7s although VK7RST has been heard. Also heard Japanese fishermen on 52.480 MHz FM (mistaken by ZLs and VKs for FKs talking in French?). The biggest "sob-story" of all was to hear Neville calling CO as T20AR one morning but I had left the linear at my work place. I called him for five minutes with 2.5 watts. He heard me but could not get my call sign (he was 5x3). So, now the linear comes home every night. So far this year Henri FK1TK and I have been on six metres, others seem to be using the TO8 prefix for the South Pacific Games.

"I took the FT-690 into the club on 16/12 and, running on batteries and in-built whip stuck out the window, worked ZL1AKW, ZL2TPY, VK4VC, VK4PU and VK4HD as TO8KPG (Club call sign) between 0800 and 0830. This made quite an impression on the HF boys!

"Longest contacts this summer were either to VK2YVG in Broken Hill or VK5RO in Adelaide. 12/12 was probably the best day here, particularly as working ZL4TBN and ZL4LV made WAZL for me. Another highlight would have been working VK2XJ 5x9 using 10 watts of FM. It seems really different doing it on FM.

"In my work hours workshop I run about 20 watts into a dipole centred on ZL and JA. At home I use the same equipment which puts out about 12 watts into the X-beam with about 5 db gain.

"Two main points of agitation: First, people who don't use standard phonetics. The JAs are the worst at this and I could probably have doubled my JA score if it wasn't for trying to work out what they were saying. Some ZLs and VKs are just as bad, but a little easier to understand. Secondly: Turkeys — who talk on and on and on in a contact on 52.050 MHz, the call channel. If I have need to have a contact on the call channel, I limit it to calls and signal reports only and I wish others would do the same. When conditions are bad it is not always possible out here to QSY and hope to maintain the contact, so if you need to have a contact on the calling frequency please keep it brief. (Perhaps your comments will carry some extra weight, Phillip, but I have been trying to get this point across for years. . .5LP).

"During 1988, I will be moving around quite a bit. February 15 to 19 at Tonga. Then May 30 to June 3, Vanuatu or Fiji; August 15 to 26 American Samoa' September 19 to 30 Fiji (3D2); October/November probably Raratonga (ZK1). There will be stopovers in ZL as well. Whilst in all these places I will be checking out the six metre scene there and try to encourage some beacon building and get some contacts so we can publish names and phone numbers of people with six metres so as to make the Pacific a little more accessible. I will try to fly over to Niue while in Tonga also. I will confirm the above arrangements as plans unfold.

Phillip sent a copy of his log which shows he started working JAs on 8/11 and the following is an abridged version of his log to show what is being heard in New Caledonia. 8, 9, 10/11 JA1, 2, 3, 4, 6 and 7; 24/11 VK4; 27/11 ZL1, 2, 3; 28/11 ZL1 and 3; 29/11 VK2; 1/12 ZL1, 2 and 3; 2/12 ZL2 and 3; 4/12 FK1TK; 5/12 ZL1, 3, VK2 and 4; 7/12 VK2XJ; 9/12 VK2XJ; 10/12 ZL1, 2, 3, VK2 and 4; 11/12 VK2, 3, 4 and 5; 12/12 VK1, 2, 3 and 4, ZL2, 3, and 4; 14/12 VK2BA, TO8KPI, ZL1; 15/12 ZL1, 2, 3, FK1TK, VK2BHO; 16/12 VK2, 3, 4, ZL1, 2 and 3; 17/12 VK2, 4, ZL1; 20/12 VK2, ZL1 and 2; 21/12 VK2XJ; 22/12 ZL2, VK4ALM, FK1TK; 23/12 VK1, 2, 4, ZL1 and 3; 24/12 VK4KJL, ZL1, VK4ALM, 3D2AR; 25/12 FK1TK; 26/12 ZL1; 28/12 ZL1, 2, VK2, FK8FL. Nothing whatever heard from 29/12 to 4/1/88, when VK2XJ was worked; nothing on 6/1 and 7/1 etc.

Summing up, Phillip worked 31 ZLs, 45 VKs, 42 JAs, 3D2AR and the FK8s. So it was just as well Phillip got into the band early or he would have found six metre contacts in very short supply. It is good therefore, that Phillip is showing this kind of interest as it helps to keep the Pacific area alive and when that happens it can encourage others to come on-air.

It seems to me that over the years there have probably been many missed opportunities because no one was at the Pacific end. The expeditions by Neville VK4ZNC, also help to set the ball rolling. I am sure that, from now onwards, we shall be getting more TEP and F2 contacts and to work DX one needs to be particularly vigilant during the equinoxes for really long haul contacts, and during the summer particularly for extended Es contacts. By the time readers have these notes, we will be in the March/April equinox and past experience seems to indicate the autumn period is slightly better than the spring period for Australia anyway. The simple answer to those who ask me how soon can we expect to work some new countries is from now onwards, but you will have to work at it. That means watching band conditions, calling on six metres and not just listening, and keep any contacts with exotic stations short so that the multitude can have a share too.

Most times there is no need for any more than an exchange of call signs, signal report and probably your name — nothing else is required except the confirmation from the other end. That way more will share in what is available. Take a leaf out of the experienced two metre Es operators — they can work 10 stations in five or six minutes if necessary. It is a different matter if the band stays open for an hour or more, after everyone is satisfied you can go back and spend a little more time with the other end-stations if they are still there. If the DX station feels the need to work his contacts on 52.050 MHz, then respect this, and don't go calling CO yourself whilst he is still there or you can hear others working him!

SOUTH EAST RADIO GROUP INC

The South East Radio Group (SERG) will be holding its annual convention again at Mount Gambier over the June holiday weekend. Being the Bicentenary year, they are aiming to make it one of the best they have staged so far.

As I have been invited again to judge the Home-Brew Section, may I urge readers who will be attending to really give extra support to this section as entries have been dwindling somewhat of recent years. For all the black boxes around there is still quite a lot of home building going on and some rather sophisticated equipment at that, and we would like to see it.

My policy in regard to kit-sets has always been that a commercially prepared PCB is acceptable providing the builder places the components on it and solders them. This then excludes commercially prepared modules. I also demand a very high degree of neatness and proper component orientation in kit-sets so that the finished product closely resembles commercial production — after all, you have for a leg-start with a good chassis or box and front panel.

Except in very specific cases, all construction, both inside and outside, should be available for scrutiny. Exceptions might be some types of cavity filters, amplifier cavities, and the like, or if you have a specific reason why the unit cannot be opened, please say why. The name of the constructor with call sign, if any, together with an outline of the equipment should be with the article when it is on display.

THIS MONTH ON THE BANDS

Through January, six metres was not very spectacular, just the occasional quick openings to VK2. 9/2 was a reasonable day. Between midday and 9 pm local time, ZL1, 2, 3, and 4 were available, also

Eric's new location at Meningie. David VK5KK is up the tower!

VK2, 3 and 4. Col VK5RO reports that, during the evening of 9/2, Ian VK3ALZ, was extremely strong on two metres from some hill-top. Good signals also from VK3UM and VK3DUQ. In the other direction, VK6AOM, at Esperance.

On two metres, 1/2, VK6WG, in Albany, was worked, also VK6AOM, plus VK3 stations. Good conditions continued to prevail on 3/2 with more VK3s, (VK3AUG and VK3AUU during the morning and VK3AUU, VK3ALZ, VK3UM and others in the evening).

Certainly the poor Es conditions over the Christmas and New Year period was received with dismay in many places. It seems that this time the good conditions came earlier, hence the good two metre Es openings.

The VK5LP establishment, after getting going on the bands, found TVI in the form of overload problems at a group of elderly citizens homes across the road. An inspection revealed a mast-head amplifier with about 20 dB gain feeding into a distribution amplifier with about 30 dB gain! The whole thing was such a poor installation that I decided if I was to have any peace I would have to upgrade the system. First move was to disconnect the masthead amplifier, as the signals are good enough not to need the two amplifiers. Cleaning and generally overhauling the CA16 antenna then produced four good channels. One section of the homes still had snow so out came the amplifier. This required the second RF amplifier to be replaced and the section which had been supplying the area of poor reception was found not to be even connected to the amplifier. Obviously the installer, when he found poor signals in part of the building, just added a further amplifier. The simple addition of a 1000 pF capacitor connected the fifth outlet to the system so the whole building now has the best signals ever. A series tuned trap for six metres and one for two metres cleaned up every trace of signal getting into the system. When my antenna points to the south-east I look right down the throat of the elderly homes' antenna but at least now, if needed, I can use my amplifiers on 52, 144 and 432 MHz. A long time-consuming job but a good exercise in public relations!

ROSS HULL CONTEST

Doug VK3UM, has sent me an outline of some suggested changes to the Ross Hull Contest. They certainly are a change! I had hoped to include then in this month's notes but I have already run our of room. Hopefully I can include them next month. In the meantime, a copy to the Contest Manager for his consideration.

CLOSURE

That seems to be about all that is relevant this time. I hope now to be able to spend a little more time on the bands and keep up with what is going on. Closing with two thoughts for the month:
"Did you hear about the despondent cockroach who committed insecticide?" and "Shakespeare once said that the evil that men do lives after them. On television, this is called a re-run".
73, the Voice by the Lake.

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EXAMINATION DEVOLUTION UPDATE

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

The Department of Transport and Communication (DOTC) plans lo approve examiners to conduct the three classes of amateur operator certificates of proficiency from June 1, 1988.

DOTC will continue to conduct examinations where required and prepare examination papers until March 1, 1989.

The Department held public forums throughout Australia in February to explain and answer questions about exam devolution. DOTC said the response to the forums had been very encouraging. It was now clear that a number of educational institutions and radio amateurs are likely to take a very active part in the examination process.

The devolution of exams allows individuals to prepare and conduct examinations that will qualify successful candidates for certificates of proficiency.

To prepare the examination papers, persons may develop their own questions, or obtain a copy of the Department's question bank. DOTC could possibly, in the future, consider publicly releasing the question banks — a practice already done by the United States Federal Communications Commission.

The Department admits that, while examiners can be expected and required to maintain strict security over their examination papers, the questio.i banks would eventually leak out.

Under devolution, the examinations can be made up of questions unique to the examiner, a combination of the examiner's and the Department's questions. or contain only DOTC questions from their question banks expected to contain 500 questions.

A copy of the Department's Morse code generating program can be obtained by examiners to prepare code examinations.

The current examination standard of Morse code must be used. For the AOCP examination, individual Morse characters are sent at 12 words-per-minute with the spacing adjusted to achieve 10 words-per-minute — the novice examination uses characters sent at eight words-per-minute and the spacing adjusted to achieve five words-per-minute.

Applications for examination approval for any class of certificate will be considered from individuals, colleges, institutions, and other like educational bodies and amateur radio clubs. Applications must provide full details about those seeking approval, and a copy of the proposed examination.

A list of equipment available for the Morse code test, details of the qualifications of those preparing the examinations, and an affidavit to the effect that all requirements and conditions of DOTC will be met. Examiners must verify the identity of all candidates. Documents with the candidate's photograph or signature should be viewed. In instances of suspected candidate substitution, the examination will proceed to normal conclusion, and then a report submitted by the examiner for the Department to follow up.

Written results of examinations are to be provided to candidates and individually signed by the nominated examiner. The candidates can then approach DOTC to seek the appropriate certificate and station licence.

This article is an update summary of examination devolution. Those interested further, or wishing to become examiners, should obtain the latest DOTC document "Amateur Operator Certificates of Proficiency — Examination Approval and Examination."

Inquiries should be directed in writing to: Manager Regulatory, Operation Branch, Broadcasting and Radio Communications Services Division, Department of Transport and Communications, PO Box 34, Belconnen, ACT. 2616.

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Editorial Comment: Both Jim and the Federal Education Officer Brenda VK3KT attended the DOTC meeting. Brenda's account of it is on page 48. We have published both, because each reported on different aspects, with little overlap. —Ed.

RSGB 75TH ANNIVERSARY

The Radio Society of Great Britain (RSGB) will be issuing GB75 prefix call signs for special event stations during its 75th anniversary year.

Already the RSGB headquarters club stations, GB75RS and GB75HQ, have been active on 20 metres.

The RSGB has advised it will issue the prefix to other stations set up to promote the hobby of amateur radio during 1988.

RON WILKINSON ACHIEVEMENT AWARD

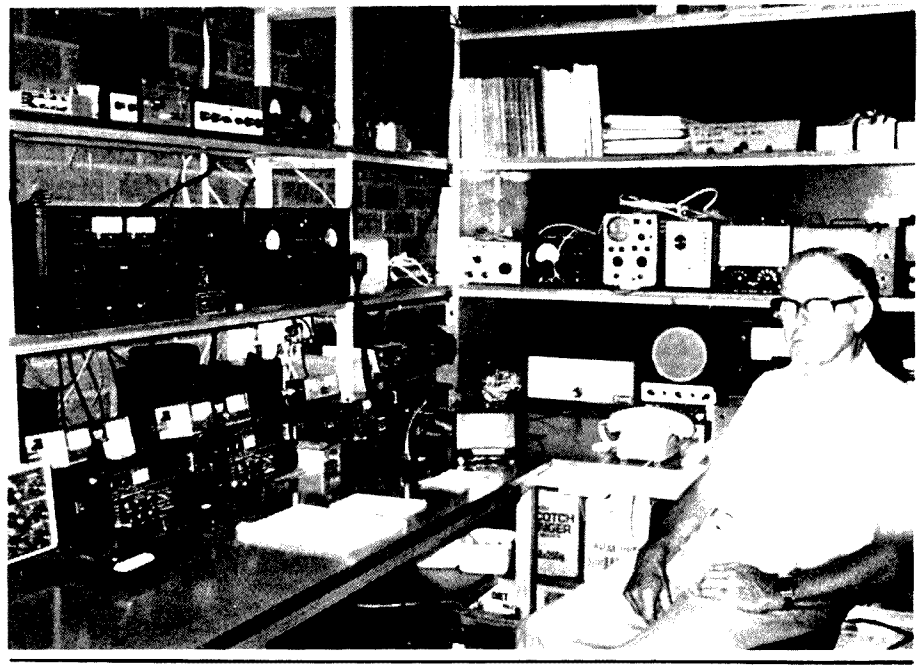
No nomination was received for this award in 1986. However, Executive has great pleasure in announcing that, for 1987, it is awarded to Eric Jamieson VK5LP. Eric was nominated by the VK5 Council primarily for his services to *Amateur Radio* magazine, to which he has contributed the monthly column *VHF UHF — an expanding world* and its predecessor *VHF Notes* since December 1969.

There is no other contributor to AR who has even approached this record for uninterrupted regularity. Others who have been, and are, responsible for monthly columns and the like, must wonder not only how has Eric kept it going for so long, but how has he been able to find so much about which to write!

It is also obvious that, until his recent move to Meningie produced a temporary interruption of activity, Eric's awareness of VHF and UHF doings was not just hearsay, but was based on many continuing personal "hours in the shack". Such persistent devotion is the mark of a very rare type of person indeed, and it is not surprising that Eric's capabilities have been recognised in other fields as well.

On page 43 of AR for September 1985, there is a detailed account of Eric's career in many different areas of public life, resulting in his recognition in 1984 as "Citizen of the Year", and in 1985 by his being awarded the Order of Australia. The WIA is honoured by his acceptance of the Ron Wilkinson Achievement Award. I am sure that even Ron himself, before his death in 1977, could not have suggested anyone who even then had done more to earn such a distinction.

Bill Rice AX3ABP



Eric Jamieson VK5LP, in the shack at Meningie.

—Grateful thanks to Valerie and her OM David VK5KK, Eric's wife Myrna and Jenny VK5ANW for supplying photographs of Eric

Try This!

CLEARING BRANCHES & LEAVES

Herb Unger VK2UJ
El Rancho, Alectown, via Parkes, NSW. 2870

There are many problems associated with the use of trees as supports for antennas.

In some cases it is difficult to support the wire clear of the leaves and branches, especially if the tree is lacking in height.

This idea has proved very successful at this QTH. It consists of a length of one inch steel water pipe.

A length of quarter inch round iron, or similar material, three or four feet long, is bent into an inverted Y shape and inserted into the bottom end of the pipe. The idea is to climb up the tree as far as possible, carrying the pipe vertically and hooking the inverted V on to a suitable limb adjacent to the trunk. Wind several turns of fencing wire around the pipe and main vertical trunk of the tree as high up as can be reached. This should bring the top well above the leaves of even a comparatively small tree.

Before ascending the tree, an old cup-type of telephone insulator is fitted on the top of the pipe, together with a small pulley, through which the antenna or strain wire is inserted , depending on whether it is an intermediate or end pole.

If it is to be a long wire antenna, it is wise to hang a weight on the end of the strain wire to compensate for the tree swaying in the breeze.

Pine Tree showing Extension Pipe Antenna Support.

How's DX?

Following is the latest information regarding the DXAC study on the future of the ARRL DXCC, also the DXCC Rules forwarded to me by John Parrott W4FRU, Chairman of DXAC.

In his covering letter, John also advises that S0 and Aruba P40 are now new countries for DXCC.

Ken McLachlan VK3AH

DXAC SPECIAL STUDY OF THE DXCC

REFERENCES:

1. Minute 59 of the July 1986 meeting of the ARRL Board of Directors
2. Minute 70 of the March 1984 and Minute 103 of the October 1984 Board of Directors meetings
3. Minute 87 of the July 1987 meeting of the ARRL Board of Directors

The DXAC has completed its Special Study of the DXCC in accordance with Reference 1.

The cliche "If it ain't broke, don't fix it" became the battle cry of the DX community world-wide when it became known that the DXAC was studying the possibility of restructuring the DXCC program. The message we received was loud and clear; add a few more awards, clarify and simplify some of the rules, but don't change the basic program — just fine tune it.

To simplify this report, the DXAC recommendations are contained in a new set of DXCC rules. (See following rules). Among other things, the DXAC is recommending a revision to the present DXCC Rules format, a new country criteria and a deletion criteria under the provision of Reference 2, an expanded accreditation criteria and general "wordsmithing" to pull it all together into a simple and easily understood set of rules.

Preparatory to writing these new rules, the DXAC studied the data obtained from approximately 1500 opinion polls, individual letters, alternate DX programs, including the *Law of the Sea* per Reference 3, comments from members of other National Radio Societies and committee participation in Hamfest, Hamventions and other meetings of DXers. Many worthy recommendations were considered and discarded because they were not practical to implement or manage. Other majority recommendations, such as dropping or shelving DXCC Countries that have been inactive for long periods of time, were considered as not being in the best interest of the DXCC program. A majority of DXers also feel that some countries should be deleted from the Countries List. The committee could not find a simple solution to this issue without decimating the Countries List; therefore, we do not recommend any deletions at this time. However, by and large, the DXAC acceded to the wishes of the DX community in what the DXCC program and Countries List should include and how it should be conducted.

The recommended DXCC Rules have been coordinated with the ARRL Headquarters staff and represent a composite of the DXAC and staff efforts with the DXAC position prevailing in the following version. The DXAC surveys reflect that the DXers want single band DXCCs and a 5BDXCC endorsable by additional bands as they become available and unrestricted, such as the new WARC bands.

The DXAC recommends single band additions to the rules along with a proposed start date. The Headquarters staff does not agree, arguing that the 80 and 40 metre single band DXCC serves only the "Old Timers" and provides little or no incentive for the new amateurs. Our survey shows just the opposite. The Honour Roll members do not want the single band DXCC, but the younger amateurs do.

The DXAC recommends that the start date of all new single band DXCCs be November 15, 1945, so that those who have worked a lifetime to attain their present position will not be penalised. This is also consistent with the negative position most DXers take with regard to a fresh start of anything related to DXing. The lingering bitterness over the start date of the DXCC-CW award is a good example. The Headquarters staff does not agree with the DXAC on this issue.

The Headquarters staff believes that the DXAC Accreditation Criteria is too detailed in a couple of instances. The DXAC position is that the accreditation part of the DXCC Rules has caused more bad press for the League than all the rest of the rules combined. We believe that the better informed a DXer is, the less likely his/her DX operation will be disallowed, and the less likely that there will be bad press for the ARRL. The DXAC stands by its recommended version.

The DXAC recognises that implementing all of the DXAC recommendations may increase the DXCC manager's workload, and additional help may be required unless a workload offset can be arranged. One area which should be explored with the view of reducing costs of DXCC management is the present processing mechanism for the new DXCC member. There is an extravagant waste of time and effort at the DXCC Desk, counting the initial 100 QSL cards for the basic DXCC award. This task could be performed by volunteers, as is the case with some other ARRL awards. There is a perception that the integrity of the DXCC would be in jeopardy if the basic DXCC card count was conducted by anyone other than the DXCC Desk representative. In my judgment, this attitude is ludicrous and without merit.

On behalf of the DXAC, I thank the Board of Directors for giving us the opportunity to play a small role in the future of the DXCC. If approved, we are confident that the validity of our recommendation will be proven repeatedly in the years to come and will serve to enhance and maintain interest in DXing by the young and "Old Timers" alike. I thank the DXAC members who have given unselfishly of their time and experience, and to the Headquarters staff who have been most cooperative in all aspects of this study. I extend a special thanks to my sub-committee chairmen, Robert Beatty W4VQ, James Rafferty N6RS, and James Spencer W0SR, who sifted the wheat from the chaff to give us a road map for the future of the DXCC.

The DXAC recommends that the Membership Communications Service Manager be requested to explore the merits of utilising designated Volunteer Verification Specialist (QSL card counters) for applicants of the basic DXCC Award. In time, and for monetary reasons, we may have to employ a different verification mechanism for the DXCC awards. If volunteers are incorporated into the system at this time, it may well offset additional costs which could accrue as a result of adapting the DXAC recommendations, and at the same time provide experience for further decentralisation of the DXCC Awards program at some future date.

The DXAC recommends that the Board of Directors approve the attached DXCC Rules, which were unanimously adapted by the DXAC, and make them effective from July 1, 1988.

AMERICAN RADIO RELAY LEAGUE DX CENTURY CLUB RULES

INTRODUCTION

"...the number of countries worked is increasing becoming the criterion of excellence among outstanding DX stations."

Clinton B DeSoto W1CBD, October 1935 *QST*

From its simple beginnings, culminating in the announcement of the new DX award, the DX Century Club, in September 1937 *QST* (which was itself based on the "ARRL List of Countries" published in January 1937 *QST*), membership in the ARRL DX Century Club (DXCC) has been the mark of distinction among radio amateurs the world over. That it is regarded with such prestige by DXers is a testament to its integrity and level of achievement. The high standards of DXCC are intensely defended and supported by its membership. The rules established by the founders of DXCC were consistent with the art of amateur radio as it existed at the time. As technology improved, the ability to communicate, the rules were progressively changed to maintain a competitive environment and complement the gaining popularity of DXCC.

Because of vast changes in the international scene bought about by World War II, it logically followed that DXCC needed to be recast, as indicated in December 1945 *QST*. Ultimately, after a great deal of study, the first post-war DXCC Countries List emerged, published in February 1947 *QST*. The new DXCC Rules appeared in March 1947 *QST*. Contacts were valid from November 15, 1945, the date US amateurs were authorised by the FCC to return to the air.

The DXCC rules today represent the aggregate of experience gained from administering post-war DXCC. Some countries on the DXCC Countries List do not of course, meet the present criteria. This includes countries "grandfathered" from the WWII era, or those that met the criteria as it existed at the time and are not subject to deletion (see Section III for the appropriate grounds for deletion). Changes are announced under DXCC Notes in *QST*.

SECTION I — BASIC RULES

1. The DX Century Club Award, with certificate and lapel pin (there is a nominal fee of $2 for the DXCC lapel pin) is available to amateur radio operators throughout the world free of charge. ARRL membership is required of DXCC applicants in the US and possessions, and Puerto Rico, and CRRL membership is required for applicants in Canada. ARRL membership is not required of foreign applicants. All DXCCs are endorsable (see Rule 5). There are 12 separate DXCC awards available, plus the DXCC Honour Roll:

a) MIXED (general type): Contacts may be made using any mode since November 15, 1945.

b) PHONE: Contacts must be made using radiotelephone since November 15, 1945. Confirmations for cross-mode contacts for this award must be dated September 30, 1981, or earlier.

c) CW: Contacts must be made using CW since January 1, 1975. Confirmations for cross-mode contacts for this award must be dated September 30, 1981, or earlier.

d) RTTY: Contacts must be made using radioteletype since November 15, 1945. Confirmations for cross-mode contacts for this award must be dated September 30, 1981, or earlier.

e) 160 METRE: Contacts must be made on 160 metres since November 15, 1945.

f) 80 METRE: Contacts must be made on 80 metres since November 15, 1945.

g) 40 METRE: Contacts must be made on 40 metres since November 15, 1945.

h) 10 METRE: Contacts must be made on 10 metres since November 15, 1945.

i) 6 METRE: Contacts must be made on 6 metres since November 15, 1945.

j) 2 METRE: Contacts must be made on 2 metres since November 15, 1945.

k) SATELLITE: Contacts must be made using satellites since March 1, 1965.

l) FIVE-BAND DXCC (5BDXCC): The 5BDXCC certificate is available to those amateurs who submit written proof of having made two-way communications with 100 or more DXCC countries

on each of five bands since January 1, 1969. This DXCC award is endorsable for additional bands. (10/18/24 MHz not accepted at this time). 5BDXCC qualifiers are also eligible for an individually engraved plaque (at a charge of $25).

m) HONOUR ROLL: Attaining the DXCC Honour Roll represents the pinnacle of DX achievement:

- MIXED — to qualify you must have a total confirmed country count that places you among the numerical top 10 DXCC countries total on the current DXCC Countries List (example: if there are 318 current DXCC countries, you must have at least 309 countries confirmed).
- PHONE — same as Mixed.
- CW — to qualify, you must have a total confirmed country count equal to the station/s with the highest confirmed CW country count or among those between one and nine less than that total.

To establish the number of DXCC country credits needed to qualify for the Honour Roll, the minimum possible number of current countries available for credit is published monthly in *QST*. First-time Honour Rill members are recognised monthly in *QST*. Complete Honour Roll standings are published annually in *QST*, usually in the June issue. See DXCC Notes in *QST* for specific information on qualifying for this Honour Roll standings list. Once recognised on this list or in a subsequent monthly update of new members, you retain your Honour Roll standing until the next standings list is published. In addition, Honour Roll members are recognised in bold print in the DXCC Annual List (usually published in the December issue of *QST*) for those who have been listed in the previous Honour Roll listing or have gained Honour Roll status in a subsequent monthly listing.

#1 HONOUR ROLL: To qualify for a Mixed or Phone Number One plaque, you must have worked every country on the current DXCC Countries List. On CW, you must have the highest number of country credits given to any station. Write to the DXCC Desk for details.

2. Written proof (confirmations, ie QSL cards), of having made two-way communication must be submitted directly to ARRL Headquarters for all DXCC countries claimed. The use of the official DXCC application forms is required. Complete application materials are available from ARRL Headquarters. Confirmations for a total of 100 or more countries must be included with your first application. By ARRL Board of Directors action, 10 MHz confirmations are not creditable for DXCC.

3. The ARRL DXCC Countries List criteria will be used in determining what constitutes a DXCC country.

4. Confirmation data for two-way communications (ie contacts), must include the call signs of both stations, the country, mode, and date, time and frequency.

5. Endorsement stickers for affixing to certificates or pins will be awarded as additional DXCC credits are granted. For the Mixed, Phone, CW, RTTY and 10-metre DXCC, these stickers are in exact multiples of 25, ie 125, 150, etc, between 100 and 250 DXCC countries; in multiples of 10 between 250 and 300, and in multiples of five above 300 DXCC countries. For 160-metre, 80-metre, 40-metre, six-metre, two-metre and satellite DXCC, the stickers are in exact multiples of 10 starting at 100 and multiples of five above 200. Confirmations for DXCC countries may only be submitted for credits in increments that will at least bring the new total up to the next endorsement level.

EXCEPTION: Once per year, any participant in Mixed, Phone, CW, RTTY or 10-metre DXCC having an accredited DXCC total of 250 or more, or any participant in 160-metre, 80-metre, 40-metre, six-metre, two-metre or Satellite DXCC with an accredited DXCC total of 150 or more, may make a submission without regard to the number of cards submitted.

6. All contacts must be made with amateur stations working in the authorised amateur bands or with other stations licensed or authorised to work amateurs. Contacts made through "repeater" devices or any other power relay method (aside from Satellite DXCC) are invalid for DXCC credit.

7. In countries where amateurs are licensed in the normal manner, credit may be claimed only for stations using regular government-assigned call signs or portable call signs where reciprocal agreements exist or the host government has so authorised portable operation. No credit may be claimed for contacts with stations in any country that has temporarily or permanently closed down amateur radio operations by special government edict where amateur licenses were formerly issued in the normal manner.

8. All stations contacted must be "land stations". Contacts with ships and boats, anchored or under way, and airborne aircraft, cannot be counted.

9. All stations must be contacted from the same DXCC country.

10. Contacts may be made over any period of years since November 15, 1945, for the mixed, phone, RTTY, 160-metre, 80-metre, 40-metre, 10-metre, six- metre, and two-metre DXCCs, January 1, 1975, for the CW DXCC, and from March 1, 1965 for the Satellite DXCC, provided only that all contacts be made under the provision of rule 9, and by the same station licensee. Contacts may have been under different call letters in the same area (or country), if the licenses for all was the same. (You may feed one DXCC from several call signs held simultaneously as long as the provision of rule 9 is met.

11. Any altered, forged or otherwise invalid confirmations submitted by an applicant for DXCC credit may result in disqualification of the applicant. Any holder of a DXCC award submitting altered, forged or otherwise invalid confirmations may forfeit the right to continued DXCC membership. The ARRL Awards Committee shall rule in these matters and may also determine the eligibility of any DXCC applicant who was ever barred from DXCC to reapply and the conditions of such application.

12. Operating Ethics:

a) Fair play and good sportsmanship in operating are required of all DXCC members. In the event of specific objections relative to continued poor operating ethics, an individual may be disqualified from DXCC by action of the ARRL Awards Committee.

b) Credit for contacts with individuals who have displayed continued poor operating ethics may be disallowed by action of the ARRL Awards Committee.

c) For a) and b) above, "operating" includes confirmation procedures and/or documentation submitted for DXCC accreditation.

13. Each DXCC applicant must stipulate that he/she has observed all DXCC rules as well as all pertinent governmental regulations established for amateur radio in the country or countries concerned and agrees to be bound by the decisions of the ARRL Awards Committee. Decisions of the ARRL Awards Committee regarding interpretations of the rules here printed or later amended shall be final.

14. All DXCC applications (both new and endorsements) must include sufficient funds to cover the cost of returning all confirmations (QSL cards) via the method chosen. Funds must be in US dollars, utilising US currency, check or money order made payable to the ARRL, or International Reply Coupons (IRCs). A chart showing the various return postage rates is available from the DXCC Desk. Address all correspondence and inquiries relating to the various DXCC awards and all applications to: ARRL Headquarters, DXCC Desk, 225 Main Street, Newington, CT 06111, USA.

15. The ARRL DX Advisory Committee (DXAC) requests your comments and suggestions for improving DXCC. Address correspondence, including petitions for new country consideration to: ARRL Headquarters, DXAC Desk, 225 Main Street, Newington, CT 06111, USA.

SECTION II — COUNTRIES LIST CRITERIA

The ARRL DXCC Countries List is the result of progressive changes in DXing since 1945. The full list will not necessarily conform completely with the current criteria since some of the listings were recognised from pre-WWII or were accredited from earlier versions of the criteria. While the general policy has remained the same, specific mileages and additional points have been added to the criteria over the years. The specific mileages in Point 2(a) and Point 3, mentioned in the following criteria, have been used in considerations made in April 1960 and after. The specific mileage in Point 2(b) has been used in considerations made in April 1963 and after.

When an area in question meets at least one of the following three points, it is eligible as a separate country listing for the DXCC Countries List. These criteria address considerations by virtue of Government (Point 1) or geographical separation (Points 2 and 3), while Point 4 addresses ineligible areas. All distance are given in statute miles.

POINT 1, GOVERNMENT

An independent country or nation-state having sovereignty (that is, a body politic or society united together, occupying a definite territory and having a definite population, politically organised and controlled under one exclusive regime, and engaging in foreign relations — including the capacity to carry out obligations of international law and applicable international agreements) constitutes a separate DXCC country by reason of Government. This may be indicated by membership in the United Nations (UN). However, some nations that possess the attributes of sovereignty are not members of the UN, although these nations may have been recognised by a number of UN-member nations. Recognition is the formal act of one nation committing itself to treat an entity as a sovereign state. There are some entities that have been admitted to the UN that lack the requisite attributes of sovereignty and, as a result, are not recognised by a number of UN-member nations.

Other entities which are not totally independent may also be considered for separate DXCC country status by reason of Government. Included are Territories, Protectorates, Dependencies, Associated States, and so on. Such an entity may delegate to another country or international organisation a measure of its authority (such as the conduct of its foreign relations in whole or in part, or other functions such as customs, communications or diplomatic protection) without surrendering its sovereign status. DXCC country status for such an entity is individually considered, based on all the available facts in the particular case. In making a reasonable determination as to whether a sufficient degree of sovereignty exists for DXCC purposes, the following characteristics (list not necessarily all-inclusive) are taken into consideration:

a) Membership in specialised agencies of the UN, such as the International Telecommunication Union (ITU).

b) Authorised use of ITU-assigned call sign prefixes.

c) Diplomatic relations (entering into international agreements and/or supporting embassies and consulates), and maintaining a standing army.

d) Regulation of foreign trade and commerce, customs, immigration and licensing (including landing and operating permits), and the issuance of currency and stamps.

An entity that qualifies under Point 1, but consists of two or more separated land areas, will be considered a single DXCC country (since none of these areas alone retains an independent capacity to carry out the obligations of sovereignty) unless the areas can qualify under Points 2 or 3.

POINT 2, SEPARATION BY WATER

An Island or a group of islands which is part of a DXCC country established by reason of Government, Point 1, is considered as a separate DXCC country under the following conditions:

a) The island or islands are situated off shore, geographically separated by a minimum of 225 miles of open water from a continent, another

island or group of islands that make up any part of the "parent" DXCC country.

b) This point applies to the "second" island or island grouping geographically separated from the "first" DXCC country created under Point 2(a). For the second island or island grouping to qualify, at least 1 500 mile separation of open water from the first is required, as well as meeting the 225 mile requirement of a) from the "parent". For any subsequent island/s to qualify, the 500 mile separation would again have to be met. This precludes, for example, using the 225 mile measurement for each of several islands from the parent country to make several DXCC countries.

POINT 3, SEPARATION BY ANOTHER DXCC COUNTRY

a) Contiguous land mass: Where a country, such as that covered by Point 1, is totally separated by an intervening DXCC country into two areas which are at least 75 miles apart, two DXCC countries result. This straight line measurement is made at the closest point, and may include lakes and seas (that are part of the country) in the measurement. International waters may be included in the separation but do not contribute to the 75 mile minimum requirement.

b) Islands: Where two islands, of the government under Point 1, are totally separated by an intervening DXCC country (also under Point 1), each island counts as a separate DXCC country. No minimum distance is required. The test for total separation means that a straight line cannot be drawn from any point on one island to any point on the other island without passing through another DXCC country. This intervening country may be part of either island, another island, or part of a continent.

POINT 4, INELIGIBLE AREAS

a) Any area which is unclaimed or unowned by any recognised government does not count as a separate DXCC country.

b) Any area which is classified as a Demilitarised Zone, Neutral Zone or Buffer Zone does not count as a separate DXCC country.

c) The following do not count as a separate DXCC country from the host country: Embassies, consulates and extra-territorial legal entities of any nature, including, but not limited to, monuments, offices of the United Nations agencies or related organisations, other inter-governmental organisations or diplomatic mission.

SECTION III — DELETION CRITERIA

A DXCC country is subject to deletion from the ARRL DXCC Countries List if political change causes it to cease to meet Point 1 of the Countries List Criteria (a derivative of such change may cause it to meet Point 2 or 3) or if it falls into Point 4 of the criteria. Additions to and deletions from the DXCC Countries List come about as a result of a myriad of such political changes. Reviewing the *nature* of the changes which have occurred since 1945 as they affect DXCC, these changes can be grouped into categories as follows:

a) ANNEXATION: When an area that has been recognised as a separate country under Point 1 is annexed or absorbed by an adjacent Point 1 country, the annexed area becomes a deleted country. Examples: India annexed Sikkim (AC3); China annexed Tibet (AC4); Indonesia annexed Portuguese Timor (CR8).

b) UNIFICATION: When two or more entities that have been separate DXCC countries under Point 1 unite or combine into a single entity under a common administration, one new DXCC country is created and two or more DXCC countries become deleted. Example: Italian Somaliland (I5) plus British Somaliland (VQ6) became Somalia (6O/T5).

c) PARTITION: When one country is divided or partitioned into two or more countries, one DXCC country is deleted and two or more DXCC countries are created. Example: French Equatorial Africa (FQ) was deleted and replaced by Central Africa (TL) Congo (TN), Gabon (TR) and Chad (TT). The partition category is not employed when the original political entity continues in some form. That is, if part of country A splits off to form country B, the original DXCC country (A) is retained and one new DXCC country (B) is added. Example: the British Sovereign Bases on Cyprus (ZC4).

d) INDEPENDENCE: Mere independence does not result in a Countries List deletion. Examples: the Tonga Islands, then a British protectorate (VR5), is the dame country as the present listing of the Kingdom of Tonga (A3). Further, an entity already recognised as a separate DXCC country is not deleted because of a change in its independent status. Bangladesh (S2) is the same listing as East Pakistan (AP), which was already separate from West Pakistan by virtue of Point 3. Also, a country that merely changes its name (such as when Upper Volta became Burkina Faso) does not change its basic status as a DXCC country on the DXCC Countries List.

SECTION IV — ACCREDITATION CRITERIA

1. The many vagaries of how each nation manages its telecommunications matters does not lead itself to a hard set of rules that can be applied across the board in accrediting all amateur radio DX operations. However, during the course of more than 40 years of DXCC administration, basic standards have evolved in determining whether a DX operation meets the test of legitimate operation. The intent is to assure that the DXCC credit is given only for contacts with operations that are conducted appropriately in two respects:

I) proper licensing; and ii) physical presence in the country to be credited.

2. The following points should be of particular interest to those seeking accreditation for a DX operation:

a) The vast majority of operations are accredited routinely without any requirement for submitting authenticating documentation.

b) In countries where amateur radio operation has not been permitted or has been suspended or where some reluctance to license amateur stations has been evidenced, authenticating documents may be required prior to accrediting an operation.

c) Some DXCC countries, even though part of a country with no amateur radio restrictions, nevertheless require the permission of a governmental agency or private party prior to conducting amateur radio operations on territory within their jurisdiction. Examples: Desecheo Island KP5; Palmyra Island KH5; Kingman Reef KH5K.

3. In those cases where supporting documentation will be required, the following should be used as a guide as to what information may be necessary for the ARRL Awards Committee to make a realistic judgment of the legality of an operation:

a) Photocopy of license or operating authorisation. If licence is a non-amateur format, it should authorise operation on amateur radio frequencies (not necessary all) and not be restrictive to geographical points of communications. Example: Use *of amateur radio frequency only* authorised between country "A" and country "B".

b) Contract agreements with governments.

c) Photocopy of passport entry and exit stamps.

d) For islands, a landing permit and/or signed statement of the transporting ship's, boat's or aircraft's captain showing all pertinent data such as date, place of landing, etc.

e) For some locations where special permission is known to be required to gain access, evidence of this permission having been given is required.

4. These accreditation requirements are intended to preserve the DXCC program's integrity and to ensure that the program does not encourage amateurs to "bend the rules" in their enthusiasm, thus jeopardising the future development of amateur radio. Every effort will be made to apply these criteria in a uniform manner in conformity with these objectives.

INTERESTING QSOs

DECEMBER 1987

CU2DG on 21 MHz SSB. Orlando on Azores Island.

DF0MM/60 on 14 MHz SSB. Ben, near Frankfurt. A special event station for the 60 years German amateur radio anniversary.

JANUARY 1988

BV2B on 14 MHz SSB. QSL to PO Box 30547, Taipei, Republic of China.

LS8E on 14 MHz SSB. Joe near Buenos Aires operating in the "Hunting Lions Contest". QSL to PO Box 20, Solano City 1881, Buenos Aires, Argentina.

YS1JBL on 14 MHz CW. Joe in San Salvador. QSL to Jose Bou Lopez, PO Box 1476, San Salvador, El Salvador.

DA1FR on 21 MHz CW. QSL via G4KIE.

—Contributed by Steve Pall VK2PS

ar

Try This!

SCREW INSERTION

Herb Unger VK2UJ
El Rancho, Alectown, via Parkes, NSW. 2870

Have you ever tried, with great difficulty, to get a nut started in a confined space where only a finger can reach? I think we all have!

Here is a simple hint to overcome the problem.

Use a small piece of grafting wax on the tip of your finger to hold the nut in place.

Grafting wax can also be used between the slot in the head of a screw and the screwdriver.

Grafting wax can easily be made by melting together equal quantities of resin, beeswax and fat.

ar

QSP

NEW BROADCAST STATION

Hobart is to get a new commercial radio station by late 1989. Communications Minister, Senator Gareth Evans, said Tasmania's capital city was capable of supporting an independent FM station because it had some 200 000 potential listeners.

He said the Ipswich area of Queensland was also likely to its own commercial FM radio station next year.

RADIO TIME SIGNALS

The following is an extract from the Chief of Naval Staff Newsletter (unrestricted) of December 1987.

Over the past years, major ships have relied on radio time signals transmitted from station VNG in Victoria. The RAN has since designed and built a unit to transmit the time service from Canberra. It is transmitted on the upper sideband of two assigned Naval frequencies, 12.082 and 6.488 MHz. The time is indicated by 1 kHz pulses at one second intervals by the leading edge of each pulse, four clipped pulses precede a wide minute pulse with a series of two wide pulses to indicate the half-hour and three wide pulses the hour. The service is controlled by a highly accurate frequency standard and is maintained in step with Universal Time.

—Contributed by Gerry Preston VK5PI

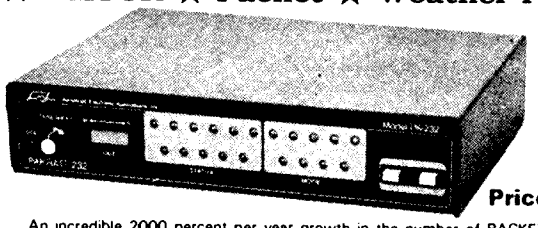
SYDNEY — MELBOURNE — BRISBANE

JOIN THE PACKET REVOLUTION!

New PK-232 Breakthrough

A new software enhancement makes the AEA PK-232 the only amateur data controller to offer six transmit/receive modes in a single unit.

★ Morse Code ★ Baudot (RTTY) ★ ASCII
★ AMTOR ★ Packet ★ Weather FAX



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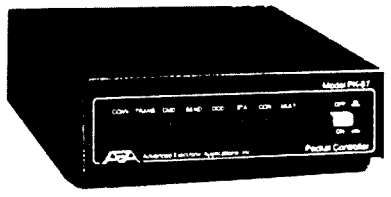
Price $699

An incredible 2000 percent per year growth in the number of PACKET RADIO OPERATORS has been recorded in the USA. This packet revolution is fast coming to Australia and EMTRONICS is ready to serve you!
NEW PACKRATT PK-232 — Morse, Baudot, ASCII, AMTOR, and packet data controller in stock now! This six mode machine goes with any RS232 computer or terminal. Call for full specs.



PK-87™ PACKET CONTROLLER $399

The PK-87 is not just another copy, it's much more. With all the packet program features of the Multi mode PK-232, the PK-87 is an economical new TNC designed to bring you enhanced, completely compatible packet software plus new hardware features for improved packet operation.

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★ AEA's exclusive "MBX" Mailbox Monitor command lets you read and save received data without confusing headers, callsigns, or repeats ★ New commands let you restrict the use of your station for connects and digipeater functions ★ Host mode for improved terminal program operation and development of specialized programs and applications ★ Compatible with existing WORL/WA7MBL PBBS/Mailbox/Gateway programs, with complete software command for remote selection of link rate, modem tone, etc ★ Autobaud routines for terminal data rates from 300 to 9600 baud (programmable down to 45 baud), and software control to set on-air data rates from 45 to 9600 baud. While the PK-87 can be used for HF operation, AEA recommends the PM-1 packet modem as a high performance front end for best results in HF packet service. Only the new AEA PK-87 has all these features. Contact your local AEA dealer and join the packet revolution today by ordering the new PK-87.

Hardware Enhancements

★ Eight front panel status indicators show Converse, Transparent, and Command modes, Multiple Connects, Data Carrier Detect, Push to Talk, Status, and Connect ★ High sensitivity (5 millivolts RMS), and dynamic range from 5 to 770 millivolts RMS ★ Rear panel AFSK output level adjustment from 5 to 100 millivolts RMS ★ One minute hardware watchdog timer provides system security in unattended VHF/UHF PBBS/Mailbox and digipeater operation ★ Modem disconnect circuits guarantee compatibility with future high speed modem applications and developments ★ Zilog 8530 SCC provides dependable hardware HDLC for higher speeds, and AMD 7910 for reliable modem performance without calibration.

NEW 1KW EMTRON TUNER EAT-1000A Only $549

This new EAT-1000/A is EMTRON'S latest antenna tuner built on special request by many amateurs. Built with finest components available. 5 position internal antenna switch, cross needle SWR/power meter, built in 3:1 balun for open feedline and antenna terminals for coax line, open feedline as well as longwire. EAT-1000A will tune almost everything from 1.8 to 30 MHz. At lowest price professional design and quality that EMTRON provides. MADE IN AUST.

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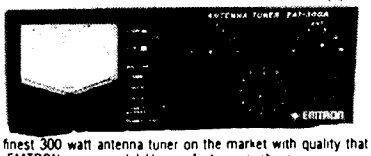

The finest 300 watt antenna tuner on the market with quality that only EMTRON can provide! Unique features such as:
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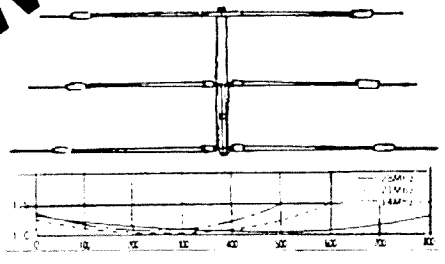
Only $239

TET—EMTRON ANTENNAS

NEW

3el 10/15/20m band—HB33DX



Band	14/21/28 MHz
Element	3
Gain	8.5/8.5/10 dB
F/B Ratio	20 dB
VSWR	1.5
Power R	2 kW PEP
Impedance	50 ohm
Element L	8.26m
Boom L	4.0m
Turning Radius	4.59m
Wind Surface Area	0.52m²
Wind Load (EIA STD 80 MPH)	51.2 kg

Made in Australia

Dr. MAC TANIGUCHI of TET Japan has now joined EMTRON IND. and improved his already famous phase-feed matching system based on the "HB9CV" concept. This new matching system provides an increase in gain roughly comparable to adding another element to the antenna while significantly improving the front to back ratio. The performance exceeds even conventional YAGI-UDA design and these new TET-EMTRON multiband beams exhibit extremely flat VSWR over a wide frequency range.

Our new antenna factory "TET-EMTRON" a division of EMONA ELECTRONICS is now producing a range of antennas aiming specially at the export markets of Japan, USA and Europe.

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HAYMARKET, NSW.
2000

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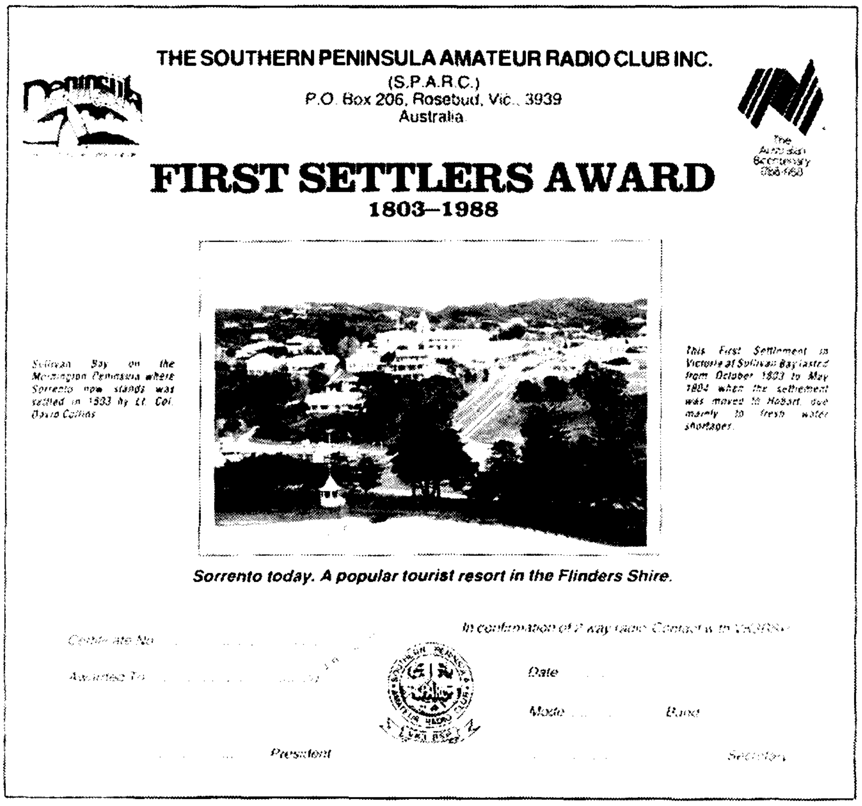
VICTORIA:
288-294 Queen St, Melbourne
Vic. 3000.
Entrance from Lt. Lonsdale St
Ph: (03) 67 8551 or 670 0330
FAX: (03) 670 0671

QUEENSLAND:
416 Logan Road, Stones Corner
Qld. 4120.
Ph: (07) 394 2555
FAX: (07) 394 4316

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014



THE SOUTHERN PENINSULA AMATEUR RADIO CLUB INC.
(S.P.A.R.C.)
P.O. Box 206, Rosebud, Vic., 3939
Australia

FIRST SETTLERS AWARD
1803–1988

Sullivan Bay on the Mornington Peninsula where Sorrento now stands was settled in 1803 by Lt. Col. David Collins

This First Settlement in Victoria at Sullivan Bay lasted from October 1803 to May 1804 when the settlement was moved to Hobart, due mainly to fresh water shortages.

Sorrento today. A popular tourist resort in the Flinders Shire.

Date ......
Mode ...... Band ......
...... President ...... Secretary

FIRST SETTLERS AWARD

The First Settlers Award has been produced by the Southern Peninsula Amateur Radio Club as a Bicentenary project for the whole of 1988.

The award may be obtained by one two-way contact with club station, VK3BSP. Such contact is to be confirmed by applicants QSL card and with a $2 fee to cover production and postage costs. School radio clubs will receive one free award.

Applications should be addressed to:
SPARC, PO Box 206, Rosebud, Vic. 3939.

The Club Station will operate as often as possible during the currency of the award on various open bands but can always be found on club nets on Tuesday evenings at 0930 UTC and Sunday mornings at 2330 UTC, on 3.620 MHz. The club will listen for school clubs on two metres, particularly during lunchtimes.

Shortwave listeners will be eligible to receive the award on receipt of hearing one reported contact with VK3BSP plus the appropriate fee as stated.

The issuance of the award is an approved Bicentenary project.

—Contributed by J A Donald, Publicity Officer, SPARC

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NEW TECHNOLOGY CABLE INTO HOMES

Homes in both Sydney and Melbourne have been involved in trials of a communication medium of the future. A pilot scheme has seen 90 houses in the Centennial Park area of Sydney and 90 in Toorak, Melbourne, linked to the telecommunications network by fibre optical cable.

Telecom said that in the future enhanced services likely to be offered will include one-way video two-way voice for home shopping and education and two-way links for video phones, community video *conferencing and* transmissions between personal computers.

Telecom network engineering spokesman, Mike Harrison said, "It will allow a lot more people to work from home.

"All these uses would not be possible on the existing copper wire network."

Those in the pilot scheme with a basic fibre-optic line have simultaneous access to several facilities such as multiple phone channels, viatel and security systems. Some of the homes had a low speed data channel whilst others have a 2m/bit data channel.

The costs of optical fibre cable distribution is expected to be similar to conventional copper cable in the 1990s when optical fibre cables go into widespread use.

Telecom was also moving toward using the new cable for business communications in capital cities, linking the cities and trans-ocean fibre optics would also link countries.

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

Well, I have just discovered that the Post Office has a sense of humour . . . they have increased the price of IRCs from 85 cents to $1.35 — they **must** be joking!

In December 1987, the following people helped out with intruder reports:
VK2DEJ, VK2EYI, VK3AMD, VK3XB, VK4AKX, VK4BG, VK4BHJ, VK4BTW, VK4BXC, VK4KHZ, VK4NFL, VK5GZ, VK5TL, VK6RO, VK7RH, VK8HA and VK8JF.

There were 112 intruders reported using AM, 152 using CW, 152 using RTTY, 76 using other modes and 34 intruders gave identifying call signs on the air. By far the biggest single problem for the month was the number of reports of Asian CB-type activity on 28 MHz. This problem will get worse, and we want to hear about what you hear on 10 metres.

Please let us know if you are hearing the Spurii of an AM station on 14.025 MHz from about 1000 UTC onwards. We are working on the theory at the moment that it may be a result of the "Luxembourg Effect", and is the result of the effect working on two stations, one on 11.805 MHz and the other on 9.585 MHz. The "Luxembourg Effect" phenomenon was first described by two Australian physicists as an effect where a powerful station could affect the ionosphere in such a way that any other waves reflected from the affected region would acquire a modulation from an unwanted powerful station, and was most marked when:
1. the two transmitting stations were approximately on the same Great Circle Bearing from the receiver; and
2. the interfering station was geographically between the receiver and the wanted transmitting station.

Our two stations on the above-mentioned frequencies meet these requirements, and this could well be the cause of the problem. This is a difficult problem and will need further investigation.

And, onto the mode for the month — Facsimile or FAX.

FAX is designated R3C or F3C, and is a legitimate amateur mode. We cannot assume a heard FAX signal to be an intruder as it could be an amateur operator. FAX is used for the transmission of maps, charts, diagrams, etc and has a very distinctive sound, like a musical tic, tic, tic. It is virtually impossible to label a FAX signal as an intruder, unless you can decode the transmission. FAX intrusions, fortunately, are uncommon, although not rare, and we need not worry too much about them. Next month we will tie the ribbons on the current series of mode descriptions. See you then.

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Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7251

CONTEST CALENDAR

APRIL 1988
9 — Israel ARC Contest
23 — 24 Swiss Helvetia Contest

MAY 1988
14 — 15 CQ M Contest (Rules this issue)
28 — 29 CQ WW WPX CW Contest

The Oceania results for the 1986 USSR CQ M Contest are as follows:

SINGLE OPERATOR SINGLE BAND

VK4TT	4275 points 14 MHz
VK5AGX	2210 points 14 MHz
ZL3AGI	228 points 14 MHz

SINGLE OPERATOR MULTI-BAND

VK4XA	15575 points
VK2BQQ	8502 points

The rules for the 1988 CQ M Contest are as received from Box 88.

1. OBJECT — To strengthen friendly relations among radio amateurs of the world.
2. DATE and PERIOD — The second full weekend of May annually, from 2100 UTC Saturday to 2100 UTC Sunday.
3. ELIGIBILITY — All licenced amateurs and SWLs, world-wide.
4. CONTEST CALL — CQ M (means "Peace to All").
5. MODE — CW and SSB (no cross mode).
6. BANDS — 3.5, 7, 14, 21, 28 MHz and Mode A may be used according to IARU band plans. QSOs through Mode A count as a separate additional band.
7. CATEGORIES —
   A) Single operator, single band.
   B) Single operator, multi-band.
   C) Multi-operator multi-band single transmitter.
   D) SWLs (listeners).

NOTE — Only one transmitted signal allowed at any given time. Multi-operator multi-band single transmitter stations are only allowed to change band one time for a period of 10 minutes.

8. EXCHANGES — RS/T plus QSO serial number starting at 001.
9. QSO POINTS — Each QSO with own continent counts as one point and with other continents, three points.

Listeners logging both call signs and one number score one point, both call signs and numbers — three points.

10. MULTIPLIER — The multiplier is the number of different countries ("R-150-S" country list) worked on each band. Listeners have not got multipliers.

A station may be worked once on each band only. QSOs within own country count for multiplier only.

11. SCORING — The total QSO points multiplied by total multipliers from all bands added together.
12. AWARD — The winners in each category in each country will receive a diploma, and the winners and two runners up will be awarded medals also. All non-USSR stations working at least 10 USSR stations will be awarded badges.
13. DEADLINE — All entries must be postmarked no later than July 1 of the current year.

Logs must be sent to: Krenkel Central Radio Club of the USSR, CQ M Contest Committee, PO Box 88, Moscow, USSR.

NOTE — The various awards issued by the Krenkel Central Radio Club of the USSR may be claimed on the basis of these logs if application is made when they are submitted.

NOTE FROM FCM — The (R-150-S) country list mentioned in the above rules appears to be the same as the DXCC list.

1987 ROSS HULL MEMORIAL CONTEST RESULTS

The VK5 Division is to hold the trophy for this year!

The overall winner this year was VK5NC with a total score of 1796 points, followed by VK3AUU with 1588 and VK3AUG with 1400 points.

The highest scores in each of the six Maidenhead Locator Fields that were activated, according to the logs received are as follows:

QG winner VK4YZ*
QE winner VK7JG*
PG winner VK4KHQ*
RF winner ZL1TZA*
RG winner FK1TS*
QF winner VK5NC*

CALL SIGN	SCORE	LOCATOR SQUARES
VK5NC	1796	29
VK3AUU	1588	28
VK3AUG	1400	23
VK3BBB	1259	22
VK4YZ	987	19
VK2COD	938	18
VK2BHO	725	14
VK7JG	694	12
VK3XRS	594	11
VK7ZHA	540	10
FK1TS	514	10
VK3ZXY	447	8
VK3KKW	437	8
VK5LP	423	8
VK4ZRC	409	8
ZL1TZA	309	6
VK2TR	212	4
VK4KHQ	102	2
VK7LZ	102	2

* Indicates certificate winner.

The number of entries has remained static and I will accept the blame this time around, but will expect a lot more stations to participate in the next Ross Hull Contest, which will receive more promotion. The rules for the 1988 contest will remain the same but the duration will be shorter.

The standard of logs submitted was very high and all the comments received have reinforced my belief that we are on the right track in our bid to make this contest more interesting for the majority of amateurs and I believe that it will be very difficult for the same station to be a certificate winner two years in succession!

COMMENTS RECEIVED FROM THE CONTESTANTS

Firstly I would like to congratulate the contest committee for an excellent Ross Hull Contest during 1987/88 and for their plain courage in bringing in the new rules and regulations. I thoroughly enjoyed every minute of it despite my age of 75-and-a-half years. The contest got off to a slow start at first, but as soon as everyone realised the meaning of the squares it took off very well indeed.

Some suggestions if I may.

1. I would like to see more reminders in AR and on the Sunday broadcasts prior to the starting date, as I was amazed at the number of stations who were unaware of the contest.
2. In my opinion the "locator square" was a great success and caused considerable interest. Keep it going.
3. Perhaps it may be an idea to include UHF bands in future, in order to keep the multi-band boys happy.
4. I am not in favour of band multipliers as I think this was one of the factors which caused a serious decline in previous contests.
5. I am not sure of contacts via satellites as I have heard it argued, but why not repeaters?
6. I prefer to have the contest remain for its present duration rather than be reduced. I realise it is an impossible task to please everyone and would be happy if the next contest was run on similar lines. . .VK3AUG

Although not as active as I hoped to be this year, I enjoyed my participation. The use of Maidenhead locator squares I believe is a change for the better. I know there were and are grumbles from some stations active on 1296 MHz and above. Maybe a special division for these bands, with say certificates for winners in each State and national, would recognise their efforts and keep/stimulate activity and experimentation on these bands. . .VK3ZXY

Pity the contest wasn't two days earlier as I worked VK2, 4, 5, JA9 and P29 on 17/12 and 19/12, including a two-way RTTY contact with VK2YVG in Broken Hill, all on six metres! I ran my keyer for a total of 96 hours 44 minutes during the contest on 52.060 and 52.050 MHz. I also heard the Darwin beacon at 0040 on 3/1/88 but couldn't wake Darwin up! Maybe better luck next time. . .VK4KHQ

That's the spirit. . .FCM

This contest really got me hooked, once I started, the longer it went the harder I worked to gain those extra points. It was a very enjoyable contest and very fair. The point of starting your numbering from 01 each UTC day needs a bit of explaining to some stations but for the most part stations know what to do. My only disappointment was the lack of stations working the contest and the difficulty in getting that DX coming in. Thanks again for the great contest, I will be back again next year././VK4YZ

My entry for the Ross Hull Contest must be the smallest you will get. See you next year. . .ZL1TZA

I like the idea of using locator squares, I will be asking most of my contacts from now their locator square to see how many I can work before leaving here. I think it is a good way of injecting a little more interest into 6, 2, 70 cm, etc. Starting ladders would be a good idea but also some awards for say 50 locator squares as a basic award with endorsements for 60, 70, etc. I imagine it would be quiet difficult to wok 50, it will be interesting to see the highest number worked during the contest. You could also have a separate, more prestigious award for 100 squares worked. When I get all my QSLs in for this season I will be getting out the atlas and see how many I have worked, anyway, I enjoyed the contest although six metres was not very kind to me. Do not shorten the period of this contest, the three or so weeks now is a must. . .FK1TS/VK3XGK

Just a short note to let you know how much I enjoyed the Ross Hull Contest, despite the very poor Sporadic E season we suffered. Unfortunately my log is not eligible as the majority of my contacts during the contest were made from a portable station operated jointly by two other operators. Nevertheless, I had a good time providing contacts for others and logging the odd locator square. I must compliment your courage in biting the bullet by introducing the grid square locator system to this contest. It provided a novel twist and I am sure has finally established the use of grid squares in Australia, even after the contest many stations were still looking for new grid squares. Pay no attention to the handful of knockers. . .VK3BRZ

It was unfortunate that coinciding with the introduction of locator squares to the contest that we should have one of the worst Es seasons ever. Six metres was a write-off and also two metres, except for the usual tropo contacts. In the absence of the usual large number of six metre contacts, most activity had to be confined to 144 MHz and above. As with any major changes to the rules, the use of locator squares for the first time caused quite a degree of confusion, especially from those who are not WIA members. Many did not know their own locator squares and these had to be worked out by those having the necessary information. Some operators said they would wait until after the contest before spending much time on the air! This may have been different if there had been Es around. I am not sure the locator square system is really useful for the Ross Hull. There was ample evidence of mountain top operating in response to in advance scheduling of Ross Hull contacts! I am not against locator squares for contests as such, but believe it should be an ongoing thing such as for DXCC, Australian record tables, etc, but not for the Ross Hull Contest. As the result of considerable on-air

discussions, I am slowly coming around to agree that a much shorter contest may be desirable, with one half in the summer and the other in the winter, the two being added together for a final result. Within certain limitations, the idea of scoring at the rate of one point per kilometre irrespective of band has some merit and I am currently looking at this idea. I am sure the Federal Contest Manager will be disappointed with the logs he receives this year, which might indicate an overall lack of interest even worse than before. But, in fairness, we must take into account the poor conditions this year, the impact of the locator squares system, as well as the perennial situation that the contest is limited to WIA members only. I earnestly hope the Ross Hull Contest will continue in one form or another. I will endeavour to expand on some of my views direct to the contest manager as well as through my columns in AR. In the meantime, I say thank you to the Federal Contest Manager for an honest attempt to some real changes, but I think you will be disappointed. . VK5LP

Well, that is it until next time! I think that the majority of contesters seemed to approve of the new Ross Hull rules and regulations. I was quite pleased to receive the same number of logs as Ian received for the 1986 contest in view of the rather poor conditions that prevailed during this contest and the new type of contest exchange introduced, I am satisfied. • •

A disappointment was the absence of an entry from VK6. Could this be a reaction to the Remembrance Day Contest which has evolved into a more or less VHF only contest over in the west due to the existing RD rules. Perhaps if six metres had been open we would have had a number of entries from VK6. If six metres had been open we would have received many more logs. Is that wishful thinking? Next year will tell!

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SUPER PLASTICS

A team of scientists at the National University of Singapore are trying to develop a breed of super plastics that can carry electricity cheaply and reliably.

By the 1990s these experts predict electrically conductive plastics being used in lightweight batteries, switches, printed circuit boards, and a range of electronic devices.

SOUTH KOREAN SUPER CHIP

South Korea, which exported $1.92 billion worth of semiconductors last year, has now developed its own super chips.

It will become the third country after the United States and Japan to make the super-chip which can store as much information as 30 newspapers.

The four megabit dynamic random access memory (D-RAM) chip is the most sophisticated semiconductor commercially available.

The chips were jointly developed by the government-backed Korea Electrotechnology Telecommunications Research Institute and three leading local electronic firms.

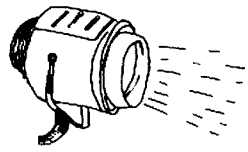
CORDLESS PHONES BANNED

Concern about interference from cordless telephones has led DOTC to have these items made a prohibited import. Tourists had been assured by some overseas merchants that their products are suitable for Australian use.

But, those available overseas often operate on frequencies used in Australia by television Channel 0, aeronautical, emergency and other radio communications services.

DOTC says only those cordless telephones on sale in Australia, which have been tested and labelled under compliance requirements for Australian conditions, can be legally used.

Anyone suffering interference from a suspected illegal cordless telephone should immediately contact the DOTC.



Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

Autumn has arrived and already daytime conditions have significantly improved. The solar flux is rapidly climbing upward, although the A-index, which indicates the level of geomagnetic activity, can fluctuate dramatically. I find the daily propagational reports, via Radio Australia, quite indispensable, and much easier to understand than the WWV reports at 18 minutes past the hour. Mike Bird's reports are heard from Monday through to Saturday at 0425, 0827, 1227, 1625 and 2027 UTC, on the usual RA outlets. On Sundays there is a weekly summary of propagational conditions in *Communicator*, RA's weekly communications magazine.

And whilst we are on DX magazines, I have some updated information so you may keep abreast with the fast breaking shortwave scene. As I have already mentioned, RA has re-titled their communications magazine and has also extended it to 27 minutes. This meant that the program had to be re-timed and it is now heard at the following times: 0230, 0730, 1230, 1730 and 2030 UTC, Sundays. The easiest release for me is at 0730 UTC, as the Pacific Islands Service on 5.995 MHz from Shepparton booms in here. However, those living in metropolitan areas are able to get local studio quality as the ANS'c Radio National relays RA between 1400 and 1930 UTC on Sundays.

HCJB's *DX Partyline* has also been re-scheduled to 1030 UTC and has also been reduced to Mondays and Saturdays. The best frequencies are 6.130 and 11.925 MHz. As I am typing this, I came across this program at 0230 UTC on Tuesdays, beamed to North America on 11.775 MHz, but it was a marginal signal. If you do miss the 1030 release, conditions on 11.775 MHz may be surprising in winter, Incidentally, HCJB, on 11.835 MHz in Russian, really booms in here, yet it is not surprising as they are using their 500 kW sender compared with only 100 kW on 11.775 MHz.

Another DX program for listeners within this region is the *Pacific DX Digest* over KTWR, Trans World Radio in Guam. It is heard at 0945 UTC on Fridays on 11.805 MHz, which is received well here. Other well-known programs remain unchanged, such as *Waveguide* on the BBC World Service, *Media Network* on Radio Netherlands and *DX Merry-Go-Round* on Swiss Radio International.

DXers and SWLs in Asia and the Pacific are trying to persuade Radio Canada International to include *SWL Digest* on their Asian English-language program via Radio Japan's Yamata relay. RCI have only scheduled a 30 minute English release in the morning and evening with no plans to include it. Incidentally, the RCI program commences on the fourth of this month at 1200 to 1230 UTC on 15.290 and 17.810 MHz, from Yamata and from 2200 to 2230 on the single channel of 17.885 MHz, which is followed by French at 2230 UTC. Japanese programs from the CBC's Vancouver studios are on at 1300 to 1330 and 2200 to 2230 UTC on 6.150 MHz.

I know that RCI are anxious to hear how reception is via the NHK Yamata site, so you can forward your reception reports to Radio Canada International, PO Box 6000, Montreal, Quebec, Canada, H3C 3A8.

If you are hearing the Spanish Foreign Radio at 1000 UTC, in Spanish, on 7.165 MHz, it does not mean 41 metres is open to Europe at that time. The transmissions are directed to Japan in Spanish, but are actually coming from Kunming in the People's Republic of China. The Spanish and Chinese governments signed an agreement at the beginning of this year to exchange programs via their senders. Madrid is also on 11.870 MHz via Kunming to the Phillipines at 1100 UTC, with excellent signals. Radio Beijing is using Spanish senders in the Canary Islands to transmit to North America, in English.

This sharing agreement is the third Radio Beijing has entered into. They commenced with Swiss Radio International in Berne last year, and then updated Radio Mali's senders in Bamako, West Africa to relay Radio Beijing's programming to Africa and South America. This agreement, however, is a one- way affair unlike those made with SRI and the Spanish Foreign Radio (REE).

By now, I should have more time to get involved in SWLing as I have stepped-down from the VK7 Divisional Council after a two-year-stint. Conditions are rapidly picking up and the latest indications are that the next maxima for sunspots is in 1989-1990 — only 18 months away!

Two interesting utility stations recently logged have been in the news. The first one was the Canadian ice-breaker, *Lady Franklin*, call sign VOCP, logged on February 3 on 14.415 MHz. She was hurriedly chartered by ANARE when the famed *Nella Dan* sank off Macquarie Island. The second signal was GBTT, the *QE2*, which was heard on February 7 and 14, once on ARQ and the other on USB within the maritime allocations.

Net month, I hope to be reviewing both the *World Radio TV Handbook* and the *International Broadcasting Handbook*. Until then, the very best of DXing and good listening!

—Robin VK7RH

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Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW, 2868

SHARING THE SHACK

In earlier times it was uncommon for a woman to hold an amateur radio licence. The wife was not encouraged to show an interest in the mysterious array of bits and pieces, (or the weird noises often produced when those bits and pieces were put together), that were so much a part of her otherwise neat and orderly home. If she were foolhardy enough to attempt an entry to his domain, where chaos ruled supreme, she was, in most cases, gently but firmly shunted to the door with a murmured "You wouldn't understand any of this, dear," to return to the civilised world of children, dogs, cats, cooking, washing, etc.

Those times are gone! The number of married couples jointly involved with amateur radio is growing continually, and in many cases whole families enjoy this fascinating hobby of ours.

This no doubt has its advantages and disadvantages. Sharing the radio shack and equipment requires plenty of give and take, but on the other hand, amateur radio becomes as much a part of the household as the family cat, and is not booted out the back door to take up residence in the garden shed.

What can be more pleasant than a shared hobby?

CLARA (the Canadian Ladies' Amateur Radio Association) is at present very interested in families involved with amateur radio, and issue a special Family Certificate (see details below).

CLARA FAMILY CERTIFICATE

Families must reside in Canada. Work two or more members of the same family to get family status. They need not live at the same address. All bands and modes. All QSLs dated January 1975 or later may be counted. Log sheets must also show the full names and relationships of contacts. One point is allotted for the first member of the family and two more points for each additional member worked. Remember two or members from the same family must be worked. For this certificate 22 points are required. Endorsements are issued for each additional 22 points.

Example:
Hallie du Freez VE6AUP — 1
Buddy du Freez VE6ANC — 2
Tavis du Freez VE6BMW — 2
Total of five points

Pauline Burt VE3LQA — 1
Jim Sweet VE3AAI — 2
Glenn Sweet VE3GCI — 2
Total of five points

QSLs must be in your possession and the log must be verified by one other currently licenced amateur. Send $2 and log data, complete with full name and relationships to CLARA Certificate Custodian.

The Canadian Amateur Radio Magazine, November 1987, "YL News and Views" list a number of well-known DX couples from all parts of the world:
Christel DF1LV and OM Lothar DF1LU, Deckert. (Christel is an ALARA member).
Erry HS1KY and OM Piya HS1KO, Malakul.
Aola ZL1ALE and Dave ZL1AMN, Johnston. (Aola is an ALARA member).
Darleen WD5FQX and Joe WD5HIL, Magen. (Darleen is an ALARA member).
Lea LX1TL and Jules LZ1TJ, Toussaint.
Clare EI7CW and Ken EI9AB, Dixon.
Elsa 8P6MH/9Y4XL and John 8P6KX/9Y4JW, Webster.
Diana ZS6GH and Reg ZS6J, Green. (Diana is an ALARA member).
Neveen AP2YL (first woman licensed in Pakistan) and Ali AP2AL, Munir.
Diana G4EZI and Richard G4DZI, Hughes. (Diana is an ALARA member).
Margaret GD3RFK and Doug GD4RFK, Dodd.
Funi JA1AEO and Abe JA1PK.
Ellen LA5H and Ken LA3DO, Grandel.
Kirsti VK9NL and Jim VK9NS, Smith. (Kirsti is an ALARA member).

This is, of course, only a fraction of the married couples actively engaged in the hobby of amateur radio. We certainly cannot omit the globe-trotting Colvins, Iris and Lloyd, from any list of this nature. I would also like to add our own Mavis VK3KS and Ivor VK3XB, Stafford, who have contributed a great deal to amateur radio. The list could go on and on.

One thing is certain, amateur radio can really be a family hobby!

MAVIS STAFFORD BICENTENNIAL TROPHY

The response to the Mavis Stafford Bicentennial Trophy (details March AR) has so far been most enthusiastic, and indications are that it will be keenly contested.

ALARA contacts for the Trophy must be made between January 1 and December 31, 1988 (UTC).

This trophy, together with the Dutch YL-Year 1988 Award and WARO Century Award tend to make 1988 "YL Year" as well as Australia's 200th birthday.

50 YEARS ON AIR

Mary (Bobbie) Lilian Hill VK6MH, was born in 1906. She married Stan Hill in 1932. They have two married sons and four grandchildren.

Bobbie and Stan were both licensed in 1937 whilst living at Wiluna, WA, (1200 kilometres NE of Perth) and, like other amateurs at that time, taught many young men Morse code to help them in the Services.

Bobbie's AOCP Certificate is numbered 1976, dated August 27, 1937, and shows she passed Morse code at 12 WPM. Bobbie preferred CW although she would join Stan on phone for some QSOs.

Bobbie has not been on air for some time although she liked to listen in. She enjoys reading the ALARA newsletter and hearing about the girls' activities. She is still an amateur at heart.

Bobbie was delighted to receive a dried flower arrangement from ALARA congratulating her on 50 years in amateur radio and sends her sincere thanks. She had to explain to the nursing staff at the hospital what it was all about!

YL ACTIVITY DAY

It is pleasing to see an increase in the number of YLs on air on the sixth of each month — YL Activity Day. I was thrilled to catch up with Diana G4EZI on February 6, with reasonable signals, which enabled us to have a good "rag-chew". It was pleasing also to talk to Jean GW0ARP (an ALARA member) for the first time. European propagation does appear to be improving.

There were, in addition, more VK and ZL girls, and at least one Japanese and one German YL on air during the time I had available that day.

Please make an effort to come on air on the sixth of the month, if only for a short time. If you do not hear anyone on the YL Activity Day frequencies (see February AR), call "CO YL" as other may be listening.

ALARA AWARD UPDATE

No/DATE	NAME & CALL SIGN
132/October 1, 1987	David Stevens L20508
133/October 1, 1987	Bruce Bilton VK1BEB
134/December 15, 1987	Liz Randall VK3PSG

ZL THELMA SOUPER MEMORIAL CONTEST 1988

Saturday and Sunday, April 16 and 17, 1988 from 0700 to 1000 each evening. All contacts on 80 metres phone and CW. YLs contact YLs and OMs. One contact with each station permitted in each half-hour period. Call "CO WARO Contest". Exchange report, serial number (commencing with 001) and name.

To qualify as a multiplier a WARO member station must have at least 20 contacts. A bonus station using the WARO call sign, ZL2YL, will be in operation for random periods each night of the contest; if worked it will count as a multiplier once on each night of the contest.

To qualify, enter date at beginning of each evening, each log entry must contain time of contact, call sign of station worked, cipher sent, cipher received and name of operator contacted.

Score one point for each contact, multiplied by the number of WARO members and bonus station if worked. Logs to have each contact claimed as a multiplier underlined.

Include a summary showing your call sign, name and address, number of contacts, number of

Photographed at the ALARA-meet in September 1987 are Jenny Warrington VK5ANW, Vicki Shaw ZL1OC and Marilyn Syme VK3DMS. Marilyn is ALARA President.

Maria McLeod VK5BMT, ALARA-meet Co-ordinator.

WARO members worked, your score and declaration that all radio regulations have been observed.

The highest scoring WARO member and OM will each be awarded a trophy to be held for one year. The first three WARO members, first three OM and the highest scoring VK YL operator will be awarded certificates.

Logs to reach the Contest Manager, J Gilchrist ZL2BOD, PO Box 651, Hawera, South Taranaki, New Zealand, by May 14, 1988.

Another YL contest to watch for is the DX YL to North America YL. CW will be held on April 6-8 and phone on April 13-15.

BITS AND PIECES

A barbeque for ALARA members will be held at the home of Liz VK3PSG, on Sunday April 17. Weather will not be a problem, children welcome, but no dogs please. Arrival time about noon. Liz will supply hot water for tea and coffee. Please bring your own meat and salads, etc. If you think you can attend please ring Liz on (03) 723 1744.

Bev VK6DE and OM Brian VK6AI, planned a touring holiday in New Zealand meeting many of their ZL friends along the way. We will be interested to hear all about your trip, Bev.

Bev also reports that there are now 34 licensed YLs in VK6.

It is sincerely hoped that by the time this goes to print Gill VK6YL, will be literally back on her feet again and fully recovered from the accident which resulted in a broken leg.

Congratulations to Marjorie VK3HQ, who recently celebrated 55 years as an amateur radio operator. She was pleasantly surprised to receive a suitably inscribed silver bud vase from ALARA.

Sincere sympathy is extended to Joy VK4VFJ, on the death of her sister.

NEW MEMBERS

Welcome to ALARA:
Ree VK2CAK, Jean VK6JMP and DX member, Barbara CP5LE.

Congratulation on upgrading to Noela ex-VK4MBP, now VK4KCU.

Until next month, 73/33, Joy VK2EBX.

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NEW KENWOOD TRANSCEIVER

An all-band, all-mode 100 watt HF transceiver, which can also give 10 watts output on six metres, has been announced by Kenwood.

The company's new TS-680S transceiver has dual VFOs, 31 memory channels, programmable scanning, IF shift, dual noise blankers, RIT and FM squelch.

A new feature is a programmable band marker which Kenwood says can be used to mark band edges to prevent out-of-band operation. It is not known when the model will be available in Australia.

SUPER CHIP

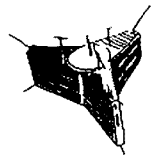
The world's fastest dynamic memory computer ship has been developed by IBM researchers who say it can send and receive information at a rate of 20 billion units per second.

The chip, which allows computers to think three times faster, is expected to have great application in medicine and engineering.

It will enable big improvements in video screen images such as the development of two and three dimensional graphic data and moving images.

OMISSION

There were 11 proposed motions for the 1988 Federal Convention published in AR, February (pp 27-28). They were attributed to VK4 and VK1, but without indicating which Division had proposed which motion. In fact, only the last motion listed (re the 20 metre band plan) was from VK1, with all the rest from VK4.



AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SOUTH WEST PACIFIC
2200 UTC Saturday
14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian Elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

PHASE 3C UPDATES

With the launch of Phase 3C in the foreseeable future, the following items of news are presented, along with an item highlighting the problems currently being experienced by Phase 3B, better known as OSCAR 10.

Newest OSCAR Prepared for June Launch

Final preparations are being made prior to shipping AMSAT's Phase 3C spacecraft to South America for launch. The most powerful OSCAR ever built will be lofted to orbit from the European Space Agency's Kourou, French Guiana launch site. The launcher will be an Ariane 4 rocket, the largest ESA has ever flown. This will be the 22 flight and is designated V-22. The 300 pound AMSAT spacecraft, one of three satellite payloads on Ariane, will eventually operate from a high elliptical orbit completing just over two orbits of earth per day. The new AMSAT satellite contains four separate transponders (repeaters) covering frequencies from 145 MHz to 2.4 GHz. A packet radio transponder is one of the four. One transponder will be capable of carrying more than 75 simultaneous QSOs. Another transponder uses FM and could be suitable for beaming bulletins for relay by terrestrial VHF repeaters. Phase 3C will receive its OSCAR designator number after it is successfully operating in orbit. That should occur about 30 days after launch. The satellite should operate for more than five years. Upgraded computer memory chips are "hardened" for the severe radiation encountered in orbit. This satellite is the third in the Phase 3 series. Phase 3B became AMSAT OSCAR 10 upon its successful launch in 1983. On-air coverage of the June launch will originate with a network of stations around the world including ARRL Headquarters' Station. W1AW. Repeater systems can link into the network via landing circuits. Besides routine QSOs, Phase 3C will be used for so-called "Techno-Sport" activities. These on-air competitions emphasise technical skills and recognise superior ability with plaques and awards. The AMSAT "ZRO-test" tests a station's receive sensitivity by sending successively weaker signals from the satellite. The new "SatFox Test" is a version of fox and hound transmitter hunting done by satellite. More Techno-Sports are in the planning stages. AMSAT Phase 3C is a joint project of AMSAT North America and AMSAT DL, with additional contributions from other AMSAT affiliated organisations. The project cost more than US$400 000. Initial design of the Phase 3 generation of OSCARs began in the mid-70s.

PHASE 3C LAUNCH EFFORTS CONTINUE

Momentum is increasing on several fronts leading to a launch of AMSAT's Phase 3C spacecraft in late spring. Whilst the actual launch date has apparently slipped a month into late May, or early June, preparations to support the launch activities are proceeding well. These support activities include planning for the launch support team from AMSAT NA and AMSAT DL, in Kourou and launch activity coverage by the AMSAT Launch Information Network Service. AMSAT NA's launch support team met recently in Boulder, Colorado, to map out plans for their activity in Kourou. Together with the AMSAT DL team, they will accomplish the final preparations on the Phase 3C satellite after it has arrived at the Kourou launch site of the European Space Agency. They will apply thermal blankets, install the antennas, fuel the spacecraft and integrate it with the SPELDA, the large container which sits atop the Ariane 4 launcher and which supports and contains the payload. After integration, a minimum support team will remain on-site to monitor the spacecraft telemetry sent through the umbilical to the monitoring facility. A 24-hour watch team will assure all telemetry values remain within tolerance. This watch will continue through to launch. Major launch-related activities will be broadcast on a world-wide ALINS prior to, during and after the launch.

OSCAR 10 — TIME FOR A REST. . .

Hello to all! Just a message to tell you what experience I made with our old bird in the past few days. On Sunday, January 31, there were FMing effects again on the GB beacon and transponder signals were reported for the first time. On February 4, when I looked at AO-10, I found the GB and Transponder off, but the high power EB on with a good signal. Around 16.30 UTC, I tried to reset the IHU/Transponder, but all attempts failed until LOS. At AOS of the next visible orbit, on February 4, at 2000 UTC, I could not hear anything. The satellite appeared to be dead. Later, around 2030 UTC, I found the general beacon (GB) extremely weak transmitting PSK garbage. I then tried the reset procedure again at 2035 UTC, with success! The GB switched back to a continuous carrier, the signal strength increased slightly and the transponder passband was also on again. But heavy FMing was persistent. In the past few days I have found the satellite in normal operation (GB and passband on), but still FMing continuously. I conclude that the power system is now operating with a near-negative power budget and the battery cannot fully charge. This probably means that the sun angle (S/C attitude) is about 10 degrees worse than estimated. When the satellite enters eclipse and there is a large transponder usage, this will probably produce random resets and unknown IHU/transponder states due to the under voltage condition. Users have to take these effects into account and should not use the transponder when the GB shows FMing effects, etc. It is time to give our good old bird a time of rest! Best wishes and 73, de Peter DB2OS.

AMSAT-AUSTRALIA NEWS BULLETIN

A reminder for newcomers to the satellite ranks, that the Sunday Evening News Bulletin presented by Graham VK5AGR, (refer schedules at the head of this column) continues to be the best source of up-to-date and reliable news available anywhere in the world. With the impending launch of Phase 3C, the latest launch information, orbital elements, telemetry formulae, etc, will be disseminated by Graham as they come to hand. Stay tuned.

de Colin VK5HI

ar

REPEATERS & BEACONS

Tim Mills VK2ZTM
FTAC Beacon Co-ordinator

The expansion of paging networks, in particular those of Telecom since their channels start adjacent to 148 MHz, is a continuing concern in VK2. The question which now comes up is whether there is the same expansion in other States? Would State Repeater Committees please advise FTAC the number of two metre repeaters in their region which are already at or adjacent to Telecom sites with paging networks and those also at Telecom sites likely to be fitted with pagers.

The latest VK2 system to become affected is VK2RBB 7200 at Byron Bay. There has been a recent installation of a 148.0125 MHz pager on the adjacent tower. The matter is being investigated and alternative channels looked at for a transfer.

The possibility of reversing the input/output frequencies of repeater systems above 147 MHz has been discussed with both P29 and ZL. Whilst there has not been the requirements for P29 to install systems above 147 MHz, they favour the idea. ZL were not keen on the idea. Whilst there is usually enough geographical separation between the respective countries, the problem may arise during the annual trans-Tasman openings. Several times a year it is possible for the eastern Australian coastline to work New Zealand on two metres (and higher frequencies). It would be during these times that systems in both countries, using the same but reversed channel pairs, would lock up until time out is reached. New Zealand repeaters have neither time out (nor CW identification) so it would have to be the Australian system to time out and break the lock up. New Zealand also feels that the existing 31 channels above 146 MHz are not sufficient for their needs and they propose to introduce a further 19 channels between 144.725 and 145.775 MHz. Inputs 144.725 to 145.175 MHz with outputs 600 kHz up at 145.325 to 145.775 MHz. They plan also to move their beacon band from above 145 to 144.300 to 144.400 MHz. That is below the Australian beacon segment. The five channels, 144.600 at 25 kHz steps to 144.700, are planned for their packet systems. That news came from Ted ZL2TAX, FMTAG Secretary (FMTAG is the ZL equivalent to FTAC).

The important thing for Australian amateurs to remember is that, whether we like it or not, pagers above 148 MHz are there to stay and are our neighbours. We must learn to live with them. We cannot keep moving systems out of channels above 147 MHz, otherwise we will just create a guard band which some commercial will request they move into. Wherever possible we must continue to install systems above 147 MHz. Design better receivers, select sites that do not have pagers but use all of our bands or lose them! In those call areas with nothing above 147, put some systems.

Eric VK2YVF/P29ZEF, who is the president of the PNGARS, advised late last year on the beacon and repeater position in P29.

BEACONS

P29BPL, on 52.013 MHz — 23 watts omni-directional cross dipoles, 158 metres ASL at Port Moresby.

P29BTO, on 144.105 MHz — 15 watts vertical quarter-wave ground plane, 97 metres ASL at Port Moresby.

TWO-METRE REPEATERS

P29RAE, 6650 with 20/5 watts on Mount Albert Edward, 4100 metre range over 200 kilometres. 30 second time out, hi/lo remote switching, remote shut-down, solar powered.

P29RBI, 6850 with 20 watts on Bougainville Island, 402 metres. To serve the Arawa and Panguna region. Undergoing testing in late October 1987.

P29RPM, 7000 with 12 watts on Burns Peak, 380 metres. Serving Port Moresby using an Isopole antenna, mains and battery backup.

P29RWH, 6900 with 28 watts on Mount Keegum, 2000 metres serving the Western Highlands region. Was being tested at Port Moresby in December 1987 before installation at the site.

70-CENTIMETRE REPEATERS

P29RHB, 8800 with 16 watts on Hombrums Bluff, 723 metres. Serving Port Moresby and hinterland using a directional antenna — bears 245 degrees.

All repeaters except P29RAE have three minute time out. Mains powered with battery back up. The beacons also have battery backup.

Eric reports that there are about 138 amateurs licences issued in P29 of whom about 25 to 30 are active. He also mentions that pagers do exist there but on a higher frequency than in Australia.

ar

QSP

SEMICONDUCTOR PIONEER DIES

Russell S Ohl N6DJG, credited as the father of the modern semiconductor industry, recently became a Silent Key.

Whilst studying the anomalous behavior of a bar of silicon, he discovered that a photovoltaic effect was generated in the bulk of the material.

Russell found that the photo sensitivity occurred at the junction of two types of silicon, and named these types N and P. The function is now known as the PN junction. This breakthrough made the invention of the modern transistor possible, and additionally became the basis of the solar cell.

He received 82 US and 50 foreign patents, and published five scientific papers.

A profile on Russell Ohl, who first became licensed in the early 1920s, was published in *QST* magazine in May 1981.

—From the *ARRL Letter*

COMMEMORATIVE CALL SIGN

As part of celebrations for the centenary of local government in the town of Birkenhead, New Zealand, a commemorative call sign will be on-air.

Watch for ZM1BCC operating from the Public Library of Birkenhead City Council offices, April 15 to 25. HF operation will be during office hours, with extra time planned on Thursday 21 and Friday 22.

Organiser Ray Tout ZL1BXC, says ZM1BCC will QSL mostly via the bureau.

US PACKET RADIO CHANNELS

The ARRL has adopted a number of recommendations made by its committee on amateur digital communications.

These include:

1. RTTY sub-bands should be used for general packet radio communications.
2. The following frequencies outside normal RTTY sub-bands will provide usable automatic message-forwarding channels:

Inter-continental message forwarding: 3.594.3, 7.038.3, 10.145.3, and 14.102.3 MHz (with 14.104.3 MHz as backup).

Intra-continental message forwarding: 14.108.3 MHz (with 14.106.3 MHz as backup).

North America message forwarding: 3.607.3, 7.091.3 and 10.147.3 MHz.

The 20 metre frequencies are considered experimental. Use of 30 metre frequencies is on a non-interference basis with fixed stations on this shared band.

SATELLITE ACTIVITY FOR THE MONTHS OF DECEMBER 1987 & JANUARY 1988

1 LAUNCHES

The following launching announcements have been received:

INTL NO	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INC deg
1987							
106A	Cosmos 1904	Dec 23	USSR	104.9	1021	989	83.0
107A	Cosmos 1905	Dec 25	USSR	89.6	280	229	70.4
108A	Cosmos 1906	Dec 26	USSR	88.8	274	190	82.8
109A	Ekran 17	Dec 27	USSR	23h48m	35628		1.5
110A	Cosmos 1907	Dec 29	USSR	90.2	398	208	72.9
			1988				
001A	Cosmos 1908	Jan 06	USSR	97.7	678	850	62.5
002A	Cosmos 1909	Jan 15	USSR	113.8	1433	1386	82.6
002B	Cosmos 1910	Jan 15	USSR	113.8	1433	1386	82.6
002C	Cosmos 1911	Jan 15	USSR	113.8	1433	1386	82.6
002D	Cosmos 1912	Jan 15	USSR	113.8	1433	1386	82.8
002E	Cosmos 1913	Jan 15	USSR	113.8	1433	1386	82.8
002F	Cosmos 1914	Jan 15	USSR	113.8	1433	1386	82.6
003A	Progress 34	Jan 20	USSR	88.8	277	191	51.8

2 RETURNS

During the period 64 objects decayed including the following satellites:

1987-063A	Soyuz TM-3	Dec 29
1987-093A	Cosmos 1896	Dec 25
1987-107A	Cosmos 1905	Jan 08
1987-110A	Cosmos 1907	Jan 12

3 NOTES

1987-104A Soyuz TM-4 docked with space station MIR on December 23, 1987; the space complex is linked with Kvant 1, Soyuz TM-3 and Soyuz TM-4.

1987-63A Soyuz TM-3 undocked from space station MIR on December 29, 1987, with Yuriy Romanenko, Aleksandr Aleksandrov and Musakhi Manarov on board; the descent module landed 80 kilometres from the Soviet town of Arkalyk.

1988-003A Progress 34 docked with space station MIR on January 22, 1988.

—Contributed by Bob Arnold VK3ZBB

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Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic. 3199

During February, Department of Transport and Communications (DOTC) officers attended public meetings in each State to explain the Department's intentions relating to the devolvement of amateur examinations.

Our thanks go to the Divisions who made the arrangements for the meetings.

I was able to attend only the VK3 meeting, but I understand that the pattern was similar in other States, and issues raised were often those that had been raised elsewhere.

The VK3 meeting was attended by about 30 amateurs, ranging from those with an extended involvement in education and examination matters to others who were unaware of the current procedures or the background to the devolvement proposal.

Mr A Jordan, from the Canberra office, presented copies of two papers — a short one outlining the rationale for devolvement and a summary of the Department's intentions (see summary at the end of this column), and a longer one covering procedures for accreditation, approval of papers and conduct of examinations as well as copies of the syllabuses and sample examination papers.

PROPOSED TIME SCALE

Speaking to the papers, Mr Jordan explained that requests for accreditation and copies of examination papers for approval may be submitted to the Department after June 1, 1988, at which time the Department's Question Bank and program for generating Morse code examinations will be made available to intending examiners.

The February 1989 examinations will be the last to be conducted totally by the Department, although special examinations for handicapped candidates will be provided as necessary after that date.

During the "phase-in" period, the Department will meet reasonable requests for copies of sets of questions. Existing official papers cannot be used by others unless a different title is used — if they are titled as official papers, the present fee arrangements must apply.

The preferred method will be for those who wish to arrange examinations to prepare their own papers, either totally or from the DOTC Question Bank, and submit it for approval at least six weeks before the proposed examination date.

MAINTENANCE OF STANDARDS

This was a concern raised by over 60 percent of those responding to the original proposals.

The DOTC is sensitive to this issue, and has specified a range of quality control measures, including approval of question papers, visits to examination venues, provision for review or verification of marks obtained, and procedures for penalising any attempt at fraud or revoking the accreditation.

It will be necessary for the District Office to be notified of examination schedules, approved papers, names of authorised examiners and names of persons nominated to sign candidate notifications. The candidate notification sheet becomes the authority for the issue of the licence.

REMOTE CANDIDATES

Permission for the examiner to use other persons to supervise an approved examination will allow candidates in remote areas to arrange examinations as required. A supervisor does not need to have any knowledge of the content of the examination. Morse code testing can be carried out on cassette tapes both ways if necessary, and assessed elsewhere.

FEES

The DOTC will not charge fees, nor set a standard fee for examiners to charge. It is assumed that examiners will need to recover reasonable costs, but in most areas, market forces will have an effect.

A number of other issues were raised. Most related to the minor mechanics of organising examinations or having papers approved. I will be presenting a fuller report to the Executive as soon as possible. Copies of it will be made available on request.

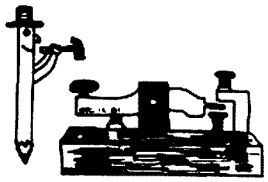
It appears that the devolvement is now in progress. It is up to us to establish a system which is acceptable to the Department, the Institute, the amateur body and the candidates.

As usual, comments from readers will be welcome.

SUMMARY

1. The responsibility for conducting amateur examinations will be devolved.
2. The Department will maintain responsibility for examination standards.
3. The Department will continue to administer examinations for handicapped candidates as required.
4. With the exception of 2 and 3 above, the Department will have no further involvement with preparing and conducting amateur examinations effective March 1, 1989.
5. The Department will continue to prepare examination papers until March 1, 1989.
6. The Department will continue to conduct examinations in remote areas and examination centres without an authorised person in the area until March 1, 1989.
7. The Department will supply examination papers to authorised persons during the phase-in period, if required.
8. The Department will provide its examination question bank to intending examiners.
9. The Department will approve examinations in accordance with the *Examination Approval and Administration* package.
10. Persons, whose examinations have been approved, may use other individuals to conduct the examination on their behalf.
11. The Department will implement a quality control program, to assure a maintenance of standards.
12. The Department has the right to revoke the examination approval, or individual authorisation, for contravention of the examination administration procedures, any other instructions, or for actions affecting the results of a candidate.
13. The requirement for the Department to conduct amateur examinations, as established by Regulation, is to be reviewed and amended as appropriate.

ar



Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

"Gidday Morsiacs".

Last week I experienced the horror of being blinded by an accident at work. Thankfully things have improved somewhat and the eye specialist says that everything will be okay. Stumbling around in the dark for a few days gave me plenty of time to think about the few blind amateurs I know, and how hard the everyday jobs become, not to mention operating in the shack. I missed the WIA broadcast because I didn't know the time. I must have tuned around parts of the band I had never seen before, let alone on a Sunday morning, a time when I am usually outside mowing lawns, etc. To cut a long story short, I ran across a net running on 7 MHz, or thereabouts, and spent a while listening before making a bit of a fool of myself and actually joining in. Anyhow, Geoff Butterworth VK3ED, was kind enough to send me some information about the net, so this month I will pass on what I have learned about nets and their operation.

You may know that there are a group of QN codes especially for net operation (I have a list on my wall), and Geoff has supplied the following list. They certainly save much time.

The CW Net (CWN), began as an alternative to round table sessions (like the Friday high speed net) which are often difficult to enter and leave, and, which because of their sometimes clannish nature, can seem forbidding to newcomers. Whereas, in a round table of 10, a station has to wait nine overs for his turn, in the CWN approach you can have as many QSOs as you wish, and on the average one would be in the transmit mode nearly half the time.

The CWN is in no way exclusive. It makes no demands on members because it has no 'members' in the usual sense. It is an organised activity, however, where operating procedure is concerned, and thus offers the added benefit of possibly improving the general standard of Morse operating.

Being a net, it must have a net control station (NCS), whose function is to record the stations who call in and to pair stations for OSOs. The NCS begins the net (see QND), maintains order, and is always available on the same frequency to facilitate reporting in and out. It remains on for the whole session and concludes it (see QNF). Following the end of each session those interested can take part in a post-mortem discussion on 7.040 MHz SSB.

To report into the net any Sunday, merely call in sometime between 0930 and 1130 on 7.025 MHz and listen for the station calling CQ CWN QNI. Give a short call and report in with QNI. Then wait until he calls you again with a station for a QSO. Do not forget to return after each QSO to let the NCS know whether you would like another one or would like to be excused from the net.

In the course of a session each Sunday, any station who thinks they would like a turn of being NCS lets it be known to the NCS for that session. In this manner, there is no pressure on members to take a session, yet those who would like to can do so. An efficient logging system has been evolved which makes the work of NCS almost "childs play" and this procedure is available to those interested.

NOTES ON THE USE OF QN SIGNALS

1. The QN signals listed are special ARRL signals for use on amateur CW nets only. Other meanings that may be used in other services do not apply.
2. Some QN signals are for use by net control stations only, these are marked with an asterisk. Others have slightly different meanings when used by the NCS and net stations. In this case, the meaning when used by the NCS is marked with an asterisk.
3. Some QN signals have two meanings, the difference depending on how, or by whom used. Eg: when used as a preface to transmission of a message, carries the first meaning; when used by a station reporting in to the net, (W9NCS de W9NET QNI QNC), it carries its second meaning.
4. QN signals are never followed by a question mark, even though the meaning may be interrogatory.
5. Do not use QN signals on phone nets. Say it with words. (This should apply to all Q signals ... VK3CQ).
6. Use QN signals in nets only. They are not for use in casual amateur conversations.
7. Make frequent use of standard Q signals in traffic nets, for meanings not covered by QN signals. Eg: QRU, QRV, QSV, QTA, QTB, etc.

SPECIAL ARRL QN SIGNALS FOR NET USE

QNA*	Answer in prearranged order.
QNB*	Act as relay between .... and ....
QNC	All net stations copy. I have a message for all net stations.
QND*	Net is directed (controlled by NCS).
QNE*	Entire net please stand by.
QNF	Net is free (not controlled).
QNG	Take over as net control station.
QNH	Your net frequency is high.
QNI	Net stations report in.* I am reporting in.
QNJ	Can you copy me? Can you copy .....?
QNK*	Transmit messages for .... to ....
QNL	Your net frequency is low.
QNM*	You are QRMing the net. Please stand by.
QNN	Net control station is ....* What station has net control?
QNO	Station is leaving the net.
QNP	Unable to copy you (or .....).
QNQ*	Move frequency to ..... and wait for ..... to finish handling traffic. Then send him traffic for .....
QNR*	Answer ..... and relay (or receive) traffic.
QNS	Stations in the net * (follow with list). Request list of stations in the net.
QNT	Leaving the net temporarily (or for ... minutes).
QNU*	The net has traffic for you. Stand by.
QNV*	Establish contact with ..... on this frequency. If successful, move to ..... and send him traffic for .....
QNW	How do I route messages for .....?
QNX	You are excused from the net.* Request to be excused from the net.
QNY*	Shift to another frequency (or to .... kHz).
QNZ	Zero beat your frequency with mine.
*	For use by NCS only.

My thanks to NCS Eric VK2BII, and Geoff VK3ED, for their help. . .VK3CQ.

Any stations who would like a copy of the QN signals can send me a stamped addressed envelope and I will print one for their wall. In future I hope to be able to do the same for any lists and the like that appear in this column. It is computerised, that's howl. And after I type in the previous 13 articles, maybe I can get back on the air!

My IC-251 has found a new home, (where it will get plenty of happy use) and our family computer has got a printer at last. Which just goes to show that Morsiacs are not really living in the dark ages by loving an old fashioned mode of communication. Don't talk to me about packet . . . I really have not got the time, but I can see the benefits and would love to see a packet column in AR.

Anything you would like to see in *Pounding Brass*, or if you can supply something of interest, please let me know. You would be surprised where some of the ideas and material come from. I have plenty of material for and from New Zealand and England, and inquiries from Canada, which is about as far as you can get — thanks to all.

I have run out of Curtis 8044ABM chips. If you want one please let me know before the end of May and I will order some more from the States.

73 . . . VK3CQ

ar

SPECIAL PARKING FOR RADIO AMATEURS

These parking signs will soon appear throughout Australia. The Local Government Organisation of Australia (LGOA), at its annual national conference in Melbourne, passed a resolution binding on all municipal councils.

In a news release the LGOA said the new signs are in recognition of the valuable contribution made by wireless experimenters and now radio amateurs for just on 100 years. The world has continued to benefit from the work carried out by the pioneers of wireless.

"The preparedness of radio amateurs to provide emergency communications during times of natural disasters is highly commendable, and without their help local municipal disaster plans could be inadequate," it said.

"The special parking signs are the least all municipal councils can do to recognise the unique and worthy contributions radio amateurs provided to their local community."

The LGOA said the signs are available from April 1, 1988, for erection at places visited by radio amateurs including outside electronics stores and radio clubrooms. Store managers and radio club officials should contact the Town Clerk or Shire Secretary of their local municipality, which is listed in the Local Government section of the white page telephone directories.

The signs will be erected free of charge. But individuals can also obtain a sign as a memento for their shack, or as a special gift to send to an overseas friend. They can be bought for $12 each, which includes postage. The money raised through their sale will go to fund projects fostering amateur radio in undeveloped countries.

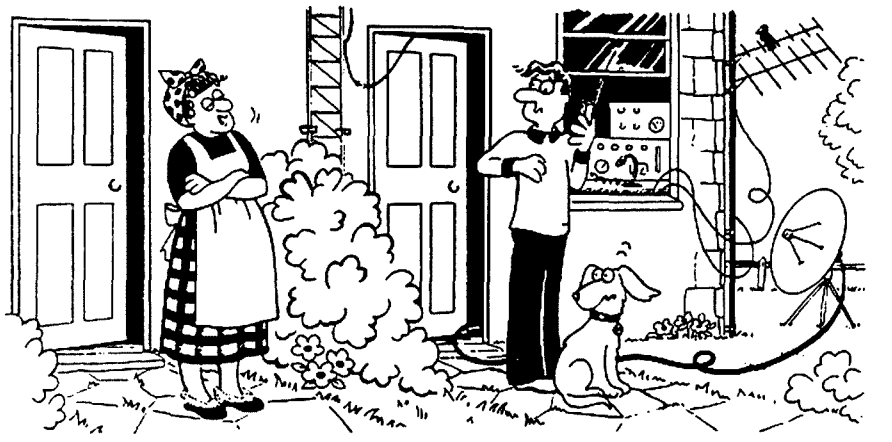
A portion of fines incurred by motorists illegally parking in areas reserved for radio amateurs will also go to such projects.

When parking near a sign do not forget to display your call sign on the dashboard of your vehicle.

The first of these signs are due to be installed appropriately in Hawthorn Road, Caulfield, Victoria, outside the WIA's Federal Office, to provide four all day free parking places.

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209



This EMC-Report is reprinted from a very informative paper published in the RSGB magazine* Radio Communication, *May 1987, and contributed by Norm Burton.

"Were you on your radio last night?"

Angus McKenzie, MBE, FIERE, FAES, CEng, G3OSS
57 Fitzalan Road, Finchley, London, N3 3PG

Most radio amateurs have had the ominous knock on the front door, the telephone call, or the polite words over the fence about television breakthrough complaints. Fortunately, the large majority of complaints can be dealt with amicably and efficiently by the use of filters, and the first part of this article deals with the ways in which the strong RF signal or field is picked up by the television and video recorder installation, and produces breakthrough to vision and/or audio if the installation's electromagnetic compatibility (EMC) is inadequate. As the result of very many EMC tests on over a dozen television installations in 1986, it is quite clear that there is well over 20 dB difference in vulnerability to disturbance between the best and worst modern sets. It is essential to understand the different ways in which the radio signal or field gets into the installation, but first of all one has to determine that the radio transmission itself does not contain components, spurii or harmonics which are actually causing the trouble, rather than the energy on the main transmitting frequency.

SPROGS, SPURII AND HARMONICS

Most HF, VHF and UHF transmitters that I have checked in the last few years have been adequately clean, and both harmonic and spurious outputs have been no higher than —60 dB ref the maximum carrier output level. Very few HF rigs should cause trouble once you have added a well-matched lowpass filter, and only in exceptional cases have I noted spurious outputs out of band. However, just a few transmitters or transverters have shown up problems which are worth mentioning, as you may not realise just how a problem can arise.

An early 432 MHz transverter gave the most horrific spurious around 488 MHz, at only 30 dB below the carrier level on 432 MHz. The 488 MHz signal, when amplified, caused a severe problem to Channel 23 video. Upon investigation, I discovered that in the transmit mixer from 28 MHz to 432 MHz the input IF of 28 MHz was being multiplied by three, and only then added to the 404 MHz local oscillator frequency, thus producing 488 MHz. The transverter had inadequate filtering in its RF stages, and the manufacturer had not provided sufficient RF gain, so that in order to get 10 watts PEP output it was necessary to drive the 28 MHz input fairly hard. Very careful realignment of the RF stages increased the gain considerably, improved the rejection of 488 MHz, and allowed the mixer to be driven at a much lower level, thus giving a 488 MHz output at —70 dBc, which was just about acceptable. The linear that was in use did not help the original situation, since its input circuits had a grossly excessive bandwidth.

One multiband rig included 70 MHz, modified by the importer to replace the original 50 MHz capability. The circuits had been inadequately tuned, and a serious complaint of TVI on Channel 23 proved to be due to an unwelcome amount of seventh harmonic at 491.400 MHz (70.2 x 7 MHz). A British solid-state linear amplifier happened to have a resonance around Channel 23, thus slightly exaggerating the problem when switched in. Incidentally, the same amplifier produced a second harmonic at 140.400 MHz of —30dBc when driven to 80 watts PEP output on 70 MHz, and had to be returned to the manufacturer for them to put in a lowpass filter on the output, which should have been there in the first place.

144 MHz BAND HARMONIC PROBLEMS

You are highly unlikely to have any serious problems with harmonic radiations from 144 MHz rigs and linears, unless you live in an area which regularly has television sets tuned to Channel 34 (fourth harmonic), or Channels 52 and 53 (fifth harmonic). Fortunately, there is only one very important transmitter on Channel 34, Caldbeck/Sandale near Penrith in Cumbria. Having an output of 500 watts ERP, this transmitter on BBC 2 covers a huge area including the Borders and adjacent counties. If you live in a fringe area you will have to be very careful about the fourth harmonic. The remainder of transmitters on Channel 34 are listed in the table, and are all very-low-power relays covering small fill-in areas. Unfortunately, there are very many transmitters on Channel 52 and 53, and whereas the CW and SSB end of the 144 MHz band will have a fifth harmonic in the video passband of Channel 52, FM channels from 145.400 MHz upwards have the fifth harmonic occurring in Channel 53. This is not likely to cause a problem though, as the ERP of the harmonic is likely to be very low. However, you will need to be careful if you are using high power in the satellite band above 145.800 MHz, as the fifth harmonic is right in the middle of the video carrier of Channel 53. I have not heard of any amateurs having fourth or fifth harmonic problems from 144 MHz, but it is as well to mention the possibility of one, together with a recommendation for the use of an effective lowpass filter if you are within the coverage areas of the channels mentioned.

BREAKTHROUGH AND BLOCKING PROBLEMS CAUSED BY SIGNALS DIRECTLY INJECTED INTO THE CENTRE CORE OF THE TELEVISION COAXIAL DOWNLEAD

The television antenna itself will pick up RF to varying degrees over a very wide frequency range, despite the fact that television antennas are normally directional with maximum gain in Bands 4 and/or 5. The signals will transfer to the television set or video recorder down in the inner with reference to the outer, and can cause blocking of the input preamplifier stage of the equipment. Even if this is well filtered, signals can leak through to the first local oscillator circuitry, and many other circuit areas. This type of pick-up is normally only a problem at VHF and UHF, and most of the television sets I have checked gave a comparatively adequate performance at HF. The two bands which are likely to cause most problems for this type of RF pick up are 144 and 432 MHz. If you are active on both bands, then you may need to insert either a very good highpass filter with the knee at 470 MHz, or a less-good highpass filter, but with the addition of appropriate tuned rejection filters covering at least the 432 MHz band.

Occasionally you might have a problem on HF or lower VHF in which case a comparatively-simple highpass filter should suffice, but as often as not the problem is more likely to be due to coaxial braid or mains lead pick-up.

RF PICK-UP ON THE BRAID OF THE COAXIAL DOWNLEAD

Braid pick-up is more likely to be troublesome if the local transmission is on the lower frequency or HF bands. The pick-up levels are likely to be more severe if the length of the downlead relates to the wavelength of the transmission concerned. However, every braid acts as an antenna, and the currents that can be generated through the earth plane of the set and capacitively down to earth can be quite high. Some installations can be very immune to such currents, but poorly-designed sets can be rather vulnerable to these currents, and severe breakthrough to IFs, control circuits, microprocessors and audio circuitry can occur. Some form of braidbreaker is required, which will pass Bands 4 and 5, but which will block off lower frequency currents. There are several types of braidbreakers, including UHF transformer versions, capacitive breakers and coaxial loop inductors. Ferrite rings can, of course, be used combined with loops or coaxial coils to increase the rejection effect. I have measured tens of volts of RF between the bottom of a downlead braid and a mains earth, and high EMFs can generate very nasty RF currents through a set's earth plane.

Braid pick-up is not normally a problem with higher VHF and UHF but can be the cause of a severe problem at 50 and 70 MHz.

MAINS LEAD RF PICK-UP

Although the large majority of modern television sets and video recorders do not have an earth connection to the mains, RF pick-up on the two-core mains lead can be troublesome. RF can be capacitively coupled through to the set's groundplane, and to many of the circuits. Even if house wiring earths are well made on the mains input to

Station name/locality	Channel	Powar (ERP)	Sarvica	Pol'n
BRAILES. Shipston on Stour	34	45W	ITV	H
CALDBECK. Nr Penrith	34	500kW	BBC 2	H
CHISLEDON. Avon	34	19W	ITV	V
EASTER COMPTON. Avon	34	10W	ITV	V
FINTRY. Strathclyde	34	26W	BBC 1	V
KEWSTOKE. Avon	34	12W	ITV	V
MOEL-Y-SANT. Welshpool	34	115W	BBC 1 Wales	V
REDCLIFF BAY. Portishead. Avon	34	t0W	ITV	H
OVER BIDDULPH. Stoke-on-Trent	34	22W	BBC 1	V
WEST KIRBY. Wirral Peninsula	34	13W	BBC 1	V
ALSTON. E Cumbria	52	400W	BBC 1	V
ANGUS. N of Dundee	53	100kW	C4	H
BACUP. Lancs	53	250W	C4	V
BEACON HILL. Torbay	53	100kW	C4	H
BIRCH VALE. SE Manchester	53	250W	C4	V
BRIGHTON, Sussex	53	10kW	C4	V
CARMEL. Dyfed	53	100kW	C4	H
DOVER. Kent	53	100kW	C4	H
HEYSHAW. E Pennines	53	500W	C4	V
KINGS WESTON HILL. Bristol	52	1kW	C4	V
LES TOUILLETS. Channel Is	52	2kW	C4	H
LETHANHILL. Ayrshire	53	250W	C4	V
REIGATE. Surrey	53	10kW	C4	V
SALISBURY. Wilts	53	10kW	C4	V
SHATTON EDGE. West Derbyshire	52	1kW	BBC 1	V
STRANRAER. Dumfries & Galloway	53	250W	C4	V
STROUD. Glos	52	500W	C4	V
THORNHILL. Dumfries & Galloway	53	500W	C4	V

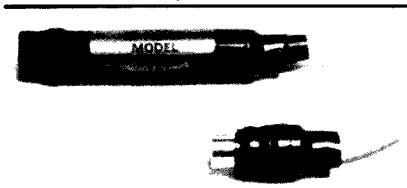
Notes: There are just under 60 low power stations on Channels 52/53, too numerous to mention. Additional information in *Radio and Television Stations, 1986* available from BBC Engineering Information Department, Broadcasting House, London W1A 1AA. Iree of charge, but sae required.

Table 1: Some television stations lying on the fourth and fifth harmonics of the 144 MHz band.

the house, all the house itself can become quite a good receiving antenna which can contribute RF into the set. Even if you have filtered the coaxial downlead very adequately, you can still have trouble with mains pick-up, and it is often the video recorder that introduces the problem. In-line mains filters placed at the mains socket end can be a help, but if there is a serious problem, you may well have to use appropriate ferrite rings at the television or video recorder end of the mains lead to choke off the RF from the set.

DIRECT RF PICK-UP ON THE CHASSIS OR INTERNAL WIRING OF THE TELEVISION OR VIDEO RECORDER

If you have tried filtering the coaxial downlead and the mains lead to the video recorder and to the television set, and breakthrough is still noted on video and/or audio despite using all the appropriate filters, then the set itself is vulnerable to the actual RF field generated by the transmissions. Audio breakthrough can result from pick-up by long loudspeaker leads, and is particularly prone to occur if there is a connection from the set to an external loudspeaker or hi-fi system. Pick-up on external audio wiring can be minimised by the appropriate use of ferrite rings, but direct pick-up within the set is by far the most serious problem as a cause of television breakthrough. My own tests have shown that direct chassis pick-up is most likely to rear its ugly head if the RF is at VHF or UHF; high field strengths on the 144 MHz band created by SSB signals being the most troublesome. The degree of pick-up can often be dramatically reduced if the set is rotated slightly, but careful attention to antenna location and an increase in height of the transmitting antenna can often be a help. The social and political problems that can arise are beyond the scope of this article, but I do recommend the greatest caution in dealing with any chassis pick-up problem, and it is extremely important to keep the "temperature" cool, and also to study the advice given by the RSGB. Do make sure that you really have tried all the appropriate filters in the downlead and mains lead. Don't forget to note down carefully the make and model of both the television set and video recorder for later reference, so as to avoid disturbing you neighbour when making further inquiries.



The AKD HPFS Filter.

COAXIAL CABLE FILTERS

Highpass, bandpass, band-reject and various braid-breaking filters all come within this category. They are normally supplied with a coaxial Belling Lee type socket at one end for the downlead, and a plug on the other end for insertion into the television set. It is worth noting that they are normally designed for 75 ohm matching, and it should be remembered that the input impedance of the television set or video recorder is usually anything but 75 ohms! The set's input impedance will also vary greatly with frequency, being almost equivalent to a short-circuit at some frequencies, and extremely high impedance at others. For this reason, the degree of a filter's attenuation of an RF transmission outside Bands 4 and 5 may not be as much as is claimed, but even so it should be adequate to cope with the powers used by radio amateurs. There is no hard-and-fast rule about the positioning and order of filters when you have to use more than one, and a degree of trial and error is essential. You should already have found out which bands are causing the main trouble, and so some degree of appropriate filter choices should already have been made before you visit the problem installation.

It may not be sufficient just to filter the downlead at the point where it feeds into a video recorder, as the lead connecting the latter to the television set itself can also pick up RF from the field and transfer both forwards to the television set and backwards through the output circuits of the video recorder and into its more vulnerable circuits. One case of video breakthrough was completely cleared by adding an additional coaxial transformer braid-breaker hard on the output socket of the video recorder, having already added ferrite rings to the mains leads, and excellent filters to the coaxial input sockets.

If the set is receiving a comparatively weak signal on Bands 4 or 5, you should bear in mind that the use of too many filters in series may well attenuate the required television signals too much, and thus produce snow and poor colour instead of RF breakthrough patterning, etc. You may require both a braidbreaking action and highpass filtering, and while a combined filter may well be the easiest to install, you may achieve a lower loss if you use a straight-through highpass filter combined with a coaxial coil filter having additional filter rings or coring.

It is as well to consider problems that might be caused from bands on which you do not normally operate. It will save you a lot of aggravation, and your neighbour much frustration, if the filters that you have installed will also give a good attenuation on a band such as 432 MHz which you might very well be attracted to at some time in the near future.

If the problem is braid pick-up, then remember that the braid itself may re-radiate, near the television installation, a field picked up further up its length. You may well find that you can achieve improved results with the braidbreaker installed several metres away from the set. It is also well worth having a thick braid earth strap between the coaxial downlead braid and the nearest water pipe, if this is conveniently placed. It may make matters worse, but there is a good chance that it may help.

MAINS BREAKTHROUGH FILTERING

There are many types of mains filters available either as adapters for use at the mains socket end, or within 13 amp plug tops. Assuming these are efficient, they will only filter the mains at a point two metres or so away from the set, and if you are in a difficult situation you may well have to use ferrite rings through which you wind the mains lead, as near to the set as possible. This will mean that you will have to take off the plug top, which hopefully is not a moulded type, but doing this takes some time, and it might be prudent to accomplish the filtering as quickly as possible. AKD have now introduced a new type of ferrite-cored component in several parts, enabling you to wind the mains lead around the U-shaped pieces, followed by complete assembly and installation. These components are more expensive, but are much more easy to use and could well save the day.

CHECKING THE NEIGHBOUR'S ANTENNA

As often as not, the television signal being received by the set is a lot weaker than it need be. Many antennas turn out to be very old and partly rusty, water may have got into the downlead, and poor-quality splitters might have been used to feed more than one set. Don't forget the resistive splitters lose at least twice as much signal as do transformer types. A transformer splitter may also give a degree of bandpass filtering action.

One of the worst evils to cope with is a television antenna masthead preamplifier. Some models are already quite well filtered, have a good noise figure, and have a good bandpass characteristic for just Bands 4 and 5. Some others, however, seem to amplify just about everything from DC to light, and can be upset with only the slightest provocation! You may well have to apply some efficient filters in front of the preamplifier, as well as at the bottom of the downlead. It is worthwhile examining the complete television installation at a neighbour's premises before you even start any filtering experiments. Frequently, a neighbour has no idea whether a masthead preamplifier is installed or not, as the installation may well have been inherited from a previous occupier. There may even be splitters feeding points that have long since disappeared, leaving an unterminated line on the unused port. If you can improve a neighbour's picture by some careful checking, you will be improving the atmosphere, but it is not advisable to touch the alignment of anything in the installation. By all means ask your neighbour to twiddle the knobs if you know that there is a problem such as frame hold or inadequate tuning.

FILTER	28MHz	50MHz	70MHz	100MHz	144MHz	432MHz	480MHz	580MHz	750MHz
HPFS	−59	−60	−52	−44	−38	−4	−1·5	−2·3	−4
HPF 1	−55	−29	−31	−43	−24	−3·1	−2	−0·7	−2
PO six-section special	< −65	< −65	< −65	< −65	< −65	−50	−4	−0·7	−1·1
BB1	−3	−2·8	−2·6	−2·3	−2·2	−2·6	−2·5	−2·5	−4·1
TNF/2/2m	−0·5	−1·5	−3·5	−20	−25	−0·5	−0·5	−1·1	−1·8
HPF 2	−63	−39	−17	−2	−1·5	−0·8	−0·9	−1·4	−2·4
PO five-section	< −65	< −65	< −65	< −65	< −65	−46	−10	−1·2	−1
TNF/2/10m	−33	−9·7	−38	−15	−9·5	−1·5	−1·4	−0·5	−1·8
RBF1/70cm	−20	−15	−12·5	−9	−6·5	−13·5	−3·4	−1·2	−1·4
PO/DTI FS74A (barrel)	−5·4	−3·8	−3·1	−3	−2·7	−1·9	−2·4	−2·7	−2·9
PO/DTI FS 72A	−68	−62	−58	−58	−55	−20	−2·7	−0·9	−1·3

Table 2: Filter teat measurements.

You might also check that the neighbour's antenna is actually pointing in the optimum direction, as I have known many antenna riggers who just copy the direction in which other antennas in the street are pointing! You can imagine what happens when a cowboy firm Installs the first television antennas in the street!

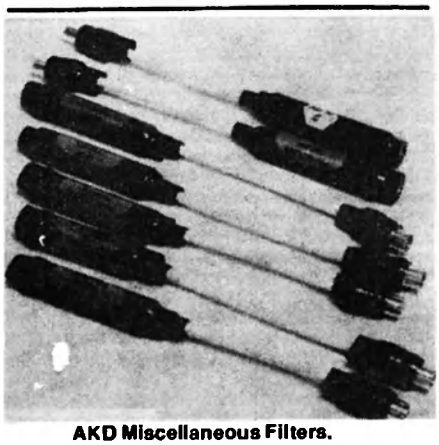
AKD COAXIAL FEEDERS

Since the summer of 1986, several filters in the AKD range have been made available to RSGB members and non-members from RSGB Headquarters, and are regularly advertised in *Radio Communication*. I have taken some measurements of these filters on several bands, and have also checked the insertion loss on Bands 4 and 5 in a 75 ohm circuit. Please see the table for the insertion losses measured on the inner with reference to the outer. The braidbreaking action was not measured. I am also including various AKD and other filters which are either only available in the complete AKD kits, or have been available through the DTI, and, formerly, the Post Office Interference Service.

AKD HPFS (RSGB): This filter includes a transformer braidbreaker and has a steep highpass filter action below the 432 MHz band. It is suitable as an excellent filter for HF and VHF, but it is not likely to be of any help in rejecting 432 MHz. It has an acceptable insertion loss on Band 4, but the loss on Band 5 could be just a little high in fringe areas. It also gives an excellent braidbreaking action.

AKD HPF1: This highpass filter incorporates the simpler capacitance braidbreaking action, which is useful but not so effective as the HPFS type. The HPF1 is excellent at HF, and may be adequate at VHF, but it is not suitable for 432 MHz. It has less Insertion loss than the HPFS, but if you are primarily an HF operator it could well suffice. You may need to add a ferrite ring/coaxial coil braidbreaker of your own make to Improve the braid rejection for HF This model is supplied in the complete kits, and is also available direct from AKD.

AKD HPF2 (RSGB): An excellent filter for use with Band 2 FM radio installations, as it cuts HF extremely well, is good at 50 MHz, and gives some useful rejection at 70 MHz. By 88 MHz it only has 0.7 dB through loss, although this loss varies to a maximum of 2 dB on Band 2. It does not give any useful attenuation on 144 or 432 MHz. The through loss on Band 4 and 5 is low.



AKD Miscellaneous Filters.

AKD TNF/2/2M (RSGB): This filter can give a notch of up to 35 dB on the 144 MHz band, but my review sample was slightly maladjusted with the notch appearing at 140 MHz, thus giving just an adequate notch on the 144 MHz band. It is not suitable for use with Band 2 FM tuners, and will not give any attention at HF, nor at 432 MHz. It gives a very low insertion loss on Bands 4 and 5. There is an internal pre-set adjustment for tuning the precise notch frequency. A second sample notched correctly, and the overall, response from 45 to 245 MHz is shown in Figure 1.

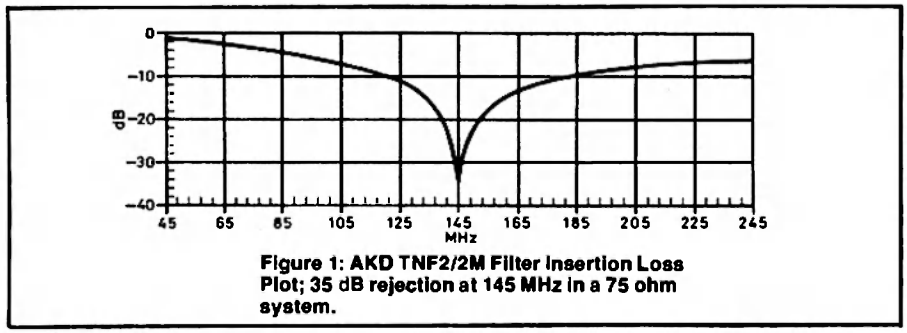


Figure 1: AKD TNF2/2M Filter Insertion Loss Plot; 35 dB rejection at 145 MHz in a 75 ohm system.

AKD TNF/2/10M: This filter can be used if you just have a problem on 28 MHz, although for some odd reason the review sample also gave a good notch on 70 MHz. It is not suitable for use with Band 2 FM tuners, but does have a low insertion loss on Bands 4 and 5. Note that it does not give any significant attenuation on 144/432 MHz. Other models are available for 21 and 14 MHz bands, direct from the manufacturers.

AKD RBF1/70 CM (RSGB): Specifically designed for rejecting strong 432 MHz band signals. It should give a rejection of around 20 dB on this band, but the notch position was placed too high in the band on the review sample, 21 dB notch being noted at 438 MHz, but only 13.5 dB at 432 MHz. It gives a low insertion loss at the top end of Band 4 and on Band 5, but there will be marked loss on Channels 21, 22 and 23, which may be relevant in a fringe area. The filter also gives some attenuation at HF and lower VHF It is not suitable for Band 2 FM tuner feeds. You may need to adjust the small tuning preset inside for the particular part of the band that you are most likely to be using with high power, eg 432.300 MHz for SSB centre or 437 MHz for ATV centre.

AKD BB1 (RSGB): This is a simple but very effective transformer type braidbreaker which just plugs in line with the television downlead. It is also useful for Band 2 FM tuner installations. The insertion loss is slightly higher than the original Post Office/DTI type FS74A, but the manufacturers claim that it has a better braidbreaking action at HF Its use would not be advisable if channels at the top end of Band 5 are in use in a fringe area, in which case you might have to resort to a ferrite ring with the coaxial looped several times around it as an inductive braidbreaker, which would have a barely perceptible loss on the inner. Ferrite ring inductive braidbreakers were once available from the Post Office/DTI under the type numbers FS62/1A and 62/2A, the two types having different numbers of turns around the ring.

The former Post Office/DTI type FS74A transformer braidbreaker was originally supplied as a small cylindrical in-line model having a plug on one end and a socket on the other, without any flying lead, allowing it to be put right on the output of a video recorder. More recently it was modified to have a flying lead on the output with a plug, and the performance was not quite so good.

PO/DTI FS72A: This filter was nominally designed as a highpass on the inner only, and was intended to remove the entire HF and VHF spectrum. It had quite a low loss on Bands 4 and 5, and while some samples did give some rejection at 432 MHz, other did not; the design changing over the year. Although a very useful filter, one almost invariably had to use some form of braidbreaker with it.

PO 5 & 6 SECTION HIGHPASS FILTERS: The original Post Office Interference Service used to supply five-section filters which had a superb performance at HF, VHF and even at 432 MHz. There was no braidbreaking action, and while the insertion loss in Channels 21, 22, 23 was rather high, losses on higher channels were low. A few six-section filters were specially made, and I am lucky enough to have one of these. They were handmade, and offered a fabulous rejection at all frequencies up to the top end of the 432 MHz band, and yet the insertion loss on Bands 4 and 5 was low. It is to be hoped that a new version of the six-section filter might become available shortly.

CONCLUSIONS

Probably the most important filter to consider for HF and lower VHF is the HPFS, but you may have to consider the HPF1, or an old FS72A with an inductive braidbreaker if you are in a fringe reception area. The notch filters can be useful, but you will have to make sure they are on frequency. Although expensive, the new ferrite inductor kits from AKD are very useful for inserting inductance on audio and mains leads, and these can also be recommended for use with telephones and other appliances which have a poor electromagnetic compatibility. Do not forget that when you are carrying out tests with a neighbour, you should always choose the most favourable antenna direction, which may not necessarily be one which is beaming at the television antenna. Taking trouble over removing a neighbour's TVI problem becomes a useful investment in the furtherance of you hobby.

(TO BE CONTINUED)

ABOUT THE AUTHOR

Angus McKenzie became a licensed amateur in 1960 and was soon active on 144 MHz and HF Currently, he is active on all bands (when time allows!) on SSB and CW, VHF/UHF bands, and on FM. He first transmitted stereo multiplex on 144 MHz in 1970, then stereo PCM, 16-bit digital in 1983, including colour television. He has the Supreme VHF/UHF awards (including Seniors) on 70, 144, 432 and 1296 MHz.

He entered the sound recording and audio industry in 1955, and became an audio consultant in the late

60s. He spent some time in gramophone record and hi-fi retailing, and his time now is spent in "audio criticism" including writing reviews and articles. He is a consultant to legal and consumer organisations on audio engineering and RF matters, and is currently a member of the RSGB Council and of the VHF Committee.

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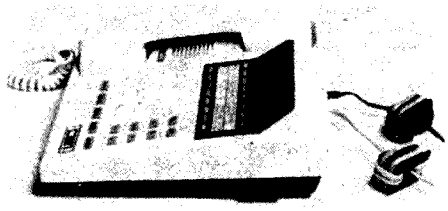
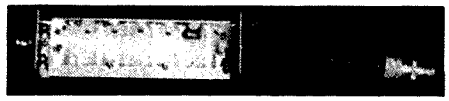
The FS74A transformer braidbreaker.

Ferrite ring FS64/2/A coaxial braidbreaker.



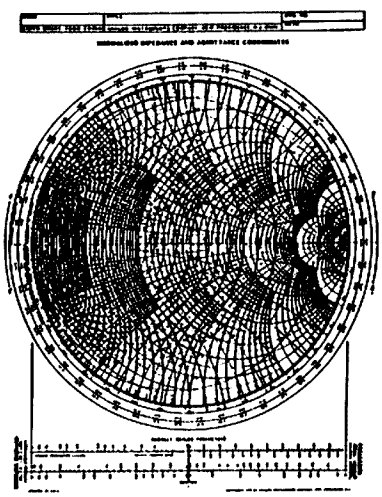
The PBT600S telephone with new AKD DIY ferrite ring filters.



450 MHz bypass six-section filter.

REMEMBER

When inquiring about products published in AR, always mention where you read of the product!



SMITH CHART FORMS

Anyone who has been involved in radio frequency or transmission line design will be aware of the Smith Chart conceived by Philip Smith of the Bell Laboratories in the 1930s and the many uses to which it can be put.

One inherent short-coming of the original design was that it only allowed the manipulation of either impedance or admittance values without the necessity to rotate values through 180 degrees to convert from impedance to admittance or vice versa. There is a way to overcome this short-coming however, and for your convenience Stewart Electronics are now stocking a dual co-ordinate Smith Chart form.

The form, printed on high quality bond paper has the impedance co-ordinates in their normal red and the admittance co-ordinates in a pale green. Ideally suited to any application involving matching networks, this form should save much time and many potential inaccuracies through the continual process of rotating values through 180 degrees.

The dual co-ordinate Smith Chart form is available from stock in single sheets (Stock No BX900) or in packs of 100 (Stock No BX900C).

For further information contact Stewart Electronic Components Pty Ltd, 44 Stafford Street, Huntingdale, Vic. 3166, phone (03) 543 3733.

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VICOM ACQUIRES SCALAR

Melbourne-based telecommunications company, Vicom International Pty Ltd, has acquired the assets of the Scalar Group of companies.

The Scalar Group ran into financial difficulties last year culminating in the liquidation of the company.

A new company has been formed — Vicom Scalar Pty Ltd — to take over the manufacturing, exporting and marketing activities of Scalar.

Michael Goode VK3BDL, has been appointed General Manager of Vicom Scalar and new R and D programs established to ensure that the operation continues to expand its market position.

Vicom Scalar will be entering new high technology markets during 1988 and will substantially increase export revenue.

"The company is ideally placed to be a major supplier of defence, government and major communication users within Australia and South East Asia and we intend to give the other companies operating in this area a run for their money", Michael said.

Vicom's other activities include communications engineering, consulting, research and development, test equipment and specialist product sales.

Vicom is well-known to radio amateurs since it was originally formed in 1974 to supply Icom and other brands to the amateur market.

The founding directors held various positions on the WIA Victorian Divisional Council before Vicom was formed. Since this time the group has gone from strength to strength with offices opened around Australia and overseas.

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NEW DATES GIVE PERTH ELECTRONICS SHOW MAXIMUM IMPACT

The 10th annual Perth Electronics Show will be held at Claremont Showgrounds from July 13 to 17, (two weeks earlier than normal), to ensure the innovation planned for the exhibition's anniversary achieves maximum impact with industry, media and consumers.

Organisers have been endeavouring to work around the Retravision Conference in Queensland.

The new July dates guarantees a large attendance by consumers because the Perth Electronics Show is clear of any other competing attraction in the State. Nationally, the electronics industry will also be focussed on Perth because the exhibition does not clash with any other industry event throughout Australia.

Fresh ideas on content and promotions mean the committee expects large crowds to support the show, which has become the most successful consumer electronics and homeware exhibition in the Southern Hemisphere. The trade aspect, which has become such an integral part of the show, is to be further enhanced with the establishment of eastern States-based industry representation. The major role of these committees will be to attract influential buyers, industry VIPs and national trade media to the show. A whole host of promotions are also being arranged to make certain the public attends the show.

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Club Corner

WIA NORTH WESTERN BRANCH

The postal address for the North Western Branch is:

WIA, Tasmanian Division, North Western Branch, PO Box 194, Penguin, Tas. 7316.

Club call sign in VK7NW.

Meetings are held on the second Tuesday of each month at the Penguin High School, beginning at 7.30 pm. Business sessions are brief and are followed by an activity or topic of interest and supper.

Activity and club station nights, when held, are on Fridays at PHS, at 8 pm. Details from Greg VK7ZBT.

Interests within the Branch include HF Operation, ATV, Special Communications, Antennas and Computing. Several members of the Branch are now becoming very interested in packet radio.

For further information contact Greg Stammers VK7ZBT, President, or Tony Clayton VK7AH, Secretary, phone (004) 24 5375.

Visitors are welcome at meetings and activity nights.

—Contributed by Tony Clayton VK7AH, Honorary Secretary, North Western Branch

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GEELONG AMATEUR RADIO CLUB

The 40th Anniversary of the club will be celebrated on June 18, 1988. This will be a great "Natter Night" complete with a guest speaker. To help obtain an estimate of numbers attending please contact the Secretary, GARC, PO Box 520, Geelong, Vic. 3220 as soon as possible if you are interested in attending.

During this anniversary year the club is seeking photographs, slides or movies of the activities of GARC of the years. Readers who may be able to assist are requested to contact Alf Forster VK3AJF, on Geelong 21 4190.

Work is progressing well at the Mount Anakie site of repeater VK3RGL (Channel 8).

In December 1987, a number of club members participated as checkpoint operators and net controllers, on HF and VHF, for the Caltex Bike Ride from Stawell to Melbourne. Approximately 3700 cyclists took part in the event and WICEN undertook to provide communications — providing about 20 operators each day.

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EASTERN ZONE 50TH ANNIVERSARY

The Eastern Zone is celebrating its 50th anniversary on the weekend of May 13-15, 1988. (The inaugural meeting was held at the Railway Hotel in Warragul on May 14, 1938). The location for this coming event will be the scenic Moondarra Camp, a short drive north of Moe. It is close to the towns of Erica and Walhalla, the new Thompson Dam and the Baw Baw National Park.

Accommodation and meals will be provided for up to 100 people at a very reasonable price. (See Registration Form inserted in this issue of AR for price details).

Activities planned for the weekend include QSL and CW contests, fox hunts, white elephant sale/auction, childrens competitions with prizes, homebrew contests, performance checks on amateur equipment and trade displays. Of course, this is all in addition to sitting around a fire remembering those good-old times and taking it easy!

All amateurs and their families are welcome to register for what will be a fun filled occasion. Do not delay with your registration as numbers are limited. For more information please contact Stewart VK3BSM on (051) 27 4229, Bill VK3KBM (051) 277616 or Chris VK3KME (051) 27 5656, or write to PO Box 459, Moe, Vic. 3825.

—Contributed by Chris Morley VK3KME, President, Eastern Zone WIA

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SUMMERLAND AMATEUR RADIO CLUB

The President for the past three years, "Doc" VK2DOC, has resigned. The club and committee accepted the resignation with great regret. During Doc's presidency the club has gone from strength to strength, with both membership and finances doubling. The 80 metre net and the *La Balsa Award* were instituted early in the period and have proved to be very popular. With Doc as the main MC, the club, via the net, has made friends with many amateurs and listeners from as far afield as Western Australia and New Zealand.

Through the courtesy of John VK2JWA, the clubrooms at Richmond Hill are indeed fact! Two digipeaters are operational and the Byron Bay repeaters will shortly be operating.

If any amateurs or SWLs are about to visit the area contact can be made via PO Box 524, Lismore, NSW. 2480. A warm welcome is guaranteed.

The digipeater, VK2RPL, is currently operational on 145.050 MHz, at Mount Nardi, north of Lismore. Australian map grid co-ordinates are Zone 56, Easting 528280, Northing 6842460.

This frequency has provided Summerland with a 24-hour path into VK4 via VK4RBT-3. Contacts are possible into Brisbane and beyond.

It is anticipated that the second part will be operational again on 147.575 MHz by this time. Coffs Harbour should also have their repeater installed by this time and it will be interesting to investigate the Nardi-Coffs path!

Whilst it is possible to use VK2RPL as a switch (ie ask the digi to connect you to another station with the digi's C and CA commands), it is requested that all stations refrain from using this method of operation; also accessing PRBBSs using this method will cause the BBS not to recognise your connect request correctly. Use of VK2RPL solely as a digipeater on either frequency as required will save us all hassles.

—Contributed by Jim Cunningham VK2ESI, Publicity Officer, SARC

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TOWNSVILLE AMATEUR RADIO CLUB

The Townsville Amateur Radio Club had another successful year in 1987, due to the excellent support of members.

The club's newest acquisition is a two metre repeater on Mount Inkerman. At Mount Stuart there are beacons for two metres and 70 centimetres, repeaters for two metres and amateur television, whilst on Mount Saint John there are beacons for 10 and six metres. The club also has a portable WICEN repeater. This constitutes a considerable amount of work by members in their construction and maintenance.

The shack is quite adequate with HF, VHF, RTTY and ATV equipment.

Meetings have been enriched frequently with well-presented lectures, and social outings have become family occasions. Substantial displays were held at the showgrounds and Lavarack Barracks creating a great deal of interest and the club has been involved with WICEN exercises and JOTA.

It was an honour to have the President of the WIA, David VK3ADW, attend the Club Convention. The club benefited from his short stay and, likewise the WIA must have gained much in feedback from this visit.

In the near future, the club may become incorporated. A sub-committee is working on the viability of this issue.

—Contributed by Evelyn Bahr VK4EQ, President, TARC

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DEADLINE FOR JUNE IS April 18, 1988

Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

G — General
C — Constructional
P — Practical without detailed constructional information
T — Theoretical
N — Of particular interest to the Novice
X — Computer program

AMSAT UK OSCAR NEWS — No 69, February 1988. General satellite news. Satellites for the beginner. Letters, circuits, computer programs, etc.

SHORT WAVE MAGAZINE — December 1987. Index to Volume 45 (G). Selcal for aircraft (G). Radio Data System (G).

CQ MAGAZINE — January 1988. The Tchad Story (G). 160 metre receiving antennas (G). Worldwide WPX Contest (G). Nuclear accelerator (G).

RADIO COMMUNICATION — January 1988. 75th Anniversary issue (G). 1987 Convertion (G).

WORLDRADIO — January 1988. ARRL Forum (G). Amateurs aid hospitals (G). DX news, QRP, information on contests, etc (G).

ELECTRONICS NEWS — January 1988. Trade information on new products. New digital storage oscilloscopes with electro-luminescent screen. Ten gigibit discs, etc.

QST — December 1987. VHF Watt meter (C). Amateur radio and the Blind (G). RX Noise Bridge (C). DX Century club awards (G).

73 MAGAZINE — December 1987. Hand-held special issue (G). Speech for the Vic-20 and Commodore (C).

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STOLEN EQUIPMENT

A Yaesu FT-480R, two metre all-mode transceiver was stolen from the front of the Geelong Amateur Radio Club Rooms on February 5, 1988. The serial number is 2F 180653.

Readers with any knowledge of this unit should contact Barry VK3YXK on phone 43 7317 or the Geelong CIB.

1000TH ANNIVERSARY

Dublin, Ireland, is celebrating its 1000th anniversary in 1988. The Dublin Millennium Amateur Radio Committee (DMARC), is committed to partaking in this unique celebration through the medium of international amateur radio. A number of events have been planned for 1988.

A special station was operational on Saint Patrick's Day, March 17, from the centre of Dublin, Ireland, when as many other Dublins world-wide were contacted on radio.

—Contributed by Martin Hughes EI8FV

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

ANNUAL GENERAL MEETING

Members are reminded that the 1987/88 AGM will be held on Saturday, April 30, at 2 pm, at Amateur Radio House, 109 Wigram Street, Parramatta. A separate posting will be made with the annual reports and matters for the meeting.

CONFERENCE OF CLUBS

This will be hosted by Fishers Ghost ARC on Saturday (and Sunday if required) April 16. Matters for discussion will include agenda items submitted by clubs and the agenda items for the 1988 Federal Convention. Meeting location: Cambelltown region.

TRASH AND TREASURE

The next events will be held as usual in the Parramatta car park at 2 pm on Sundays May 29 and July 31.

POSTCODE CONTESTS

The last Friday evening of the month between 9 and 11 pm. April 29, 70 centimetres all mode; May 27, two metres SSB; June 24, two metres FM simple. Details on AX2WI broadcasts.

FIELD DAYS

Easter — the 40th Urunga Convention on the mid-North Coast will be held.
June long weekend — the Oxley Region ARC at Port Macquarie.

STATE REPEATER COMMITTEE

Barry White VK2AAB, has taken over the duty of co ordinator. Dennis Williams VK2XDW, is liaison to Council.

VI88NSW

By now most clubs will have a one week slot. Check with your local club or group for their operating schedule. Those amateurs who will not have the chance to work with VI88NSW through one of the clubs, may have a three-hour segment in a week reserved every two months. The next such slot will be May 30 to June 5. Details and registrations from the Divisional Office, from 11 am to 2 pm. Times start at 1000, 1300, 1600, 1900, 2200, 0100, 0400 and 0700 daily. When inquiring, advise first and second day and time slot preference and expected operating band/s and modes/s. Other slots will be in early July, August, October and December. In November there will be evening slots. During the day in November there will be the Parramatta Bicentenary Award which requires you to work VI88NSW at 10 different historic sites.

Club and group weeks (as at February 18), are April 4 to 10 Hornsby and District ARC; 11 to 17 Blue Mountains ARC; May 2 to 8 Orana ARC; 9 to 15 Castle Hill ARC; June 6 to 12 ANARTS; 20 to 26 Schools — Orange High; July 18 to 24 Illawarra ARS; September 5 to 11 Fishers Ghost ARC; September 26 to October 2 RNARS; October 24 to 30 Westlakes ARC. During the week September 19 to 25 there will be celebrations of the working by Marconi and Fisk between England and Australia 70 years ago.

There is a VI88NSW QSL card which is sent for all cards received direct (with return postage) or through the bureau. The AX2WI Broadcasts will keep you up to date on the use of the special call sign. With about 5000 amateurs in the VK2 call area it has to be shared as widely as possible.

BLANK QSL CARDS

The Division has a new range of cards available which are suitable for overprinting your own call sign. It features the Bicentenary logo. Check the office for details and cost.

USING THE BICENTENARY LOGO

The use of the logo and other names associated with this year of celebration is copyright to the Bicentenary Authority. The VK2 Division has been appointed by the Authority to act as their agent for those who wish to design and produce their own card or award using any Bicentenary references. The approval condition is that the amateur must be a member of the Institute or the club affiliated with the Institute. This approval applies throughout Australia. Further details may be obtained from the VK2 office on phone (02) 689 2417 from 11 am to 2 pm weekdays or by writing to the address above.

ITU DAY

This is on May 17. On that day VI2ITU will be activated. A special QSL card will be exchanged.

AWARDS

The VK2 Division introduced a range of awards from the start of this year. Full printed sheets are now available and may be obtained from the office. If you want the sheets posted, please include three 37 cent stamps to cover the paper and postage costs. It is also available from the VK2AWI Packet Bulletin Board on 4850 in the Sydney-area or on some of the 7575 systems. The awards are:
The Bicentenary of Australia Award, 1788-1988, which requires 200 contacts with VK2 amateurs between January 1 1988 to December 31 1988,
The Worked All New South Wales Award,
The NSW National Parks Award,
The 25's Award.

In September there will be a Marconi Award and in November the Parramatta Bicentenary Award. Further details will also appear in the magazine awards column.

TECHNICAL TAPE

A reminder that the AX2WI Broadcasts this year begin at 1045 and 1915 with a pre-recorded tape. The news content follows at 1100 and 1930 on Sunday. The tape is available for use by other Divisions. The tape content covers a range of historic and technical subjects. The Divisional Broadcasts originate from AX2WI Dural on HF and VHF frequencies. It is further relayed through several country repeaters.

NEW MEMBERS

The Institute would like to welcome the following who were in the February intake.

L Adney VK2ZLA	Beacon Hill
R R Fox VK2FKP	Chatswood
P K Freeman VK2MCZ	Cassilis
M G Howard VK2XIL	Chatswood
C A Jensen Assoc	Artarmon
Y Timmer Assoc	Bowraville
R J Van Heekeren VK2MDK	Newtown
W J Watts VK2MDQ	Nambucca Heads
R B Wilson Assoc	St Marys

EXAMINATION DEVOLUTION

There was a meeting held at Amateur Radio House on Tuesday, February 16, to hear Alan Jordon from DOTC outline the transfer of the examinations. Attendance was 35. The same meeting was held in all other States. The new requirements have been reported in *Amateur Radio* and other publications. Those examiners who have not received copies of the information should write direct to DOTC in Canberra or check with your Divisional Council for details.

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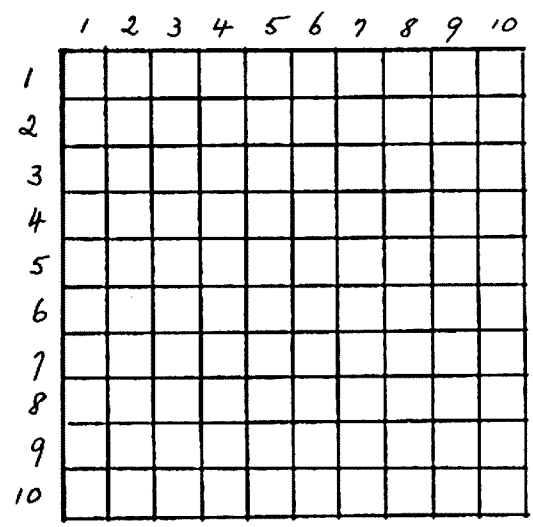
MORSEWORD© 14

Compiled by Audrey Ryan
30 Starling Street, Montmorency, Vic. 3094

ACROSS		DOWN	
1	A fixed gaze	1	Joint
2	Capital of Peru	2	To lie partly over
3	Matted fabric	3	God of love
4	Chanted	4	Curve
5	A preposition	5	Drunkards
6	On the top	6	Acts
7	Interior	7	Float through the air
8	Leave	8	God of war
9	Donate	9	Oath
10	Listen	10	Spouse

Solution see page 60. . .



Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

April is one of the busiest months in this Division. The Clubs' Convention will be held over the weekend of the eighth to tenth. I hope that all clubs will send delegates if they possibly can. The clubs that have attended in previous years have found that there is much to be gained by discussing things "face-to-face" and we feel that Divisional Council also benefits by knowing what you think. One of our aims this year will be to look at ways to make the benefits of membership more tangible. In other words, to differentiate more between what members can get and non-members cannot! I will not be too specific at this stage as there are several things being "tossed around", but be assured that we are aware that many members are not happy with the status quo. The main aim being to keep current members happy and to encourage new members to join.

Of course, the other way to ensure that you have a say in the running of the Division is to nominate for Council. If you didn't do that this year when you received the Nomination Form and still feel that you could be of service, please let a member of Council know, we are able to co-opt members if the situation warrants it. If you live too far away to attend meetings in Adelaide, do not forget to elect the members that you want. (I hope that there will be enough volunteers to have an election).

I wish to thank Ray Bennett VK5RM, who, when it looked as though we were not going to get a replacement for the Historian, offered to continue for another 12 months, and also John Hampel VK5SJ, who has offered to take over from Ray, but was not able to do so until about the middle of the year. I have left it to John and Ray between them to sort out how and when this will happen.

As you will be aware, our speaker in February was not Ray Dobson VK5DI, but the representatives of DOTC, Canberra, speaking on the proposed Devolvement of Examinations. We hope that some useful discussions and information will be had. Our thanks to Ray who agreed to postpone his talk on the "Thick Film Hybrids as used in the Philips FM900 series two-way radios". Ray tells me that these hybrids can be used individually such as a VHF/UHF preamplifier, or combined to make a UHF to VHF, or UHF to HF converter (down to 21 MHz). The parts include a UHF amplifier, UHF mixer, UHF VCO and IF amplifier. Ray has several suggestions as to how these bits and pieces can be used (some are only the size of a postage stamp!), but he would also be pleased to hear other suggestions from members.

All being well, Ray will now do his talk on Tuesday, May 24, at 7.45 pm.

It is with regret that we mourn the passing of three well-known amateurs. Jim Poulson VK5UT, passed away the week before Christmas, very suddenly. Carl Sappiatzer VK5SS, passed away in January after a short illness, and I have just heard that John O'Dea VK5KOP, from Middleton, near Victor Harbour, passed away suddenly. I hope that amateurs who knew these men better than I, will write something for the Silent Keys column. We extend our sympathies to the families of all these amateurs.

All good things come to an end, or so they say, and sometimes we need to make the decision to end them. I have enjoyed writing this column but have decided that, perhaps it is time to let someone else take over. I began in July 1982, when a Federal Convention Agenda item decided that each Division should have a column of its own. I thought that it was a great idea and said that I would do that first one (the idea in my mind being that we would have several people taking it in turn, needless to say that did not happen and, apart from one or two occasions, I have been doing it ever since). I have no wish to better Eric Jamieson's record (VK5LP). I think he does a fantastic job and certainly deserved the Ron Wilkinson Achievement Award. I doubt there ever was a more worthy recipient, not only for the column but for the help and encouragement he gives to others, particularly the young. Perhaps the events of the past week have also had some bearing on my decision. For those who don't know, my OM Mike VK5AMW, suffered a heart attack, but I am delighted to say that, at the time of writing, is making a good recovery and is expected home in a few days. My thanks to all who sent their good wishes, it was appreciated very much.

So, if there is a budding columnist out there (or several) please let us know. After all, if I can do it...

DIARY DATES

CLUBS CONVENTION WEEKEND — April 8, 9, 10.
YWCA Cooranga Campsite, Aldinga Beach.
(Visitors welcome, but please let Don VK5ADD, know if you are coming, for catering and/or seating arrangements).
Tuesday, April 26, AGM — 7.45 pm. BGB (34 West Thebarton Road).
Tuesday, May 24, Ray Dobson VK5DI, on "Thick Film Hybrids" 7.45 pm.
Tuesday, May 31, Buy and Sell Night, 7.30 pm (no ESC etc).

VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

NEW MEMBERS

The following applications were received for the month of December 1987, and were accepted by Council on January 20, 1988. A warm welcome is extended to all.

Gregory Coe VK3BRU	Ouyen
David Dessardo VK3TBC	Airport West
David Merrett VK3PKZ	Casterton
Emmanuel Mirando	Diggers Rest
Frank Patrick VK3FJP	Bundoora
Matthew Robinson VK3TAY	Canterbury
Douglas Wilson	East Malvern
Peter Ramsden VK3TPR	Mill Park
Graham Reynolds	Doncaster

THANKS

The WIA (Victorian Division) would like to express its thanks to the following for their donation of QSL cards towards the WIA collection.
Perce VK3MX
Geoff VK3AC
Mrs Mary Morris for cards of her late husband, Morrie VK3BZ.
Mrs Ilsa Morgan for cards of her late husband, Ivor VK3DH.
Mona Swinton VK3BRE, for cards of her late husband, Alex VK2AAK.
Marjorie Williamson VK3HQ, for cards of her late brother, Alan Hutchings VK3HZ.
Bing VK2BCH, for cards of Silent Key, Doug VK2OUG.
Mrs Pat Paine for cards of her late husband, Doug VK3FH.

We would also like to thank Alan VK1WX, and John VK1CJ, for unclaimed QSL cards from the VK1 bureau.

The collection is still in need of rare DX, commemorative QSLs, special prefixes and pre-war QSLs. Please contact Ken VK3TL, phone (059) 64 3721, or write to PO Box 1, Seville, Vic. 3139, for QSL pick-up.

CALLING ALL CLUB SECRETARIES AND QSL MANAGERS

As you no doubt already know, the WIA has established its own QSL collection. There have been some very generous donations of all kinds of QSLs from many DXers throughout Australia, but there are many gaps in the collection. This is a never-ending process as new call signs and prefixes come on the air. The WIA would be grateful indeed, if your club committee would consider donating all unwanted and uncollected QSLs to our collection. Some clubs have already done this and we would like to see the policy extended.

QSLs from metropolitan Melbourne will be collected personally, but country and interstate donations may be collected through the kind co-operation of WIA members who are passing through your area on their way to Melbourne. Please direct inquiries to the Honorary Curator, Ken VK3TL, PO Box 1, Seville, Vic. 3139, or telephone (059) 64 3721.

Q R M from VK7

John Rogers VK7JK
VK7 BROADCAST OFFICER
1 Darville Court, Blackman's Bay, Hobart, Tas. 7052

This is the first opportunity to bring news of the changes in Branch Officials which has been brought about by the various Annual General Meetings!

NORTH WESTERN BRANCH
President — Greg VK7ZBT
Vice-Presidents — John VK7ZPT and Noel VK7EG
Secretary — Tony VK7AH
Treasurer — Bruce VK7MB
Repeater and Beacons Co-ordinator — Andrew VK7ZAP
Assistant Repeater and Beacons Co-ordinator — Andrew VK7ZHA
QSL Organiser — Steve VK7EQ
Stores — Rob VK7KAB
Publications — Terry VK7BV
WICEN Director — John Duncombe VK7ZPT
News Scribe — John VK7KDR
Branch Publicity Officer — Ron VK7RN

Volunteers from the NW Branch are looking forward to a great day helping with the exercise at Wynyard this month. The ANZAC weekend always seems to be a times for enjoyable activities and this year should be no exception.

In the south, the new officers are:
President — Stuart VK7NXA
Vice-President — Russ VK7ZRP
Secretary — Rai VK7VV
Assistant-Secretary — Mike VK7MC
Treasurer — David VK7NDO
Assistant-Treasurer — Peter VK7GT
Equipment Officer — Mike VK7MC
Southern Broadcast Co-ordinator — Mike VK7ZMH
WICEN Co-ordinator — Alan VK7CI
Repeater Co-ordinator — Antony VK7ZTA
Membership Officer — Vic VK7VK
QSL Officer — Peter VK7GT
Publicity Officer — Lew VK7LJ
Honorary Auditor — Brian VK7BS
Activity Centre — Russ VK7ZRP
State Council Delegates — Peter VK7ZPK and Mike VK7ZWW

There is an important change of address: The Southern Branch, PO Box 123, Sandy Bay, which replaces the 105 Newtown Road, Hobart address for all official correspondence.

The WICEN (South) group has established a close working relationship with the State Emergency Services, and so has formalised their call-out procedure to enable quicker deployment of their resources in the event of an emergency. There are four sections — Base, Satellites, VHF Mobiles and VHF Special Services. Details of how contacts are made "down the line" have been circulated to registered members, but are also available to others who may be interested in becoming part of the network. Contact Alan VK7CI, QTHR.

WIA meetings for the month will be held as follows:
Northern Branch — at the Maritime College, Launceston on April 8 at 7.30 pm.
North Western Branch — at Penguin High School on April 12 at 8 pm.
Southern Branch — at the Activity Centre, 105 Newtown Road, Hobart on April 6 at 8.15 pm.

For VK7s who travel to the mainland for their holidays for the winter, a reminder that the VK7WI Sunday Morning Broadcast relay on 20 metres will be recommencing soon. Please watch for detailed announcements during the month.

For the first time in many-a-year there is a news-co-ordinator for the VK7WI broadcast in the north (Bill VK7AV, who is happy to make tapes of his contribution), in the north-west (John VK7KDR, temporarily anyway!), and in the south (Mike VK7ZMH, who has acquired a rig for HF so that he can collect news on the Saturday morning net). Now, there should be very close to a commercial/professional level of news-gathering in VK7 from now on.

Work is progressing at the Hobart Activity Centre on a vintage AM transmitter, originally a commercial station, 7CA, and, if Barry VK7RS has anything to do with it, it should be heard on the air by the time the 1988 TARC comes around. Rumour has it that it will be used to skyrocket the interest in top band!

As this column was being prepared, both the north and south of the island were making a common approach to improving their two metre repeaters. Both branches were in the process of acquiring new control units and, by the time this is published, all should be reaping the benefit. There is no doubt about it — the VHF repeater groups may not be large in number but they are great in their efforts!

Two small appeals to end this month's *QRM* — the first is for actual, real, practical support for the much-talked-about idea of having two or three minute tapes from members for insertion in the weekly broadcast, much the same as the Federal Tape. The subject can be of your own choice, preferably directly concerned with amateur radio topics — but remember that the editor would retain the right to edit!

The second appeal is for members to come forward with an offer of a short talk, again on some point of interest to operators, to be given at branch meetings throughout the year. Last year this did happen a few times, always with good results. This year could we make it a regular feature of monthly meetings?

73, John VK7JK

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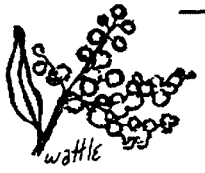

Forward Bias

Ken Ray VK1KEN
Box 710, Woden, ACT. 2606

Amateur operators in the National Capital are actively supporting the Australian Bicentenary. A Bicentenary Committee has been established with Dan VK1ST, Philip VK1PJ and Rob VK1KRM as members. VI88ACT has been very active on the HF bands during the first few months of 1988. We are now preparing for a major portable operation at the opening of the new Parliament House.

Approval has been given for VI88ACT to operate from the Parliament House site on the opening day, May 9, 1988. Operation is planned for all HF bands with preferred frequencies being 3.588, 7.088 (or 7.188), 14.188, 21.288 and 28.488 MHz.

It is hoped to broadcast the Queen's Message live using a VHF link from Parliament House to HF relay stations elsewhere in the ACT.

Contact with VI88ACT will gain you an attractive Bicentenary OSL Card and also earn valuable points toward the Australian Bicentenary National Capital Certificate. The QSL and Certificate will have matching artwork so you could receive the "matched set" by joining in the Bicentenary Celebration on the air.

Rules for the certificate are explained below and it is hoped amateurs around Australia and the world will want to achieve this award.

More details about the Parliament House Opening Day operation will appear in May AR and also via both the VK1 weekly broadcast and the Federal Broadcast.

RULES
QSL card confirmation of contacts claimed is not required.

Any VI88 special event call sign may only be claimed once per band per mode. Eg; Contact with VI88ACT on 20 metres SSB and 20 metres CW can be claimed as two contacts, or 10 points, because it is different modes on the same band.

Any band and mode within the terms of the applicant's licence, is accepted.

Requests for endorsements will be considered. Eg; If all points claimed are for contacts on a single band or mode, an endorsement to the Certificate would be possible.

Contacts made by any terrestrial voice repeater method are not valid. Packet radio contacts using a digipeater or (several digipeaters) are valid contacts.

FOR HF OPERATION
Contact with any Australian call sign counts as one point; and

Contact with any Australian VI88 special event call sign counts as five points.

For VK operators only — All contacts, except for VI88 special event stations, are to be made with call areas other than the area from which the applicant is operating.

FOR VHF OPERATION
Contacts between stations up to 30 kilometres equals one point, and over 30 kilometres equals four points.

Contact with any Australian VI88 special event call sign counts as 10 points, ie VI88ACT or any other "VI88. . ." prefix.

COST
The cost of the certificate will be $A4 or seven International Reply Coupons (IRCs). Please include with application.

APPLICATION
Applications for the certificate should include the applicant's name and call sign (as they want it to appear on the certificate) and their return address.

Applications for the certificate should be in the form of a log extract showing for each contact claimed the call sign, the date and time (UTC) of the contact, mode and band used and the signal reports exchanges. All claims must be certified as a true and correct record of the log by at least one other licensed amateur other than the applicant. This requirement may be waived for applicants in remote areas — please attach an explanation.

Inquiries for further information should be directed to Philip Rayner VK1PJ, on (062) 92 3260 (home) or at the address below. Applications for the certificate should be sent to:
VI88ACT Awards Manager, GPO Box 600, Canberra, ACT. 2601.

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Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Over to You!

WHERE IT ALL HAPPENS!

The accompanying photograph shows the radio shack at VK7OW. Since the photograph was taken a shelf has been put over the Collins equipment on the left and that is now packed with equipment.

There are 18 transceivers in total, also a rare First World War "Sterling" Spark transmitter used by the RAF in the UK.

Note the superb 1927 Philips carbon microphone in the original sprung cradle used by an early New Zealand broadcast station.

The station sits on top of an extensive metal ground mat.

73

Jim Davis VK7OW
Latrobe, Tas. 7307.

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THE TRAVELLERS' NET

I cannot keep my mouth shut any longer, and wish to write in defence of the Travellers' Net.

Firstly, Arthur VK6ART, does not want to be a knight in any kind of armour, although, I think he deserves to be for his services to amateur radio.

Secondly, I do not think he has any cronies, and his role was not self-appointed.

Third, the job he does year after year, every day, could not and would not be attempted by 99 percent of amateurs. It would be found his service is supported by a very large number of operators, plus listeners and emergency services.

It is not his net exclusively, he is assisted every day and it is used daily by hundreds of different amateurs during the year (up to 30 or even more per day).

Is it possible to program these electronic robots to switch off on one frequency (14.106 MHz) only for one hour between 0230 and 0330 UTC dally and continue on for the other 23 hours uninterrupted by nasty travelling amateurs? The net only lasts for one hour of the 23!

What is being said in effect is:

"Look Arthur, our machines want this particular frequency 24 hours per day. This is important — we cannot spare this one hour, so we demand the net users move somewhere else". Get off or elsel My guess is, if the net users did this, the robot owners would follow it up and repeat their demands.

Arthur VK6ART, being any other than the man he is, might well say, "What is the use of arguing — I'll quit."

I would like to know just what information of any significance or importance these electronic noises are conveying, also how can the average amateur be sure they are not commercial intruders?

Hold your ground Arthur, don't be intimidated by insults and threat — you have a very large umber of supporters!

Keith Scott VK3SS
34 Henry Street
Maffra, Vic. 3860

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TO THE EDITOR — NOT THE CASE

I was interested to read in the CARF journal that you had expressed interest in CARF because you understood Canada was one of the few countries where the second society had some measure of IARU approval. That is not the case, as under the IARU constitution only one society is a member of IARU.

CARL was one of the founding members of the International Amateur Union in Paris, France in April 1925, and has represented Canadian amateurs internationally for the past 62 years.

With very best wishes to you and the membership.

73

Sincerely

Thomas B J Atkins VE3CDM
CRRL President
Treasurer, IARU Region 2
55 Havenbrook Boulevard
Willowdale, Ontario, M2J 1A7.

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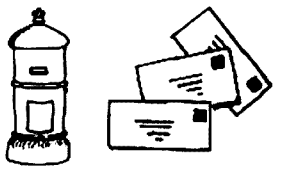
MEMORIES

The accompanying QSL cards and photograph take us back a few years.

The VKZ and VHE go back to the early days of 1930. VKZ was in Alice Springs in 1934. Joe Kilgariff, the owner/operator states that he was using a petrol engine driving a generator which was situated 10 feet (three metres) from the receiver which was rather noisy!



Some years ago I visited the radio museum in Alice Springs and, as they had no information of the operation of VKZ, a photocopy of this card was sent to them. I was the operator at VK2FZ and the recipient of the card.

Joe VKZ, later took out a VK5 call sign and moved to Adelaide.

The rig in the photograph made the first ever contact with Brunei. There was a DXpedition by W0ELA to Brunei and I was VK4QL, in Townsville.

W0ELA was a friend and I knew of his plans so was just waiting for him to get on the air. My first contact with VS5ELA was on July 27, 1952, on 14 MHz. W0ELA is still active today!

My rig was an 807 preamplifier operating 50 watts from 3.5 to 28 MHz. The antenna was a 135 feet Windom, still in use today. The receiver was an AR7 with band spread coils.

Incidentally, it was whilst I was based in Townsville with the RAAF that I started the DX page in AR.

It is nice to see the IPS Radio and Space Services monthly summary appearing in AR.

Yours faithfully and 73

Frank Hine VK2QL
30 Abbotsford Road
Homebush, NSW. 2140

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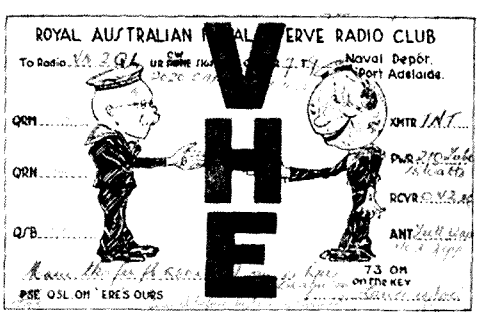

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PRESERVATION

The VK3 Division of the WIA is to be commended for its initiative in reserving selected rare and unusual DX QSL cards of Australian amateurs, for posterity.

The fate of most QSL cards is either the dump or incinerator. This is a sinful waste; there are better uses for those pieces of 5" x 3".

I am in the process of culling 40 000 of my own DX QSLs — accumulated over a period of 50 years — and have divided them into four categories:

1. Those rare and early cards, with a personal story attached, which I will keep filed or mounted on display.
2. QSLs with postage stamps affixed will go to stamp collectors.
3. Ones in the form of a picture card (and they seem endless) are being given to primary schools. Teachers tell me they are great for various projects undertaken by pupils.
4. The discards, which will be dropped into the incinerator.

I would be grateful to hear from any reader who can suggest other uses. Also, I will donate QSLs to anyone wanting cards for bonafide purposes; eg museums, clubs, etc, who can use them as a back drop to their displays.

Pre-war "raries" are now very, very thin on the ground. How many OTers still have cards from AC4YN Tibet, PK6XX Celebes, XU8CR Shanghai, C9AR Manchuria (now Mongolia). All these cards (and many more) tell a story unto themselves. Mine have all been lost — so, let us preserve what is left, as long as is possible.

Alan Shawsmith VK4SS
35 Whynot Street
West End, Qld. 4101

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HAVE WE GOT IT ALL WRONG?

What all wrong? Amateur radio towers. . .

Fortunately, in Wagga Wagga, we have been able to have towers, but I have just moved to a new home, and this time I was actually asked to submit a rough plan of my 15 metre tower. I was granted council permission to erect that tower. However, my new location is at the top of a hill, in an area of new and very attractive homes. The question was 'did I really want a huge, great tower that would stand out like a wart on the landscape?'. 'No!'.

What I now have is a three-section wind-up tower (bought for $30), to which I have made some minor modifications. Wound down, the tower sits just above the gutter line, the rotator and TH3 about half-way between the gutter and the level of the ridge of the roof, and the two metre Yagi most people take for a new type of television antenna. I am in the motor industry, so was able to borrow a spray gun to paint the tower to match to colour of the bricks, and I am very satisfied.

Sure, I have the task of winding my tower up when I want to transmit, but I can now climb my tower to a reasonable height to work safely on antennas when I want to, and if I have need to, I can drop it on my own — something that was quite impossible with my free-standing tower. When I needed to move that it was necessary to use the winch on a Land cruiser, and even with that I was almost killed. Now I have a tower which, extended, is identical in height to my original free-standing one. Just one more thing — has anyone any idea how I can make recoil drums to automatically wind-up the guy-wires when the tower is wound down?

Finally, instead of having amateurs fighting every city council in Australia, could a committee of building engineers belonging to the WIA design a tower suitable to the Unified Building Regulations Board? It should be suitable to be built for the best part by a handyman. A plan approved by such a board would tend to be acceptable to most council engineers — they do not want hassles. In other words, what I am saying is that, just as the WIA works with the DOTC, so it should also work with the UBRB. Put all your effort into this idea, and ultimately you will save members thousands of dollars in years to come.

David C Brand VK2PGE
4 Tolland Close
Wagga Wagga, NSW. 2650

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HAPPY 1988!

I notice the discussion on the future of amateur radio has petered out but there are a couple of things I feel obliged to say following some QSOs last year.

The consensus was that amateur radio is just a hobby and as such should be enjoyable. It is agreed that, due to the need for organisation, AR and so forth a certain business aspect and some commercialism is unavoidable, rather, it is necessary and acceptable. But, amateur radio was never, and should not be, a rich mans hobby. Unfortunately, the home-brew AM days are gone, parts are not readily available, SSB rigs need a lot of building and adjustment skills and test equipment to do so is at a premium. The black box reigns supreme and frankly, how the insides work is about as much use to an operator as Newton's knowledge of the laws of motion when riding a push-bike.

Such has been the advancement of amateur radio and the multitude of new facets that many old timers have been left behind, technically, as well as financially.

A similar technological revolution in the motor car industry put many old time mechanics out of work. (A recent article by the NRMA warns of the unskilled tampering with computerised cars).

Many black and white television technicians gave it away when colour television arrived (or those that joined the hobby at an advanced age).

Now we are saying that OTs should remain novices because they are ignorant of packet radio, RTTY, satellite communications, and what-have-you. It just does not make sense, particularly when all they want to do is rag-chew with old mates and new acquaintances — on all bands and at a decent power level. Newcomers to amateur radio are confronted with the same obstacles. In Summer, 80 metres goes dead during the day and 40 metres works but they can't use it. Two metre operation is somewhat limited.

I repeat, it is a hobby, not a life or death game as with motor vehicles! I cannot envisage any catastrophic calamity resulting from upgrading any novice with both Morse and "time served" experience behind him.

Last year, Brenda remarked, somewhat facetiously I thought, that a lot of old timers hadn't done a course in transistors, etc and ought therefore to 'upgrade'. I respectfully point out that the licence is primarily to maintain correct operating procedures in the same manner that a driving licence supposedly guarantees ones' ability to drive a car in traffic or a shooters' licence means you are able to fire a gun. How many shooters know anything at all about the different explosives in a cartridge? The only time solid state knowledge is really necessary is when you are actually designing a piece of equipment — and most amateurs that have a go at designing learn very quickly!

One of the traps in educational circles (into which I fell myself) is that teachers and their ilk become not only too smart for themselves, especially in setting examinations, but of dis-service to their students, whom they are supposed to help. The type of examinations, written, multiple choice etc has less to do with fair assessment than the straight forwardness or honesty of the question itself. An frankly, I have tired of picking out the ambiguities and often nonsensical, even incoherent statements and questions in the sample examinations I have read.

The most pitiful aspect is that it is possible to rote learn all the answers, pass the examination and still know very little about the subject.

By definition, the term novice means newcomer, someone who lacks experience. This is true of recently fully licensed amateurs too. Many upgraded amateurs crammed and rote-learned for the big event and are often not much more technically advanced than the novice.

Why not have one examination? An Amateur Radio Licence Exam. Upgrading to full call could be by Morse speed and a decent sized log as I believe is done in Canada.

Cut out all the packet radio/ satellite etc questions and stay with basics. Safety precautions, regulations, radio fundamentals, antennas, interference and allow amateurs to delve into other facets of the hobby if they want to. They will soon acquire the necessary knowledge and skills. I am sure my MD did not get questioned on brain surgery at his examination.

I believe amateurs are special people, but it is not their knowledge that makes them so, it is their dedication to their chosen hobby. Talk of lowering standards is thoughtless because elimination of rote-learning for unintended activities allows more time for study of the basics.

Do we need more amateurs? Do we need to increase WIA membership? Are we supposed to be a group of multi-specialised boffins or do most of us settle for basic radio communication, rag chews and exchanges of ideas?

Surely it is time for us to take stock and get on with what used to be an uncluttered and enjoyable hobby.

73

Don Law VK2AIL
RMB 626, Adelong Road
Tumblong, NSW. 2729

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TRAVELLING AROUND

With reference to the letter in December's AR by Art Oliver VK6ART. I fully agree with Art and some agreement should be reached with regard to the frequency 14.106 MHz.

I have been a traveller checking into the net since September 1983 and have found this a very valuable service.

During my last trip, in August 1987, I had great difficulty in making contact with the net due to the packet radio interference. Of course, I realise, as Art has stated, no amateur has exclusive right to any frequency, but during many travels over the past few years I have come to rely upon the Travellers' Net for information and advice, It is comforting to know that at least once every 24 hours there will be a contact. I always leave Art's telephone number with my friends so that, if an emergency arises, I can be contacted. Our trips, incidentally, cover all Australia with no fixed itinery, the last one being 15 500 kilometres and taking three months.

Please keep up the good work Art, together with your team of helpers — we travellers rely upon you and enjoy our contacts.

Ed Dyring VK2ED
PO Box 3
Gosford, NSW. 2250

ar

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CATCHING UP

The Christmas break gave me the chance to read a pile of ARs going back to April last year and, having seen all the letters to the editor and all the articles on the future of amateur radio, I would like to contribute my comments on these subjects.

1. It amazed me to find amateurs clamouring for 'equal rights for novices' over a bureaucratic error in Canberra with Japan. (It reminded me of when opportunists rushed in to give 27 MHz to the CBers). How about we look at the principle involved and see how good our foreign affairs people are at diplomatically reversing the mistake so as to maintain our standards?
2. If we are going to talk about a common band for all licence classes, let us make it a separate issue. It is a great idea; why not allow it on 70 centimetres FM? This frequency needs populating for its survival, it has equipment similar to two metres,

and it helps keep a lot of people away from the nonsense on two metres.
3. Of all the proposals looking at our hobby's future, John Anderson's stands *out* as the most logical, objective and readable (AR, October 1987, page 28), and I commend it to anyone seriously interested in the subject.
4. Finally, on the presentation standard of our magazine, Colin MacKinnon has said it all (AR Letters, September 1987 and November 1987). I too am prepared to pay the extra few dollars. To the AR Team: keep up the good work (I especially like the September issue's content) and let us get going forward again.

Yours faithfully
Gareth Davey VK2ANF
18 Grafton Crescent
Dee Why, NSW. 2099

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HELP ME PLEASE! ! !

Through the columns of the magazine, I wonder if anyone in Radio-land can help me?

Having an interest in "eartier" model radio, mainly between 1920-1930, I am looking for a technical book entitled *The Australian Official Radio Servicing Manual, Volume 1.* Not really your off-the-shelf, readily-available book, but perhaps some enthusiast reading this has a copy no longer needed and willing to pass it on to a fellow enthusiast, just longing to add it to a reference collection. My the same token, the writer is quite prepared to purchase this volume, if that be the wish of the owner.

This could be a "tall order". Thank you and I remain, in *appreciation*,
Yours sincerely,
F J M Elliott
15 Lincoln Street
Forster, NSW. 2428

ar

MEMBERSHIP

As Bruce Kendall VK3WL, has solicited comments from readers of AR, I (a comparatively new chum to amateur radio), have decided to put pen to paper and have my comment.
1. Bruce, in my opinion, both in your letter of September 1987 and that in February 1988, you appear to me to be making a considerable amount of sense with regard to lagging membership in the WIA.
2. One reason why you have had so few comments could be, simply, that the readers of AR are either comatose or agree wholeheartedly with your ideas.

Bruce, as you obviously know your subject, I suggest with respect, you approach our Federal Body and volunteer your services as Marketing Officer!

Good luck.
Tony Williams VK2DJW
PO Box 131
Wahroonga, NSW. 2076

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COMPARISONS!

Reading AR over recent months, I find it disheartening to note the number of contributors to *Over to You!* who seem to look at the WIA from a "what-can-I-get-out-of-it" stance, with the accent vary much on the I. This is a bad attitude: at best short-sighted: at worst selfish, and in the long run, self-defeating.

Our hobby is at all times under pressure from powerful interests which see us as unnecessary. National societies and the IARU provide a bastion of defence, but they cannot operate to the best advantage without adequate funds, which must oome from individuals in the main. It seems to me therefore, that it is an obligation, rather than a choice, to support one's national society because it is for the good of one's fellows.

Individual preferences and prejudices will always exist, but they must surely be subservient to the main issue, which is the continuance of the hobby.

Comparing the VK amateur population with that of G, (17000 to 62000 in 1987), and the WIA subscriptions with those of the RSGB ($A49 maximum against £18.50 ($A45.50)), it seems to me that, as both societies have the same tasks, the WIA is underfunded.

Come on chaps — pay up and stop whingeing! It is in our own interest!

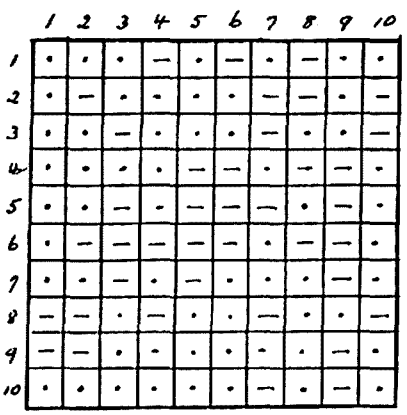
I became a member of the RSGB in 1948 and the WIA in 1986, whilst visiting VK for the first time for a two month holiday. I hope to continue in membership of both societies for many more years.

Yours faithfully,
S Arnold Matthews G3FZW (ex-VK4AUN)
2 The Parchments
Lichfield
Staffs
WS13 7NA
England

ar

Solution to Morseword© 14

Across: 1 stare 2 Lima 3 felt 4 sang 5 for 6 atop 7 *inner* 8 quit 9 gave 10 hear.
Down: 1 hip 2 lap 3 Eros 4 bend 5 sots 6 does 7 waft 8 Mars 9 vow 10 wife



Silent Keys

It is with deep regret we record the passing of:

MR SID BRYANT	VK3CI
MR FRANK WILLIAM CHAPMAN	VK6CC
MR J J CHRISTENSEN	VK3DOJ
MR H R FITZSIMMONS	VK3FI
MR A R HART	VK2BXN
MR K J HENDUCKS	VK7ZAH
MR W D ILIFFE	VK3OY
MR V LEONARD	VK3PJ
MR J A MACKAY	VK4QX
MR LAWRENCE GEORGE MARSH	VK2DWH
MR JOHN (MAC) MCCONNELL	VK3RV
MRS E L MCGRATH	VK4BEM
MR W O (BILL) THOMAS	VK2NXT
MR FRANCIS GEORGE WINDSOR	VK2CFW

Obituaries

CARLOS GEORGE SAPPIATZER VKSSS

It is with deep regret that we record the passing of Carl on January 5, 1988, at the age of 72 years.

Carl was born at Millicent, the eldest of three children. The family moved to Adelaide in 1919. Carl was then about three years old.

As a lad, he had experimented with radio and there have been many stories of his crystal and valve constructions.

It was not until the Second World War, when he joined the RAAF as a Radio Operator, that he became more heavily involved with radio.

After gaining his full call licence he taught Morse code in the old Methodist Mission building in Franklin Street, Adelaide. In 1957, he started Morse code practice sessions on the old one metre band. At this time he also gave theory lessons from his home. He also found time to spend some years on the Divisional Council of the VK5 Division.

Involvement in exhibitions held at the Royal Adelaide Showgrounds and the Adelaide Town Hall were part of his commitment there.

Cart also encouraged young people in their radio activities; some of whom have gone on to successful radio careers.

As a result of his contacts on radio, he made many friends as well as interested listeners. VK5 Sugar Sugar was one of a group holding regular contacts on the 7 MHz band in years gone by. Among his associates there, were the late Frank Bentley VK5MZ and Clyde Cook.

In later times, he met up with others in the 28 MHz band. Those involved were Peter Barlow VK5NPC, Jack Dew VK5JX and the writer.

Carl's other interests (yes, he was a man of many parts) included rifle shooting, photography (he had many films of steam trains), restoration of old steam locomotives (as part of a group he delighted in referring to as "Dad's Army"). His train films have been bequeathed to the South Australian Railway Historical Society. Many hours were spent on the locomotive restoration work, particularly the "Duke of Edinburgh" used recently to convey the Prince and Princess of Wales on an historical journey in South Australia. Carl was unable to take part.

Another of his associations was work carried out on the old steam tug boat, *Yalta*, as part of the South Australian Maritime Museum. Carl was looking forward to the day when the tug would be "fired up" and given a trial run at Port Adelaide. He had hoped to be able to ride on the first trip. Unfortunately, he did not live long enough for this to happen.

He enjoyed cycling and often rode his bicycle for several kilometres before breakfast.

His cheery comment of "You beaut" will no longer be heard when he was amused by something which happened.

There was a goodly collection of "bits and pieces" accumulated over the years and Carl was able to supply a collection of usable valves to Bob Roper VK5PU, now resident in the United States, when Bob wished to give a demonstration there on "the old days on one metre".

To Mrs Sappiatzer and family, the Division extends its sympathy in the loss of their husband and father, Carl.

—Compiled by Tom Laidler VK5TL from information supplied by Carl's son, Douglas VK5ZDJ

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CLAUD WELSH VK4DK

With regret, the passing of Claud Welsh VK4DK, is announced. He passed away in Mackay Hospital on January 17, after a long period of illness.

Claud was 73 years of age at his passing. Born in Warwick, Queensland on December 30, 1914, his early working days were spent at the *Warwick Times* newspaper.

Licensed as an amateur in 1936, he was one of the first operators in his city. His original call sign was VK4CW.

Claud joined the RAAF at the beginning of the 1939-46 war and spent the war years as a Radio Operator, where he met many other well-known amateurs of that era. After the war, he worked in the radio-field and operated in VK5, 7 and 3 before returning to Mackay in Queensland.

Ill health caused his early retirement when he became a TPI War Pensioner. He always retained an interest in amateur radio as an active WICEN operator, and gave publicity on amateur radio via his local newspaper who also published several stories on Claud's life and assistance given to various people on air, during emergencies.

Claud learned to speak the Japanese language fluently and had many JA friends on 15 metres.

Many American and European amateurs visited Claud when they passed through Mackay en route to the Barrier Reef, as Claud was well-known on the DX bands.

Local operators were also helped with their CW to obtain licenses when required.

Claud's wife, Isabel, was also well-known to amateurs all over the world and to her and family, our deepest sympathy is expressed at Claud's passing.

My personal QSOs with Claud, over nearly 50 years, will be long-remembered.

Al Carter VK4KT

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LESLIE RAYMOND JOHNSON VK3ZPB

It is with deep regret that the Western and Northern Suburbs Amateur Radio Club reports the passing of Les on December 7, 1987, aged 79 years.

Les was a founding member of the club in February 1970,the first Secretary from 1970 to 1974 inclusive, Member of the Year in 1975, and had also been elected a Life Member of the club.

He was Magazine Editor for several years and a committee member for some time. Until recently, when his health prevented it, he was an active and enthusiastic supporter of all club activities and always enjoyed a natter at meetings or on the two metre club net.

Les was a friend who will be greatly missed by the members.

Tom Page VK3AGH

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VERNON FRANCIS KENNA (ex-VK4FK) VK2JR President WIAQ 1933 President IREE 1968-69

Vern's abilities were such that he excelled in every talk he undertook. Without doubt, his short term as President was WIAQ's loss; he possessed physical bearing, rhetoric and the ability to fill the WIA's top position in Queensland very admirably.

Born at Brisbane on May 6, 1908, Vern showed a very early interest in radio, qualifying for his AOCP as VK4FK, in 1927 and constructed and operated receiving and transmitting equipment at Hamilton for a number of years. Those who knew him claim he lectured on wireless to students, when in his late teens and his commitment to radio was total throughout his life.

Vern commenced employment in the PMG in 1924 as a junior mechanic-in-training. He advanced through technical grades, finally assuming the position of senior engineer in the radio section of the headquarters administration in Melbourne. In 1961, he became Federal Controller of Technical Services with the ABC until his retirement, late 1960s.

From 1931 to 1934, Vern was a member of the technical staff at Broadcast Station 4QG, Brisbane. In 1934, he moved to the PMG Research Section in Melbourne where he assisted in the development of the now familiar top-loaded broadcasting radiator and also VHF radio relay equipment designed for use on outside broadcasting work. He qualified as an Engineer in 1935. During the early stages of WWII, Vern was concerned with the installation of aeradio and assisted DF equipment at a number of centres in Queensland and other adjacent Pacific areas. Then, in the light of the critical war situation, he was involved in the urgent removal of the NBS metropolitan stations 4QG and 4QR to preferred sites outside the city limits.

In 1950, Vern represented Australia as a delegate to the International HF Broadcasting Conference held in Italy. He also found time to rewrite the constitution of the Flying Doctor Service in order to give it a Royal Charter and a new title, Royal Flying Doctor Service (RFDS).

Dubbed "Marconi" by his pre-war peers, he rightfully earned his title and that of "Pathfinder" because of his very early experiments with VHF Vern became a Silent Key on Christmas Day 1987, after previously suffering a heart attack.

Alan Shawsmith VK4SS

ar

HAROLD F BREMERMAN VK4HB

The WIAQ sadly announces the death of one of its long term members, viz Harold Bremerman VK4HB.

Harold's interest in wireless began whilst he was still a teenager living in Sidcup, England, where he gained the COCP as a very young man. He emigrated to Queensland during the early 1920s and was one of the many enthusiasts who assisted Thomas M B Elliott with television experiments in the Observatory Tower in 1929. Harold was able to construct a NIPKOW Disc which

used square scanning holes, for the first time. This resulted in much better picture resolution.

In 1932, he obtained his AOCP at Brisbane. Harold broadcast the Institute News on VK4WIA for a period of 15 years; his clear, slightly English voice became synonymous with this service. He was a Charter Member of the Brisbane DX Club and always participated in the RD Contest.

A qualified electrician, Harold was employed by the following firms: *Courier Mail* for 15 years, Besley and Pike for eight years and Mount Olivett Hospital, as Chief Engineer for four years.

Being a commercial air pilot, he was an instructor with the Queensland Aero Club for many years and also found time to do long stints as a trade teacher at the Central Technical College in Brisbane.

A Life Member of the WIA, Harold rightfully earned the title "Pathfinder", because of his early experiments. Aged 86 years, Harold became a Silent Key on January 21, 1988, and is survived by his YF 'Blondie'.

Alan Shawsmith VK4SS

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DEADLINE

All copy for inclusion in the June 1988 issue of *Amateur Radio*, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, April 18, 1988.

IONOSPHERIC REPORT

The IPS Radio and Space Services summary for December contained some information that will be of interest to those new to the DX bands.

The monthly indices values are as follows:
Monthly averages for them are 10 cm flux 94.9,
Sunspot number 26.5
A index 7.7
I index 54.2
Two solar flares on December 26.

Solar activity in December was low except for these two flares. The region which produced these flares seemed likely to produce further energetic events but had not done so by the end of the month.

The monthly averaged 10 cm flux value for December was lower than those of recent months, being the lowest since June 1987.

Geomagnetic activity was extremely quiet for December with only three days on which the A index exceeded a value of 20. The extended period of quiet geomagnetic conditions from December 24 to 31 was a feature of the month. On December 5, the field was at active levels. December 10, had active to minor storm levels. December 16 to 17, the field was at storm levels early in the day and generally active on the 17th.

Ionospheric disturbances for Sydney — December 6, MUFs were slightly depressed at times and depressed on December 11 and 17.

It is now clear that the sunspot cycle, Number 21, reached its end during September 1986. Since then, the sun has become more active, telling us that the new cycle, Number 22, has begun. Also, the sunspot regions, visible throughout 1987, have been appearing at higher latitudes. This is another good indicator of a new cycle. The smoothed sunspot number has risen very quickly this past year. In fact, the rise has been so fast that it is breaking all records and suggests that we could be in for another high sunspot maximum. We expect a continuation of the rapid rise of the sunspot number in 1988 with the yearly average working out to at least 60. However, associated with this rise in sunspot number, we will also experience an increase in the number of solar flares. This will mean more frequent shortwave fadeouts. Also we will have an increase in the number of flare induced geomagnetic disturbances which will also disrupt or degrade HF communications. The most reliable predictions of the amplitude of the new cycle are telling us that the sunspot number should reach a peak of around 150. IPS previously gave a figure of 130 as their estimate. The rapid early rise of the cycle in 1987 supports this view but it is early days yet. If the cycle progresses as the average of previous cycles then solar maximum can be expected in late 1989 or early 1990.

Remember a cycle always rises faster at its beginning and is much slower during the fall.

—Contributed by Frank Hine VK2QL

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Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not*** use ***scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No inquiries at office please . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

COMPONENTS: Wide range of parts for receiver, transmitter and other electronic equipment. Semiconductors, valve, plate bypass capacitors, coaxial connectors and many more. Mail inquiries welcome. Sorry, no catalogue available. D Dauner Electronic Sales, 51 Georges Crescent, Georges Hall, NSW. 2198. Telephone: (02) 724 6982.

WANTED — NSW

AUSTRALIAN OFFICIAL RADIO SERVICING MANUAL: Vol 1. Required for a reference collection. Contact F J M Elliott, 15 Lincoln Street, Forster, NSW. 2428. Ph: 54 6583.

CIRCUIT DIAGRAM: or pinout supply details for RC7C transceiver. Also, old valve manuals & valve circuits for any valve type equipment. R J Paxley, 71 Brown Street, Armidale, NSW. 2350. Ph: (067) 72 9878.

DRAKE R7A, JRC NRD-515 RECEIVERS: Also, old ARRL handbooks. Tony. Ph: (042) 29 2573.

FV-101DM VFO: or FV-102DN VFO. R K Richardson, 12 Bowden Street, North Parramatta, NSW. 2151. Ph: (02) 630 1621.

TWO 572B TUBES & BAND SELECTION SWITCH: for FL-2100B Yaesu linear. Used linear for spare parts considered. Ron VK2BKN, QTHR. Ph: (069) 72 2021.

WANTED — VIC

ALLIANCE TENNA ROTOR: Lightweight rotator in good order. Merv VK3AFO, QTHR. Ph: (060) 24 2537.

AR88: Any model in good order. Hepburn VK3AFQ, QTHR. Ph: (03) 596 2414.

IC-730, IC-731: or similar compact HF mobile transceiver. All offers considered. Bruce VK3BPT, QTHR. Ph: (03) 544 8055 BH or (03) 763 6680 AH.

SERVICE/WORKSHOP MANUAL: for Yaesu FT-707. Circuit/Service data sheet for early (1930s) Astor radio, Model FF 720 (round dial with two magnifying lenses) Price & particulars to VK3CQK, QTHR. Ph: (058) 52 1372.

TOWER: Crank up type in good condition. Denis VK3CUI. Ph: (054) 43 4530.

70CM MULTIMODE TRANSCEIVER: Will exchange for Yaesu FT-7B in excellent condition. Roger VK3XRS. Ph: (051) 56 8291.

WANTED — QLD

BOOK: Ex-serviceman wants to buy or borrow old British/Australian Army book Signal Training Volume III, 1936. Would someone help please. VK4EF, QTHR. Ph: (07) 366 1803 AH.

EARLY WIRE AND WIRELESS TELEGRAPHY EQUIPMENT: Also handbooks for the same. Pre 1972 Bill Orr, Radio Handbook. Contact Fred VK4NMA, QTHR or Ph: (07) 396 3521 after 6 pm.

FM BOARD FOR YAESU FT-102: Yaesu part C0023470 Board No PB2347. Will pay fair price. VK4AEM, QTHR. Ph: (071) 92 1630.

ONE VALVE UX-201A/UV-201A: else UX-200A, UX-112, CX-300A, CX-301A, UV-199, CX-399, UY-224 or UY-227 for early Flying Doctor set. Mervyn VK4SO, QTHR. Ph: (07) 846 3875.

YAESU FT-101 SERIES MAINTENANCE SERVICE MANUAL: Must include 101E. Reasonable price paid. Alex VK4RU, QTHR. Ph: (07) 265 3269.

WANTED — SA

OPERATING & MAINTENANCE MANUAL: for Telequipment Servicescope Model D52. Reverse charges John VK5KAF Ph: (087) 35 2028. or PO Box 578, Millicent, SA. 5280.

WANTED — WA

M-600 MULTI-MODE CODE RECEIVER: or Pakratt PK64. Ph: (09) 341 4361.

FOR SALE — ACT

YAESU FT-207R: 2m hand-held with speaker/mic, NiCAD rechargable battery, flexible antenna, charger & manual. $220. Vic Burman VK1VB, QTHR. Ph: (062) 86 0611 AH or (062) 46 2302 BH.

BEAM: 5-element Hy-gain No 411 10 metre. 1 Crown rotator Model CAR 24. Both with manual. Perfect condition. $300. 1 Sideband SE-502 28.3 to 28.6 MHz, new in box. $90. Norm. Ph: (065) 68 2544.

CHEAP DX: FT-200 black panel, custom power supply, mic, leads, English manual, $290 including freight. Proof of licence essential. Doug VK2DHK, PO Box 584, Lithgow, NSW. 2790. Ph: (063) 52 1305.

DECEASED ESTATE: VK2AXR FT-102, FT-200, Eddystone 770 Rx, GDO, VFO, Small multimeters. For appointment & inspection Ph: (02) 524 6282.

HY-GAIN VERTICAL MULTIBAND ANTENNA: 10 to 80 metres complete with manual & in good condition. Price $95. Al Rice-Davies VK2AXR. Ph: (02) 477 6275.

KENWOOD R-2000 COMMUNICATIONS RECEIVER: 150 kHz to 30 MHz SSB AM FM 10 memories scan, digital & clock display, timer, VGC, very little use. £350. VK2BD. Ph: (02) 68 3273.

NATIONAL RJX-1011D TCVR & XTNL VFO: Shure 444 dual impedance mic, all max 100 hours use. $1500. Bruce. Ph: (02) 570 5840 after 6.30 pm.

SWAN 350 & SWAN 500CX: 5 band transceivers with P/S & handbooks. Buyer to collect. Ph: (02) 651 3006.

YAESU FT-707: plus power supply FP-707 & antenna tuner. Won't sell separately. Lot $950. Richard VK2CRB. Ph: (02) 546 6498 AH or (02) 887 7212 BH.

FOR SALE — VIC

ANTENNA: 80 to 10 metre vertical. DSE Model No D-4305. $70. Neil VK3CNT, QTHR. Ph: (03) 754 6410.

COMPLETE DRAKE STATION: T-4X-Tx, R-4B Rx, matching spkr/pwr supply. Speech processor, Ameco preamp PCL-P, RFE100 digital adaptor, many spares, all manuals. The lot $850. Bill VK3WK, QTHR. Ph: (055) 67 1046.

ESTATE OF THE LATE-VK3DOJ: FT—ONE: in mint condition. FM board, RAM card, Keyer board, DC power cable, filters, CWM, 10.7 FM 6.9 MHz AM & SSB. YM-35 mic. FC-902 500W ant tuner. FTV-107 144/432 transverter. 144 fitted. FT-208 FM hand-held with speaker mic. Leader solid state signal gen. LPM-815 GDO with all coils. Hansen SWR/Power meter. TH6 20/15/10 beam. ASR33 printer with paper tape acc excellent. Siemens RTTY with tape reader & monitor. CS-20 2-way coax switches. Rapar RLC bridge. Offers, inquire John VK3ABW, Ph: (03) 568 7428 for inspection at VK3DOJ's QTH.

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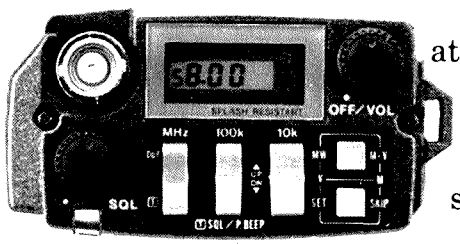

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Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL. 56, No 5, MAY 1988

Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
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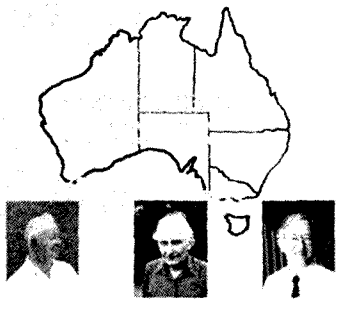

Wally VK6WG.

Les VK3ZBJ.

Roly VK3KXW.

Photographs courtesy of Brian Green for Wally VK6WG

Photographs courtesy of Barrie Bunning for Roly VK3KXW and Les VK3ZBJ

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Editor's Comment

BACK TO THE TREADMILL

Yes, I am afraid it does seem rather like a treadmill, this business of getting out a magazine each month. Maybe more so for some than others. As editor, I get it easier than the producers, for example. All I have to do is to find something of interest to write a "Comment" on, sort out a few spelling errors or mixed-up statements in a few articles, make sure none of the letters to *Over to You!* is likely to provoke a libel suit, or even cause extreme displeasure, write four or five replies a month to letters which can't be published, write several more to people who have asked for information, make a few dozen phone calls, answer a few dozen more. . .etc. The salary is zero, and the rest of the time is my own! Except that this month the annual Publications Committee report must be written.

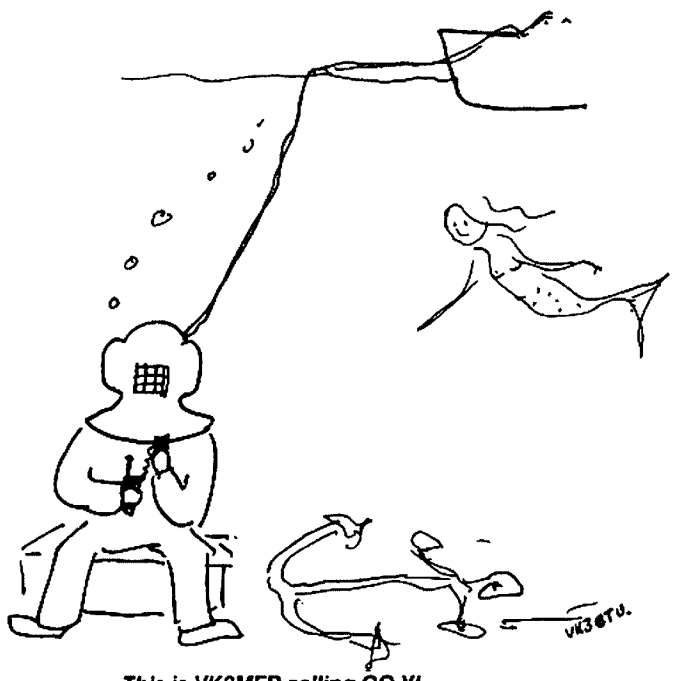
No, I'm not really as disgruntled as I sound, even though I forgot to mention in that lot the commitment to three nights out of every month, one to chair the Publications meeting and two Executive meetings at which mostly I need only sit and listen.

Why do I do it? Why do all the other Executive members spend so much of their time, unpaid, working for the WIA? Because we are convinced that without strong representative national organisations in every country with more than a handful of amateurs, the hobby of amateur radio would shortly cease to exist. That conviction is shared by all those committee members, Divisional councillors, magazine contributors and all those who work for the benefit of the hobby without expectation of reward. Paradoxically, we tend to spend so much time on these activities that we have very little left to actually get on the air ourselves!

So why not hand our various responsibilities over to someone else? I personally would love to find a suitable successor. So also would the acting Federal Treasurer, and most of the Executive, not excluding the President! The problem is that suitable people are not much more plentiful than the proverbial hens' teeth! They must be willing to pay for the use of their plentiful spare time, not to be paid for it. Rare creatures indeed!

And if these rare and dedicated creatures are unable to do quickly all those things that you, the members, expect of them, what then? Believe me, if you can find someone else, or some other way, to do it better for less, then snap them up! If they can do it better for more, are you willing to pay more? Almost certainly the Institute's efficiency could be increased by structural changes. By the time you read this, the 1988 Federal Convention may have introduced such changes. It will be interesting to see how it all evolves, perhaps bringing about a leaner, stronger, more efficient organisation. We can afford nothing less!

Bill Rice AX3ABP



This is VK3MER calling CQ YL. . .
—VK3BTU

BRUCE REGINALD MANN VK3BM

The Life Story of an Old Timer

Titanic *sparks a young lad's interest in radio!*

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

AS A SIX-YEAR-OLD, Bruce heard of the rescue of about 700 survivors from the *SS Titanic* in 1912 after she struck an Atlantic iceberg on her maiden voyage.

Bruce, now in his 81st year, reminiscing about the early days said, "My first knowledge of wireless was the rescue of the *Titanic* — the tremendous part wireless played.

"In a couple of years I started making little models, electric bells and using rejuvenated discarded telephone batteries."

His father and uncle were pioneers in opening up Victoria's north-west wheatbelt. Bruce lived on his father's farm at Quambatook and the Mann's became the biggest independent wheat producer in Victoria at that time. By chance, a young city fellow, interested in having his own farm, got work on the Mann property for the experience in 1919 and brought a home-made crystal set with him. He thought the wireless would help fill in the idle hours by listening to ship-to-shore coastal stations, but working six days a week from daylight to dusk left him little spare time.

After a few month, the young man said: "Bruce, you had better take this wireless and get your dad to put up an antenna and see what you can hear."

In Easter 1920, his father, James Mann, erected two 60 foot poles 300 feet apart with a 20 foot lead-in and a three wire flat-top antenna.

"I started getting the spark Morse signal from all the capital cities and ships from Townsville to Perth.

There was a magazine called *Sea Land and Air* which published all of the regular transmissions of the coastal stations — I could identify them that way."

His father encouraged him and later went to Melbourne to buy a wireless, some books, a key and buzzer. A city retailer told Mr Mann (snr) that by adding a valve to the wireless, signals could

be heard from America — but to get a valve you had to obtain a Navy permit by passing a 12 words-per-minute Morse test.

A local stationmaster trained Bruce up to the required speed in about 10 days, and with his declaration of proficiency, he was granted a Navy permit in 1921.

Bruce has held the call sign VK3BM since 1937 — before that his experimental licence was 3CK (no prefix).

Although having obtained a Navy permit earlier to buy a valve, and being certified at 12 words-per-minute, he was later required to pass the code test again. He recalls visiting the Melbourne radio inspectors office on March 9, 1937, and persuading them to give him a test on the spot. Then there was the rush down the street to get a "shilling in the slot" picture from the photograph machine.

Bruce remembers that, when his certificate was issued, it was suggested he could have a call sign with his initials — VK3BM. He baulked at the idea because Howard Kingsley Love, well-known radio amateur and long serving WIA president, had had the call sign for nine years. The radio inspector said: "He's just tossed it (call sign) in." Bruce believed Howard surrendered the call through "pressure from the missus".

After the then mandatory six months operating CW, Bruce moved on to telephony. During 1938, while his father and mother were travelling overseas, he lowered the two 60-foot masts and joined them into one 121 foot mast. DX heard his signal loud and strong being radiated by a big V-beam. The VK3BM signal from Quambatook was renowned.

During his parent's overseas trip, Bruce was able to line-up stations in the UK and USA so they could chat with him via amateur radio. But the conversations, which included talk of business and management matters relating to the Mann's farm, were drawn to the attention of the radio inspectors in November 1938. Bruce was given a reprimand, told that there was a maximum fine of £1000 or one year in jail, for discussing commercial matters over amateur radio. After signing a "confession" and agreeing to do his best to prevent a repeat of the infringement, no further action was taken.

Four years later, when Darwin was bombed during World War II, a car load of radio inspectors arrived at the Mann farm seeking Bruce's help. It was agreed that, should the enemy invade Australia and destroy military communication installations, the Quambatook set-up would be activated. Bruce was earlier asked to keep radio receivers in the area working so locals could hear news broadcasts.

"I also had an official request to listen to German propaganda broadcasts and report periodically on that. Their musical programs were superb, and some of the propaganda was very well done," he said.

After the war, VK3BM was reactivated with his booming signal being heard overseas long after Radio Australia had faded out.

In April 1964, Bruce made a break-through by achieving the first ever telephony contact with the USA on the 160-metre band which had been released to the Amateur Service two years earlier. Using a 136 foot high vertical with 16 radials of 126 feet each, an historic contact with signals at strength four was made with Dale Hopper W6VSS, in La Cresenta, near Los Angeles.

SCHOOL DAYS

Bruce was educated at Melbourne's Scotch College, graduating with honours in science and mathematics, and founded the college's radio club in 1923, being the first secretary. (As mentioned earlier, Bruce had obtained his 3CK experimental licence in 1922).

After entering Scotch, he soon became acquainted with four or five other boarders interested in wireless, and a day-boy, Keith Ballantyne (later VK3AKB), who wore a WIA badge. Keith proposed Bruce for WIA membership, and the pair were friends for more than 60 years.

Bruce recalls that the proper use of feed-back regeneration to boost receiver sensitivity and selectivity was "being suppressed in magazines through pressure from the military because it could interfere with their communications." However, at Scotch, the finer points of regeneration were quickly learned and applied.

The Post Master General's (PMG) Department had taken over control of wireless from the Navy, and there was discussion about the possibility of broadcasting stations, a medium which existed in the USA and being experimented with in Europe.

Then came exciting news that the Australectric Company in Little Collins Street, Melbourne, had imported a Marconi Telephone Transmitter from England.

Experimental two hour music transmissions were scheduled on Monday nights — the first such regular programs in Australia.

"I was just bursting to get home for the May term holidays to see if I could hear it at Quambatook.

We were all keyed up to hear if we could get the music on a Monday evening. Sharp at 8 o'clock there it was, loud and clear in two sets of headphones " Bruce vividly remembers.

Bruce's father heard the announcer say that he would appreciate telephone calls or written reports from people hearing the broadcast at a distance.

"I have a call from Mr Mann, 200 miles away at Quambatook in the Mallee. The greatest distance from which we have previously been reported is Seymour — 50 miles," the announcer told his audience.

The Mann family enjoyed another wireless music concert before the holidays ended.

Back at college, on telling his mates of the broadcast, they pleaded with him to rig-up a wireless set. Buying another valve out of his pocket money, a big coil of copper wire was obtained to make an antenna between school buildings, and a large six volt acculumator was borrowed from the practical physics laboratory.

At 8 o'clock the music began. Soon all 18 boarders were eager to hear the broadcast, but could not fit in Bruce's small bedroom, however they managed to get an ear to six earpieces! The music was soon shattered by the voice of the college's principal, Bill Littlejohn, who shouted: "Where is everybody?"

The senior prefect, who had been among the 18 boys, raced to him and said: "Mann has got a wireless going up in his bedroom and we are listening to the concert." Mr Littlejohn was given a complete headphone to listen, and overcome by the excitement, summoned his wife.

The principal, a senior science master, later encouraged Bruce to begin the Scotch College Wireless Club by setting aside two rooms on an upper floor with a flag pole handy to support an antenna. Initial response saw about 40 members join the club which affiliated with the WIA. The school provided some money for books and equipment, and weekly meetings were held.

Bruce remained the club's secretary until he left the school at the end of 1924 — and still occasionally has contacts with Scotch College under its call sign, VK3ACQ.

BACK TO FARM VIA EUROPE

After completing school he declined a position at University and offers of employment in the new radio industry — deciding to return to Quambatook and work in partnership with his father.

But, before becoming a farmer, his father saw a circular looking for senior college boys to join a Young Australian League seven month tour of Europe. Seeing the wonderful opportunity for Bruce to widen his horizons, Mr Mann encouraged his son to set off on the adventure of a lifetime which included 30 days at sea, each way.

Bruce says he had a very interesting visit to London University during the tour. There in a corner of the electronics laboratory was Doctor Fleming, then an Emeritus Professor, inventor of the thermionic valve.

"He retired from the professorship a tired old man, but they just left him in his old age to play around in his laboratory, because he was the man who invented the wireless valve and was a world authority on electricity."

Bruce had some of Fleming's books, and the pair chattered for half an hour, with the professor very eager to know what was happening with wireless in Australia.

On returning to Quambatook, tractors were becoming suitable for wheat farms. The honours student applied his knowledge to greatly increase production and reduce manpower by engineering some farm machinery.

His radio set had grown to five valves, with a loud speaker giving out the news and weather forecasts — the era of radio broadcasting had arrived.

There was no thought of getting a transmitting licence then because his experimental licence had lapsed while overseas and re-sitting the examinations did not appeal.

Bruce became interested in improving the quality of music being received, and all types of experiments were carried out — including the development of push-pull direct-coupled audio. A great friend and founder of the Rola Company in Australia, Len Webb, would send Bruce a prototype speaker for test, and offered any production speaker at factory price. The Mann experiments also led to improvements in the arm tracking of gramophone pick-ups.

Another friend, Murray Orr VK3OR (SK), who was leader of a jazz band, and his mother, who had been a concert pianist, heard the music Bruce was reproducing and got very excited about it. Murray told his friends on the air how good the music sounded off the gramophone records.

There was no holding a car load of Melbourne amateurs, including Max Howden VK3BQ (SK), from travelling to Quambatook to listen in person.

HEARING PROBLEM

Bruce has had a life-time interest in audio and music — a pursuit he followed despite having a serious hearing problem. The industrial deafness was caused by driving noisy high-powered tractors with no silencer nor cabin for many years.

The problem is, at 1 kHz and above, his hearing is down 60 dB. For his amateur radio activity he has done much research and used numerous speakers to cut the bass and emphasise the high tones. He built a graphic equaliser from a kit and modified it to achieve a suitable level of balance for his hearing difficulty. It is only in the last 17 years that he has used a hearing aid with compensation.

In 1962, Bruce approached a top hearing consultant in Philadelphia who said there was nothing that could be done for his hearing

problem. Bruce suggested a hearing aid with compensation but this was dismissed because of the high development cost. Using valves, Bruce built up an electronic compensation for his hearing which made a great difference. He sent a report on his findings to the Philadelphian specialist who thanked him but made no further comment.

About four years later, a traveller from the company of Angus and Coote arrived at Quambatook seeking out Bruce and giving him a prototype Swiss-made hearing aid. The only obligation was a full technical report from him after three months of use.

"They picked me out to see whether to put it into production obviously," Bruce said.

"It revolutionised my family life and public affairs." (Earlier he had been forced to relinquish the position of secretary with several organisations as he could not hear to write the minutes).

Since the first model delivered by the Angus and Coote traveller, Bruce has tested four advanced models of compensated hearing aids.

A classical music buff, Bruce enjoys listening to music and his interest has progressed from electric pick-ups to the latest Compact Disc (CD) technology.

STILL ENJOYS AMATEUR RADIO

Bruce has regular scheds on 20 metres with friends in England and into the USA on 40 metres. He doesn't call CQ anymore, but rather enjoys keeping his regular scheds.

His 30-metre tall mast and beams at his Swan Hill QTH, where he and wife Margaret retired to in 1971, is a local landmark.

The experimenter also operates via amateur satellite with a motorised antenna array of his own design.

Bruce was founding president of the Swan Hill and District Radio Club. Commenting on amateur radio in the later 1980s, Bruce said: "At my age the problem is that most of my life-long friends have gone — gone on.

"When you put put a good signal, the trouble is that all the young squirts want your card."

The modern-day on air amateur radio has "so little technical talk — the tendency is to all get into groups and pass it around quickly.

"I'm too old and slow-witted to keep up with that — the hearing doesn't help either."

ar

TOPICAL TECHNICALITIES — 4

Lindsay Lawless VK3ANJ
Box 112, Lakes Entrance, Vic. 3909

If effective length of an aerial is known it is possible to measure the field strength of an incident wave in volts per metre.

Continuing the discussion about aerial absorption cross section, it is interesting to look at some of the implications of the concept of area as a measure of aerial effectiveness.

What are the dimensions of an aerial absorption cross section? The absorption cross section of a dipole is $0.13\lambda^2$ and if the length of the element is one dimension the other is 0.26λ and the area is $\lambda/2$ by $\lambda/4$. Carrying that idea a stage further, it is probably true to say that one dimension is always parallel to the electric field. This leads to another measure of a receiving aerial's effectiveness which is more useful to amateurs — 'effective height' or 'effective length'. If the effective length of an aerial is known it is possible to measure the field strength of an incident wave in volts per metre.

The power extracted by a receiving aerial is:

$$P_i = (Eh)^2/R_t$$

E is the field strength in volts/metre
h is the effective length of the aerial
R_t is the total resistance of the aerial and

$$R_t = R_r + R_a + R_l$$

R_r is the radiation resistance
R_a is the absorption (receiver) resistance and
R_l is the loss resistance.

If R_l is comparatively small and ignored, maximum absorption will occur when the aerial is matched to the receiver by making $R_r = R_a = R_t/2$ then,

$$P_i = (Eh)^2/2R_r$$

.....(1)

and the power absorbed $P_a = (Eh)^2/4R_a$

.....(2)

and the power re-radiated is $P_r = (Eh)^2/4R_a$

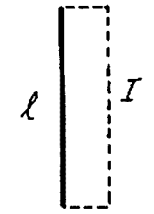


Figure 1(a) — Uniform Current Distribution.
h = l

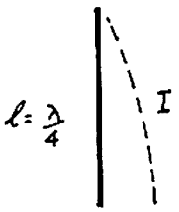


Figure 1(b) — Sinusoidal Current Distribution.
I average = 2I/π
h = 2I/π = λ/2π

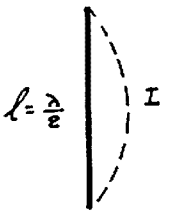


Figure 1(c) — Sinsuidal Current Distribution.
I average = 2I/π
h = 2I/π = λ/π

The actual length of an aerial equals h only if the current distribution is uniform along its length (Figure 1(a)). Practically, the current distribution on a straight wire or rod element is a portion of a sine wave (Figure 1(b) and 1(c)) and the effective current is the distribution average. The average of the distribution in both a quarter wave and halfwave aerial is $(2/\P)I$ where I is the maximum value. The effective lengths of those examples is therefore $2/\P$ times the actual length

$$h_{0.25} = \lambda/2\P$$

.....(4)

and $h_{0.5} = \lambda/\P$

.....(5)

Comparing the power absorbed by those examples:

$$P_{a(0.25)} = (E\lambda)^2/16\P^2 R_{a(0.25)} \text{ and}$$

$$P_{a(0.5} = (E\lambda)^2/4\P^2 R_{a0.5)}$$

$$R_{a(0.5} = 2R_{a(0.25)}$$

therefore a halfwave aerial will absorb twice that absorbed by a quarter wave aerial.

The important practical application of the above theory is:

$$P_a = V^2/R_a \text{ for a matched aerial}$$

.....(6)

V = the volts at the matched receiver input therefore:

$$E = 2\P V/\lambda \text{ for a halfwave aerial and —}$$

.....(7)

$$E = \sqrt{8} = 2.8\P V/\lambda \text{ for a quarter wave aerial.}$$

.....(8)

Measure V and calculate E. How do you measure V? Borrow a good signal generator and calibrate the S-meters of the stations receivers. Remember that most receivers are matched to halfwave dipoles or 50 ohm feeders.

ar

TO MULTIPLEX OR PERPLEX

Some simple experiments leading to a better understanding of multiplexing.

Jack Heath VK2DVH
2 Barclay Street, Quakers Hill, NSW. 2763

A single digit seven segment display would require eight lines, seven for segments a to g, plus one common return. See Figure 1.

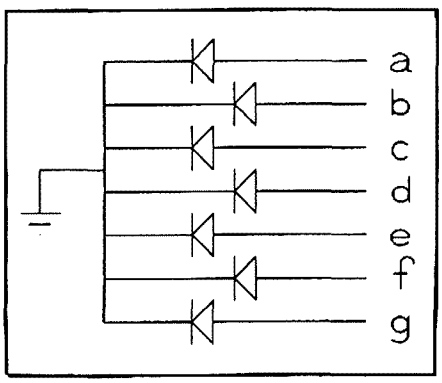


Figure 1.

Three digits would require 24 lines and so on. There is a simpler and more economical way of achieving this. If we take a three digit display and join all the a segments together, b together, and c together, etc, we would get the result shown in Figure 2.

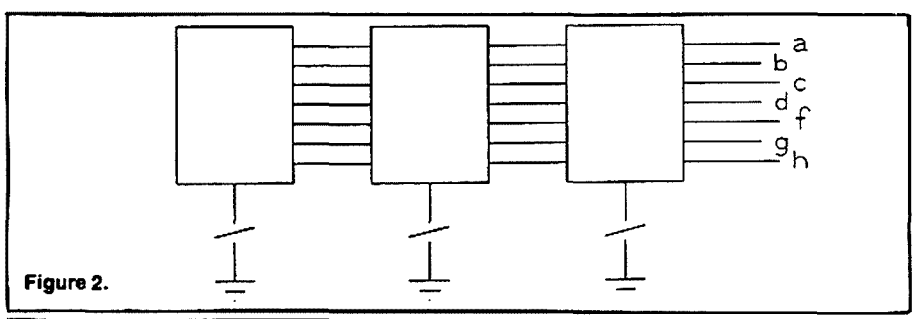


Figure 2.

Note that each digit common cathode line is taken to earth via a switch. If we apply a positive voltage (two volts approximately) to say segment a, it will not light until one of the digits cathode switches is closed, we now have a choice of which digit can be lit.

We can replace the mechanical switch with a solid state switch such as a transistor, see Figure 3.

By applying a positive voltage to any of the bases we can enable (switch) that particular digit and by means of a selector switch we can enable any segment we want to light.

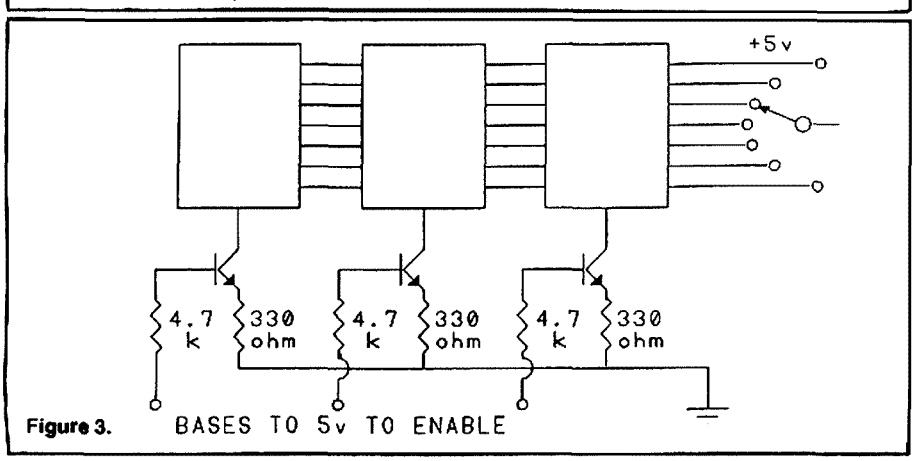


Figure 3.

Going a step further we can replace the switch that goes to the bases of the transistors with an IC type 4017, which is a divide by 10, but for our particular purpose we will use only three of its outputs, (of the available 10) as a stepping switch. (See Figure 4).

By applying a positive going pulse (how this is achieved will be described later) to the input of the 4017 we can activate each of the three inputs sequentially. So, now we have a solid state sequential switch activating digits and a mechanical switch for segments.

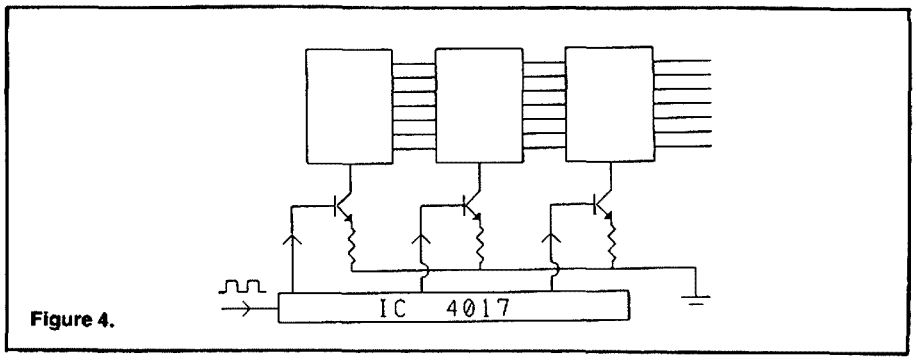


Figure 4.

For our pulse generator we will use a 555 IC connected as shown in Figure 5.

A seven segment mechanical switch is rather cumbersome and not of much use, so a second 4017 is used as a segment enabling switch activated by the same IC so it will step in unison with the first 4017.

So far we have a three digit display with two stepping switches and little else (Figure 6).

Supposing you want to display the word LES (the use of numerals has been avoided). Outline of line one, IC3 I would connect three diodes to segments d, e and f forming the letter L.

Out of line two, IC3 connect five diodes to segments a, f, e, d and g, forming the letter E.

Out of line three, IC3 connect five diodes to segments a, f, g, c and d, forming the letter S.

As both 4017 ICs are driven by the same 555 they will step in unison, so the first digit will display the letter L, the second digit the letter E and the third digit the letter S.

Figure 7 shows the complete circuit.

The circuit in Figure 7 will spell out LES and keep repeating itself. For a permanent display, the clock frequency can be increased.

The display used here had twelve digits already connected for multiplexing of which we could use 10 digits the number of drives available from the 4017. The display cost 75 cents.

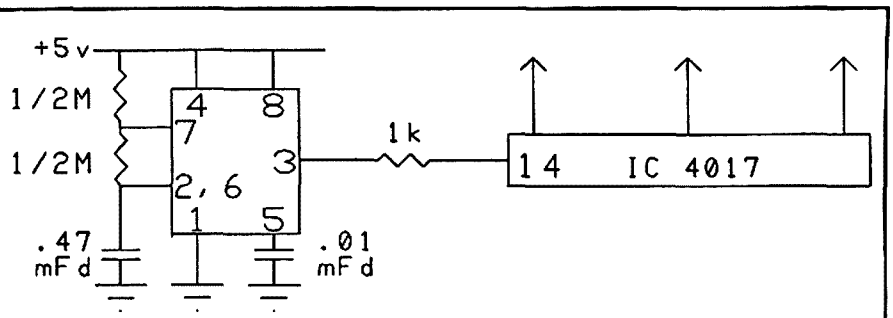


Figure 5.

NOTE: Some 555 ICs will not work at five volts although the ones used here worked as low as three and a half volts.

POWER SOURCE

If four penlight cells are used it is necessary to connect two diodes in series to drop the voltage to approximately five volts (see Figure 8).

All inquiries to the above address. Please enclose an SAE for reply.

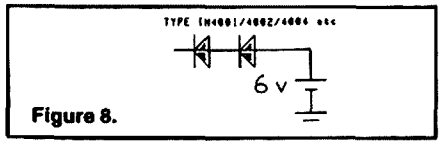


Figure 8.

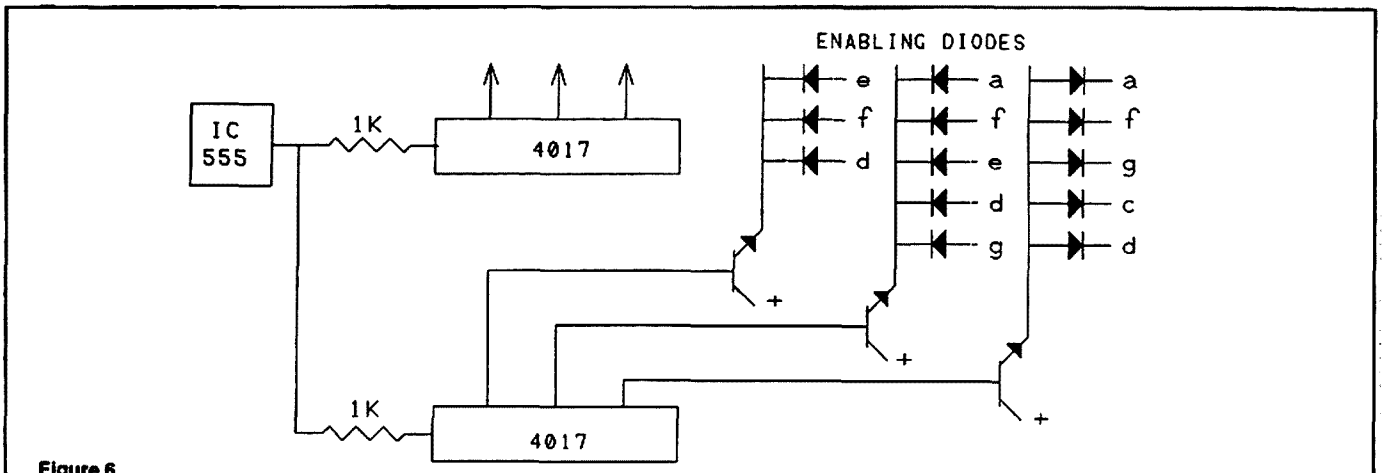


Figure 6.

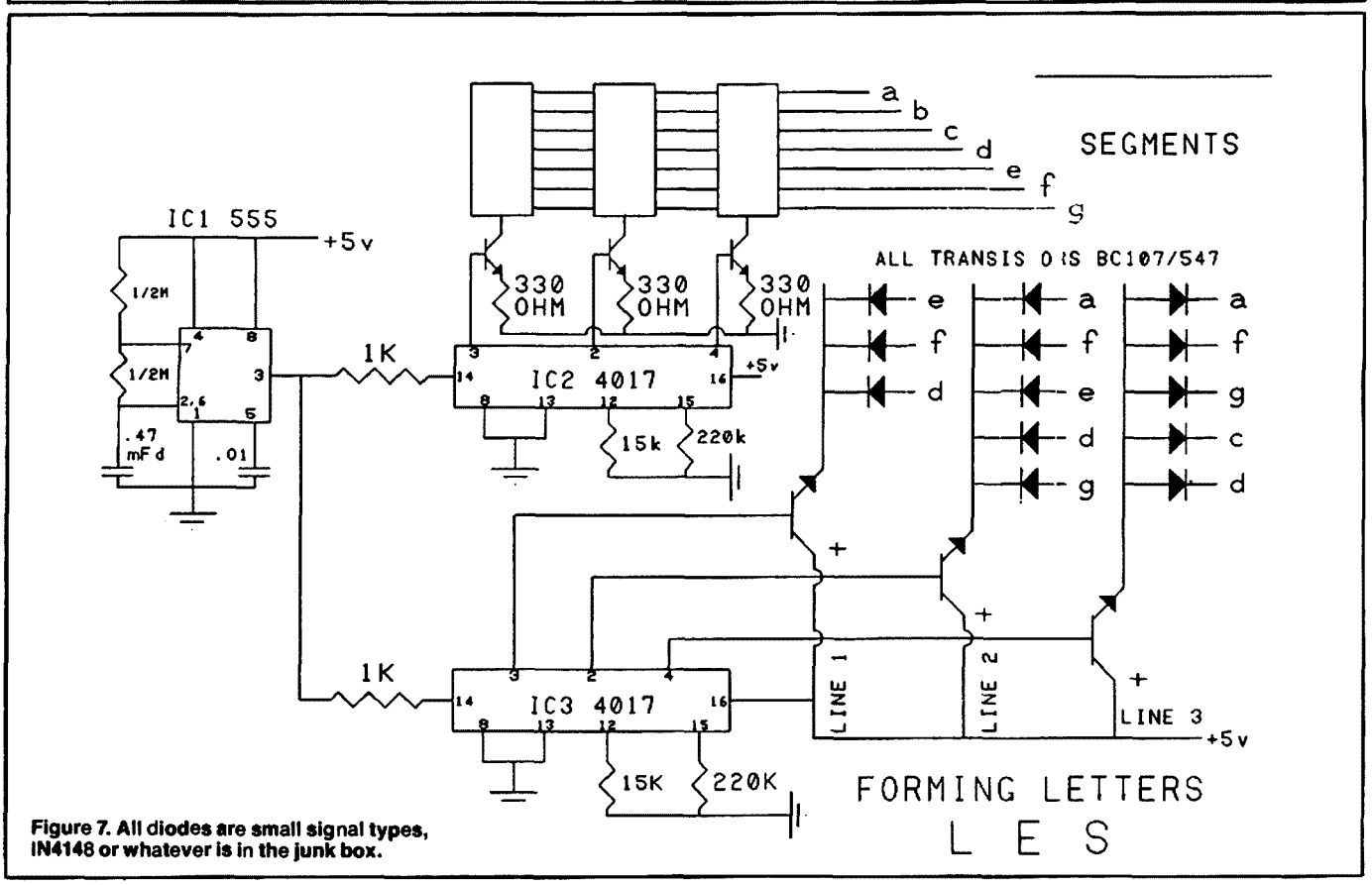


Figure 7. All diodes are small signal types, IN4148 or whatever is in the junk box.

TANK CIRCUITS & OUTPUT COUPLING

Lloyd Butler VK5BR
18 Ottawa Avenue, Panorama, SA. 5041

The output tuning and coupling of the final RF amplifier is an important part of the transmitter.

IT IS DESIGNED to load the amplifier for optimum power output with a minimum of harmonic content. Here are a few notes on its design.

INTRODUCTION

To obtain high efficiency, final RF power amplifiers for single sideband operation are normally operated in Class AB or Class B and those for CW or FM operated in Class C.

In coupling a tuned RF power amplifier to its load (the antenna or antenna feed line), two requirements must be satisfied:

1. The correct load resistance, which will enable the amplifier to deliver its rated power, must be presented to its output.
2. The loaded Q factor must be carefully selected. Plate current in a class AB, B, or C amplifier does not flow for the complete period of an AC cycle and the waveform is maintained by the inertia of the tuned circuit. Too low a Q causes waveform distortion and increased generation of harmonics. As Q is increased, circulating current in the tank circuit is also increased and if made too high, it causes excessive IR power loss in the circuit. A loaded Q of 12 is considered optimum although values between four and 20 might have to be tolerated over the tuning range of a multi-band amplifier.

RF amplifiers can also be operated in a wideband or untuned mode and for this method of operation, a low pass filter is required in the output circuit to reduce harmonics generated by the waveform distortion.

In the following paragraphs, a simple design procedure will be discussed for the tuned amplifier and the wideband untuned amplifier in turn.

LOAD RESISTANCE

For valve RF power amplifiers operating at power levels suitable for amateur use, load resistances (RL) in the region of 1000 to 7000 ohms are typical. The *ARRL Handbook* provides the following approximation for valve RF amplifiers:

$$\text{Class A RL} = \frac{Eb}{1.3Ib}$$

$$\text{Class B RL} = \frac{Eb}{1.5IB}$$

$$\text{Class C RL} = \frac{Eb}{2Ib}$$

where Eb = Plate voltage
and Ib = Plate current (Amps)

For the valve power amplifier, the required load resistance is normally much higher than the transmission line impedance (typically 50 ohms). By comparison, the transistor power amplifier requires a load much lower than the transmission line impedance. Neglecting bottoming voltage, the load resistance of a single ended transistor amplifier is calculated from the following:

$$RL = \frac{Ebb^2}{2Po} \quad \ldots a$$

where Ebb = Supply voltage
and Po = Power output (watts)

For a 13.5 volt supply and output powers between 10 and 100 watts, RL varies between 9.5 and 0.7 ohms.

There could be some confusion in applying the expressions to sideband transmission where both the power output and plate current swings with speech modulation. In this case, Po should be taken as the maximum RMS power delivered, or PEP power and plate current should be taken as peak DC current swing.

BASIC TANK CIRCUIT

To set the required loaded Q factor in the basic coupling circuit of Figure 1a, the tuning capacitor and inductor in the tank circuit must be selected for the correct reactance at the frequency of operation. Reactances (XC and XL) are calculated as follows:

$$XL = XC \quad \frac{RL}{Q}$$

where Q = loaded Q (say 12)

Capacitance and inductance are calculated then using the usual formulae:

$$C = \frac{10^6}{2\pi.f.XL} \text{ pF} \quad \ldots b$$

and

$$L = \frac{XL}{2.\pi.f} \text{ uH} \quad \ldots c$$

where f = frequency in MHz

The number of turns on the primary (Np) of T1 is set by the inductance calculated. Where the secondary is tightly coupled to the primary, such as in a multi-filar wound toroidal transformer, the secondary turns (Ns) are calculated as follows:

$$Ns = Np. \frac{RA}{\sqrt{RL}} \quad \ldots d$$

where Ra = Antenna or transmission line load resistance.

When using such a transformer, there is no provision for loading adjustment except for connection of different combinations of multi-filar windings (if such a facility is available). Hence, the antenna circuit must be carefully matched to ensure that the selected value of Ra (say 50 ohms) is presented to the transformer secondary.

With an air wound coupling transformer, the coupling coefficient is lower and more secondary turns than that given by the previous formula, are required. The degree of

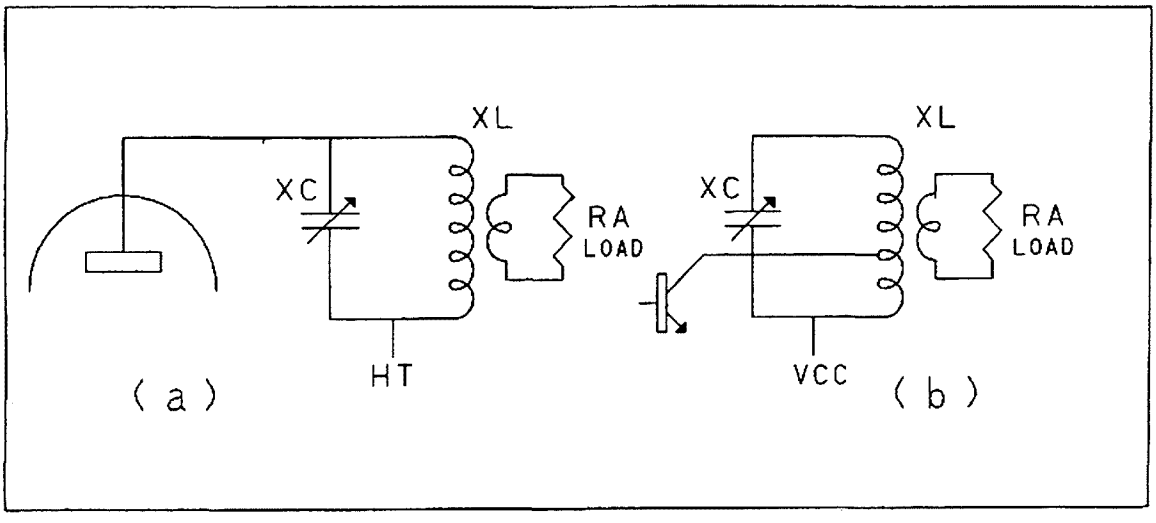


Figure 1: Basic Tank Circuit.

coupling can be adjusted by either taps on the coils or by varying the spacing between primary and secondary. Adjustment is usually carried out by initially resonating the tank circuit with the secondary loosely coupled and then gradually increasing coupling and re-resonating until the rated loaded power amplifier current is achieved.

Resonance is indicated by a pronounced dip in plate (or collector) current. If the off-resonance current is too low to achieve the rated loaded current when dipped, the amplifier may have insufficient input drive power. A variable tuning capacitor is usually fitted in the tank circuit and a tuning procedure could be to initially set the capacitor value near that calculated to give the correct loaded Q, then adjust the indicator taps for near resonance and finally fine tune with the capacitor.

The circuit of Figure 1a, as it stands, is somewhat impractical for transistor use. Suppose RL = 1 ohm and Q = 12, then XC = 12 ohms and at 1.8 MHz we would need the somewhat large capacitance of 7400 pico-farads. The situation can be improved by tapping down the collector connection on the inductor as shown in Figure 1b. If a tap were selected at a quarter of the turns, the 12 ohms would be increased by a factor of four squared giving a value of XC = 192 and a capacitance at 1.8 MHz of only 460 pico-farads.

THE PI COUPLER

The Pi coupling network (Figure 2) is a suitable coupling system where it is necessary to reflect, to the output of a power amplifier, a high resistance load from a lower impedance transmission line. It is ideal for coupling a valve power amplifier, normally requiring a high resistance load, to a low impedance line.

To examine this network in more detail, we divide the network into

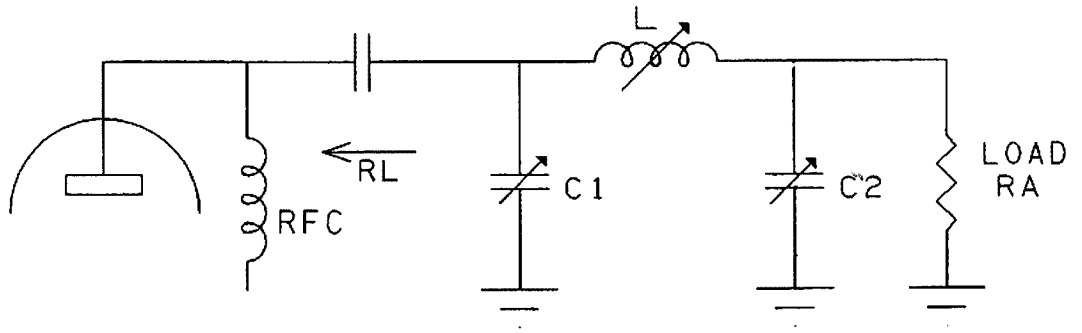


Figure 2: Pi Coupling Network.

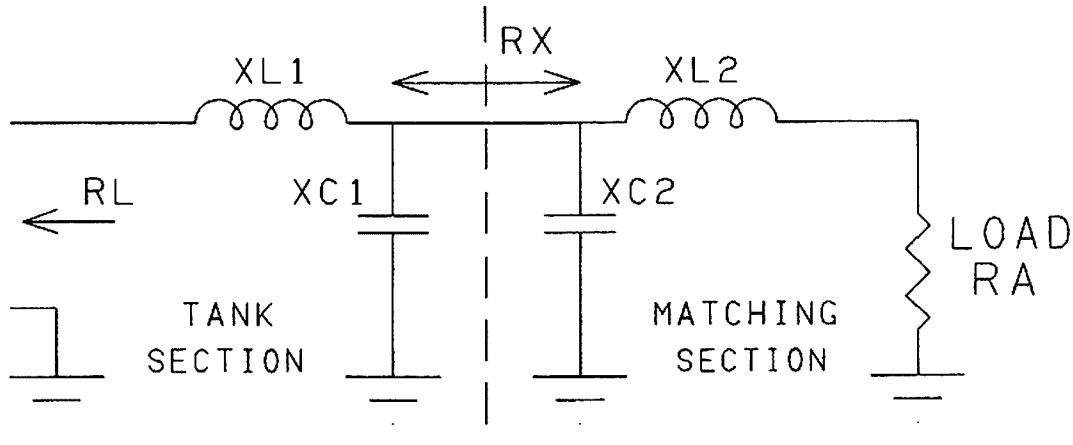


Figure 3: PI Network split into two sections for analysis.

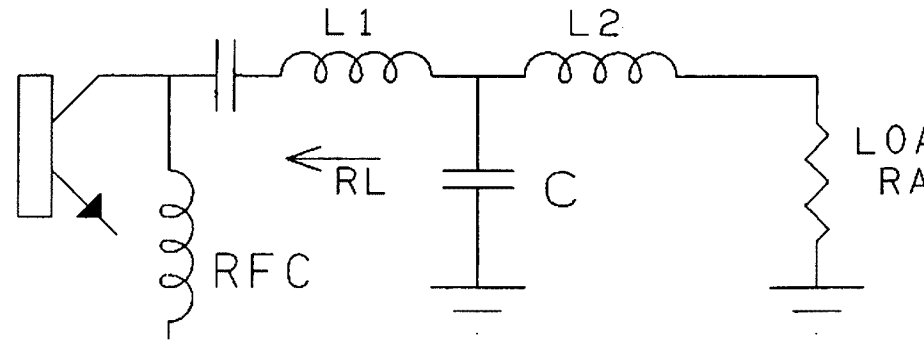


Figure 4: 'T' Coupling Network.

two sections (Figure 3), splitting the inductor (L) into two parts, L1 and L2. The first section can be considered to be the tank circuit which sets the correct value of loaded Q. To reflect the correct value of RL to the amplifier output, a resistance value of Rx must be presented at the tank circuit output. The two reactive components and Rx, are calculated as follows:

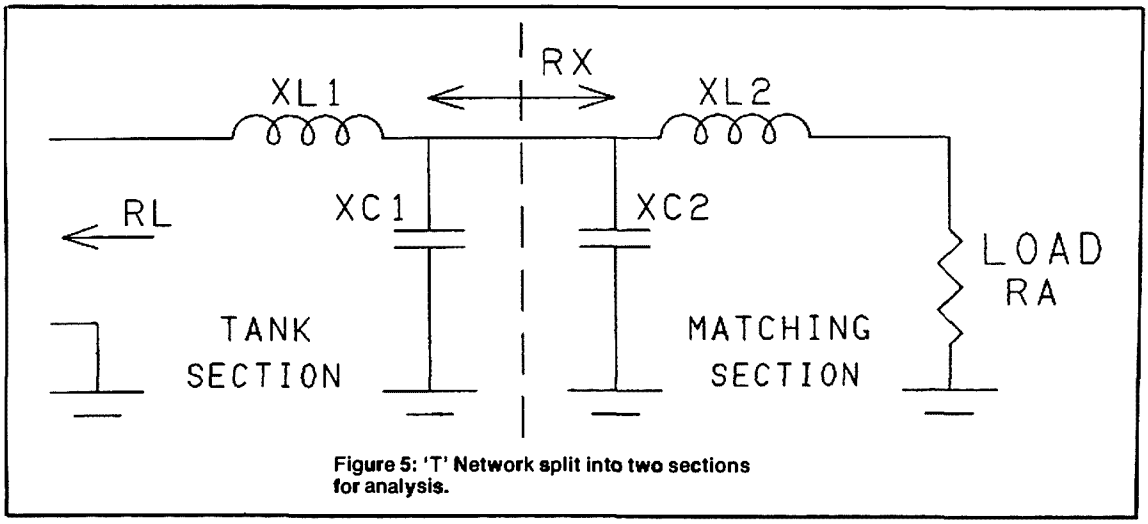


Figure 5: 'T' Network split into two sections for analysis.

$$XL1 = \frac{RL}{Q}$$

$$XC1 = \frac{XL1}{RL}$$

$$RX = \frac{}{Q^2 + 1}$$

where Q = loaded Q (say 12)

The value of Rx is normally lower than 50 ohms and the purpose of the second section is to match this resistance to the transmission line impedance (Ra). Making use of formulae described in references 1 and 2, we calculate the reactive components in the second section as follows:

$$XC2 = \sqrt{\frac{RXRA^2}{RA - Rx}}$$

$$XL2 = \frac{XC2 \cdot RA^2}{RA^2 + XC2^2}$$

Putting the two sections together, a single inductive reactance (XL) is formed by the sum of XL1 and XL2. The components L1, C1 and C2 are calculated from their reactances, as before, from the formulae b and c.

The Pi coupling system is often considered desirable because its formation makes up a low pass filter which attenuates the harmonic components.

In the preceding discussion, the transmission line load has been considered as resistive, however, the three components in the network are normally made adjustable and can be used to also correct for reactance in the line load.

A tuning method for the Pi coupler is suggested as follows:

1. Preset the inductor near its desired value (hopefully set for a suitable loaded Q).
2. With C2 set for maximum value, resonate the plate circuit using C1.
3. Increase the loading gradually, by decreasing C2, until the rated input power is reached. (For each change of C2, reset resonance with C1).

THE T NETWORK

For the transistor RF power amplifier, where the amplifier load (RL) is low compared to the transmission line impedance, the T network (Figure 4) is more suitable.

Again we split the network into a tank section and a matching section with capacitor C split into two parts C1 and C2 (refer Figure 5). In this case, Rx is made greater than RL and calculation, for the tank section, is as follows:

$$XL1 = RL.Q$$

$$XC1 = \frac{XL1}{}$$

$$Rx = \frac{}{RL.(Q^2 + 1)}$$

For the transistor power amplifier, Rx also works out greater than Ra and, in the matching section, we again use the formulae from references 1 and 2, to calculate the reactive components as follows:

$$XL2 = \sqrt{(RX - RA)\,RA}$$

$$XC2 = XL2 + RA^2/XL2$$

Putting the two sections together, the reactance (XC) of capacitor C, is the parallel result of XC1 and XC2, ie

$$XC = \frac{XC.XC2}{XC1 + XC2}$$

The components L1, L2 and C are calculated from their reactances, as before, from the formulae b and c.

As stated earlier, the load resistance (RL) for a transistor is normally quite low and certainly less than the transmission line impedance (typically 50 ohms). Using power MosFET transistors, the supply voltage is often much higher than that used with bipolar transistors and for low power stages of the MosFET type, the load resistance might turn out to be greater than 50 ohms. For this case the Pi network might be more suitable than the T network. To make the decision, work out the value of RL first. If RL is greater than the line impedance, use the Pi network. If it is less thah the line impedance, use the T network.

UNTUNED OR BROADBAND AMPLIFIER

Instead of using a tank circuit, transistor RF power amplifiers of today are often coupled to the antenna transmission line via untuned broadband transformers. Harmonics of the operational frequency components are reduced by feeding the output via a low pass filter which has a cut off frequency some 20 to 30 percent above the operating frequency (refer Figure 6).

If the amplifier is to work in a linear made for single sideband operation and a high efficiency is to be achieved, it must work in class AB or class B where amplifier current flows for less than the whole AC cycle. In the opinion of the writer, a broadband linear RF amplifier, *operating* in class AB or class B, should be given the same design considerations as a similar class of audio amplifier, that is, it should operate push-pull to maintain continuity of amplifier current flow for the whole AC cycle. (It is a different case to the single ended tuned amplifier which has the inertia provided by a tank circuit to maintain a good waveform).

Notwithstanding what has been said in the previous paragraph, circuits are published for single ended broadband linear amplifiers which rely on a following low pass filter to remove the harmonic components generated. However, in these, one must question the level of additional components, within the filter passband, which might be generated by intermodulation between the various sideband components passing through the amplifier. Another point is that second harmonic components are those nearest to the fundamental frequency and the least attenuated by the slope of the low pass filter. Push pull operation helps by balancing out these particular harmonics.

A few words can be said about the load resistance of a push pull transistor amplifier. Formula a, previously given, is for a single ended stage. If the amplifier works push pull class B, each transistor works on half a cycle and the load resistance across one half of the output transformer should be the same as formula a. The load resistance (Rcc) across the complete winding is four times this, ie:

$$Rcc = \frac{2Ebb^2}{Po}$$

For push pull class A, each transistor shares half the power over the full cycle and each should see a load resistance, at its own half of the transformer primary, twice that of formula a. The load resistance across the complete wind is four times that of the half wind, *ie*:

$$Rcc = \frac{4Ebb^2}{Po}$$

For class AB, one must judge whether operation is closest to class A or class B.

The coupling transformer should be tightly coupled with multi-filar type windings and a ferrite core. The primary reactance, at the lowest operating frequency, should be a number of times larger than the primary load resistance (RL). Turns ratio (T) is calculated from:

$$T = \sqrt{\frac{RA}{RL}}$$

The design of the low pass filter can take many forms depending on the type of filter ad

ripple specified in the passband. The following is presented for the design of a 50 ohm 0.1 dB ripple Chebychev filter as applied in Figure 6:

$$L1, L2 = \frac{12.38}{fc} \text{ uH}$$

$$C1, C3 = \frac{4142}{fc} \text{ pF}$$

$$C2 = \frac{7134}{fc} \text{ pF}$$

where fc = the cutoff frequency in MHz

With fc 25 percent above the operating frequency, the filter should attenuate the second harmonic of the operating frequency by about 35 dB and the third harmonic by about 55 dB. To achieve a satisfactory filter response, aim for a high loss resistance such is found in ceramic capacitors.

SUMMARY

Design procedures for various methods of coupling RF power amplifiers to the transmission line have been described. Coupling systems described are divided into those which are tuned and those which are untuned and broadband.

For the tuned systems, you may choose to use a simple tuned tank circuit or take advantage of the harmonic reducing characteristics of the Pi or T network. Where the transmission line impedance is less than the load impedance required to be reflected to the amplifier (such as for the value amplifier), use the Pi network. Where it is greater (such as with the transistor amplifier), use the T network.

For the untuned wideband system using an RF power amplifier operating in class AB, B, or C, a low pass filter must be included to reduce harmonics radiated.

References

1. LLOYD BUTLER, VK5BR. *Loading up on 1.8 MHz.* Amateur Radio *December 1985.*
2. LLOYD BUTLER, VK5BR. *An Approach to Antenna Tuning.* Amateur Radio *June 1987.*

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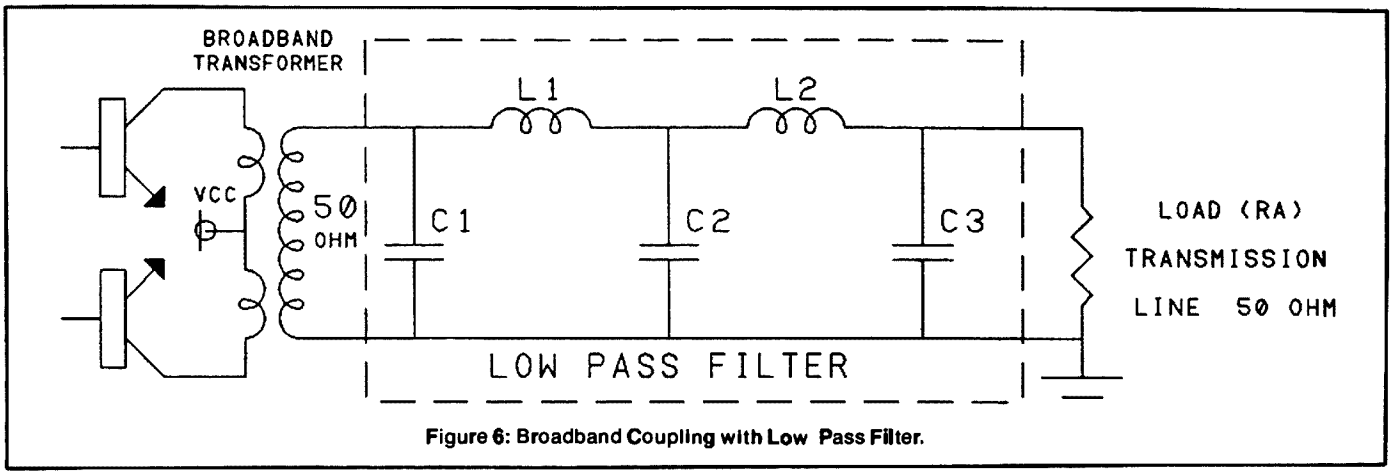
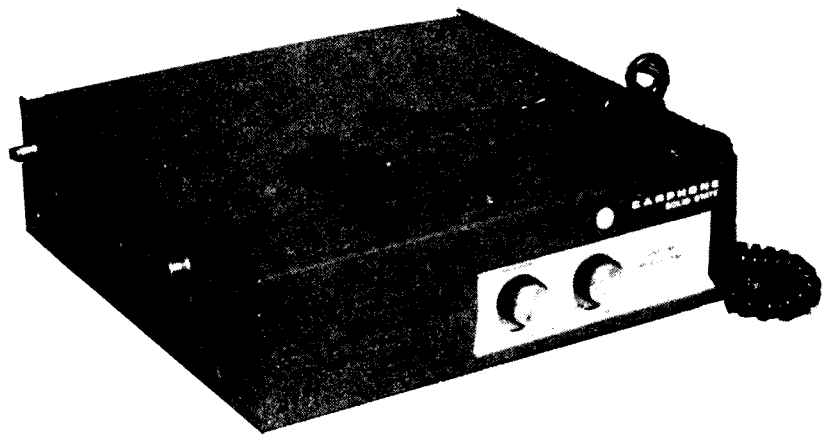


Figure 6: Broadband Coupling with Low Pass Filter.

CONVERSION OF THE AWA 25M TO SIX METRES FM

Ian Keenan VK3AYK
6 Pretoria Street, Caulfield South, Vic. 3162

The AWA 25M/21 is a low band (70 to 85 MHz) solid state 25 watt mobile radio which made its appearance in the early 1970s.



The 25M/21 is constructed on four major circuit boards; receiver, transmit exciter, audio and preamplifier board. The receiver has a 10.7 MHz first IF followed by a 455 kHz second IF. The transmitter is phase modulated and, by a process of three tripler stages, obtains the carrier frequency.

MODIFICATIONS

1. RECEIVER

The 25M receiver, in my opinion, was not the most sensitive for its time so, in this case, it is not prudent to merely pad the front end coils with capacitance to make them tune the six metre band without further degrading its capabilities. Instead, the coils should be rewound. NOTE: The wire sizes for this are the same as the original. All rewound coils should be spaced to occupy two thirds of the receiver coil formers.

Carefully remove the receiver circuit board, taking note of all wiring connections to the board. Note that all coil formers on the receiver have a base. The coil cans have two flaps, one on each side of the can. By using a small instrument screwdriver, these can be bent out from the underside of the base allowing the can to be removed without the need to remove the whole assembly from the circuit board.

Locate can TR1 (front end coil) and rewind the secondary with eight turns. The primary should be increased to two turns interwound with the secondary at the bottom of the coil. Change C1 from 18 pF to 22 pF Locate L1, observe the direction of winding, then rewind it with eight turns tapped at 6.5 and 4 turns from the bottom. Change C6 to a 22 pF capacitor. L2 is rewound with eight turns tapped at 4.5 and 1.75 turns from the bottom.

C8 remains unchanged at 22 pF Finally comes the question of the receiver front end filter. This can be omitted if liked, however I retained it as it does add additional front end selectivity. L1 and L3 of the filter should be rewound with eight turns tapped at 2.5 turns from the bottom. C3 and C6 are replaced by 47 pF capacitors. L2 is rewound with eight turns tapped 1.5 turns from the bottom. C5 is change to a 33 pF capacitor. There are no alterations to the multiplier stages as injection is now on the high side of the signal.

The receive crystal is calculated as follows:

Receive Crystal Frequency = Fc + 10.7/2
Hence for 52.525 MHz:
= 52.525 + 10.7/2
= 31612.500 kHz (K-style)

2. TRANSMITTER

The transmitter originally used three tripler stages to obtain the operating frequency. In this case, the last tripler (VT7) is changed to a doubler. Locate L6 and solder a 30 pF ceramic capacitor across the under side of the coil (copper side). This then is in parallel with C51 which is located inside can L6. Remove C55 and replace it with a 56 pF capacitor. Turning now to the PA board, remove L1 and rewind it with 18 turns of 26 gauge insulated wire. L4 is rewound with five turns, L8 with four turns, both close wound. Finally, L11 is rewound with six turns, the length of the coil is expanded to about 18 millimetres in length. I found that it was not necessary to alter the low pass filter which is located behind the aerial connector.

The transmitter crystal is calculated as follows:

Transmitter Crystal Frequency = Fc/18
Hence for 52.525 MHz:
= 52.525/18
= 2918. 055 kHz (D-style)

ALIGNMENT

1. RECEIVER

Insert the receive crystal into the socket, connect the meter between TP1 (+VE) and TP2 (-VE) on the receiver board. Adjust TR2 and L3 for maximum and then readjust TR2 for a peak. Note this figure and then wind the slug of TR2 in until 80 percent of the original indication is obtained. This will be around 36 microamps. Then adjust TR3 for a minimum reading around 14 microamps. Apply a signal at the carrier frequency to the aerial socket. Adjust L2, L1, TR1, L4, and L5 for a maximum meter reading. The meter, in this case, is connected between TP17 (+VE) and TP18 (+VE) on the 2.5 volt range. Gradually reduce the input level as the front end is brought into alignment. Tune L1, L2 and L3 of the receiver input filter for maximum reading on the meter. Finally, net the receiver from a known accurate source. With a meter connected across TP13 and TP14 adjust crystal netting capacitor C101 for a zero reading on the meter. If you are able to check the quieting it should be about 20 dB for 0.8 microvolts input or if you are lucky, better!

2. TRANSMITTER

Connect a sensitive power indicator (50 ohms) to socket SKA of the exciter. Insert the crystal into the socket, connect the meter between TP13 (-VE) and TP14 (+VE) on the exciter board. Key on he tansmitter and adjust TR1 for maximum and L3 for minimum, then adjust L2 for 80 percent of a peak (around 28 microamps). Transfer meter -VE to TP16 and tune TR1, L3 and TR2 for maximum. Adjust L4 for minimum (around 45 microamps). Transfer the meter to TP15, and adjust L4 and TR3 for a maximum reading, then tune L6 and L7 for maximum into the sensitive RF indicator. Power should be between about 25 to 60 mW out of the exciter. Disconnect the low power indicator and restore SKA to the power amplifier board and connect a power meter to the aerial socket.

CAUTION

When tuning capacitors on the PA board the transmitter should only be keyed on for short periods. This will prevent damage as these stages will be off-tune. Connect the meter to TP4 (+VE) and TP3 (VE) on the PA board. Tune C2 for maximum and transfer the meter to TP5 and tune C8 for maximum. Then, move the meter back to TP3 and tune C2 and C3 for maximum. As soon as power is indicated on the power meter adjust C19, C18, C14, and C15 for maximum/output power. Then, repeat above again including C8 and C13. If more than 25 watts is obtained, reduce the capacity of C14 slightly, also readjust C15. It will be found that some capacitors peak and do no cause a corresponding drop off in power as tuned further on. These should be tuned to the initial maximum and not taken any further otherwise excessive current may be drawn resulting in possible damage to a power transistor. Remove the transmitter crystal with the transmitter keyed on and ensure the RF output falls to zero. With a frequency counter net the transmitter by adjusting C101. Finally, check the deviation for 5 kHz or this can be done with another station for an adequate audio level without distortion.

Converting ex-commercial sets is an inexpensive way of getting on air. They may not have all the modes and whistles — but they don't have the same price! So, don't leave it in the garage for the next 20 years — have a go!

—Photograph courtesy Bill Trenwith VK3ATW

TOPICAL TECHNICALITIES — 5

Lindsay Lawless VK3ANJ
Box 112, Lakes Entrance, Vic. 3909

That theory cannot be found in any of the popular amateur text books is neglecting a very important subject.

A recent decision to install a desk microphone to replace the assorted microphones hanging by their coiled cords from the various appliances on my operating table revealed the fact that very little information about this subject is available to the average amateur.

Manufacturers brag about the frequency response of their microphone and readily supply an estimate of impedance but they are usually very cagey about microphone 'Pressure Response' (or sensitivity).

When a sensitivity rating is supplied it will be in one of four ways which the prospective purchaser has to interpret to decide whether or not the microphone will drive the modulating stages of the rig. The following sensitivity specification for four different models are typical:

'Pressure Response' at 1000 Hz.
Mic (a) -73 dB
Mic (b) -53 dB
Mic (c) 2.2 mV/Pa
Mic (d) 0.22 mV/μbar

Would you believe that those four sensitivity ratings are exactly the same? They are and it is necessary to retrieve some basic theory to find a practical meaning. That theory can't be found in any of the popular amateur text books which is neglecting a very important subject.

Microphone (c) deserves first consideration because the manufacturer has changed to SI units. Why others haven't done so baffles me — SI units are as essential for good modern engineering as round wheels! A pressure response of 2.2 mV/Pa means that the microphone will produce 2.2 milli-volts RMS on open circuit when the RMS sound pressure at 1000 Hz at the diaphragm is one Pascal. If the microphone amplifier matches the microphone impedance the input to the amplifier will be 1.1 mV for the same pressure. Our search for a practical use for that information continues.

An RMS sound pressure of one Pascal is a 'Sound Pressure Level' (SPL) of 94 dB above a reference pressure level of 2×10^{-5} Pascal which is recognised as the lowest sound level that can be detected by the human ear. Some call it the threshold of audibility.

Conversational speech at a distance of one metre has a SPL of 70 dB; amateur microphones should produce usable output at this level — the sample microphone will produce an open circuit output of 24 dB below 2.2 mV, which is 0.14 mV, 0.07 mV will be available at the input of a matched amplifier. Will this drive the modulating stages of all your appliances? It does not suit any of mine.

Looking at the other ratings: microphone (d) is the same as (c) because one micro-bar is 0.1 Pa and also one dyne per square centimetre, which leads to a consideration of microphone (a). The pressure response rating used for microphone (a) is still popular unfortunately, particularly with those who like to hide behind esoterics. The reference level for the quoted -73 dB is one volt and therefore it should be written -73 dBV. It means, but neglects to say so, that an RMS sound pressure of one dyne per square centimetre at the microphone diaphragm will produce an open circuit output of 73 dB below one volt which is 0.22 mV.

Rating (b) recognises the existence of SI units and is marginally preferable to (a) if you still prefer to be circumlocutory. The reference is one Pascal. Microphone (b) will produce an open circuit output of -53 dBV when the 1000 Hz sound pressure at the diaphragm is one Pascal RMS -53 dBV is 2.2 mV.

If you must buy one of those handsome desk microphones for the home station be sure to ask the salesman to quote its pressure response in milli-volts per Pascal. If he can and does, divide his answer by 30 and, if the answer is much less than the input required for your rig/s, leave it.

Here are some snippets about the same subject:

One Pascal = One Newton per square metre = 10 dynes per square centimetre = 10 μbar.

The intensity (I) of a sound wave (in fact any wave) is the average time rate of transfer of energy per unit area of a surface perpendicular to the direction of propagation. The intensity is proportional to the square of the RMS pressure,

$$I = P^2/pv \text{ watts per square metre.}$$

P is the RMS excess pressure in Pascal
p is the density in kilograms per cubic metre
v is the velocity in metres per second

For air the product pv is approximately 400 at 20 degrees Celsius.

The intensity of the threshold of audibility is approximately 10^{-12} watts per square metre.

Don't worry if you discover that you can't hear 10^{-12} watts per square metre; you are probably one of the 95 percent who can't.

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POSTCODE CONTEST — a WIA NSW Division Initiative

The old adage "use it or lose it" has traditionally been used in reference to our bands which are under pressure from other spectrum users. From time to time, efforts are made to encourage activity on bands which appear to be little used, and therefore could be difficult to defend if commercial Interests seek them.

In Victoria, the lower part of two metres has had scrambles (mini-contests) to promote SSB operation. The WIA had, one on occasion, encouraged activity on the bands gained by the Amateur Radio Service at the World Administration Radio Conference (WARC) in 1979.

Now, the WIA NSW Division has gone one step better with the introduction last November of a contest on the last Friday of every month aimed at promoting simplex operation using voice-mode.

The contests (see list below) involve 10, six and two metres, 70 centimetres, and microwaves. They have become known as the "Postcode Contests" since an integral part of the report exchange are the postcodes of the participants.

Novices can join in the fun by taking part in the 10 metre contest. That band Is virtually deserted at night and it has long been held that 28 MHz should take some of the across-town contacts using the often congested 80 metre band.

At the other end of the spectrum, contest activity is available for those experimenting in the microwave bands which will be sought after as expanding technology increases applications for information distribution systems.

The Postcode Contests are held between 9 pm and 11 pm Sydney-time on the last Friday of the month. The report consists of a serial number from 001, and the postcode of each contestant. The final sore Is the number of distinct participants worked, multiplied by the number of distinct postcodes — electronic calculators are permitted to be used to tally up the score.

The general rules are voice-mode (FM or SSB as appropriate), from a single transmitter, and rare postcode. Multi-operator stations are permitted, but the call sign of the station itself must be used. All stations in New South Wales are eligible, and, in some cases, a separate category is established for country operators, defined as operation more than 16 kilometres from the official measurement point in Bridge Street, Sydney.

Certificates for first, second and third place-winners are issued for each contest. SWL entries are welcome.

Perhaps other WIA Divisions will follow the NSW Division's example and run their own postcode contests — any volunteers out there to help organise such events? Contact your Divisional Council.

And, why not a national WARC bands postcode contest to promote activity on these bands?

The NSW Division announce contest details on its Sunday Broadcasts. Information sheets are available for each specific contest. Further details are available from the NSW Divisional Office, PO Box 1066, Parramatta, NSW. 2150, or by telephoning (02) 689 2417 weekdays between 11 am and 2 pm or on Wednesday nights between 7 and 9 pm.

POSTCODE CONTEST CALENDAR

May	Two metre SSB
June	Two metre FM
July	10 metre, microwaves
August	Six metre
September	Two metre FM
October	70 centimetre
November	Two metre SSB

Contributed by Jim Linton VK3PC with acknowledgment to the WIA NSW Division for details.

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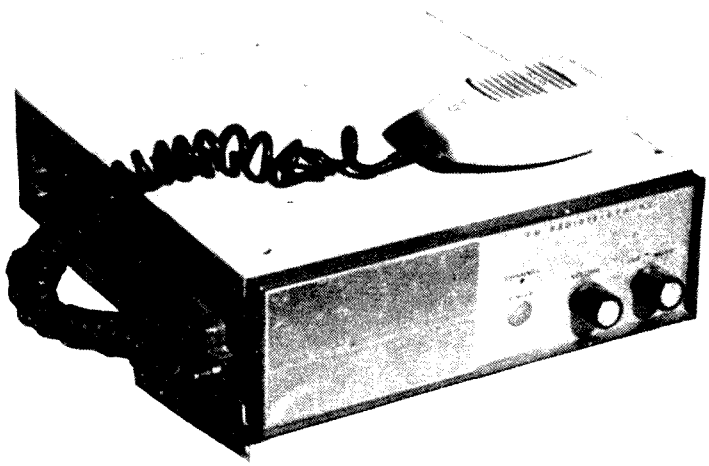
CONVERSION OF THE PHILIPS 1680 to SIX METRES FM

Ian Keenan VK3AYK
6 Pretoria Street, Caulfield South, Vic. 3162

These days, the 1680 is a comparatively old commercial mobile radio. Hence many have found their way onto the disposal market over the years.



THE 1680A/25N,W is a 25 watt low band (70 to 85 MHz) FM transceiver. There is also a 10 watt version, but the higher power one is discussed here. The A/25N is a 30 kHz model, whilst the A/25NW is the older 60 kHz channeling model. The receiver has a 10.7 MHz first IF followed by a 455 kHz IF.

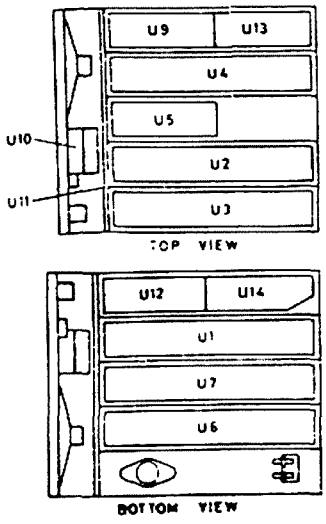


Figure 1: Layout of the various boards.

CONVERSION

Before beginning, give the unit a thorough inspection and ensure it is, as far as possible, in working order. This can save a lot of time and trouble after the modifications have been carried out.

Figure 2.

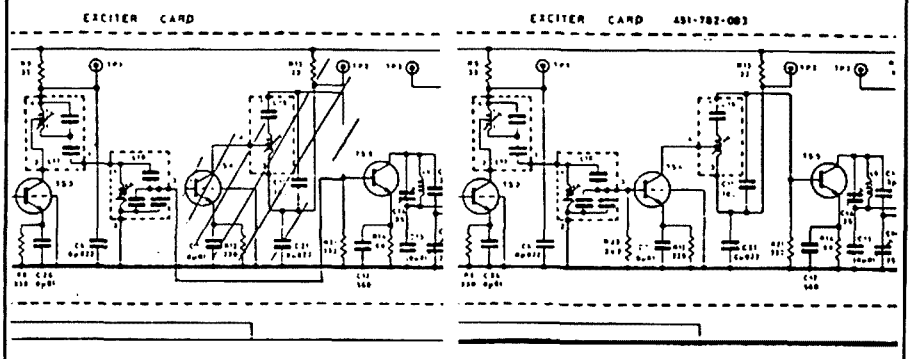


Figure 2 a: Before. **Figure 2 b: After.**

TRANSMITTER

Originally the transmitter crystal was in the range of 8.750 to 10.625 MHz. The oscillator/phase modulator is followed by three doubler stages, ie TS3 x 2, TS4 x 2, and TS5 x 2. The remaining stages are tuned to the operating frequency. To simplify conversion one doubler stage is omitted this being TS4 as per Figure 2.

Remove the exciter board from the unit. Locate transistor TS4 (refer Figure 2 and 3). Cut the track on the circuit board leading out of L18 to the base of TS4. Also, cut the track from L19 leading to the base of TS5. Then join L18 to the base of TS5. (Refer Figure 2). Thus TS4 is now bypassed.

Rewind L6, L7, L11 and L14, each with 13 turns of enamelled copper wire, the same gauge and diameter as was originally used.

Moving to the PA board (refer Figure 4), rewind L3 and L4 with nine turns — same gauge and diameter as the original coils. The old L3 and L4 should be carefully removed as these will be used later.

Next, rewind L9 and L10 with 10 turns of 14 gauge enamelled wire of the same diameter as the originals.

The crystal formula is now:

Transmitter Crystal = F(carrier)/6

Hence for 52.525 MHz

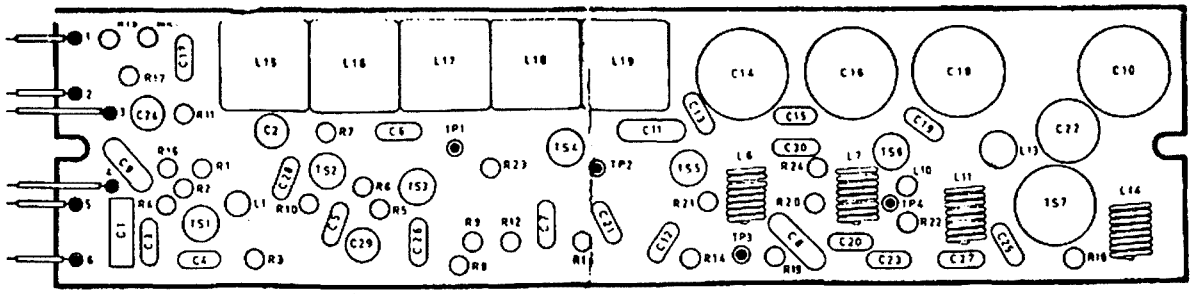


Figure 3. U2 EXCITER CARD 451-782-093

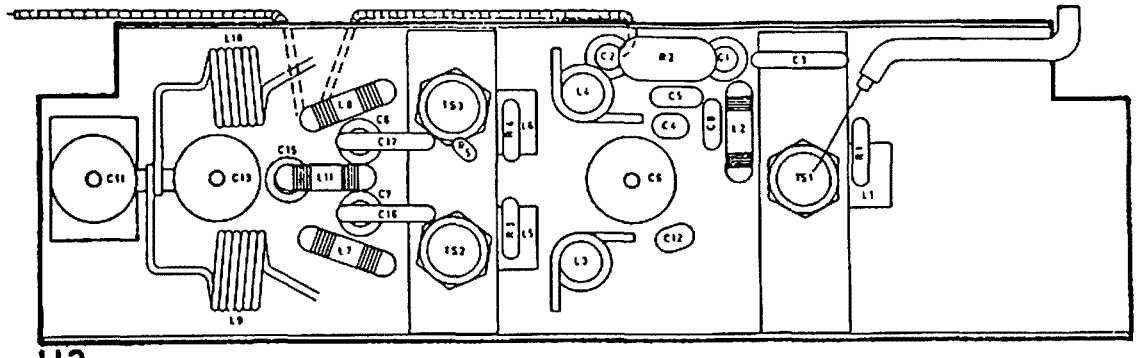


Figure 4. U3 P.A. UNIT 451-782-130, 25W.

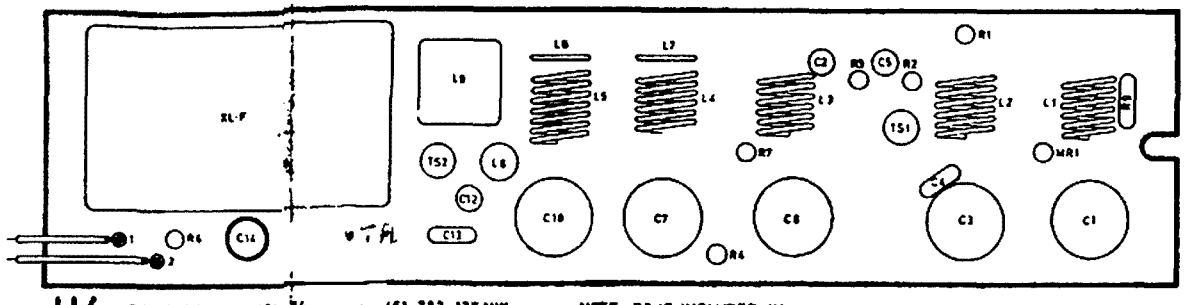


Figure 5. U4 R.F CARD 451-782-135MW. NOTE. R8 IS INCLUDED IN XL-F

= 52.525 MHz/6
= 8754.166 kHz
Specification 3502-150-0560.2

RECEIVER

Modification of the receiver involves rewinding the front end coils and the local oscillator tuned circuits. (Refer Figure 6).

Rewind L1, L2, L3, L4 and L5 with 10 turns of enamelled wire of the same gauge and diameter as the original coils. L1 should be tapped 1.5 turns from the bottom. L3 is tapped 1.75 turns from the bottom. L7 and L8 (coupled links) should be rewound to 1.75 turns each.

The coils on the local oscillator card, Figure 6, L2 and L3 should be rewound to 14 turns each and L2 is tapped at approximately the halfway point.

The Receiver crystal is calculated as follows:

Receiver Crystal = F(carrier) + 10.7/3

Hence for 52.525 MHz

= 52.525 + 10.7/3

= 21075.000 kHz
Specification 3502-150-0558.2

Finally, the low pass filter has to be modified, refer to Figure 7.

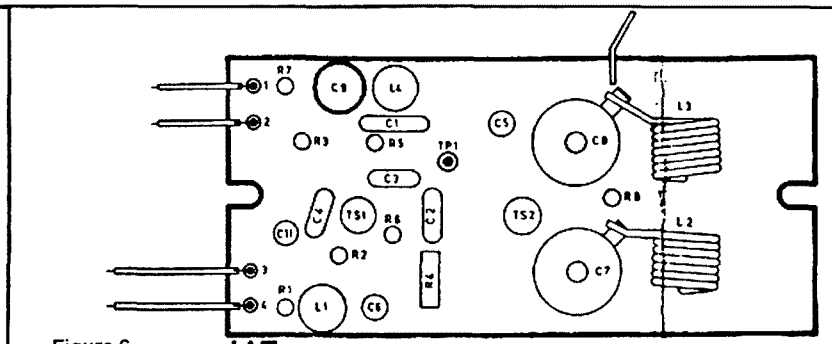


Figure 6. U5 OSCILLATOR CARD 451-782-096

Remove L1 and L2 and replace them with the coils L3 and L4 which were removed from the transmitter driver circuit.

ALIGNMENT

Set capacitors C10, C18, C16 and C14 to two-thirds mesh and C22 to two-thirds mesh. (Refer to Figure 3). Set C6 to minimum capacity, C11 to maximum and C13 to midway (refer Figure 5).

Connect a power meter to the aerial connector and insert the appropriate transmitter crystal into the socket.

a. Connect a multimeter (250 microamp range) +VE to the 11.5 volt rail or board pin 6 and -VE to TP1 (refer Figure 3). Key on the transmitter and adjust L15 and L16 for maximum (about 110 microamps).
b. Transfer the -ve lead to TP3 and adjust L18 and C14 for maximum. TP2 is bypassed due to the earlier modification (about 100 microamps).
c. Transfer the meter lead to TP4 and adjust C16 for maximum (about 70 microamps).
d. Place the multimeter leads across R2 on the PA board (see Figure 4) and tune C10 for

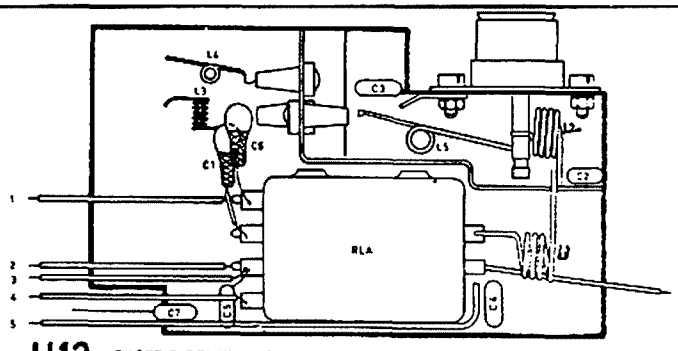


Figure 7. U12 FILTER & RELAY UNIT

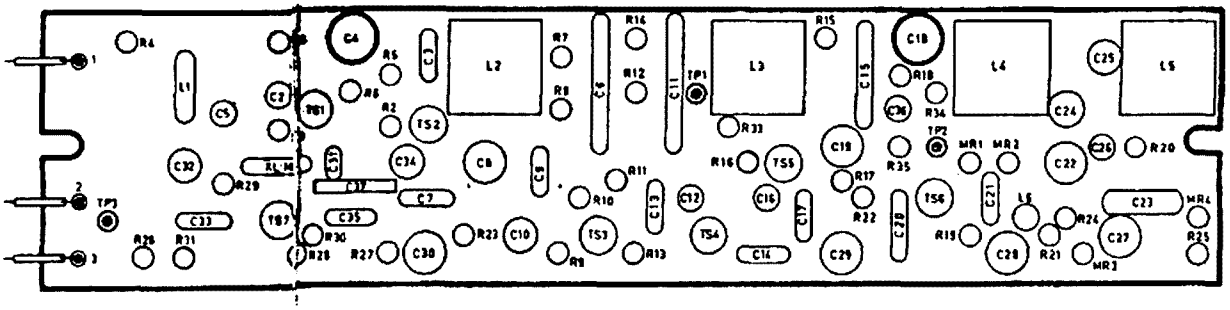


Figure 8. U6 I.F. CARD

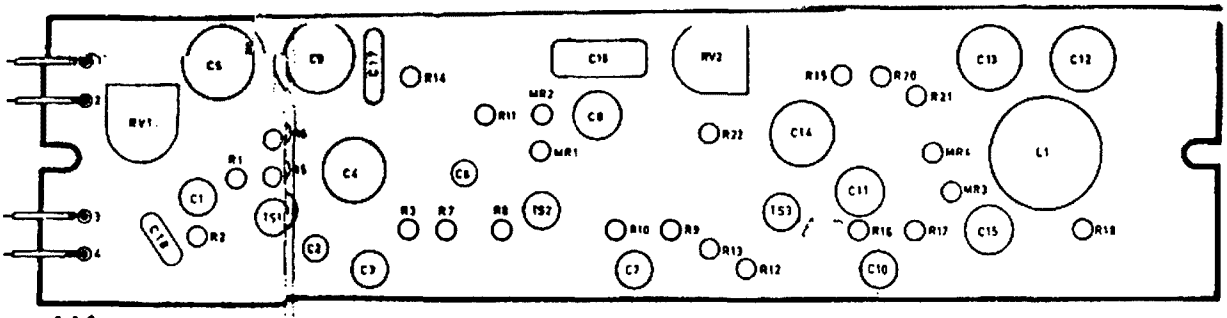


Figure 9. U1 MOD. AMP. CARD

maximum (on the exciter) around 52 microamps.

e. Tune C6 for maximum, into the power meter and, alternatively, tune C11 and C13 for maximum power. Go back and re-peak C18, C22 and C10 until 25 watts is obtained. Remove the transmit crystal whilst the transmitter is keyed on and ensure the output falls to zero.

f. With a frequency counter or on-air test with another station, adjust to the correct frequency (the coil *next* to the transmit crystal socket).

g. Check that the deviation is around 5 kHz on speech peaks with another station. RV2 is the deviation pot and RV1 is the microphone gain. (See Figure 8).

RECEIVER ALIGNMENT

Plug the receiver crystal into the socket, connect a multimeter on the 10 volt range -VE to TP1 and +VE to the 11.5 volt rail (pin 1 of the local oscillator board, Figure 6). Tune C7 for a minimum reading. Move the meter to the receiver front end board (Figure 5) -VE to TP1 and +VE to pin 2 and adjust the series crystal coil, C7 and C8 on the oscillator board for maximum.

Turn off the set several times and ensure the oscillator restarts. If it doesn't, change C1 from 68 pF to 120 pF and C6 from 12 pF to 68 pF on the oscillator board. Apply a signal at the carrier frequency to the aerial socket, then adjust the front end trimmers, C1, C3, C6, C7 and C10 for maximum receiver sensitivity reducing the signal generator level as required.

When this point has been reached, try moving coupling coils L7 and L8 and repeat above. If the receiver seems slightly deaf, try adjusting the length of the gimmick capacitor between the receiver oscillator board and the front end board mixer circuit. Sensitivity should be about 12 dB SINAD at .5 microvolt (pd) or about .5 microvolt for 20 dB of quieting.

Place the multimeter -VE on pin 2 and positive to TP3 of the IF board (Figure 9). With a *known accurate* frequency applied to the receiver aerial socket, adjust the crystal netting coil for zero volts on the meter.

This whole modification takes about three to four hours. *Hear you on six FM perhaps? ?*

—Photograph courtesy Bill Irenwith VK3ATW

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QSP

EME RECORD CLAIM

A new record for EME (moon bounce) has been set by WA4NJP, in Georgia, and K6MYC/KH6, Hawaii.

The ARRL says the contact, made on January 5, was the first trans-oceanic EME contact and the ninth ever six-metre EME contact.

Will Australia's pioneer of EME, Ray Naughton VK3ATN, mount a challenge and snatch the world record? At last report, Ray was eager to get six-metre EME operational from his QTH at Birchip.

PACKET CENTURY

Come on packeteers, who among you will be the first to claim a DX Century Club (DXCC) on this mode? Some 122 countries have now been reported on HF amateur bands using packet radio!

GETTING ON AIR — Part 4
An ATU, Antenna and Operating

Peter Parker VK6NNN
C/- Witchcliffe Post Office, WA. 6286

A very useful antenna system and ATU.

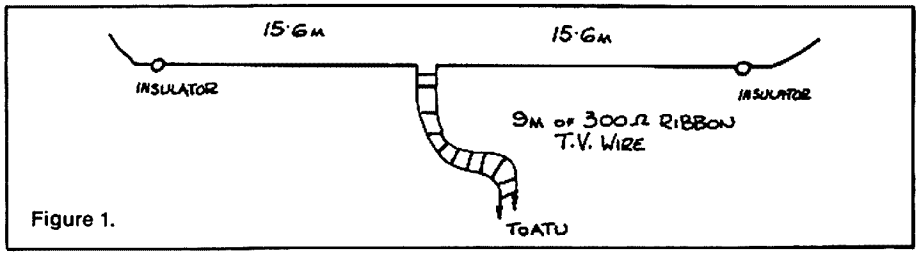


Figure 1.

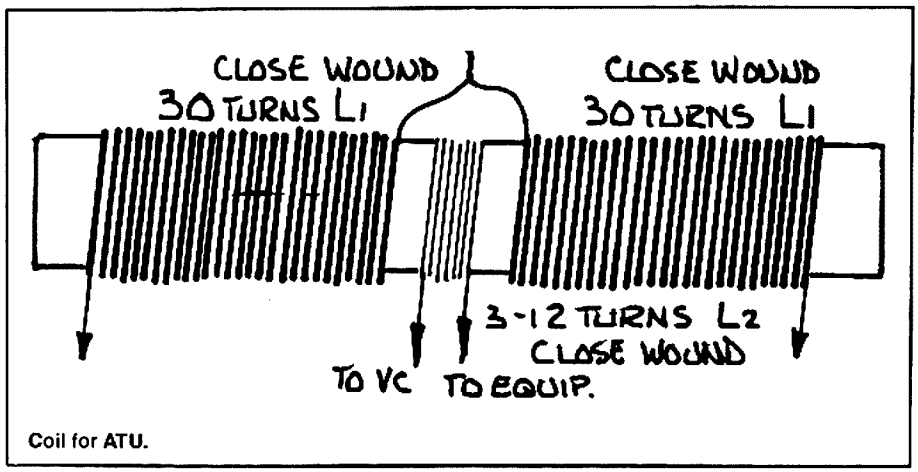
This antenna is claimed to work on all bands, but so far it has only been tested on 80 metres. It is the famous G5RV as described in AR, December 1982.

The ATU is described in AR, June 1986. The coil is wound on a 25 mm former. Insulated wire (plastic coated) is used for the coil with taps every two to three turns. Wire similar to four conductor telephone cable is suitable.

Connect the transmitter to the ATU and adjust the tune-up indicator to full sensitivity. Connect the antenna and VC1 to L1. (The writer has found it best if the antenna is two turns from the middle and VC1 16 turns from the middle).

Tune the tune-control and C1 until the meter peaks. Also peak C2. If it is better to short C2 for maximum strength, wind more turns for L2 and re- peak.

Remember to do all of your tuning in the daytime to minimise interference to other operators.



Coil for ATU.

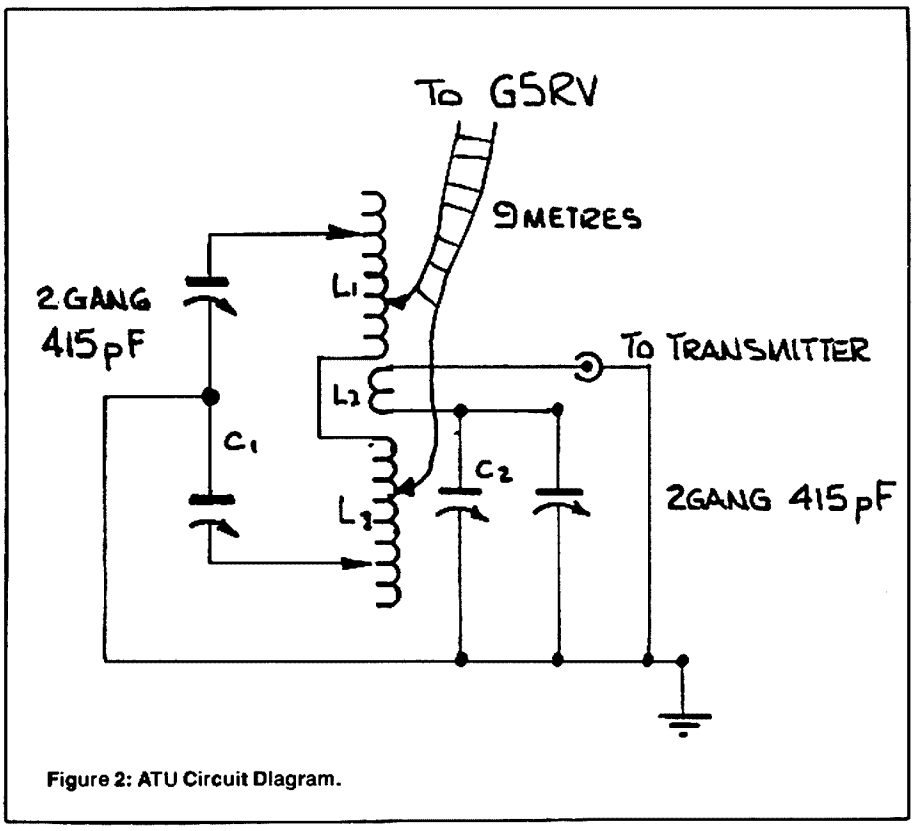
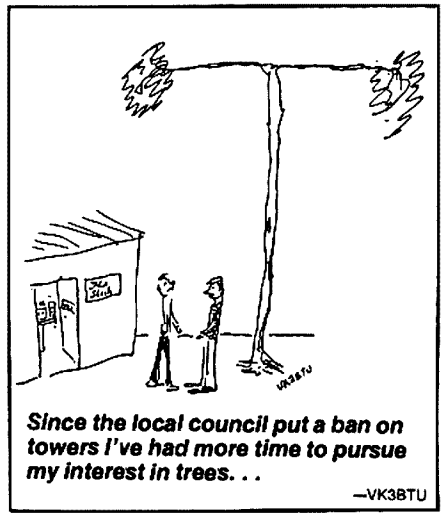


Figure 2: ATU Circuit Diagram.

Unfortunately, calling CQ on 3.580 MHz does not receive many replies as the frequency is out of the CW allocation. Ask a nearby amateur to listen for you. A good time for operating is early morning or evening time.

The band is sparsely populated and contacts up to a few hundred kilometres can be achieved with five watts.

For those living in south-west Western Australia, VK6ED will accept call- backs in CW after the WIA news broadcast on 3.580 MHz. It is wise to call in late during the call-backs so as not to delay the SSB operators.



Since the local council put a ban on towers I've had more time to pursue my interest in trees. . .

—VK3BTU

TIPS FOR FASTER COPYING WITH CW

Dean Probert VK5LB
RMD Verral Road, Hope Forest, SA. 5172

As soon as the speed creeps up a little most of us begin to experience anxiety and tension whilst attempting to write it down without missing a letter!

Every person who masters the code finds, at some time, that there are tricks and techniques which help in accurately putting on paper what is sent. There are no revolutionary breakthroughs here, just a collection of ideas which help when the speed of transmitted codes rises.

Remember when you listened to other amateurs or the WIA practice sessions? It was fine while the code was below, or equal to your level of receiving ability. As soon as the speed crept up a bit most of us began to experience anxiety and tension while attempting to get it down without missing a letter. I am sure you know what I mean.

RELAXATION

The following fundamental point must be kept in mind. Code is easier to copy, and is copied more accurately when you are relaxed in body and mind. No one wants to miss any of it. Perfection is a creator of tension leading to frustration which can build up to a destructive level. It is important to keep your efforts creative. The learning experience never ends so don't teach yourself bad habits. Think about how you can improve your code and keep tension under control. Select a style of copying which suits you and stick to it. Achieve consistency in your code habits. This will lead to familiarity, relaxation and confidence. Usa a pen, ballpoint, typewriter, or whatever suits **you.** Stick to it once you find what works for you.

DISTRACTION

I wear headphones, comfortable ones. Apart from sparing the rest of my non-amateur family the sound of the incoming traffic, I do not have the distraction of what is going on around me. Noise affects concentration and increases tension. I print. I find it easier and as fast as writing. Most of my friends find that writing code is better. (Most of the experts would agree with them. Ed).

Printing takes a little more energy so do what is best for you. Select a way of writing which is easy and natural. When increasing your code speed, write or print each letter separately. Put a space between letters and make each letter bigger than you would normally. This gives a feeling of freedom and relaxation. Have you found that, as code speed increases past your ability, you tend to write smaller and more cramped? It is a natural reaction but by writing "big" and spacing this tension can be controlled. Think small and your nerves tighten.

ATTENTION

Don't stare at the word you are copying. Especially if it is a long, unfamiliar or unexpected one. You naturally expect to be able to anticipate the rest once part of the word has been sent. Fine, but let your attention wander around the word as a whole. Let the sound of the code give you the whole word ad not the letters which make it up. If you find that the temptation is to glue your eyes to the word as it is unfolding, then cover the message if it is distracting you. The message may not take the form you have anticipated, or the portion you have copied may not make sense to you, which creates tension.

You may find the speed or the tension building to a point where you just know that you are going to miss the next letter or three coming up. Close your eyes and relax letting the sound of the code alone prompt you. The visual break stops anticipation. It acts as a tension release. With your eyes shut the only stimulus is the sound of the code.

When you miss a letter do not worry about it. Forget it straight away. In fact, if you feel you are going to miss a letter then do so. Ignore the next letter and copy the one following. If you do not ignore the one which is missed you probably will find two or three will also slip past creating a volcano of frustration. It is human nature. Especially when the code speed is pretty fast.

Accept the fact that some days it pays not to get out of bed. We have good days and the other sort. Some days are not the best for practicing faster code so why force it? You want a relaxed and confident attitude so make it as easy for yourself as possible.

HIGHER SPEED

Once code speed creeps up past about 22 words per minute the emphasis shifts from recognition of individual letters to letter groupings and word clusters such as the, of, -ing, and -ly. We must learn to recognise and copy such sounds as a reflex action.

Every code student has heard of 'copying behind' I am sure. Training yourself to copy a second or more behind the letter being sent is the idea. You consciously and deliberately delay writing down the letter sent until one or more subsequent letters are sent. It was this system that Ted McElroy used in a tournament in Ashville, North Carolina, July 2, 1939, when he officially copied code at 75.2 words per minute.

Most people at some stage write down each letter exactly as it is sent, and exactly when it is sent. This leads to slavish desperation to copy in step with the letter being sent. One therefore cannot relax one's guard for a moment for fear of missing one. I used to do it. It is a viciously uncomfortable way to copy code and limits copying speed severely. The spoken word is not made up of individually pronounced letters but of groups of sounds which make up the word. I think you have the idea.

Copying behind is the relaxing way to copy, tension free in comparison to the other way. It is also easier said than done. It takes a lot of discipline and practice to 'hold back' on writing each letter down as it is sent, the instant your hear it. Try to copy at a speed just slightly higher than your solid copy speed. Once that speed becomes comfortable, move on before your learning ability also feels too comfortable. Do not move on until you can comfortably copy behind at that speed though. Try copying in your head, without writing down what is sent. This frees you further from old copying 'slavish' habits and tensions and increases confidence. Copying behind and copying without writing are great confidence builders.

COMPUTER

I used a computer for code practice for a long time. I was able to avoid copying bad code from 'on air' amateurs and could set the speed, text or code groups to suit myself.

Some operators enjoy the rhythm so mush they improvise on the score producing the so-called Lake Erie Swingers. Copy only the best code you can on air and on computer.

Also, be realistic about how fast is practical to use on air. I can send much faster than I can receive.

My computer sends code and I use it to reduce fatigue where similar messages have to be sent over and over. I have found that attempting to receive code at speeds significantly slower than my normal speed is tiring and frustrating. For this reason it would be unwise to learn to use code at say 50 words per minute if most work is done around 12 to 18 words per minute. Only a lid would get up to 50 words per minute solely for boasting purposes or to 'big-note' himself on air. If you want to razzle-dazzle them, do it with top code and operating practices, consideration and good manners. Most of the foregoing is common sense anyway and so I wish you all tension-free-code, whatever speed you find suits you.

RATIONALISING R M S

Don Law VK2AIL
RMB 626 Adelong Road, Tumblong, NSW. 2729

If you display a sinusoidal voltage on an oscilloscope, what you see is what you've got!

Let us suppose that the amplitude is 700 volts, peak to peak. Centred on the zero axis of the graticule it is apparent that the voltage excursion is between +350 volts and -350 volts. The peak value is 350 volts. The significance is that an electric fire-bar, for instance, being totally oblivious of the actual current direction, heats up to the tune of 350 volts peak.

The anomaly is that if you applied 350 volts DC to the fire-bar it would get very much hotter and probably melt. What DC value then, would give the same heating effect, the same power or energy, as 350 volts peak?

Obviously this DC voltage will be lower because the AC voltage is not constant at its peak value and has some sort of average or mean between zero and 350 volts. (Note that the average value of a sine wave is zero but our fire-bar does not know this).

To find the mean value of a sine wave it is only necessary to sample the first quarter cycle. Remarkably few samples are needed.

Sine values range from zero at 0 degrees to one at 90 degrees, so it is convenient to use an amplitude of one volt peak in our sampling. The proportions will hold true for any voltage: our result will serve as a multiplier.

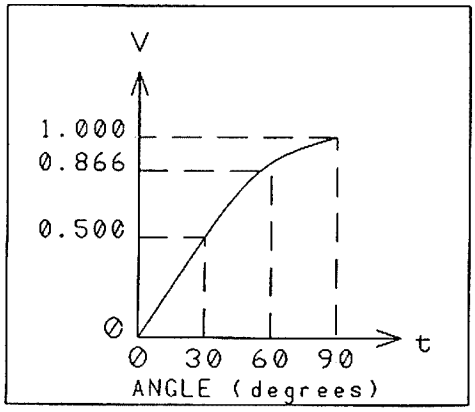


Figure 1. Note that two samples, maximum and minimum, would give the same result but would be erroneous by not taking into account the shape of the wave, ie it could be a short duration pulse.

Because P = V^2/R the samples must first be squared.

SAMPLE	ANGLE (θ)	VOLTAGE (Sine θ)	VOLTAGE²
1	0°	0	0
2	30°	0.5	0.25
3	60°	0.866	0.75
4	90°	1.000	1.00
			2.0

Divide by 4 (samples)
ANS 0.5

Needing to equate the heating effect or power we first squared the voltage samples but now, being interested in the equivalent DC voltage (for the same power) we will have to extract the square root of our answer which is 0.707. Multiplying 350 volts by 0.707 gives 254.520 volts RMS which is a little high for the mains but makes the point.

To summarise:

What you see on the oscilloscope is peak to peak.

Peak values are half peak to peak.

RMS values are 0.707 x peak, (for sine wave only).

What is this RMS? Well, it stands for Root Mean Squared or more clearly, so you will get the operational order right:

$$\sqrt{\frac{V^2_1 + V^2_2 + V^2_3 \ldots + V^2_n}{n}}$$

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MORE ON TILTING THE YAGI

Harold French VK3ZRM
RMB 1190, Yinnar, Vic. 3869

A method of single wire and earth return control which still permits the use of limit switches to obviate over-run.

I was interested to read the article by George VK3GI, describing the method of solving the beam tilting problem.

Following is a method of single wire and earth return control which still permits the use of limit switches to obviate over-run.

OPERATION

Figure 1 shows the circuit conditions which prevail when the antenna is in the vertical position.

PS will be closed in the vertical position connecting +ve from the power supply, and LED 1 will be lit to indicate that the beam is vertically polarised.

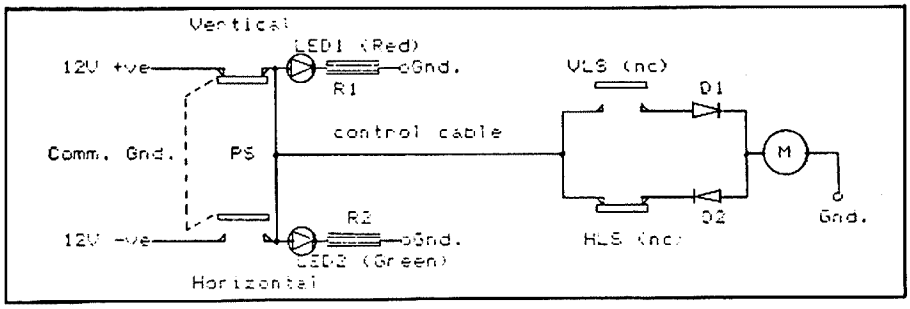


Figure 1.

PS	**SPDT Switch rated to suit the motor.**
LED 1	**Red LED.**
LED 2	**Green LED.**
R1, R2	**830 ohm, ½ watt.**
D1 D2	**Diodes to carry Motor Current.**
VLS	**Vertical Limit Switch. (Normally closed contacts).**
HLS	**Horizontal Limit Switch. (Normally closed contacts).**
M	**Permanent Magnet type Motor.**

VLS, the Vertical Limit Switch, is operated by a cam on the boom and will be open circuit while the beam is vertical and thus no current can flow in the motor.

D2 is reverse biased and no current can flow in the motor via HLS which is in its normally closed position.

When it is required to change to horizontal polarisation, PS will be changed over and -ve, from the power supply, will be connected to the control wire. Current will flow through D2 which is now forward biased and the closed contacts of HLS, to the motor, which will rotate in the opposite direction to bring the beam to the horizontal position.

As the boom commences to move, VLS will be operated and reclose the circuit via D1, which is now reverse biased. This serves no useful purpose at this time other than to prepare the circuit for the next time the antenna will be required to be changed to the vertical position.

When the beam reaches the horizontal position, HLS will be operated by the boom-mounted cam opening the circuit and the motor will stop.

LED 2 will be lit to indicate that the antenna is in the horizontal position.

Note that both of the Limit Switches are closed when the boom is in an intermediate position and the appropriate path for the motor current is switched by the diodes D1 or D2.

ar

THREE DXCC COUNTRIES

Ken McLachlan VK3AH
PO Box 39, Mooroolbark, Vic. 3138

SVALBARD — JW

Many VK amateurs have had the pleasure of working a JW station, generally someone who is stationed at the meteorological office or the airfield doing a tour of duty from their homeland. The same applies for the rarer JX prefix, but that is another story.

Svalbard, meaning "cold coast", covering an area of 62,000 square kilometres (mostly covered by glaciers frozen as deep as 300 metres) is comprised of several groups of small islands, belonging to the Kingdom of Norway. First discovered in 1194, Svalbard remained unknown and charted until it was rediscovered by two Dutch explorers in 1596. Soon after, Dutch and English whalers arrived, quickly followed by the French, Danish and Norwegian fleets seeking the valuable mammals.

Quarrels and the arrival of the Russians led to a division of the coast. By 1800, the interest in whaling declined and the area was not visited frequently until the beginning of the 20th century, when it was found that there was an abundance of coal that could be mined and claims were made by companies based in the United States, Britain, the Netherlands, Norway, Sweden and Russia.

It was not until 1920 that Norway gained sovereignty over the archipelago and mineral rights were given to the United States, France, Italy, Japan, the Netherlands, Norway, Denmark and Sweden. Five years later Russia, was given a proportionate share and all became signatories to a treaty.

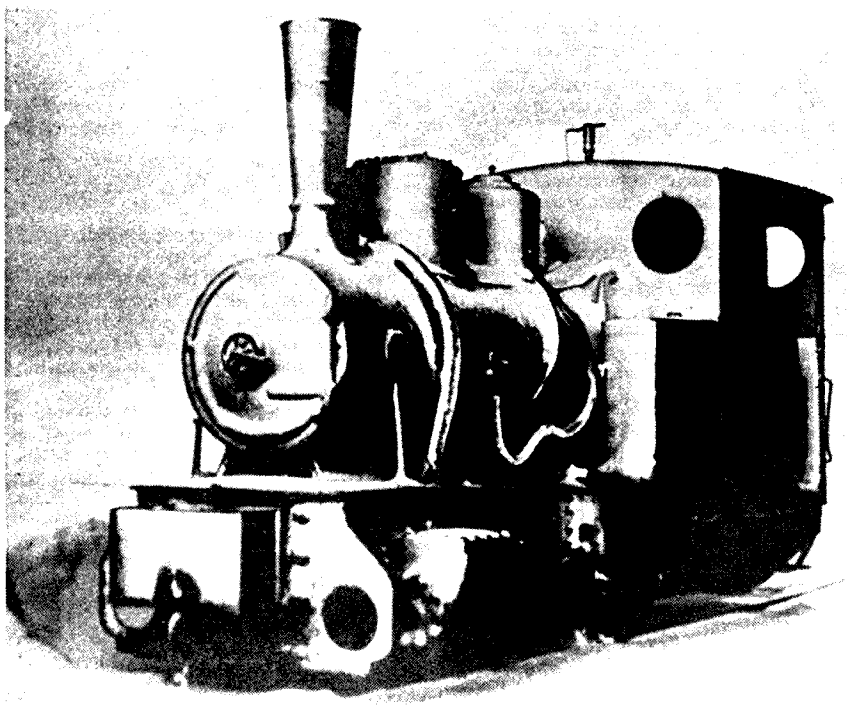
The first commercial coal mine was struck by an American, John Longyear, in a town to be named after him — Longyearbyen — known as *The City of the Longyear* because of its four months of darkness each year. The mine was bought out by a Norwegian consortium in 1916, and is now called the Great Norwegian Coal Company of Spitsbergen.

Life is not that pleasant in Longyearbyen, left with two mining operations, one being run by Norway, the other by Russia, the Russian employees outnumbering the Norwegians by two to one, with the weather and the long period of complete darkness coupled with the dust, pollutants and smog from the mines which are slower to disseminate into the atmosphere because of the weather. The main reason the Norwegian workers stay, is the money made by taxation compensations, as the pay in their home country is fairly similar and there are few places to spend it in Svalbard. One can save a considerable sum over a couple of years.

The area is well catered for, with regular mail and other necessities being flown in to a modern airport that is shared and serviced by the two countries. Continuous land exploration for other minerals is carried on but not even oil has been found. Maybe the geologists will have to go offshore as they did in the North Sea to gain their riches. If found, to the east where the Barenta Sea flows, there would be a rush by the treaty countries to exploit the area but that becomes a contentious subject, for is it practicable with the moving pack-ice and would it curtail the access of military ships and submarines to the large installations at Murmansk, Franz Josef Land and the nuclear test site at Novaya Zemlya?

Most animal and bird life is protected by Norwegian law which governs all occupants of the area, who enjoy winter temperatures as low as -40 degrees Celsius and rising to a high of +5 degrees in the summer.

Value that OSO with that station in the far north, as you have shared a dreary few minutes with someone that is used to a lonesome lifestyle, which many of us in VK could not accept.



One of the old train engines (circa 1916), that used to haul the coal out of the mines.

A not so friendly Polar Bear, with a couple of cubs.

TAIWAN

Until recently, to have a contact with an amateur station in Taiwan was quite an achievement, as there was only one amateur allowed to operate — Tim Chen, who either signed as BV2A or BV2B, depending what mode he was using. Tim tried to accommodate allcomers at all times when he wasn't working at his other love, the film industry.

Tim, one of natures gentleman and an astute business man (as I have had personal dealings with him) was the advocate of more amateurs in Taiwan. Tim was ably assisted by the DX Family Foundation members from Japan, who made quite an impact on the administration that they allowed privileges to be extended to members of the Radio Club, who passed the necessary examinations.

Taiwan, situated in an area bounded to the north by the East China Sea, to the east by the Pacific Ocean, to the south by a channel separating it from the Philippines and to the west by Formosa Strait, in itself a main island, also comprises 15 islands in the Taiwan group and 64 small islands in the Pescadores Archipelago. All up, the area exceeds 36 000 square kilometres and supports quite an unknown number of inhabitants due to the population more than doubling in the period between 1949 and 1980, though it is also known that the birth and mortality rate dropped by 50 percent in this period. It is estimated that more than nearly two million people migrated to Taiwan, during the period 1947 to 1971.

Taiwan has a varied plant and animal life which include cedars, cyprus, junipers and an abundance of rhododendrons and maples with the animal life being similar to the southern Chinese mainland which include deer, wild boers, bears of many different species, monkeys, goats, wildcats and panthers. The birdlife is also abundant and include pheasants, kingfishers, larks and many other species which enjoy a long summer, which generally lasts from April until November with the annual rainfall being in the vicinity of 2 500 millimetres, though this figure has been known to double in the summer months alone. The average temperature in this period rarely exceeds 30 degrees Celsius, yet in winter the mountains are generally covered in snow.

The main language spoken is Mandarin, but there are many variations and different dialects including at least 13 aboriginal versions, some with names that are not pronounceable and many of these are coupled to various religions. The Chinese brought Buddhism and Taoism following

the Dutch in 1622 who introduced the Protestant Christianity, followed two years later by the Spanish, who introduced Roman Catholicism to the island. Shortly after this period, the Japanese introduced Shintoism. in all, Confucianism and Taoism, known to exist for more than 2 000 years, would have been the main influence on the ethics, morality and academic thinking of these friendly people.

The Island really should be called the "Island of Worship", as there are some 3 000 Taoist, 2 000 Buddhist, 3 000 Protestant and In excess of 1 000 Roman Catholic places of worship.

Taiwan, has many resources with more than 50 different minerals that can be mined, including an extensive area of coal, gold and copper to mention a few. Timber is abundant in the high mountain area and it is estimated that one quarter of the vast area that supports so many people, is arable and fully cultivated. Rice, would be the most important crop, taking up half of the cultivated area. Sugar cane, tea, hemp, jute, and wheat are harvested whilst pineapples, bananas, litchis, peaches, watermelons and oranges are all canned for export.

Every amateur knows that Taiwan, is recognised for its manufacture of electrical and electronic equipment and they are priced to compete against a world market, with which they are being quite successful. Their trade balance until the the mid-1960s was very shaky, but with the export of textile, electronic and other goods they are now in a comfortable position.

It is Interesting to note that Taiwan, with its capital being Taipei, which Is the seat of government, has an excellent road system which extends to some 18 000 kilometres, backed up by a 3 000 kilometre rail system of two gauges, oddly one being roughly one metre and the other three quarters of a metre.

The islands are serviced by five seaports, all able to take vessels of a deep draught. The port closest to and serving the capital is Chi-lung. There are two main airports and several domes*ic ones that service the Island area and are used extensively by the population daily.

The administration is controlled by the central government of the Republic of China, which recognises that the island is the 22nd province of China, however the Nationalist government of Taiwan has continued to claim jurisdiction over the Chinese mainland and the Peoples Republic of China on the mainland has claimed jurisdiction over Taiwan which is correctly spelled T'ai-wan and formerly known as Formosa, a name given by the Portuguese explorers, which when translated means "beautiful".

The media is well represented on the island by no less than 30 dally newspapers being printed, two of these being exclusively printed in English and some 1500 periodicals generally pertinent to certain organisations. The radio frequency spectrum has made room for about 30 radio companies who have 160 outlets throughout the area. Colour television has three outlets with repeater stations. One of these consortiums The Chinese Television Service devotes a lot of on-air production to education.

So when you contact a station from Taiwan, you will have a little knowledge of their background and what the island is like. The history of the island that goes back for centuries is enchanting, and for those that are interested, it is worthwhile reading. Sources of material are plentiful and a call to your local library should provide you with many hours of interesting reading. In the meantime enjoy your QSOs with the ever increasing number of BV prefix stations that are populating the amateur bands.

SYRIA — YK

The *1986 International Call Book* boasts 10 amateurs in a country born in 1946 as the Syrian Arab Republic, amid the ruins of ancient empires that go back some 4000 years. The republic has an area of 185 180 square kilometres and Is bounded by a short coastline of 180 kilometres to the Mediterranean Sea, where one can behold some of the best beaches in the world, that lay between the nations of Turkey (TA) and Lebanon (OD). At the present time, due to the fractions that are occurring in that area, it is virtually Impossible to accurately estimate the population, but it is believed that it is in the order of nine million and the capital Damascus, which had a population estimated to be in the order of 250 000 in 1940 has grown to an incredible one and a half million.

The itinerant movements of "visitors" and "refugees" has drained the economy and strained a very tight budget to the limits mainly because of its necessary defence requirements and the Introduction of compulsory education, which accounts for more than 20 percent of the population. Some 50 000 students attend the university in Damascus and it is estimated than one fifth of these are females. The males who attend, are exempt from the 30 months of compulsory military service until their education is complete. At present, all females are exempt from compulsory training.

The land formation of this country is complicated as it varies from mountains, coastal plains to a large desolate desert that absorbs most of its area. The Jabal Alawite mountains that average 30 kilometres in width run from north to south and range in height and range from 900 metres to 600 metres in the south. The Jabal ash-Sharqi mountains mark the border of Lebanon and Syria, the highest peak being 2 600 metres. Many small mountains are scattered around the country and the highest peak is Mount Hermon, which rises to 2 814 metres.

The rest of the country is undulating plains known as the Syrian Desert that lays between 300 and 500 metres above sea level and the surface Is not a sand base as one would think but a mixture of rock and gravel which is quite porous, forming underground springs, rivers and watercourses, which with low precipitation, can become quite saline.

The climate from May to October, is a long dry season with temperatures on the coast varying from 30 degrees Celsius to 10 degrees Celsius in winter. Inland is a different story — in the arid regions the mercury can rise to 50 degrees Celsius and in the winter snow and frosts are quite common.

Forests around the mountain regions contain such trees as myrtle, boxwood, turpentine and wild olive varieties and due to excessive exploitation, the government has placed stringent regulations upon their removal and is progressing with cultivation. Wild animal life is very sparse, though hyenas, badgers, boer, deer and bears can be seen at times. In the desert area, vipers and lizards are quite plentiful.

The most used language is Arabic, as Islam is the predominant religion. Other languages that are used in the minority, are Kurdish, Armenian and Turkish. There are 12 other recognised religions in the country.

Syria depends on many natural resources including oil, natural gas and phosphates. Hydro electric power is obtained mainly from the Euphrates and a few of the smaller rivers which are not very dependable and in these cases oil is used as a substitute, for supplying the power to the quarrying and allied industries.

Other sources of income are derived from the manufacture of wool, cotton, nylon and natural silk. Items such as pharmaceuticals, batteries and plywood are exported and occasionally some of the old traditional copper and brass work can be found.

Education is compulsory for all children from the age of eight, schoolbooks and all education is free for their six years of primary, three years of lower secondary and three years of senior secondary level. They are then eligible for tertiary education, which if they pursue, their compulsory military training is deferred.

Unfortunately the country's rate of population Is not in proportion to its economic rate and it must be understood that only one half of Syria's area can support any industry and habitation.

Of all reports it appears our hobby is not encouraged and it is really unusual, seeing the number of the younger generation that are present in the schools, but equipment imports are heavily taxed and yearly salaries are very low. By all accounts unemployment is extremely high even for the qualified graduates from the universities.

I hope the above has given you a better understanding of one of the rarer DX countries.

HOT SPOT CONFERENCE 88

NEW ZEALAND'S SUNSHINE COAST

An official invitation is extended to all amateur radio operators and their families, by members of the NZART Branch 51 (Eastern Bay of Plenty), Tairanga and Kawerau, to attend the Hot Spot Convention which will be held over the Oueens Birthday Weekend, June 3, 4 and 5, at Whakatane.

The group offer hospitality, feature guest speakers, a program to suit all, excellent venues, accommodation of your choice and no earthquakes or other disasters.

Hear and meet William I Orr W6SAI, author and co-author of many radio publications.

Enjoy two hours of "Amateur Trading" — bring/sell your surplus equipment or re-stock your shack.

Excellent food — all meals except two breakfasts are provided in the weekend events.

Be at the Official Opening on Friday evening and hear the Key Note Address by Bill Orr W6SAI.

Wine, dine and dance to a six piece Convention Dance Band in the Memorial Stadium.

Social evening and light entertainment on Sunday evening.

Registration forms are available from the Conference Secretary, PO Box 2165, Whakatane.

For further information, join the Branch 51 Net on 3.722 MHz every Monday night at 1930 UTC (ZL1AIU is Net Control Station).

CONCERN RAISED ABOUT RF ENERGY AND CANCER

An alleged link between amateur radio operators and certain forms of cancer has once again found its way into the press. A similar incident occurred in 1985. Reportedly, in an article by Doctor Milham appeared in the *Lancet* the British Journal of Medicine, (April 6, 1985), where he studied the deaths of 1691 Silent Keys from Washington state and California. He claimed he found a greater number of deaths among the Silent Keys from certain kinds of leukemias than were reported in the general population of white males In a typical year.

Concern over this is understandable, but before you pull the plug on that amateur rig there are a few things to consider. This study also showed that radio amateurs had fewer deaths than the general population from certain other kinds of leukemia, and in the earlier article there were, in the opinion of competent professionals, serious flaws In Doctor Milham's methodology. For example, *QST.* Silent Key lists include only about one-third of deceased radio amateurs (not all are reported) and those who are reported are not representative of the population as a whole. The bottom line is that, even the experts have disagreed as to the significance of the study, and it certainly did not establish a causal link between amateur radio operation and certain cancer incidence.

Further comment can only be made after a detailed review of the new study!

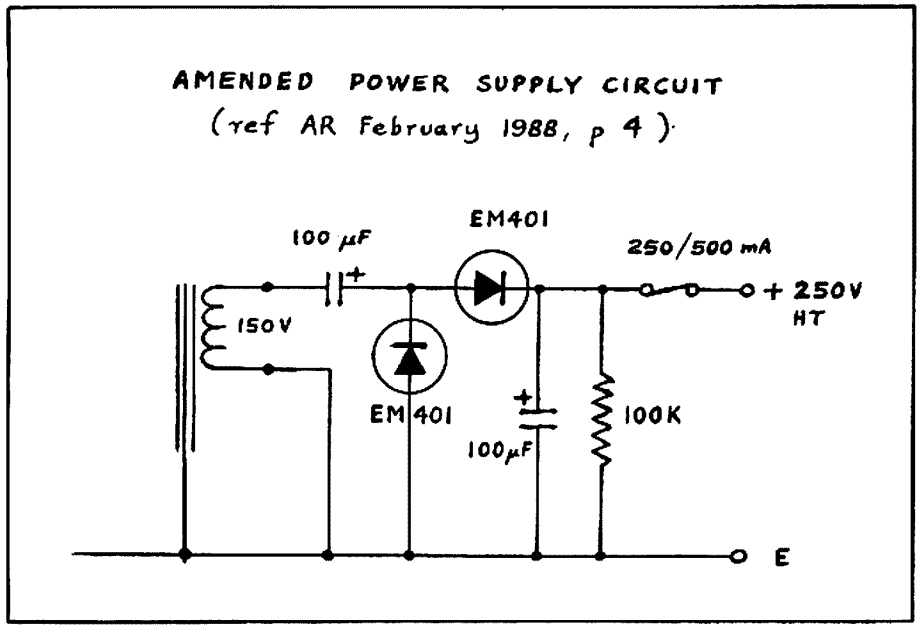
—Contributed by Allan Foxcroft VK3AE from the *ARRL Letter*, January 15, 1988

MURPHY'S DEPARTMENT

Some months go by without needing any apology for errors in preceding issues. This isn't one of them! Rather than a small corner, we have had to expand our Murphy segment into a full department this month.

The item whose errors caused the most disturbance was on page 4 of the February issue. Two eagle-eyed readers went to the trouble of writing to point out to us the various mistakes, beginning with the title. As both VK7ZRR and VK4SO could see at a glance, it is not a 16 amp supply. Perhaps a decimal point disappeared? 0.16 amps sounds more reasonable, and 160 mA is mush more consistent with the fuse and diode ratings. The transformer current rating and winding resistance will also affect the end result, so no accurate figures can be given in their absence.

More disturbing is that the published circuit is wrong. Both Derek and Mervyn pointed out, and hopefully about 99 percent of all other readers realised, that it was meant to be a voltage doubler and was consequently lacking one of the necessary two capacitors. It did have the necessary two diodes, but one was connected where it could have no effect. The correct circuit is shown in Figure 1. The original primary and filament winding connections remain as they were, although the parts list specifies a DPDT switch when a DPST as shown is sufficient.



VOLTAGE DOUBLER

For the benefit of newcomers it may be useful to explain the voltage doubler principle as a scheme whereby one capacitor is charged via one diode on one supply half-cycle, the other capacitor via the other diode on the next half-cycle; and the two capacitors, in series, are discharged into the load. The output voltage can thus approach twice the peak input at no load, but falls considerably with increasing load current, or in other words has poor regulation (compared with a similarly rated supply using a higher voltage transformer and full wave rectification).

One other alteration has been made to the circuit. The 100k bleed resistor has been placed before the fuse, in VK7ZRR's words, "enabling the resistor to perform its bleed function even in the event of a blown fuse". Also, we are inclined to agree with VK4SO when he asks, "is a bleeder shunt pulling only 2.5 mA really sufficient?". On no load, the output voltage could still be dangerously high for half a minute or more after switch-off. (100 microfarads and 100k is a time constant of 10 seconds). Even the 100k needs to be a one watt rating. A 10k bleeder would dissipate 6.25 watts. Something like 20 or 22k rated at five watts sounds better, with a time constant of only two seconds.

It may also be argued that the first capacitor ought to be 200 microfarads, in this particular circuit. Its voltage rating need be only half that of the output capacitor, but the circuit will still work with equal capacitors, although with slightly poorer regulation.

DEATHTRAP?

Mervyn VK4SO, also refers to a "deathtrap", by the same author as the power supply, on page 28 of the February issue. This was the shorting-stick made from the plunger shaft of a discarded fly-spray dispenser. Really, Mervyn? The only risk would be from forgetting to ground the clip wire first, or from the wire not being properly fastened to the shaft and falling off at the psychological moment. Both factors are well under the user's control. Perhaps it could be improved by a plastic disc at the front of the handle to keep finger-tips out of harm's way. If, as suggested by the drawing, there is a metal ferrule over the front of the handle, this should obviously be removed. After all, such a device is only going to be used by someone with some understanding of what they are doing. Maybe it is not foolproof, but hardly a deathtrap!

MARCH ISSUE

Roy V3AOH, points out to us that in the circuit of his protected power supply on page 23 of the March issue, the captions on diodes D1 and D2 have been reversed. This has no effect on the circuit, but causes the operation as described in the text to be a iittle confusing.

APOLOGIES

We apologise for the various errors detailed above, and hope that no-one has been inconvenienced too much by them. Some began with the author, should have been spotted by editors and were not, or maybe the draftspeople were confused by an over-rough sketch, or whatever! I have a feeling that most of the problems coincided with editorial holidays! Sorry folks, we must try harder. But it is nice to know we have so many keen-eyed readers!

AX3ABP

Guidelines for AR Magazine Articles

Writing an article for *Amateur Radio* magazine is not difficult — even if you have never attempted such a task before. Here are some guidelines to help you get something published.

Pick your subject — it could be something of a technical nature or a general interest item.

The first step is to put down on paper some major headings — in other words, an outline or skeleton for your article.

The difficult part is getting started — once this is overcome words and thoughts often begin to flow freely.

Very few people get a written article word perfect and in logical order at the first attempt.

The idea is to make a start by putting something down on paper first, then review, edit and improve.

Use short simple words avoiding the repetition of words and phrases. Try to use short sentences of an average length around 14 words but not more than say 30 words — remember short sentences make for easy-to-read writing.

Articles should preferably be typewritten (although neat handscript will be accepted) on one side of plain paper and double spaced. Leave a margin down the left hand side.

An old adage is that a picture is worth a thousand words and this is very true.

When writing an article, plan if possible to include a photograph or two and maybe an illustration or schematic diagram. These help break up the text and make an article more interesting.

Photographs intended for printing must be sharp, clear and with plenty of contrast. Small detail in pictures is lost when reproduced in newsprint.

Prints should be glossy and about 25 centimetres by 20 centimetres, although smaller prints can be used.

Black and white prints produce the best result, but if you only have colour prints, these should be included with your article.

Diagrams and other illustrations can be submitted with articles; they need not be top quality drawings. AR magazine has drafting experts available to re-draw your diagrams to meet the required standard.

All technical articles experience a delay because they are checked by the magazine's technical editors before being published.

General interest or non-technical articles are published when space is available. Those of a timely or news nature get preferential treatment.

Contributors should send their material to: The Editor, AR magazine, Wireless Institute of Australia, PO Box 300, Caulfield South, Vic. 3162.

—Contributed by Jim Linton VK3PC

FUTURE OF AMATEUR RADIO
— A Novice Viewpoint

Peter Parker VK6NNN
C/- Post Office, Witchcliffe, WA. 6286

Many proposals of the future of our hobby have suggested altering the novice licence but have been proposed by full or limited licensees.

Here is a novice viewpoint. (The opinions expressed are not necessarily those of the WIA, but are obviously the result of a good deal of thought. Ed)

Many of the proposals put forward have failed to address our problems in the amateur service. "Change for change's sake" seems to motivate some people while others disguise giving more privileges as "updating" or "enhancing".

Some of our problems are as follows:
— lack of youth involvement
— less experimentation
— slow growth in our population
— cost
— public awareness

To approach these one by one:

LACK OF YOUTH INVOLVEMENT

Not a large proportion of amateurs are under 20 — the Linton/Harrison paper suggests only one percent of WIA members. What with $30 examination fee, $6 for the NAOCP Certificate and then $28 a year for a licence, I am sure many young amateurs cannot afford WIA membership. As the survey only included WIA members, it may not be representative of the whole amateur fraternity.

Some adults who have asked about amateur radio have told me "I learned Morse code in the Scouts/Guides but I have forgotten it now" or "I built a crystal set 30 years ago". How many youth today have built a crystal set? The truth is, not many even though one is easier to build now than ever before. Further, in this age of transistors, it is easy to amplify the output with less than one dollars' worth of components. We have more of a public awareness problem on our hands than a need to alter radically our licensing system. One genuine problem is cost. I propose a way of solving this.

From reading the letter by VK5PI in AR, May 1986, as well as some electronics magazines of the 1960s, it seems that the YRCS system was a good idea and its demise is a pity. Some people promote the idea of "student licenses". There is absolutely no need for licences below the novice level. Anyone who has a genuine desire for entry to our wonderful hobby should be able, with dedication, to attempt *and* pass the NAOCP. I speak from experience, and indeed getting on air was harder than the NAOCP license study.

LESS EXPERIMENTATION

The second point is the most important — it is one of the reasons amateur radio exists. All other radio communication services do not allow it, but amateur operators have freedoms and bands not enjoyed by any other service. Most other communications services are concerned simply with getting messages from A to B; provided they can do that reliably and well, they are satisfied. Amateurs on the other hand are concerned as well with the technical intricacies of the whole science of radio. We should never be satisfied, we should be embracing new techniques and our Institute should be promoting modes such as SSTV, ATV, FAX, etc. Once we were ahead of the professionals — now, in many aspects, we are lagging behind. Until we can get ahead again our frequencies are threatened. The next major WARC, ITU conference possibly in 1992, will be the most challenging ever. Our service will need to do all it can to justify our allocations. My proposals, later in this article, will go a long way towards promoting experimentation by amateurs.

As well as accepting my proposals, the WIA needs to promote new modes — here are just two suggestions:

— a rare modes contest for SSTV, FAX, etc

— A national register of all members who use these exotic modes. This is so members can ask nearly listed amateurs for help in getting started in an unusual mode — this is what our hobby is all about.

The importance of experimentation to the survival of our frequency allocations is illustrated in this statement made at WARC-71 on space telecommunications. (From *Electronics Australia* December 1971, page 117).

> "You fellows aren't amateurs any more. An amateur is supposed to be primarily an experimenter, to build his own equipment, to try out new circuits, to develop ideas. You did this years ago but no longer. All you do is lay out a few hundred dollars (thousand dollars in 1988) and buy station equipment entirely commercially made. When something goes wrong, you even send it back to the manufacturer for repair. You are not amateurs; you are just communicators. We can't afford frequencies for such activities."

This view came from several of the most enlightened and progressive administrations. It is not entirely correct as some of amateurs' technical triumphs involve operating, such as aircraft enhancement. It does contain a lot of truth. Once the proposed novice licence, with its bias to experimentation, is implemented, Australian amateurs would not deserve this criticism.

SLOW GROWTH IN OUR POPULATION

Our third problem is the lack of growth in our population. Benefits of increasing population are:

— Many of our bands are empty much of the day, eg 160, 80, 40, 6 metres. More operators would increase activity on these neglected bands. The potential of these bands has yet to be explored. For example, on 80 metres one day at 2 pm local time, the writer had a QRP CW contact using a G5RV to Perth — about 250 kilometre distant. Such contacts are rare because of a lack of active operators. More operators would increase band activity.

— More WIA members. This is only a possibility and we have to ensure that the WIA membership growth rate is at least equal to the growth rate of the amateur service as a whole. This would improve AR magazine by increasing WIA income.

— With more amateur operators, public awareness, so important when dealing with towers or TVI cases, increase slightly.

I believe growth of the amateur service should not be pursued regardless of expense, rather as a positive side-effect this licence will bring.

COST

The fourth problem is the cost of entering the hobby which must be held down. If the cost of entering the amateur service increases, the attractiveness of the hobby will decrease. Low cost and home-building are synonymous. Home building also promotes technical investigation, which is a major justification for our hobby.

PUBLIC AWARENESS

Public awareness of our hobby leaves much to be desired. If it were improved, TVI, tower and associated problems could be solved. Many of the population know of "amateur radio" but do not know what we do. A change of licensing system will not cure this problem. We really need amateur operators inviting TVI or tower complainants to see how their equipment works or amateurs giving lectures/demonstrations to people in schools, retirement homes or service clubs. Even if 99 percent or more of those people do not become amateurs, they would at least have a positive opinion of our hobby. Read the letter from Tony Lewis VK2EHL, in AR October 1987, as well as from VK5QT in December.

SUGGESTED APPROACH

The main thrust of this proposal is home-building. Appropriate privileges must be provided to give scope to the licence, but not so attractive as to discourage upgrading. We must keep novice licensees' privileges consistent with their understanding and equipment building capability. This excludes exotic modes and bands needing a high level of radio theory and constructional expertise.

Today we have novice licensees using equipment (eg modern transceivers) which most of them do not understand.

OPERATING PRIVILEGES

FREQUENCIES: 1.800-1.875, 3.500-3.700, 28.000-29.700, 52.000-54.000 MHz — crystal controlled only.
MODES: CW, AM, FM, DSB.
POWER LIMIT: 10 watts DC input to the RF power amplifier.
EQUIPMENT: To be compulsory that the licensee assemble any equipment connected with transmitting, eg transmitters, ATUs, transmitting aerials, power supplies, etc. Kits are permitted.
NOTE: A special arrangement could be made for physically disabled amateurs in that their equipment may be assembled by another amateur.

Some will see these privileges as restrictive, but they are entirely adequate for a novice licence. As an incentive to attempt the AOCP theory examination, combined licensees would be allowed. SSB, VFOs and the use of commercially-made equipment on the novice bands.

Home-building requires communication in order to rectify problems, TVI and other technicalities. With the present system, we have the ridiculous situation where novice licensees cannot communicate directly with "Z-calls". A common band is required. I reject the proposal for two metres as it is already populated and its

allocation to novices will make upgrading less attractive. The novice licence was created to encourage more AOCP holders into our ranks. A similar band is 70 centimetres, however the construction techniques this band requires puts it out of the scope of novice licensees. It would be a worse choice than two metres.

Thus the preferred band is six metres or more precisely, 52-54 MHz. This band is under-used considering its very useful properties. Transmitters for this band would be more basic in construction as fewer multiplication stages are required to reach the band from a lower frequency crystal. On the receiving side, a converter for 52 MHz to say 3.5 MHz, has fewer image problems, critical layout and other constructional factors compared with higher frequency bands. Also, six metres provides the greatest VHF communication range under normal conditions, it is less affected by line-of-sight problems in mountainous areas.

We may expect that, by introducing home construction of equipment to new amateurs, it is quite likely that they will be the future technical pioneers.

In the early days, when most amateurs home-built equipment, it was they who were technologically ahead — now in many aspects of radio the professional users are ahead of amateur operators. Lack of money is one excuse put forward by amateurs, but many are not even trying. We must populate our SHF bands or lose them. If we do not experiment, our bands and privileges will be lost since one main justification of our bands (which are worth millions of dollars) is that amateurs can contribute to radio science. Only a small proportion of amateurs are contributing. This licensing system will increase that number.

A comment on power input limits. The present limit of 10 watts seems sensible as it is a useful amount of power. Higher power amplifiers tend to increased complexity. For a one valve CW transmitter the limit is sensible. (The rating of a 6GV8 (pentode) is 7 watts DC plate input which is safely within the limit).

MODES

Now to discuss the permitted modes. Those indicated are appropriate for beginners to attempt to construct transmitters. FM has been included so novices can use the repeaters on 10 and six metres and be more compatible with other licensees. FM also has a number of advantages over AM. SSB has not been included. An SSB transmitter would be a challenging project for AOCP licensees, and is too complicated for novices. DSB uses a wider bandwidth than SSB but this would not matter on 160, 10, six and the expanded 80 metres novice segment. With random interference, DSB is claimed to have a 6 dB advantage over SSB provided that complex bi-aural detection is used. Even with an ordinary product detector, SSB is only 3 dB better than DSB which is not very much considering the extra complexity of SSB. (From *Amateur Radio Techniques* by Pat Hawker G3VA, RSGB, Seventh Edition, page 117 — a very good hook which is available from your Division).

EXAMINATIONS

With this altered licensing system, changes are needed to examinations.

We will not need theory on VFOs, SSB, superheterodyne receivers and other related items. We will need to shift the emphasis to regenerative and direct conversion receivers, and to simple transmitters as would typically be built by a novice. Building has another advantage; it makes attaining AOCP level much easier if one has practical constructional experience.

The problem with multiple choice questions, while easy to mark, is that anyone can get 20-25 percent just by ticking boxes without knowing anything about the questions! Similar questions need to be retained bit with chance playing a smaller part. Nevertheless, the purpose is not to test the literary ability of the candidate. Five or so questions worth say two marks could be such as: draw a Yagi for six metres with four elements — quote approximate dimensions, or sketch a circuit diagram of a 12 volt power supply using a bridge rectifier, or draw a circuit diagram of a code practice oscillator, etc.

Now, we get to that controversial subject of Morse code examinations. It is vital to have a Morse code examination for HF amateur operators. Despite automation, the Morse code mode still has the following advantages over any other mode in existence, such as:

- low cost
- simplicity of transmitting equipment
- penetration through interference
- more "miles-per-watt"
- narrow bandwidth
- speed (at a reasonable sending speed and using abbreviations. If you still doubt me, listen to some long-winded SSB QSOs on 80 metres)
- most importantly of all — fun.

Even if WARC-92 removes the Morse requirement for operations below 30 MHz, I think the WIA and its members should lobby for the retention of NAOCP and AOCP Morse tests. Suppose there is an emergency aboard a ship and the only mode available is Morse code. The ship's transceivers have broken down and only amateur equipment is operational. The radio operator (an amateur) hears a SSB net, so breaks in using CW. If all operators knew Morse code, they could inform the authorities and handle the emergency as any amateur would be obliged to do. If no one on the net knew Morse — which could happen if the Morse examinations were removed — there would be, at best, a mad rush to find amateurs who can read Morse. As a result of this inefficiency, lives could be lost. At worst, the message could be ignored completely.

RECIPROCAL LICENCES

On to the question of reciprocal licences. The practice of Japanese novices — of a lower technical standard than our own — being allowed to operate on VHF is blatant discrimination against our own novices. Rather than allowing their novices on two metres we should cancel the reciprocal agreement!

If an Australian novice wants to operate on HF in Britain, he/she cannot because the United Kingdom do not have a novice licence. (Their only HF licence has 12 words per minute Morse and theory equivalent to our AOCP). The same should apply to Japanese novices in Australia. We should not change our licensing system to suit another country.

Another benefit of this proposed novice licence and its consequent "building boom" will be for component availability to improve from its present woeful state. This will benefit all amateurs. As VK4BMD says in his superbly written letter in AR, September 1987, we should remember our hobby is essentially a scientific hobby and as our name suggests "The Amateur Service" we should serve the community — not only through WICEN and ATN, but indirectly by contributing to science. We should not behave as a glorified CB service or we will, in the future, have only two bands — 27 MHz and 477 MHz! Our other bands will have succumbed to commercial interests. A grim outlook perhaps — but not unthinkable.

This next proposal has little to do with amateur radio, but if adopted, could benefit our hobby. I believe the DOTC should authorise a new radio-communications service called the Citizens Data Radio Service. It would be available to any person who pays a licence fee similar to the present CB fees. Similar conditions would apply. As regards the frequency allocation, I have read that it is easy to convert 40 channel 477 MHz CB sets to cover 80 channels. Thus the 40 additional channels could be set aside for the new service. Digipeaters and bulletin boards would be permitted. This proposal was published in AR. Instead of lowering our licence standards to allow these hobbyists to enter amateur radio, they would discover data communications in the easiest and simplest way. I stress that the proposed Citizens Data Radio Service is nothing at all to do with the amateur service, but perhaps a few people who are interested in the radio side of it could become amateurs.

I ask all members who support these proposals to write to, not only the WIA, but also DOTC, who have the final say. Ensure Australia adopts a licensing system which will benefit all — not just a few greedy zealots who want more for less. Remember that many empires/governments fell due to greed on their own part. Let us ensure that amateur service does not suffer the same fate.

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THE CLOTHESLINE MONOBANDER

The Clothesline Monobander is a simple solution for a compact two element 20 metre antenna.

Ron Bell VK3MB
Harkaway, Vic. 3806

THIS ANTENNA IS a simple solution to the antenna problem, being a compact two element array. It does, in fact, use the same hardware and manual rotating system as that shown in AR, March 1986, page 55. The latter antenna worked satisfactorily until the loading coils in the centre of each element became loaded with water, the SWR went into orbit and the efficiency took a dive the other way.

I had used the VK2ABQ tribander (AR, July 1981, and earlier) and found it a satisfactory antenna but wanted a simple monobander which I could feed with 300 ohm open wire line without the necessity of having a balun up-top.

The dimensions are the same as those in the tribander of VK2ABQ, but the fed element is a folded dipole of good quality 300 ohm line (ie the plastic covered type with plastic spacers) and the only balun is on the antenna side of the SWR meter inside the shack, the feed line being the same quality 300 ohms open wire.

I acquired the Hills® clothes hoist head from one of their salvage depots. It was never used for the purpose they intended. As the four arms slope slightly upwards the extensions, consisting of one inch dowel, do the same.

This means that, when the antenna wires are tightened, the whole array, instead of sagging downwards, is pulled upwards and is more rigid.

Rotation is done by rope (no expensive rotators) and one large horizontal pulley of nine inches diameter feeds the rope on to two small vertical pulleys which carry the rope to the bottom of the mast.

The front to back ratio would not set the world on fire, but it has reasonable forward gain and, having two horizontal elements, should radiate with a low angle of fire which I think is equally important.

The vertical tubing of the hoist head slipped easily into the top of a Hills® wind-up lattice television tower, which gives a height of about 35 feet (approximately 11 metres).

The Hills tower is normally made of three section, the top one being steel tubing. This was replaced by the clothesline head which is the same diameter as the original steel tubing.

The clothesline head, so mounted, enables me to build all sorts of antennas and there is no limit to what can be done with this type of boom. It could be used for Yagis, Quads, ZL-Specials and all types of arrays because it is rigid, simple and seems to eliminate one of the main constructional problems of booms in large arrays.

Anyway, it at least creates the opportunity to experiment, something I do not seem to have much scope in doing these days, in the era of commercial equipment!

ar

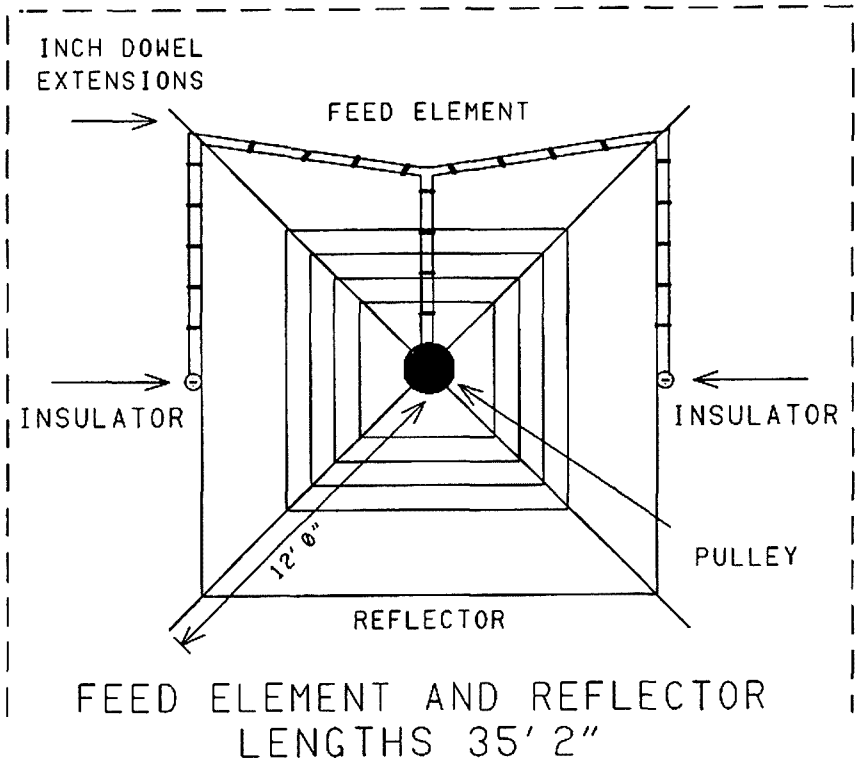


Figure 1: Diagram of the Clothesline Monobander.

Novice Notes

MEASURING SMALL COILS AND CAPACITORS WITH A DIP METER

Drew Diamond VK3XU
"Nar-Meian", Gatters Road, Wonga Park, Vic. 3115

Most of us can measure the usual qualities of voltage, current, resistance and frequency to a sufficient accuracy for our purposes, but inductance and capacitance measurements are a little more difficult if access to an LCR bridge is not available.

To the radio experimenter, the dipper (old term: GDO — Grid Dip Oscillator) after the multimeter, must be about the most useful tool around. There have been numerous books and articles written about applications for the dipper (see bibliography). What I would like to do here is go over one of the applications that does not appear to have had the coverage it deserves; that of L and C measurement.

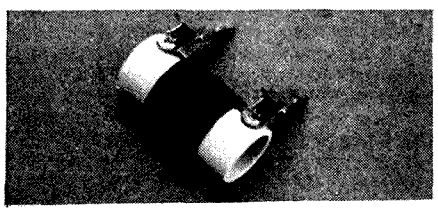
The problem of simple capacitance measurement has been solved in recent years, and a number of meters have appeared in local journals (typical example Reference 2). However, for small capacitances and inductances of the size used in tuned circuits and filters, our dipper also offers a solution.

If the calibration of the dipper is reasonably accurate, and hence by measuring the frequency at which a known value of L and C resonates with an unknown C or L; the value of the unknown can be determined.

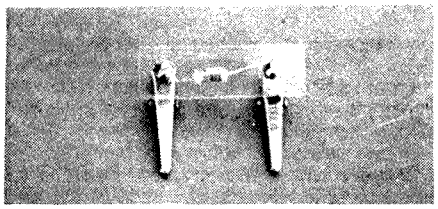
With a "standard" high-stability capacitor of 100 pF and a home made inductor of five microhenries, we can make measurements of good accuracy using the chart in Figure 1.

THE CAPACITOR

The ideal capacitor would be a silver mica of one or two percent tolerance, but as these are now practically impossible to buy, a very good alternative is a polyester or "styroseal" capacitor. I bought a quantity of these and found them all to be well within two percent of 100 pF As this capacitor may be applied to coils of various physical constructions, it would be a good plan to mount it on a strip of insulating material such as perspex as shown in Photograph 1. Two alligator clips have been fixed to the perspex to allow easy connection to a variety of coils.



Photograph 1: The "standard" capacitor.



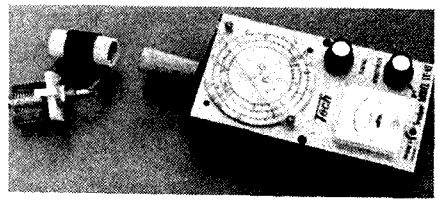
Photograph 2: The "standard" inductor.

THE INDUCTOR COIL

Once the capacitor has been obtained; the coil may be tackled. Obtain a piece of insulated tube 20 millimetres outside diameter and 45 millimetres long (eg, electrical PVC conduit). Drill two 1.3 millimetre holes (1/16") centrally located right through the diameter of the former spaced 22 millimetres. Onto this must be wound exactly 19 turns of number 18 B & S (one millimetre diameter) enamelled copper wire. Two alligator clips should be attached as for the capacitor. See Photograph 2. Check the inductance by coupling the dipper coil to the standard coil. The coil and capacitor combination should resonate at 7.1 MHz, indicating that the coil has an inductance of five microhenries. If the frequency is too low; carefully remove a turn or two as required. If the resonant frequency is too high; it will be necessary to wind the coil again, but adding perhaps another turn. If your coil former and wire is as specified, you should not have to make any adjustments.

SOME TYPICAL EXAMPLES

Most capacitors are marked with their value, but as is well-known, the markings are sometimes indecipherable, or have been rubbed off. If you estimate that the capacitance is somewhere in the range between two to 1000 pF, then it should be possible to find the value. Connect the capacitor across the coil, then couple the dipper (about three centimetres distance to begin) to the coil so that their axis are common. Starting from the lowest frequency available; sweep the dipper through each range until a dip is obtained, use the least amount of coupling necessary to obtain a visible dip, then read off the frequency indicated on the dipper. The value of the capacitor can then be looked up on the chart. Photograph 3 shows the coil and dipper being used to find the maximum value of a variable capacitor (plates fully meshed).



Photograph 3: Using the dipper to find the value of C.

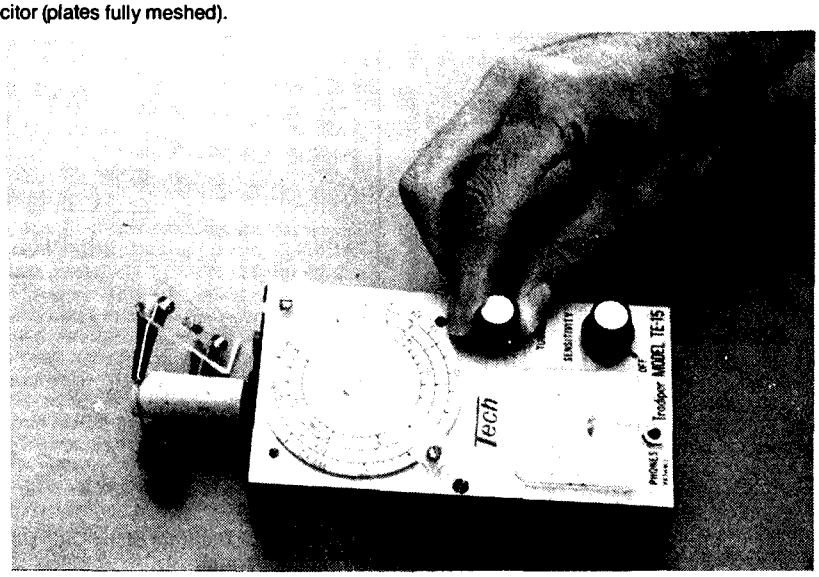
The 100 pF standard capacitor may be similarly employed to find the value of an unknown inductor. As some idea will usually be held as to the value of the inductance; it should not be necessary to sweep a wide frequency range for a dip. Once again, use the smallest coupling necessary for a visible dip.

Toroidal coils may be dipped by inserting the dipper coil between the two leads of the toroid as shown in Photograph 4.

There is a trap when making resonance measurements. It is possible for a harmonic of the dipper frequency to be read by mistake, so it is good policy to check again at multiples of the frequency first obtained. If the dip is more pronounced at a multiple of the first frequency; then the second reading is the correct one.

References and Further Reading

1. LENK. Servicing with Dip Meters. *Foulsham-Sams 65-19117.*
2. SWAIN & LEVIDO. Digital Capacitance Meter. *Electronics Australia magazine, August 1985.*
3. *ARRL Amateurs Handbook, ARRL.*
4. *Radio Communication Handbook, RSGB.*
5. BAILEY. FET Dip Oscillator Mk II. *Radio Communication, April 1987.*



Photograph 4: "Dipping" a toroidal coil.

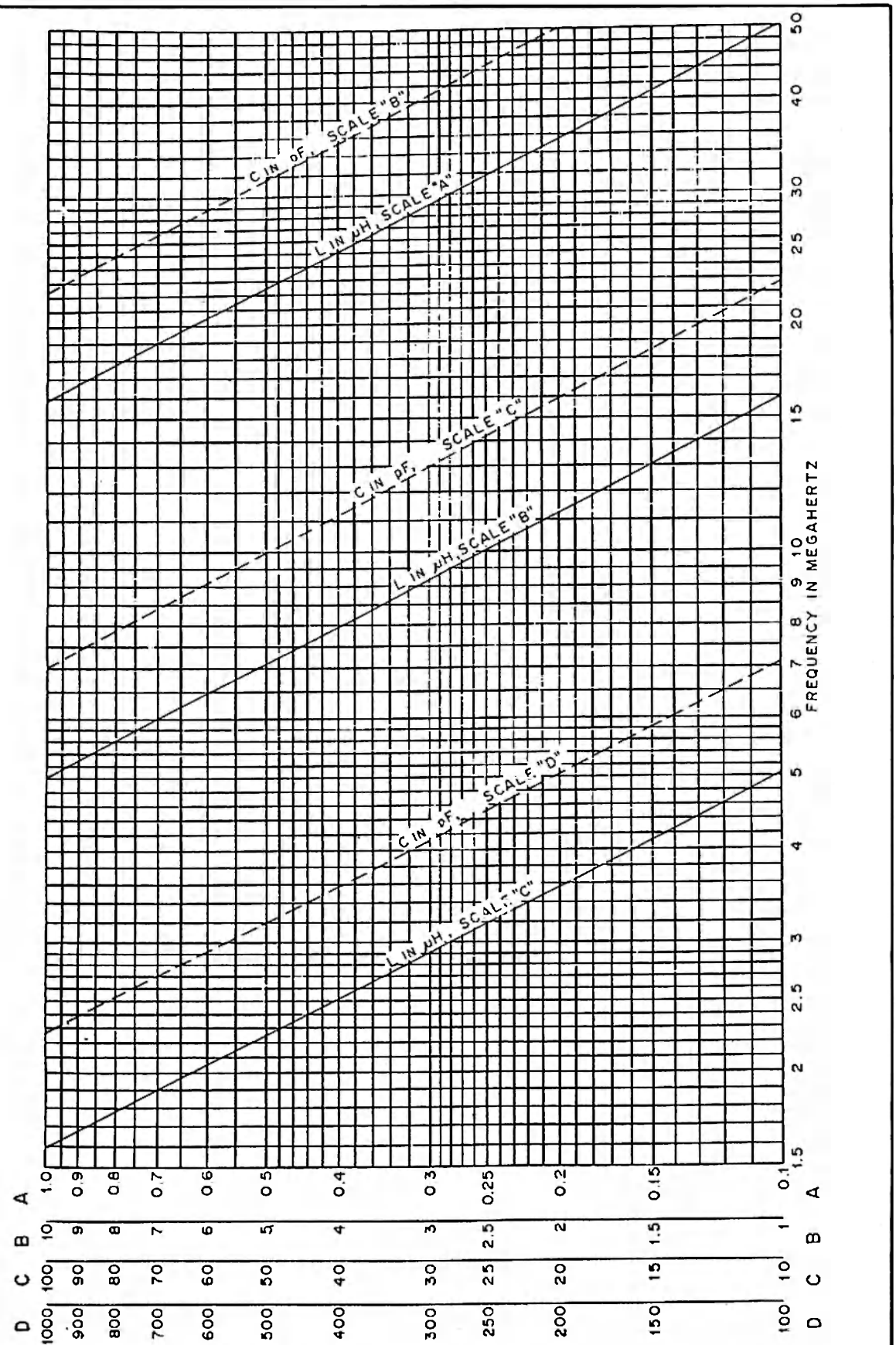


Figure 1: Chart for determining unknown values of L and C in the range of 0.1 to 100 μH and 2 to 1000 pF, using standards of 100 pF and 5 μH.

INTERNATIONAL

BEACONS

The frequency of 21.150 MHz has been chosen by the International Amateur Radio Union (IARU) for a world-wide network of beacons to indicate propagation and band conditions.

A similar network is operating on a 14.100 MHz and another is planned for 28 MHz.

The current International Beacon Project on 28.190 to 28.300 MHz will remain until December 31, 1989.

After then the segment 28.190 to 28.200 MHz will have beacons on a timed-shared system, while the segment 28.200 to 28.225 MHz is reserved for use by continuous duty beacons.

The 14.100 MHz beacons sponsored by the Northern Californian DX Foundation (NCDXF) use a single frequency on a time-shared basis.

This practice will be applied to those on 28.190 to 28.200 MHz from January 1, 1990, and the reserved 21.150 MHz channel at a future date.

Eventually the 10, 15 and 20 metre world-wide time-shared networks could each have 15 stations — and the IARU was hopeful they would be co-sited.

The NCDXF effort was well funded and is understood that the initial group consisted of wealthy radio amateurs at a time when income tax was very high and contributions to causes with a scientific content could be tax-exempt.

It now functions as a world-wide club funded by membership subscriptions and remains based in San Francisco.

The nine stations in the NCDXF network use similar equipment comprising a TS-130S transmitter and control unit which provides timing based on a quartz clock.

Each transmits for about 58 seconds in a sequence around the clock. The order is arranged to run from east to west beginning with New York on the hour, and the sequence is repeated at 10 minute intervals.

The beacons transmit in A1A mode, identifying with a call sign. They run at 100 watts for nine seconds, then reduce power in nine second steps to output 10 watts, one watt and 0.1 watt, before sending SK and call sign at 100 watts.

NCDXF 20 METRE BEACONS IN TRANSMITTING SEQUENCE

4U1UN/B	New York
W6WX/B	Standford University
KH6O/B	Honolulu
JA2IGY	Isa City
4X4TU/B	Tel Aviv University
OH2B	Helsinki University
CT3B	Funchal
ZS6DN/B	Pretoria
LU4AA	Buenos Aires

10 METRE BEACON LIST

28.050	PY2GOB	Sao Paulo
28.175	VE3TEN	Ottawa
28.195	IY4M	Bologna
28.200	GB3SXE	Crowboro
28.200	KF4MS	St Petersburg
28.2025	ZS5BHF	Durban
28.2005	LOIGI	Mt Predigtstuhl
28.2075	W8FKL	Venice Fl
28.208	WA1IOB	Marlboro Mass
28.210	K4KMZ	Elizabethtown Ky
28.212	ZD9GI	Gough Island
28.212	EA6RCM	Palma Majorca
28.215	GB3RAL	Slough
28.215	LU4XI	Cape Horn
28.217	WB9VMY	Oklahoma City
28.220	5B4CY	Zyyi
28.222	W9UXO	Chicago
28.2225	HG2NHA	Tapolca
28.2275	EA6AU	Palma
28.230	ZL2MHF	Mount Climie
28.232	W7JPI	Sonoita Az
28.232	KD4ECK	Jupiter
28.235	VP9BA	Southampton
28.2375	LA5TEN	Oslo
28.2400	OA4CK	Lima
28.240	5Z4ERR	Kiambu
28.2425	ZS1CTB	Cape Town
28.242	LU4FM	Rosario
28.245	A92C	Bahrain
28.247	EA3JA	Barcelona
28.248	K1BZ	Belfast Ma
28.250	Z21ANB	Bulawayo
28.250	4N3ZHK	Mount Kum
28.252	WB4JHS	Durham NC
28.255	LU1UG	G/ral Pico
28.257	DK0TEN	Konstanz
28.262	VK2RSY	Dural
28.264	VK6RWA	Perth
28.266	VK6RTW	Albany
28.268	VK8VF	Darwin
28.2685	W9KFO	Eaton Ind
28.270	ZS6PW	Pretoria
28.270	VK4RTL	Townsville
28.272	9L1FTN	Freetown
28.275	AL7GQ	Jackson Miss
28.277	DF0AAB	Kiel
28.280	YV5AYV	Caracas
28.281	VE1MUF	Newfoundland
28.284	VP8ADE	Adelaide Island
28.286	KA1YE	Rochester NY
28.287	W8OMV	Ashville NC
28.287	H44SI	Honiara
28.288	W2NZH	Moorestown NJ
28.290	VS6TEN	Mount Mutilda
28.292	LU2FFV	San Jorge
28.295	WB8UPN	Cincinnati Ohio
28.296	W3VD	Laurel Md
28.295	WB4JS	Fort Lauderdale
28.299	PY2AMI	Sao Paulo
28.300	ZS1LA	Stillbay
28.315	ZS6DN	Irene
28.888	W9IRT	Hollywood
28.890	WD9GOE	Freeburg Ill
28.992	DL0ANN	Moritzberg

Some 10 metre beacons operate continuously whist others are intermittent.

VK2RSY has become AX2RSY during Australia's bicentenary year and includes a special bicentenary message which recently received a reception report from the United Kingdom — *who said 10 metres is dead? ? ?*

This article was mostly adapted from The International Beacon Project report in the journal of the IARU Region 3 Association by Alan Taylor G3DME, IARU IBP Co-ordinator, with additional information on the NCDXF and AX3RSY

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AUSTRALIA AT A GLANCE

During our bicentenary year, many contacts will be made on the DX bands, particularly in view of the special AX prefix and VI88 commemorative call sign stations. The following summary may help radio amateurs to speak more authoritatively about their country.

THE LAND: Australia covers 2 966 200 square miles (7 682 300 square kilometres) about the size of the continental United States of America. It is the world's oldest continent, having split from Antarctica and South America about 60 million years ago.

MAJOR CITIES: Melbourne, Sydney, Adelaide, Brisbane, Perth and Darwin — are all coastal except Canberra, the Federal Capital.

There are six States, New South Wales, Victoria, Queensland, South Australia, Western Australia — all on the mainland, and an island State, Tasmania.

These former British colonies formed the Commonwealth of Australia when they federated in 1901.

Australia has two interior Territories — Northern Territory and Australian Capital Territory.

The interior, known as the outback, is virtual desert. Queensland State, in the north-east, has tropical rain-forests.

Australia's external territories include several offshore islands — Norfolk Island, Cocos (Keeling) Islands, Christmas Island, and the Coral Sea Islands, as well as land claims to 48 percent of Antarctica.

The country has much flora and fauna not found elsewhere, including the kangaroo and emu (both on Australia's coat of arms), koala and the platypus.

THE PEOPLE: Indigenous Aborigines, now numbering 160 000 or one percent of the population, are believed to have been in Australia for at least 40 000 years.

New South Wales was settled mainly by British convicts in 1788, followed by thousands of free settlers.

The population now numbers 16 million people. There was massive post-war immigration since 1945, and an estimated 20 percent of the population is overseas born.

HISTORY: It was believed that navigators from South-East Asia visited the Australian continent many centuries ago. Spanish and Portuguese navigators visited Australia in the 16th century, followed by the Dutch in the 17th century.

Settlement followed the exploration of Australia's east coast by British explorer, Captain James Cook in 1770.

Australia was first roughly shown on a 1597 Dutch map. The Cook expedition was an important part of Australia's history because it gave the first reports of a fertile country.

Arthur Phillip arrived at Botany Bay in command of the First Fleet and founded a convict settlement at Sydney Cove on January 26, 1788, the day now celebrated as Australia Day each year.

THE ECONOMY: Australia's economy is centred on primary industries, mostly mining, sheep and agriculture. It is a major exporter of beef, lamb, wool, and wheat. Also, it has major mineral deposits, including some of the world's biggest reserves of uranium.

—Contributed by Jim Linton VK3PC

NEW COMPLEX — KOSMOS — 1861

by A P Papkov
Translated by Dex Anderson W4KM

The short article following originally appeared in the Russian Publication *Sovetskiy Patriot* July 1, 1987. Translation form the original Russian is by Dex Anderson W4KM

Whilst some of the operational details of RS10 and RS11 are not well-known, the comments on the design philosophy to overcome the "Kilowatters" may be of interest.

David Rankin 9V1RH/VK3QV

ARTIFICIAL EARTH SATELLITE "Kosmos-1861" was launched in the Soviet Union on June 23, 1987. In addition to navigational systems, equipment for providing radio amateur satellite communication was installed. This equipment, called on-board-radiotechnical complex (bortovoy radiotekhnicheskiy kompleks) BRTK-10, was developed by the volunteer space technology laboratory attached to the museum of cosmonautics named after K E Tsiolkovskiy, in Kaluga (situated approximately 170 kilometres SSW of Moscow).

The on-board radio technical complex consists of two analogous sets of equipment, differing only in operating frequencies. One of the sets is assigned the call sign "RS10" and the other "RS11".

The BRTK-10 repeater differs significantly from its predecessors. In the first place it now operates multi-band, and in the second, it now operates multi-mode. Most importantly, it no longer has any fear of the "Kilowatters" ("Kilowattniki"), meaning that it does not become overloaded by powerful signals.

Presently, the following repeating operations can be carried out: From the 21 MHz band to the 29 MHz band, from the 145 MHz band to the 29 MHz band, simultaneously from the 21 and 145 MHz bands to the 29 MHz band, from the 21 MHz band to the 145 MHz band, from the 21 MHz band simultaneously to the 29 and 145 MHz bands.

A new, practically unused repeater band, 21 MHz, has been introduced for experimentation by amateurs. We hope this will enable us to introduce an enormous army of radio amateur shortwavers to the fascinating world of space communication, using equipment already in their possession. Repeating from on board the satellite in the 145 MHz band will also encourage the development of mass participation and the technical availability of equipment for space communication.

Finally, we hope to make still better friends of shortwavers and ultra-shortwavers by providing them mixed space communication on a variety of bands.

The repeater frequencies and beacons are allocated as follows:

	RS10	RS11
	MHz	MHz
Earth-to-Space	21.160 - 21.200	21.210 - 21.250
Earth-to-Space	145.860 - 145.900	145.910 - 145.950
Space-to-Earth	29.360 - 29.400	29.410 - 29.450
Space-to-Earth	145.860 - 145.900	145.910 - 145.950
Beacon 1	29.357, 145.857	29.407, 145.907
Beacon 2	29.403, 145.903	29.453, 145.953
Earth-to-"Robot"	21.120, 145.820	21.130, 145.830

A future issue will tell about telemetry information transmitted by the beacons, but for now a few words about the repeater being "fearless" as far as powerful signals are concerned, and about its other qualities.

As is known, a station wishing to ensure a dependable contact will instinctively increase the power of its signal, thereby overloading the repeater channel and the output channel of (the repeater's ? ? ?) transmitter and preventing other stations from communicating. That is how it was with the repeaters on the earlier satellites. Avoiding this shortcoming turned out to be not such a simple matter. If an ordinary automatic gain control (in Russian ARU — avtomaticheskaya regulirovka usileniya) were made, the effect would be the same — the powerful signal would decrease the gain ration of the repeater and would also prevent others from communicating.

We had to get a bit clever and make 10 independent AGC systems, using filters to divide the full repeater bandwidth into 10 segments. We do not hide the fact that the system turned out to be complicated; we agonised over it a great deal. But, there is no limit to what we would do to raise the quality of communication available to our friends, the radio amateurs! In addition, we raised the power of the transmitters to five watts and we can vary the amplifier gain of the repeaters within broad limits and set the repeater bandwidth, by command, equal to 16, 24 or 40 kHz. For "Retro-style" amateurs (meaning unclear, old-fashioned? ? ?) we have left the old repeater system with its common bandwidth and all of its defects and merits.

The automatic answerer "Robot-4" does not differ in the algorithm and for conducting contacts from the analogous ones installed in the "Radio-5 and Radio-7" satellites. Its log memory has been increased and the readout system from this memory has been changed. The memory capacity for circular announcements from the bulletin board has also been increased, as has the system for entering information into this memory.

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VHF UHF — an expanding world

Eric Jamieson VK5LP
8 West Terrace, Meningie, SA. 5264

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.005	H44HIR	*Honiara*
50.005	ZS2SIX	*South Africa*
50.010	JA2IGY	*Mie*
50.022	ZS6PW	*Pretoria*
50.050	ZS6DN	*South Africa*
50.075	VS6SIX	*Hong Kong*
50.075	ZS4SA	*South Africa*
51.020	ZL1UHF	*Auckland*
52.013	P29BPL	*Port Moresby*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.432	VK0MA	*Mawson*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.445	VK4RIK	*Cairns*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
52.510	ZL2MHF	*Mount Climie*
144.022	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.445	VK4RIK	*Cairns*
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK8RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
144.950	VK3RCW	*Melbourne*
145.000	VK6RPH	*Perth*
432.066	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK1RBC	*Canberra*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*Macleod*
432.540	VK4RAR	*Rockhampton*
1296.198	VK6HBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*
10445.000	VK4RIK	*Cairns*

A letter from Ron Cook VK3AFW, confirms the operation of the VK3RTG beacon, which is helpful as I have often wondered about it. Ron says he is surprised it has not been heard in VK5 recently. At my previous QTH of Forreston, I only ever heard it once during a big opening, but must admit I have not looked for it very often from Meningie. Since the letter arrived I have checked several times, but heard nothing.

BEACON OPERATION

On the question of confirming what beacons are actually operating, the list has been cleaned up quite a bit of late.

VS6SIX is confirmed as being on by *SMIRK Six Shooter* and the Japanese *CQ ham radio* magazine. H44HIR confirmed by FK1TS. VK8VF on six metres at least is reported from Japan. Presumably the two metre beacon is also operating. VK4ABP from Longreach has been heard here, also VK2RGB. VK3RTG is confirmed by VK3AFW (above).

I would be pleased to hear from any readers who can confirm whether the following beacons are operating:

50.010 JA2IGY	144.480 VK8VF
52.100 ZK2SIX	144.565 VK6RPB
52.250 ZL2VHM	432.535 VK3RMB
52.350 VK6RTU	10300.000 VK6RVF

If the above can be confirmed, the checking of the list will be complete and this should then be the most up-to-date beacon list available. I am grateful to all those who have replied to my requests so far.

For a six metre beacon, VK3RMV on 52.435 at Hamilton, is incredibly reliable here at Meningie. It is always audible, sometimes just above the noise level, rising to a peak of S5 during periods of propagation enhancement. The distance is about 350 kilometres which is quite a long way for consistent six metre operation. I find it a very useful beacon for band conditions and is monitored regularly. It also indicates my trusty old six element wide spaced (25 foot boom) Yagi is working well and is some compensation for the inability to have the use of my former eight-over-eight Yagis due to space considerations. The eight-over-eight was a superb device.

SIX METRES

Long distance operation is on the way! Graham VK6RO, phoned me to say firstly that the band was open from VK6 to VK5 on Saturday 27/2. Then on 1/3 he worked JF6MLU, at 1135 on 50.110 with signals 5 x 2/3. He had been hearing the Russian television on 49.750 MHz on and off for a few days so was not surprised at the nighttime TEP contact. The solar flux at the time was 102.

Then on 10/3, I received an excited phone call from Peter VK8ZLX, in Alice Springs, at 0940, to say he had been working JAs since 0330, mainly the long distance stations in JA7 and JA8 with signals to S9+. The JAs were also looking for Hong Kong stations as they could hear the beacon there. At the time of the phone call, Peter said a few JA2 stations were just becoming audible, so the distance was shortening, although the others were still there. Signals were mostly around 50.110 MHz.

A further phone call from Peter VK8ZLX on 12/3 said he had been working JAs from 0530 to 1030 again with very strong signals and from JA2, 5, 6 and 8, so he had a mixture of afternoon and evening TEP, again around 50.110 MHz. The JAs were also getting into Perth and had worked VK6KXW and VK6KRC.

Peter also reported having a contact via RTTY. JA1VOK and JR2RCB were set up for packet radio on 52.500, but Peter said he had not been able to make a contact so far. (The MUF probably has not risen that far for TEP contacts yet. . . 5LP).

With the increased awareness of the capabilities of six metres as a result of the very good Cycle 21, there are more operators world-wide being vigilant so it is very likely we will be having long distance contacts by TEP or F2 earlier than may be expected. The climb out of the low part between cycles is often quite rapid compared with the slower decline on the downward side.

SIX METRES FROM THE US

A copy of the SMIRK newsletter *Six Shooter* has arrived on my desk, the first for some time due to the cost of production and the failure of many members to pay their membership dues! SMIRK membership now stands at 5300 in all 50 US States and 86 other countries.

SMIRK takes issue with the continuing use (mainly in the US) of 50.110 MHz for other than DX contacts and is trying to clear the frequency for world-wide DX use. It is being accepted world-wide as the international SSB calling frequency and SMIRK says ***"If you are not looking for foreign DX you should not be there."*** The same could be said for operation in Australia, but with our restrictions on the use of 50 MHz there is only limited use of the frequency, except in VK6 and VK8. Hopefully, they are not using the frequency for local chatter or Es contacts.

The 13th Annual SMIRK Party Contest will be held from 0000 UTc on June 18 to 2400 UTC June 19, 1988. Exchange call sign, SMIRK number and grid square. Crossband, multi-operator or partial contacts are not permitted. Count two points for each SMIRK contact made and one point for each non-SMIRK contact. Total SMIRK score plus total non-SMIRK score, multiplied by the total number of different grid squares worked to give the Claimed Score. Entries must be on the new log sheets. Send your log requests (return postage required) and contest entries not later than July 6 1988, to Lisa Lowell KA0NNO, PO Box 547, Hugo, Colorado, 80821 USA.

SMIRK also reports in the Pacific segment, that Japan, during their last summer, had one of the best Es seasons for many years. Yoshi JA1UT, reports on his BV2A/B operation from Taiwan. From June 5 to 11 they worked 1663 stations, working 1010 on June 7 alone. They also worked four HL stations on that date. On June 8, they worked KG6DX for the first BV to KG6 QSO ever on six metres! HL9TM (W7KMA) had the first BV to HL contact.

From the US East Coast, K1TOL reported the super opening on June 7, and across the Atlantic worked EI6AS, GW3WS, GM3TXX and CT4KQ, running 10 watts! The GB3SIX beacon was heard on 50.020 MHz.

Norway has gained a 50 to 52 MHz allocation with a maximum of 60 watts ERP, with temporary restrictions on those stations within 100 miles of the remaining television stations which are due to close before long. F8SH and F9LT are part of a group trying to obtain some operating privileges, even if on a restricted scale, for French amateurs on six metres.

Several stations on the island of Malta are authorised to work six metres, two being Paul 9H1BT and 9H1CG. They can operate with 10 watts from 50 to 52 MHz. A beacon signing 9H1SIX on 50.085 MHz, is being constructed by Paul G4IJE.

Norway has 25 six metre permits issued. The OZ (Danish) group are working hard to get a six metre allocation. CT has six licences. The ZB2VHF beacon on Gibraltar is said to be still active. In Italy, I5TDJ will apply for a permit to work Cycle 22. The DL (German) stations have not much hope for six metres due to US military police using six metres,

also the East Germans use the band for military operations too. Active crossband 10 to six metres stations are to be found in Sweden and Finland, also Austria and Rumania. Overall, there is a fair spread of possible activity for Cycle 22.

To finish the report from the SMIRK newsletter, K2YOF during their last summer (May to August 1987) said he worked or heard CT4, C6A, EI9, FM, FY7 (beacon), G, GM, GU, GW, HH7, HK1, KP2, KP4, OX3 (beacon), VO2, VP5, V2A, XE1, YS1, YV0, ZF2, 4U1 and 8P6. Others in his area also reported C3, GI, GJ, HI8, KH6, LA and 9H1. Most, if not all, were probably worked on Es, but what a tally of countries!

It will be interesting to see how the Es season behaves in the Northern Hemisphere summer which will be starting soon after you read these notes. Will they have an early good lead-up and then collapse like the Southern Hemisphere? Incidentally, the Es collapse appears to have been common right across the Southern Hemisphere.

THE WORLD ABOVE 50 MHz

From Bill Tynan W3XO, and his column *The World Above 50 MHz* in *QST* for March 1988:

"Sporadic-E is the big story this month. Although we are accustomed to a spurt of Es around the winter solstice, this year's mini-season seemed to be better than most. It even featured a number of excellent two metre openings.

"Propagation was outstanding, particularly during the week preceding Christmas. W3XO worked XE1GE at 0100 on 19/12. K5NZS reported Central American stations YS1ECB and TI1HL, while W5FF had a great opening on the evening of 19/12 working KP4, KP2 and HH7PV.

There is good news from the Netherlands. From the RSGB's VHF/UHF newsletter comes the word that, from March 1 and running for five years, Dutch amateurs will be permitted to operate on six metres, using CW only with no more than 30 watts output and between 50.000 and 50.450 MHz. Unlike the UK, there are no restrictions as to ERP.

However, as the six metre operation is on a non-interference basis, the Dutch National Society, VERON, is recommending the use of low gain antennas.

Also, from the RSGB monthly magazine *Radio Communication* is word of G4MAB being assigned to Ascension Island in the South Atlantic where he will be operating as ZD8MB and plans to establish a beacon on 50.032 MHz."

QUEENSLAND REPORTS

Gordon VK4KAL, writes to say "it was a lousy six metre season last Christmas period. I only worked about 10 stations and all from JA! I either missed out completely on the 'locals' or came on the air as the band folded. However, I have monitored ever since on 50 MHz up and on 18/2 it came good to JA for about three days from 0530 on 50.110 MHz with signals to 5 x 9 plus. Signals were heard up to 50.200 MHz.

"Two metre activity was definitely not on either. Harry VK4LE, has had a few good two metre SSB contacts with Bill VK4LC, and a couple of the Brisbane stations during the week ending 10/3.

"The Central Highlands Amateur Radio Club now have a two *metre repeater* about 60 miles from here which now enables all members to have some form of contact as we are very scattered, some up to 300 miles apart."

Gordon is also experimenting on 432 MHz with a pair of 13 element Yagis. Thanks for your letter, Gordon.

FROM SOUTH AFRICA

Hal Lund ZS6WB, has sent another copy of *VHF News* which contains some information which could interest Australian VHF operators.

"With the opening of the 28.3 to 28.5 MHz portion of the 10 metre band to the US Novice and Technician Class licensees, 28.385 has been adopted as a second six metre co-ordination frequency supplementing 28.885 MHz. Apparently JAs and other Pacific DXers are already using 28.385 MHz for co-operation.

"The Es season that started out so well in December has quietly died with no recent activity. An interesting report from ZS1LA lists a 1 hour 45 minute opening on December 12, 10 minutes on 13/12, 35 on 17/12, 10 on 19/12 and 15 minutes on 24.12!

"The six metre DX calling frequency is 50.110 MHz; six metre SSB 50.200 and FM 51.400 MHz."

THE COLD SOUTH

I have not heard anything from Mark VK0AQ since the telephone call between us some time ago which indicated he could be leaving Mawson about mid-February, then calling at Davis to pick up David VK0CK, and others before returning to Hobart.

I understand the David VK3DHF is likely to be signing VK0HI, from Heard Island until May 1988 and running a keyer on 52.170 MHz and listening between breaks in the keying cycle.

Read in a newspaper that the Australian Bicentennial Expedition had safely arrived at Cape Hallet and were setting out to scale the so far unclimbed Mount Minto. Beyond that, nothing else at this stage. VK0AT (VK2BXM) would have been calling and listening on 52.050 MHz from his shipboard base, using CW from 1000 to 1100 daily.

THE LOCAL SCENE

Fair warning to all those in the path to the east and south-east from the suburb of Woodville, Adelaide, the QTH of Col VK5RO. There is likely to be a lot more RF coming your way before long as Col takes on a major upgrading of his antenna system. His broken antennas, on which he has done so well in the past, are all to be replaced!

Col has obtained from VK5LP one of the eight element KLM-type antennas which were so successfully used as a stacked pair on six metres; also one of my 13 elements from the stacked pair I had at Forreston for two metres (it requires some repairs but is still okay — I am currently using the other one with excellent results... 5LP). On 70 centimetres, Col already sports a multi-element J beam and this is likely to go back on the tower.

From Meningie, I will be very interested to note any differences since, although Col is behind the Mount Lofty Ranges, we have had an extremely good path between us, poor antennas and all. It is no problem for me to work Col with signals to 5 x 9 on all three bands with only a few watts; eg five watts on six metres, three watts or less on two metres and three watts on 70 centimetres and the path distance is over the ranges and around 120 kilometres. I can also work him on two metres with 100 mW.

Col has had considerable success for many years working into Melbourne from his good QTH at Woodville, so we hope the improvements will bring even more success, if for no other reason than much work is involved in such an upgrading of antennas. Of course, such improvements in signals will bring a further 1000 or more television sets within RF range, but then Col is quite adept at making TVI traps! Good luck, Col.

Roger VK5NT, also has been undertaking great improvements in his antenna system. The latest venture is into a pair of eight element Yagis on six metres (like 5LP had) and the results have already been noted giving an increase in signal strength far beyond what can be expected purely on a dB basis for stacking — the lower angle of radiation works incredibly well on long distance stations, particularly TEP and F2. Fortunately, with so much land around him, Roger can test antennas by having former antennas still in the air to give a direct comparison — the only way to go.

Roger is extremely strong here in Meningie, no matter where our beams are, on all bands. I presume I am the same on Mount Wilson!

BEACONS IN VICTORIA

Just as I was finishing off these notes, I received a letter from Gordon VK3XX, with up-to-date news on the beacon situation in Victoria.

He says "I am responding to your appeal for information on the Melbourne area beacons (AR, November 1987). If I had realised you had received such a negative response from this area I might have written to you 'ere this.

"1. VK3RTG: This beacon is consistently operating on 144.430 MHz with S9 signals to my QTH about 15 kilometres air line from Glen Waverley.

"2. VK3RAI: Is consistently on 432.450 Mhz with an S9+ signal here. However, the keyer has been heard playing up recently.

"3. VK3RMB: Have not heard this beacon at all since it moved off the old frequency. Under favourable propagation conditions it used to be audible and has been heard at up to S9 — but not for several years and never on 432.535, though I have frequently listened for it and not just on that spot frequency. So unless someone from Ballarat can confirm to the contrary, I would say it has never been reinstated.

"4. VK3RGG: was conspicuous by its absence on 52.330 for several years. However, over the Christmas/New Year period looking for non-existent Es activity (surprise!) I did hear it with a very weak signal compared with that which I used to hear.

"5. VK3RMV: was audible around the same time. It is not audible so frequently now as in the past.

"6. VK3RCW: Is confirmed as being on, also from Glen Waverley on aboul 144.950 MHz. It is a CW practice beacon sending random letters and figures on FSK."

Thanks for that information Gordon, and until advised otherwise will remove VK3RMB from the list.

Gordon VK3XX, also says he has been a keen VHF operator for many years but not on FM/Repeaters. The low end of two metres and 70 centimetre activity on SSB must be at an all time low except for one or two well equipped stations.

On two metres, Gordon uses a 1960s home-brew transverter into an 11 element Yagi, and on 70 centimetres, a Microwave Modules transverter into a 13 element Yagi. He says it is a modest installation but has worked into VK5 on both bands.

On 17/2, Gordon reports signals to VK3KUB, near Wangaratta, were S9 on 144.100 MHz and on trying 432.100 MHz, his SSB was 5 x 4 and he copied his 10 watts at S5 on CW, though not so good on SSB. He concludes by saying all we need is activity!

The letter from Ron Cook VK3AFW, with information on the VK3RTG beacon, also had a paragraph at the end which may interest readers.

Ron says: "Regarding low power operation in contests I offer a couple of (Historical) comments. In the days when we had regular VHF field days in VK3, I operated with 35 mW of NBFM on two metres and notched up a respectable score. My best effort was 50 OSOs with less than five watts out on AM. A number of stations built two transistor AM rigs with about 10 mW output. From memory the technical details were as follows:

"The first transistor was bipolar, and used as a crystal oscillator at 72 MHz and doubling to 144 MHz. A dual-gate FET was used as the PA with RF on one gate and audio on the other. There was no audio power amplification, a dynamic microphone and step-up transformer being sufficient to give adequate modulation depth. Distances of 200 kilometres were readily spanned with moderate sized Yagis.

"There needs to be some incentive/challenge to get people out into the field and the re-introduction of multipliers for low power operation should be considered by contest managers and organisers." Thanks Ron for these comments. Maybe there will be some feedback regarding low power operation.

REFLECTIONS

The comments *from* Ron Cook VK3AFW, have stirred my memories of the past which now extend beyond 27 years on VHF/UHF

A rough count-up of stations in VK3 which were worked from the old poor QTH at Forreston indicate a total of over 120 call signs on two metres and many less on 70 centimetres. About 106 of those two metre contacts were made in the days when most stations were using AM, and quite a number were made in the very early days before I managed to build a sufficiently stable VFO for my transmitters, so was confined to crystal control around 144.090 MHz, with two spare crystals if I found other stations on "my" frequency. Others nearby were VK5NW at Crystal Brook on .050, VK5ZKR .060, VK5TN .080, VK5ZEJ (now VK5LP) .090, VK5ZEP .120, VK5ZMW .130, VK5ZKV .140, VK5WV .150, VK5RO .160, VK5ZKA.170, VK5ZDR .180, VK5ZJH (VK5QZ) .190, VK5ZDX (VK5MM) .200, then up the band to VK5ZBR .250, VK5GG .270, VK5ZJD .305, VK5ZMJ .375 and VK5ZSJ on .480. Of course there were many others scattered between these, often selecting a 5 kHz spot. In those days it was often possible to decide whose station it was simply by frequency long before any announcement of call sign was made!

It was possible to run up over 100 contacts into Victoria simply because there were many stations operating on the low end of two metres, either AM or SSB. Repeaters were unheard of, black boxes either non-existent or too expensive to buy. Almost everyone made their own equipment whatever the band, utilising ex-wartime equipment if it could be obtained and modified and stations were spread out over at least 500 kHz, so you did plenty of tuning in those days using mostly a converter feed into an HF receiver (sometimes with doubtful stability and read-out) tuned to 3.5, 7.0 or 14 MHz depending where you got the best bandspread and readout.

There were many stations in western Victoria and most would be on nearly every night. Stations in Melbourne also were almost as easy to work on AM as they are now on SSB. Many contacts were made because stations used to run a carrier for five minutes or more before calling. Those tuning at the other end could often recognise the VK3 by his frequency and knew it was a VK3 because of QSB, and when he called a contact would be made. A well modulated AM signal with high level clipping and filtering and a good noise blanker (or limiter) on the receiver always ensured a high level of contacts being completed. With so many in VK5 and VK3 now being confined to repeaters it is inevitable less contacts will be made on the low end of two metres, so those coming on in recent years will be very hard pressed to amass any great score of two metre contacts between VK5 and VK3 because the stations just simply are not there!

Long time operators will remember some of these call signs which, in some cases, have been changed to full calls.

VK3s — NN, AOS, ARM, UT, ANQ, ZDM, ZCG, ZTN, ATN, ZER, ZEA, ZMS, ZGZ, ZYG, CI, ZEF ZAX, AXV, VK, XFS, AEJ, ZUC, AKN, UT, AEJ, ASV, AUR, AQR, AKC, AOT, ZNJ, ZBJ, ZCE, ZCK, ZHU, ZMS, ZYP and I could go on and on, page after page, but those mentioned were some contacted during the 1960s. How things have changed, many would never be heard now for a variety of reasons.

What set out to be a couple of paragraphs became somewhat extended, but that is what happens when you let nostalgia take over! Maybe AR would like an article on the subject, one day. I am sure it could be made into interesting reading.

Before closing I would like to mention a telephone conversation I had with Reg VK5QR, who mentioned that he and Wally VK6WG, in Albany, have been having a great time this year with contacts over the 1885 kilometre path on 1296 MHz, 2.3 and 3.4 GHz. They have had occasions when 144 and 432 MHz have only been fair and then found conditions on the other three bands have been very good. Even contacts have been made on 2.3 and 3.4 GHz, when they would have been scratchy on 144 and 432, so the lower bands are not necessarily a guide to conditions higher up. Reg wonders how many contacts have been missed because of believing 432 had to be good before 1296 was good. Likewise, 1296 has to be good before you had a chance on 23 GHz, and so on. Now-a-days, if there is any indication of enhanced conditions they will go straight away to the other three bands much to the chagrin of some of the locals who seek out Wally VK6WG, for 144 and 432 MHz contacts!

On several occasions they have tried to complete the path on 5.6 GHz but to date have not been successful, but Reg believes it is only a matter of time, the right conditions will prevail one day and the distance will be spanned. Good luck.

CLOSURE

That is about all for this month. I have not taken up space detailing the endless contacts which are made on a continuing basis each month between Adelaide and Melbourne on 144 and 432 MHz, and from Mount Gambier to Melbourne where additionally 1296 MHz is being tried. With the present state of the art, the 700 kilometre path to Melbourne is no great problem to bridge for stations with a reasonable location, with probably Roger VK5NY, from his super mountaintop location at Mount Wilson leading the field! Here at Menlngie, I am hopeful of eventually having the Melbourne and other VK3 operators remember I am 10 degrees further south than the path to Adelaide and that 10 degrees can mean several S-points with a sharp beam. But they are learning!

Closing with two thoughts for the month: "Maybe money does still talk but it sounds more like a gasp" and "He who thinks by the Inch, and talks by the yard, should be kicked by the foot."

73. The Voice by the Lake

ar

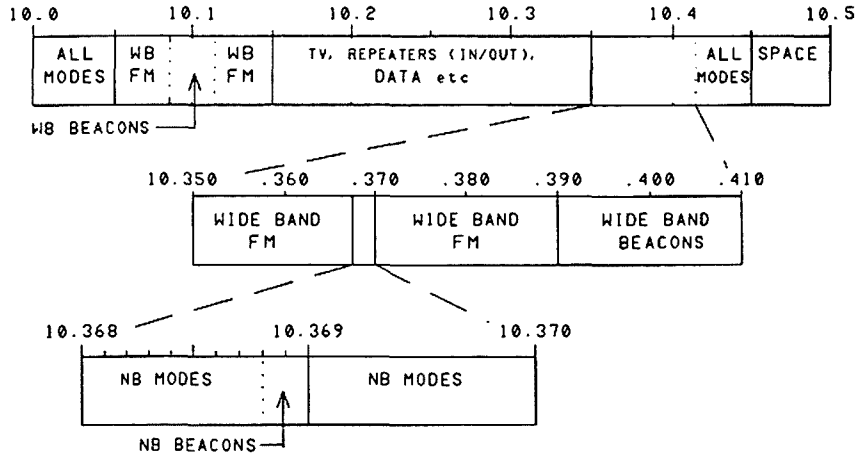
10 GHz Provisional Band Plan

This Band Plan is based upon the United Kingdom Band Plan as notified to the IARU Region 1.

GHz	
10.0000 — 10.0500	All modes
10.0500 — 10.1500	Wide Band FM
10.1000 ±	Wide Band Beacons
10.1500 — 10.3500	Television, Repeaters (in/out), data, etc.
10.1500	Packet (1 MHz BW)
10.3500 — 10.4100	Wide Band Modes
10.3900 — 10.4100	Wide Band Beacons
10.3680 — 10.3700	Narrow Band Modes
10.3688 — 10.3690	Narrow Band Beacons
10.4100 — 10.4500	All modes
10.4500 — 10.5000	Space-Satellite Communications

This Band Plan was to be discussed at the 1988 WIA Federal Convention. Please make your views on the plan known to your Divisional Federal Councillor, or write to the Federal Technical Advisory Committee, care of the Federal Office, PO Box 300, Caulfield South, Vic. 3162.

ar



AN AUSTRALIAN SURFACE-PATH UHF RECORD?

A VK6 UHF Surface Path Record?

A VK3 UHF Surface Path Record?

It is one *big thrill* for all VK amateurs, whether they work UHF, VHF, HF or the 600 ohm mode, to hear by 'the grapevine' of the following accomplishments!

Wally VK6WG, an 'Old Timer at UHF' contacted another 'UHF Old Timer', Les VK3ZBJ, on 1296 MHz at 1508 UTC on March 18. The signal report for Wally was 5 x 2. Wally is in Albany, Western Australia, and Les is in Frankston, Victoria — a distance of some 2 500 kilometres. Not bad going boys. Also, in the act was another 'Night Owl' of the spectrum, Roly VK3KXW, who is not new to records, but incidentally heard Wally first, nevertheless, Les, with a history of achievements in the hobby and recognised for his knowledge and enthusiasm of the UHF and SHF spectrum, capitalised on the magnificent opening and gave Wally his report. Wally received 429 from Les on CW.

Wally was running 50 watts into a 1.2 metre dish, 16 metres above the ground. Les was running his usual 'rig' on 1296 MHz.

Roly made the grade, and was not disgraced by a couple of kilometres, as he later said, "I am going to 'grab' that two kilometres record from Les, in the future". (Estate agents please take note, all commission to AR, please).

Sincere congratulations to the 'trio' by all concerned, in creating a 'Bicentennial Record' which will grace our history books.

Eric, who has written this column for nearly two decades, and a very popular and deserving winner of the Ron Wilkinson Award for 1987, advised during a quick 600 ohm discussion, that conditions were controlled by a large 'high' between the stations, which was in the vicinity of 1032 hP, and would have greatly enhanced the chance of 1296 MHz communication. The Bureau of Meteorology maps indicate this phenomenon quite clearly.

Roly notched another first for Esperance in Western Australia, when he placed a 1296 MHz CW signal into the shack of Dave VK6AOM, at 1527 on March 22. Dave was using a 1271A into a loop Yagi and gave Roly, who was also using a 1271A, but into a 28 element copper loop Yagi, a 569 report.

Roly, continued to fill his log book by contacting Joe VK7JG, on SSB and David VK7DC, using FM and a dipole. Ecstatic with his accomplishments, he also worked VK3MW/P Mount Gambier, at 0028 on the 22nd followed by VK6BE, in Albany at 0043, with full quieting on 70 centimetres.

On behalf of the Amateur Fraternity, congratulations gentlemen. The question is *will you update your present record in our Bicentennial Year or rest on your laurels?*

Sorry folks, the previous paragraphs have been superseded by Les, before they had time to be written to the computer's disc. Les VK3ZBJ, 'pedalled harder' and placed another signal into the shack of Dave VK6AOM, in Esperance, at 2256 on March 22. Dave didn't believe his ears, but there was Les, loud and clear, and he had the pleasure of receiving a 5 x 7 report on 1296 FM.

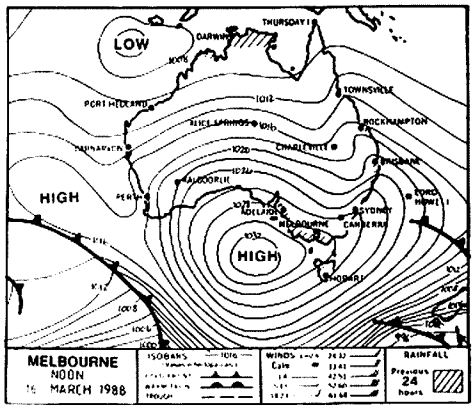
Les, was using his home-brew 55 watts output, into a two metre dish located 122 metres above sea level, combined with a MGF1402 Front End.

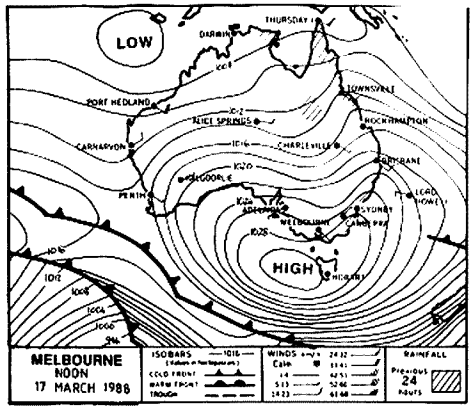
Please, NO more records this week, folks, as there is no more room left, to write updates in, as the magazines come off the printing press.

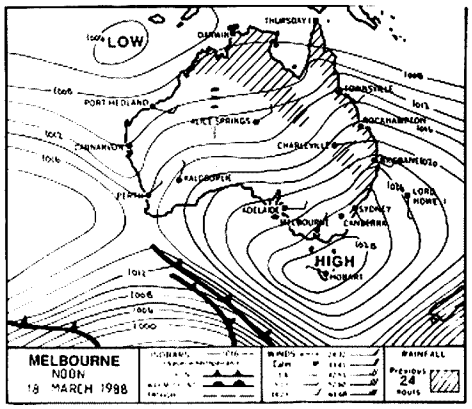
—Contributed by Kan VK3AH, with the assistance of many other dedicated VHF/UHF enthusiasts.

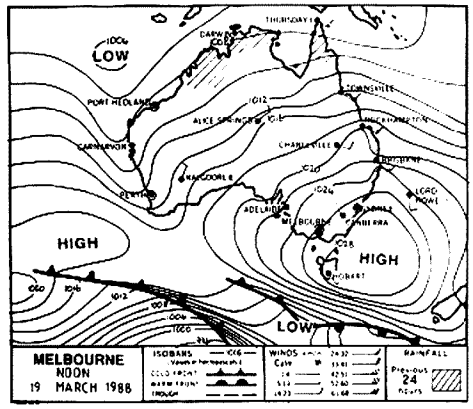
ar

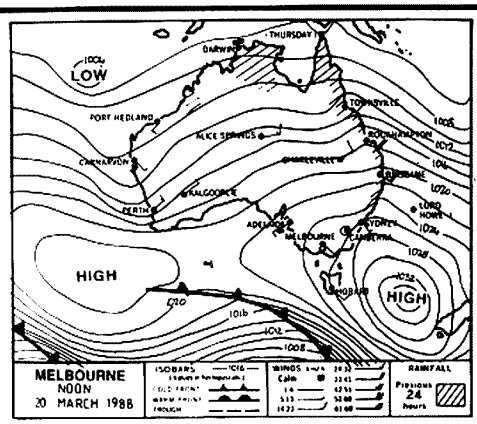
CONGRATULATIONS TO ALL PARTICIPANTS

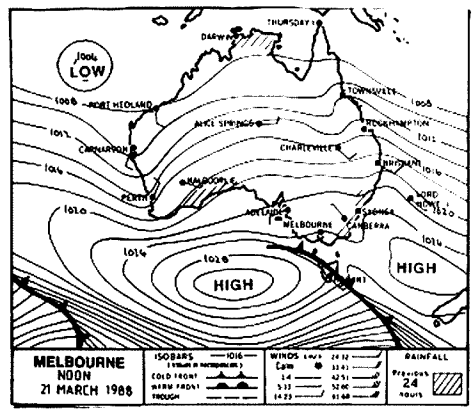


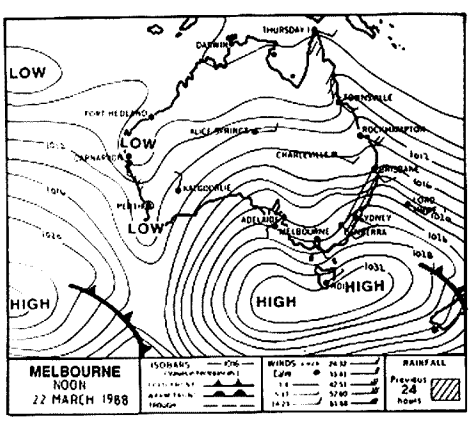


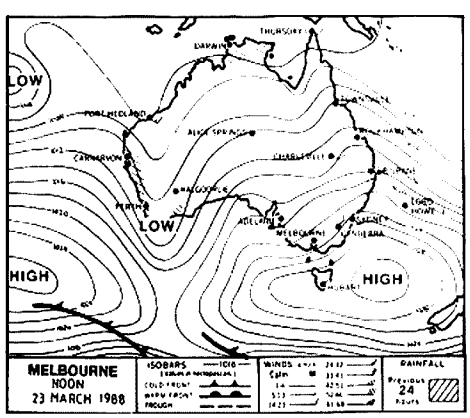












Meteorological maps courtesy of the Commonwealth Bureau of Meteorology

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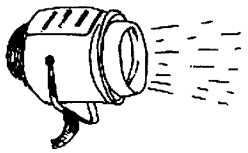

Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

Well, it is Winter and I am spending most of my daylight hours listening across the bands. You will have noticed that signals are coming in from Europe and the Americas during the daylight hours. Many signals beamed to the Americas during their night-time hours are steadily coming in, particularly on the 25 and 31 metre broadcasting allocations. Also there is the propagational path via Antarctica on the 49 metre allocation from Central Europe and the British Isles around 0200 UTC.

Do not forget either that the J-88 period commences on May 1 from 0100 UTC. The previous period was hectic catching up with all the changes caused by seasonal alterations to frequencies. As well, Central Europe and the UK, plus the USSR, went onto Daylight Saving Time. This meant that broadcasts targeted to European audiences are aired according to the local time rather than UTC, which meant programming was one hour earlier. Another target area which has a similar format is the Peoples' Republic of China which went on Summertime early last month.

Another reason why I am pleased to be back enjoying the hobby is that I have stepped down from Divisional Council after a two year stint. Now, I can readily appreciate all the hard work done behind the scenes by the backroom lads and ladies. Yet there was another organisation who wanted me to rejoin their committee, after learning about my "free time" but tactfully I declined.

One resolution I made at the beginning of this Bicentennial Year was to start and despatch reports on observations once again to international broadcasters. Already one report has been sent to the World Service of the Christian Science Monitor (Radio WCSN) in Boston and I hope to be able to send other reports regularly. Although the technical staff are appreciative of signal reports, often it is the program-makers who are very interested in comments about the format and content of the station. So, as a tip to those contemplating sending reports in, I strongly recommend you attach your comments and reactions to their programming.

Several international broadcasters, particularly those dependent on state funding of their operations, have been facing budgetary cutbacks. Some of those likely to be affected are our own *Radio Australia*, the giant *Voice of America* network in Washington and *Radio Canada International* in Montreal. The VOA recently told its Congressional watchdog that it was cutting back on total broadcast hours per day and dropping two language services this year. In 1987, they dropped Korean and closed the USIA offices in Korea. Yet they are going ahead with their expansion plans to upgrade their relay bases world wide. The first one targeted for upgrading is the Sri Lanka relay from Colombo. Their base is in the south of the island nation, unlike the Deutsche Welle relay at Trincomallee in the troubled north, which has been closed for some time now. The island's Civil War also forced *Radio France International* to drop the idea of also using Sri Lanka as a relay base.

Whilst on relays bases, *Radio Exterior Espana* in Madrid, has been using facilities of Radio Beijing's Kunmig site in the PRC to broadcast to Japan and the Philippines in Spanish. The former comes in well here on 7.165 MHz from 1000 to 1055 UTC and also its second harmonic on 14.330 MHz was heard weekly and reported on to the Intruder Watch. Radio Beijing also utilises the Canary Island relay of REE at 0500 UTC to North America in English on the 31 metre band. Meanwhile REE reportedly are going to set up a relay base in Costa Rica by the 1990s and jointly share it with Costa Rica, which does not yet possess an international service, although some commercial stations come in very well on the 49 metre band.

Later this year or by this time next year, the BBC hopes to start using the Seychelles Relay to East Africa. They have also been recently upgrading the antennas on their Ascension Island relay in the Atlantic. Deutsche Welle have commenced to use the relay facilities of Radio Veritas in Manilla for their Chinese language broadcasts at 1300 UTC. It is not, however, a direct relay as the program is recorded earlier and taken by road to the transmitting site and so is out of synchronisation with the DW signals coming direct from Germany. DW also had an experimental service in Portuguese from Radio BRAS in Brazil, although I am at present unaware if this is going to be a permanent arrangement.

I had expected to be in a position to review both the *World Radio TV Handbook* and the *International Broadcasting Handbook* this month. However, I have not seen any copies yet. Perhaps later in the year! Incidentally, in one of the club newsletters I saw that I was expected to write an article on one prominent South Australian SWL, without possessing any background material. If the office bearers in the organisation concerned contact me I will see what I can do in the future.

Well, that is all for this month and good listening!
73 de VK7RH

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Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic. 3199

I have appealed previously for information about individuals or groups who are committing their time to helping newcomers to gain or upgrade licences, so have been pleased to receive word about some CW nets. In addition to the traditional Slow Morse Broadcasts from VK2BWI, and VK5AWI, on 3.550 MHz at 0930 UTC each evening, I have the following information:

Early Birds Net, 10 WPM, DOC type and 5 Character Groups	0700-0815 EST Mon-Sat	3.547 MHz	VK3DEG, VK3EDS, VK3AHU, VK3CLV
Early Birds Evening Net, 10 WPM, DOC type, and groups	1815-1900 EST Mon-Fri	3.539 MHz	VK3DEG, VK3DZZ
15 WPM	1900-2000 EST Mon-Fri	3.539 MHz	VK3CQP, VK3CJT
10 WPM	2030-2130 EST Mon-Fri	3.540 MHz	VK3FO

In addition, in VK3 we have VK3RCW on 144.950 MHz broadcasting five and 10 words per minute alternately most of the day.

I would be pleased to hear of other nets or facilities in other States so that I can build up a set of information for publication in occasionally in AR.

The dedication and interest shown by those who run these services is a valuable contribution to the training side of our organisation.

Statistics from the November examinations was received recently. The trend towards higher pass rates has continued, with overall figures of:
51 percent for AOCP Theory, range 46 percent VK3 to 62 percent VKs 6 and 7 (VK1, 4/6 candidates).
60 percent pass for NAOCP Theory, range 44 percent VK5 to 67 percent VK2.
71 percent pass for Regulations, range 43 percent VK1 to 81 percent VK7.

Figures for States with few candidates are hardly statistically significant, but the indications are that more candidates are succeeding.

Several tentative conclusions are possible:
a) The examination standard is dropping, ie examinations are getting easier
b) The calibre of the candidates is rising.
c) The class teachers are doing a better job.
d) The questions are becoming known.
e) The recent rise in examinations fees has reduced the number of "have a go" candidates.
f) There is some completely different explanation.

A figure that does seem to be significant is the drop in the number of candidates applying and then not sitting the examination. Presumably the cost factor is responsible here.

The availability of the examination statistics from the Department does allow some measure of checking on the standard of the papers.

One aspect of the devolvement proposals that worries me is that no provision seems to have been made for the collection of this type of information, or overall review of the system as time goes by!

With a number of examiners running examinations for small groups at frequent intervals, the possibility of any statistical analysis is remote. No procedures have been suggested which require examiners to supply a central authority with the pass rates.

If, as the Department insists, quality control measures are to be instituted, it would seem to be logical to require information about all candidates, not just those who pass.

This may be an area where the Institute has to maintain a watching brief, to collect and collate information and to carry out some analyses, but if so it will have to be as a result of a Department directive, not on a voluntary basis.

Some groups, clubs, or Divisions will want to keep and analyse their own records, but to be sure the system is working smoothly and is fair to all it seems to me that machinery must be established right at the start to collect all possible information so that it can be retrieved as required, and to establish procedures for reviewing the system at regular intervals.

73 Brenda VK3KT

ar

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

Are you new to amateur radio? If so, welcome to the hobby — I am sure you will have many years of interest ahead. But whether you are new to the hobby, or have been involved for some time, you may be curious as to some of the weird sounds that are to be heard on the air. If you are, in fact, curious and care to send me a blank C60 cassette tape, I will return it to you with all the major modes of emission on it, with explanations of what they are, and mode designations. This tape will enable you to identify all the various modes you are likely to hear as you wander around the bands. Send the tape to me at the address shown at the top of the column.

Reports were received in January from the following:
VK2s DEJ, EYI, MUZ, PS, D Pearce (VK3 SWL), VK4s AKX, BHJ, BTW, BXC, DA, KHZ, VK5s GZ, TL, VK6RO, VK7RH, VK8s HA and JF.

There were 126 AM intruders reported; 217 using CW, 212 using RTTY, 129 using other modes and 34 intruders identified on-air.

Some good news — a report from JM1UXU, the Secretary of IARU Region 3, informs us that Radio Beijing (Peking) has vacated the 40 metre amateur band as from September 25, 1987. This means that the Chinese broadcast station, which has been plaguing us for years, will no longer be a problem.

This is a result of years of concerted effort by various intruder watches, monitoring systems, member societies, the administrations involved, and many groups and individuals. Undoubtedly, final work was carried out between the JARL and CRSA (China). There are still other broadcast stations operating between 7.0 and 7.1 MHz, but now there is one less, which is a plus for amateurs world-wide. Congratulations to all concerned.

Finalising the *Mode for the Month* series, we turn our attention to the 30, 17, and 12 metre bands (WARC bands).

During the series, I made no reference to these bands with regard to the presence of intruders. This is because these bands, which are relatively new allocations to the amateur service, and have yet to be allocated to many countries, are not exclusive to the amateur service. At the moment they are all shared bands. In short, I feel that intruder activity on these bands is not worthy of our attention just yet, until the bands are declared amateur-exclusive. Many of the so-called intruders appearing on these bands cannot really be classified as intruders under the present band-sharing arrangements.

Let us know what you hear on the other bands, and we will turn our attention to the WARC bands when conditions dictate. See you next month, and take care. .:73 for now.

ar

How's DX?

EUROPEAN DX NET

The European DX Net meets each Saturday on 14.243 MHz, from 0630 UTC. Net Control Station is OE6EEG, a very pleasant and efficient operator.

On March 5, 1988, I worked TA2L, Turkey, SV5ADM Dodecanese and S0RASD, Rio de Oro in NW Africa.

Contributed by George Cranby VK3GI

CHINESE DXPEDITION

The Chinese Radio Sports Association and the Chinese Mountaineering Association will be setting up two special amateur radio stations, BT0LS, located in Lhasa, Tibet, and BT0ZML, located in the base camp on Mount Zhumulangma (Mount Everest).

The stations are part of the China, Japan, Nepal Friendship expedition to Jolmolungma 1988, and will operate during March, April and May 1988.

They plan to work CW and SSB on the 15, 20 and 40 metre bands.

Both stations are QSL via PO Box 6106, Beijing, China.

Contributed by Zhou Yu-Hong BY4AA

WORKED ON THE EAST COAST — from February 6 to March 9, 1988

3.5 MHz: Doug VX5RAX/6 in Canada using a special call sign prefix. At 1430 UTC using CW. (There were many stations on the band at this time in the USA).
7 MHz: Jose EA4BJN, *on* CW at 0742 UTC. (Several USA contacts were also made).
14 MHz: Many contacts, see following:
Rudi VK9LF. Rudi DJ5CQ, is again in Australia. QSL to his home QTH.
Louiz PY4AH, from the Matto Grosso area of Brazil at 0422 UTC.
ZS4TX at 0749 UTC.
FO5JV. QSL direct to PO Box 380, Papetee, French Polynesia.
Dave KC4USV, at McMurdo Antarctic Base.
Peter OA4ZP, at 1217 UTC, in Lima. Peter is of Swiss origin and has lived in Peru for the past 21 years.
Art 9H4R, from the Island of Gozo. Operating CW at 0626 UTC.
Henry IS0QDU, from Sardinia Island at 0178 UTC.
Dimitri SV5ADM, on 14.243 MHz at 0631 UTC. QSL direct to Dimitri, PO Box 464, Rtwdos Island, Greece.
Michel TU2QQ, on the Ivory Coast. QSL direct to F6FNU.
Laurent FJ5BL, on Saint Bartholomeo Island in the Caribbean. The contact was extracted from a large "dog-pile" at 0554 UTC. QSL to F6AJA.
Roger ZK1XD. This was DL5RBW on holidays in Raratonga. QSL to his home call.
Jacek JW0B, at 1130 UTC. Jacek is a member of the Polish Arctic Expedition. QSL to SP5EVN.

21 MHz
Ron ZL9BQD, operating from Auckland Island. QSL to ZL1BQD.
Bus W200OEK, operating CW from Oregon using a special call sign commemorating 200 years of the USA Constitution. QSL via W7VSE.
Karl 3D2VU, operating CW in Lautoka. QSL to DB5UJ.
Alfo HC5AI/3, operating CW in Santa Rosa, Equador.

The AX-prefix was used extensively with good results — and this gave me the opportunity to explain about our Bicentenary Celebrations and draw attention to the various VI88 special event stations.

Alex 4K1LPK, in the "Russkaya" Russian Antarctic Base was heard on 14 MHz SSB but not worked. QSL to UY5OO.

ZD8HH, was also heard in a "dog-pile" from Ascension Island, on 14 MHz SSB.

Those interested in rare European countries and African stations should tune to Selim's Net on 14.243 MHz every Saturday around 0630 UTC. Selim is OE6EEG and "booms" into Australia long path at this time.
(See also note above from George VK3GI).

Good DX, Steve.

—Contributed by Steve Pall VK2PS

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QSP

PHONE PATCH PROGRESS REPORT

About 25 Line Isolation Units (LIU) for phone-patching, as published in AR magazine, September 1987, page 33, have now been authorised for connection to the Telecom telephone network.

Geoff Donnelly VK2EGD, said a problem faced by *some* submitting LIUs had been their inadequate packaging resulting in switches being damaged during transit.

Two units submitted also had isolation transformers other than those specified in the AR article — Arlec 45035 or Ferguson MT627 — note also the follow-up correction in AR magazine, November 1987, page 40.

Geoff said it was important that only specified components be used which were readily available.

He said only one LIU had been rejected — due to a faulty component and the need for wiring and construction improvements. But, its constructor had been given advice on having a second attempt and should have little problem in getting a LIU up and running.

"The rest have been good or excellent examples of the home-brewing skills of radio amateurs. About half of them are excellent and better built than the prototype submitted by the WIA for Telecom approval," Geoff said.

Printed circuit boards are available from RCS Radio Pty Ltd at Bexley, NSW. When ordering the PCB please quote part number 12240.

LIUs should be sent for authorisation to the WIA NSW Division, Parramatta, complete with the sender's name, and the telephone number intended to be used for phone-patching. This information is needed before approval can be granted.

General inquiries about LIUs can be directed to Geoff Donnelly VK2EGD, QTHR.

NEW DX COUNTRY

Aruba P4, is now a separate country recognised by the ARRL for its DXCC. Credit for Aruba, now separate from the Netherland Antiles, will be given for contacts made after January 1, 1986.

Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7251

CONTEST CALENDAR

MAY 1988
14 — 15 CQ M Contest (Rules April issue)
21 — 22 World Telecommunications Day Contest (Rules this issue)
28 — 29 CQ WW WPX CW Contest

JUNE 1988
18 — 19 All Asian Phone Contest
25 — 26 VK Novice Contest (Rules this issue)

JULY 1988
16 — 17 CQ magazine WW WPX VHF Contest

AUGUST 1988
13 — 14 VK Remembrance Day Contest (Rules next issue)
27 — 28 All Asian CW Contest

50th COMMONWEALTH CONTEST RESULTS — 1987

Congratulations to VK6LW for being the top Australian entrant with a score of 4548. VK2APK was second with 4055 and VK4XA was third with 3703.

The full results in the transmitting section for 1987 were published in November 1987 AR.

You will have noticed from the results of the last Ross Hull Contest in last month's AR that the winner was the station that managed to work the most DX (or distance), this was an intended feature of the rules as was the scoring of one point per contact. The aim is to work as many locator squares as possible, and to do this a station has to work harder, as the number of squares worked increases.

I have received a letter from the international section manager of the JARL indicating a plan which will be submitted to the next Region 3 regional conference and refers to a contest segments plan which will be accepted world-wide. This would be a worthwhile endeavour and could assist in the reduction of some of the more objectionable behaviour that occurs during the heat of contests.

VK NOVICE CONTEST 1988 — Rules

Contest Period — From 0800 UTC, June 25 1988 to 0759 UTC, June 26 1988

Object of the Contest — To encourage contest operation of amateur radio stations in Australia, New Zealand and Papua New Guinea, with special emphasis on contacts with Novice and radio club stations.

Stations Eligible — Only stations in VK, ZL and P2 call areas may enter. No stations outside these areas are permitted to be worked or entered in a log for the purposes of this contest. Except for radio club stations, no multi-operator working is allowed. Stations in the same call area may contact each other as well as contacting stations in other call areas.

Contest Bands — All operations must be confined to within the Novice frequency sub-band allocations in the 10, 15 and 80 metre bands. No cross-band operation is permitted.

Modes of Operation — Only Phone or CW may be used. In the CW mode, operation must not exceed a speed of *15* words per minute. This is to encourage the use of CW by all operators and to allow improvement in this mode by those operators who do not usually practice same.

Contest Sections —
Section a) Phone — Novice/Full Call.
Section b) CW — Novice/Full Call.
Section c) Listeners.

Scoring —
Transmitting — for contacts with a Novice Station — five points
for contacts with a Club Station — 10 points
for contacts with a Full Call station — two points.
Listener Entrants — for Novice to Novice Contact — five points
for Novice to Full Call Contacts — two points
for Full Call to Full Call Contacts — two points
for any contact with a Club Station — 10 points.

Call **Procedure** — For phone operation call *CQ Novice Contest* and for CW operation call *CQ N.*

Contacts — Any station may be contacted only once per band.

Number Exchange Section A — On phone, stations must exchange a serial number comprising an RS report followed by three figures. The figures must commence with 001 and increase sequentially by 'one' for each contact up to 999. If 999 is reached the serial number will revert back to 001.

Number Exchange Section A — For CW, stations must exchange a serial number comprising an RST report followed by three figures on the same basis as described above for a phone contact serial number.

Radio club stations must add the letter 'C' following the serial number.

Log Entries — Each log sheet should be laid out such as to provide columns in the order given as follows:

Date/UTC Time, Band, Mode, Station Contacted, Serial Number Sent, Serial Number Received, Claimed Score.

Each log sheet must also be endorsed at the top VK Novice Contest 1988.

Total Claimed Score for each page must be shown at the bottom.

Front Sheet — A front sheet must be attached to each log entered and must carry the following information:

Name of Operator, Address, Call Sign, Section Entered, Claimed Score.

Declaration — The Front Sheet must also carry a declaration which states —

I hereby certify that I have operated within the rules and spirit of the contest. Each entry must carry the signature of the licensed operator of the station and be dated accordingly. In the case of a club station the entry must be signed by a responsible officer of the club committee or a licenced operator delegated by the committee to do so. In the case of multi-operator stations, the call signs of participating operators must also be shown on the front sheet.

Regulation — All stations participating in the contest must be operated within the terms of the station licence and applicable regulations.

Entries to — Logs are to be forwarded to the Federal Contest Manager, entries must be posted so as to reach the Contest Manager no later than July 29, 1988. The address for entries is: Federal Contest Manager, Frank Beech VK7BC, 37 Nobelius Drive, Legana, Tas. 7277.

Envelopes are to be endorsed Novice Contest.

Certificates — Certificates will be awarded to the top scoring entries in each section at the discretion of the Federal Contest Manager and to any other entrant where meritorious operation has been carried out in the opinion of the Contest Manager.

Trophy — The *Keith Howard VK2AKX Trophy* will be awarded to the Novice entry with the highest aggregate score from both the Phone and CW Sections of the contest. This trophy is a perpetual trophy and will be held by the winner until such time as it is awarded to a winner of a subsequent Novice Contest. Should two or more aggregate scores be equal, a decision will be based on a count back as to the greater number of Novice stations listed in each log entry. Should such a count also be equal, the log containing the greatest number of CW contacts will be preferred. In the event of a further tie, under these rules the log will be placed before a committee which will exercise a vote as to the neatest and most meritorious entry.

Disqualification — The Contest Disqualification Criteria, as published in each August issue of *Amateur Radio* shall apply. Any station observed during the contest as constantly departing from the generally accepted code of operating ethics, may also be disqualified.

Operator — A person may only submit one contest log per mode. Logs for entries where an operator uses more than one call sign whilst operating in this contest will not be accepted.

WORLD TELECOMMUNICATIONS DAY CONTEST — 1988

Amateurs throughout the world are invited to participate in this world-wide activity sponsored by the IARU in celebration of *World Telecommunications Day (May 17).*

Contest Period — (Third full weekend in May)
Phone and CW — May 21-22.
Starts — 0000 UTC Saturday. Ends — 2400 UTC Sunday.

NOTE — Phone and CW are separate contests.

Objective — The object of the contest is for amateurs around the world to contact other amateurs in as many different ITU Zones as possible.

Bands — Only the 160, 80, 40, 20, 15 and 10 metre bands may be used.

Categories —
a) Single Operator/Single Transmitter/All Band operation only. (Single operator stations are those at which one person performs all of the operating, logging and spotting functions. The use of multiplier spotting nets or any other form of alerting assistance is not allowed in this category).
b) Multi-operator/Single Transmitter/All Band operation only. (After a band change the station must remain there for at least 10 minutes following the initial of the subsequent transmission on that band).

Contest Call and Number Exchange — "CQ WTD Contest" or "Test WTD". RS/T report plus ITU Zone (ie 5913 on phone or 59913 on CW).

Points —
— Contacts between stations on different continents are worth two points on the 10, 15 and 20 metre bands and four points on the 40, 80 and 160 metre bands.
— Contacts between stations on the same continent but different countries are worth one point on the 10, 15 and 20 metre bands and two points on the 40, 80 and 160 metre bands.
— Contacts between stations in the same country are permitted for zone multiplier credit but have zero point value.

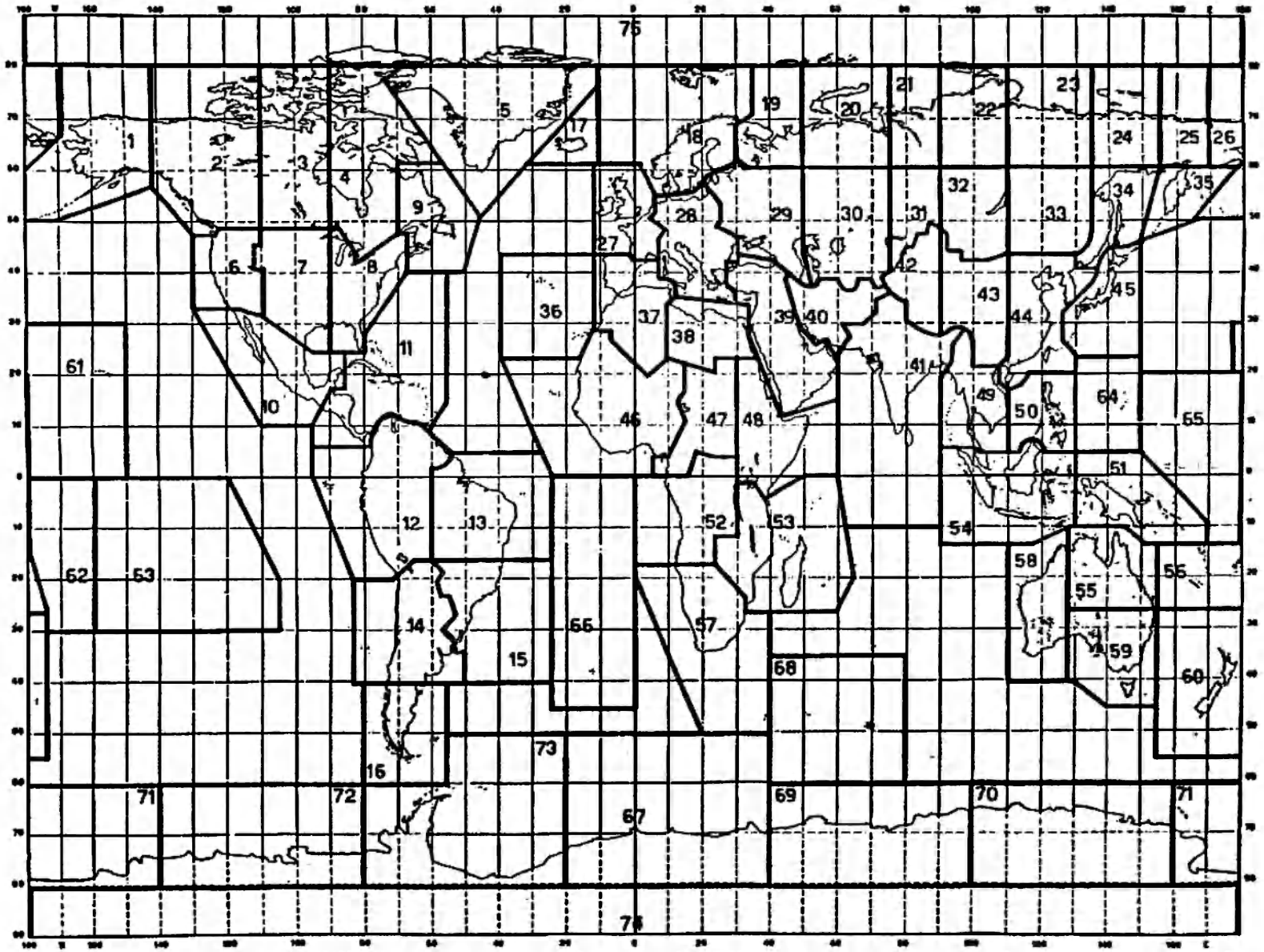
NOTE: In each contest the same station may be worked once on each band. The WAC continental boundaries and the DXCC country list are the standards.

Multipliers — On each band, the multipliers are the 75 geographical zones for broadcasting established by the International Telecommunications Union (ITU).

Scoring — The final score is the result of the total QSO points multiplied by the sum of all multipliers worked on each band.

Awards —
— Plaques will be awarded to the first place scorer in each of the operator categories listed under Categories.
— Certificates will be awarded to the first place scorers in every participating country.

NOTE: Depending on the number of entrants from



ZONES GÉOGRAPHIQUES POUR LA RADIODIFFUSION

GEOGRAPHICAL ZONES FOR BROADCASTING

ZONAS GEOGRÁFICAS PARA LA RADIODIFUSIÓN

each country, second and third place certificates will be considered by the Contest Committee. All plaques and certificates will be issued to the licensee of the stations used.

Log Instructions — All times must be in UTC. All sent and received exchanges are to be logged. Use a separate log sheet for each band. Indicate zone multiplier only the first time it is worked on each band. Logs must be checked for duplicate contacts, correct QSO points and multipliers. Each entry must be accompanied by a Summary Sheet showing all scoring information, the category of competition, contestant's name and address in block letters and a signed declaration that all contest rules and regulations for amateurs radio in the country of operation have been observed.

Disqualification — Violation of amateur radio regulations in the country of the contestant, or the rules of the contest; unsportsmanlike conduct' taking credit for excessive duplicate contacts; unverifiable QSOs; or unverifiable multipliers will be deemed sufficient cause for disqualification. Actions and decisions of the Contest Committee are official and final.

Deadline — All entries must be postmarked no later than July 31, 1988. Logs to posted to: LABRE, WTD Contest Committee, PO Box 07-0004, 70000 — Brasilia (DF), Brazil, South America.

SANGSTER SHIELD CONTEST

Presented to the amateurs of New Zealand by Mr R Sangster in 1927, the Sangster Shield is for annual competition to be won by the most efficient station. In this respect it should be pointed out that, in addition to the efficiency of the transmitter itself, the efficiency of the operator is of the utmost importance. To win this contest marks an operator as one who not only knows how to obtain the most output from low power but also as one who is most proficient in the art of telegraphic communication.

1 WHEN? May 7-8, between the hours of 8 pm and midnight on each day. The maximum period of operation will be eight hours.
2 POWER: To compete for the Sangster Shield the output of the transmitter must not exceed five watts.
3 CW to CW contacts only are permitted.
4 All operation must be in the 80 metre band.
5 a) Contacts with any one station permitted on each hour, based on "even hour" basis — eg 2000 to 2100; 2100 etc, etc.
b) It is not permissible to QSO the same station "twice running" eg at the end of one hourly period and at the beginning of the next. A different station must be contacted before the "same" station is contacted again.
c) Except that this is permissible when one of the two stations concerned has contacted a different station between QSOs or when there is a time delay of at least five minutes between contacts.
6 All ZL entrants must be financial members of NZART.
7 All radio regulations must be observed.
8 In the event of any dispute, the ruling of the Executive Council will be final.
9 Logs:
a) Quarto or A4 size paper — preferably NZART log sheets.
b) Date in this order: date, time, call of station contacted, serial sent, serial received, points claimed.
c) On a Separate Sheet a summary to show:
i. Call sign, name and address in BLOCK LETTERS.
ii. Number of contacts with stations using five watts or less.
iii. Number of contacts with stations using six watts of more.
iv. Number of contacts with overseas stations using five watts or less.
v. Number of contacts with overseas stations using six watts or more.
vi. List of different Branches worked with number and name of the Branch in order as given in the *Call Book*, together with the call sign of the station claimed as a multiplier for that branch.
vii. Total Score — (total points and different branches).
viii. Description of equipment used and power used.
ix. Declaration that all contest rules have been observed.
d) Underline each new Branch claimed as a multiplier. (Underline all entries for that QSO).
10 Cipher System:
a) RST followed by Branch number followed by power output, eg 569/11/04. This would indicate a 569 report; Branch 11; and Power of four watts. Power will always be given as two figures — over 100 watts will be given as 99 whilst below 10 watts will be preceded by 0.
b) Overseas stations give RST plus power but must receive the full cipher from the ZL station.
11 Scoring:
a) Overseas contacts with power given as five watts or less — 20 points.
b) Overseas contacts with power given as six watts or more — 10 points.
c) ZL contacts with power given as five watts or less — five points.
d) ZL contacts with power given as over five watts — one points.
e) Overseas stations using five watts or less may claim a bonus of five points per contact.
FINAL SCORE is the total of points multiplied by number of different NZART Branches contacted.
NOTE: Contacts with a contestant's OWN Branch are okay for QSO points but NOT as a multiplier.
12 Mobile or Mobile/Portable operation is not permitted. The station must be operated from a fixed location for the duration of the contest.
13 Awards:
a) The Sangster Shield to the highest scorer using five watts output or less.
b) The Transistor Trophy to the highest scorer observing the rules as enumerated, but in addition who has been licensed for 12 months or less. Entrants must give Operator's Certificate number together with date of issue.
c) Certificates to the first three contestants using five watts or less, similarly to "newly licensed" entrants.
d) A certificate to the contestant using over five watts with the highest score made from QSOs with stations using five watts or less.
e) Certificates to Overseas stations to the highest scorer in any call area.
14 Logs must be posted to reach the Contest Manager, Alan Hughes ZL3KR, 4 Exton Street, Christchurch 5, New Zealand, on or before June 2, 1988.
15 To give QRP Contestants a fair chance (particularly with DX stations) higher power stations are requested to operate above 3.530 MHz.

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REPEATERS & BEACONS

Tim Mills VK2ZTM
FTAC Beacon Co-ordinator

Elsewhere in this issue of *Amateur Radio* is a proposed band plan for 10 GHz. Whilst there are perhaps only a few amateurs active in this region, it requires interest and input from everyone. Acknowledgment from both individuals and interest groups should be sent to The Federal Technical Advisory Committee (FTAC), WIA Federal Office, PO Box 300, Caulfield South, Vic. 3162.

Recent correspondence from New Zealand indicated a possible change in their two metre beacon segment from above 145 MHz, where the frequency indicates the region, eg 145.100 MHz is in ZL1 to the segment 144.300 to 144.400 MHz. This is just below the Australian beacons. It would mean that the segment is at the top of what we consider is the narrow and tunable portion of two metres. Is there currently much operation in 144.300 to 144.400 MHz which would be affected? Please communicate direct with FTAC if you have a comment or other input.

Sydney beacons, VK2RSY, have had a prefix change for this year. QSL cards will be exchanged via the bureau for reports received on the ZX2RSY transmissions. Note that the 10 metre transmission has a little extra so have a look for it on 28.262 MHz.

What value is a beacon? VK2RGB at Gunnedah, on 52.425 MHz has been operational for many years. The very small group has to maintain both a beacon and a repeater which eats into the budget. Would it be missed if it was taken from those who benefit by its existence. Drop a note to the State Repeater Committee, PO Box 1066, Parramatta, NSW. 2150.

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Book Review

Better Radio/TV Reception

Authors: A Nallawalla; A T Cushen; B D Clark

Published by Ashley Publishing

Reviewed by Gil Sones VK3AUI
20 Moore Street, Box Hill South, Vic. 3128

Listening to DX Radio and receiving DX Television is a hobby which is closely allied to amateur radio. Indeed, at one time, most of the new recruits to the amateur ranks came by this route. Nowadays many still do but listening is a separate hobby which offers considerable interest to many.

This book offers a broad coverage of the hobby and provides a great deal of useful information on many of its aspects. There are both technical topics which are written so as to be understandable by a wider section of the community with less technical expertise than many amateurs and topics on the more general aspects of the hobby.

How to send a listener report is something which is of some importance to the beginner. Even those with an amateur licence would find the requirements of reporting on Broadcasting to be of great value. It is rather different to the amateur practice of sending off a card. The information of use to a broadcaster is rather different. All this is explained in this book.

Receivers are covered in some detail along with explanations of desirable features. This is of considerable value as many suitable receivers have a quite bewildering array of features. Also covered are the advantages and disadvantages of duty free purchases. Very worthwhile as one can often forget the problems in ones rush to get a bargain.

Aerials and propagation are covered in a manner which can be easily understood.

The book is a very worthwhile purchase for anyone engaged in the hobby of DX Listening.

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NOVICE STUDY GUIDE

Reviewed by Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3132

A problem facing both those studying and teaching the theory for the Novice theory examination from the DOTC syllabus is just how deep the theory on a particular topic should be covered.

Lecturers have had the unenviable task of teaching theory at the right level and not above that needed by candidates for the Novice examination.

Those studying from text books also have, until now, been unsure how much to read on a theory topic sufficient to pass the examination.

With the *Study Guide for Novice Amateur Operator's Certificate of Proficiency* produced by the WIA Federal Education Committee, there is now a useful document to indicate the depth of theory on each syllabus topic.

The guide will also help those wanting to write Novice theory questions for examinations under the DOTC examination devolvement plan.

It is available from the WIA for $2.50, postage extra. Much voluntary labour by a group involved in teaching theory classes went into the Study Guide over an extended period of time.

WIA Federal Education Officer, Brenda Edmunds VK3KT, said she would welcome any comments on the Study Guide.

The theory syllabus for both the Novice and AOCP examinations were revised in 1984, and the Study Guide reflects the changes to the Novice syllabus.

Work has begun on a Study Guide for the AOCP theory. Brenda said she would particularly like to hear from those who conduct AOCP theory classes on their thoughts about the depth of theory topics on the AOCP examination.

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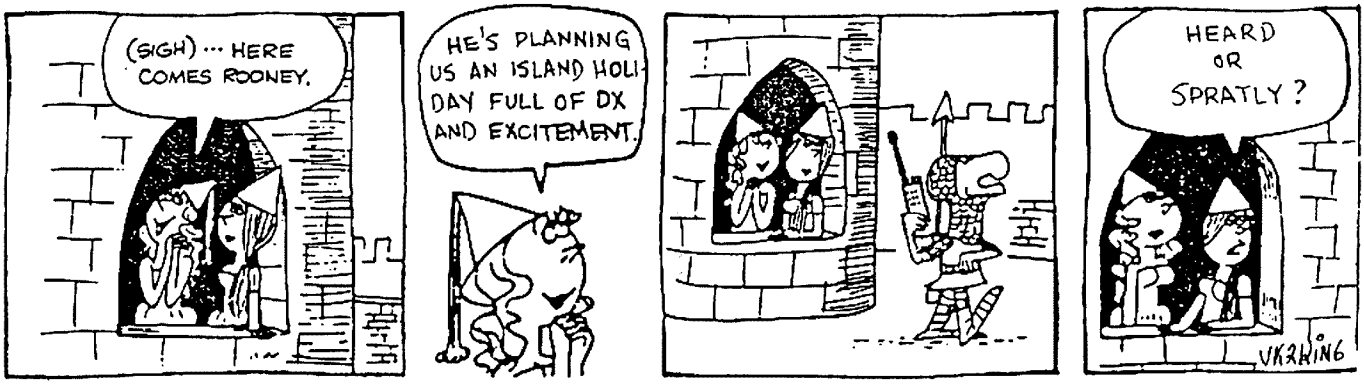


Cartoon courtesy the *Propagator*

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED IN JANUARY AND FEBRUARY 1988

DXCC PHONE

362	Peter Sykes VK7YP
363	Staunton McNamara VK5ZH

WAVKCA

1563	William J Mathews VK3WJ
1564	Serge A Sinitain UJ8JX
1565	Alex Kovach RB5DX
1566	Alex M Kuznetsou UY5EG
1567	Yuri Sarichev UH8EAD
1568	Gennady Kolmakov UA9MA
1569	Valentin Kudryavtsev UA4LM
1570	Valery V Saidin RA4HA
1571	Temirtau Club Station RL8PYL
1572	Stasys Kezelis UP2BAR
1573	Natan Sterental OA4OS
1574	Isao Numaguchi JH1ROJ
1575	Ted L Pounders KI4M

DXCC UPDATES

VK3OT	301/305 ph	304/306 op	
VK5BO	221/222 ph	267/301 op	
VK6YF	213 ph		
VK3AKK	311/315 ph	209/210 CW	311/315 op
VK4KS	317/348 ph	317/356 op	
VK4RF	314/327 ph	297/321 CW	314/344 op
VK6BQN	188/190 ph		

KARL AWARDS PROGRAM

The following Korean Amateur Radio League (KARL) awards are available to all licensed radio amateurs and SWLs.

HLA (HL Award): Will be issued to all amateurs and SWLs who receive QSL cards from any HL stations (except HL9), depending on the number of contacts made/heard with/from HL stations (except HL9), one or more of the following classes may be claimed.

Class K — five QSLs required
Class O — 10 QSLs required
Class R — 20 QSLs required
Class E — 30 QSLs required
Class A — 50 QSLs required

Stickers for affixing to certificates endorsing additional credits are available in multiples of 50 upon submission of QSL cards.

AKA (All Korea Award): Will be issued to amateurs and SWLs who received QSL cards from HL stations. At least one from each of seven different call areas, ie 1, 2, 3, 4, 5, 8, and 0.

KDN (Korean District Number Award): Will be issued to amateurs and SWLs who receive at least one QSL card from HL stations located in each of the different cities, Guns or Gus in Korea.

This award will be issued in multiples of 50, (KDN 50, 100, 150) upon submission of cards with a list prepared in order of KDN reference numbers.

APA (All Province Award): Will be awarded to amateurs and SWLs who receive QSL cards from HL stations located in each of different special cities and provinces in Korea.

Area codes for each City and/or Provinces are as listed below:

AREA CODE	PROVINCE and/or CITY
1	City of Seoul
2	Inchon City, Kyonggi-do, Kangwon-do
3	Chungchongnam-do, Chungchongbuk-do
4	Chollanam-do, Chollabuk-do, Cheju-do
5	Pusan City, Taegu City, Kyongsangnam-do, Kyongsangbuk-do

GENERAL RULES AND REQUIREMENTS

Eight IRCs will be charged per award and four IRCs for each HLA sticker.

If QSL cards are submitted, they must contain enough IRCs for return postage.

Endorsements for such operating distinctions as bands, modes and QRP may be applied for.

Proof of contacts/reception made with any HL station (except HL9) on/or after February 3, 1959, will be acceptable.

Proof of contacts/reception made with any US Army stations in Korea (HL9 call area) will not be acceptable.

All contacts must be made within the same call area.

KARL, as the Amateur Radio League of the country hosting the 24th Seoul Olympic Games, plans to make a Commemorative Award available to all amateurs/SWLs. The award is issued in three classes as follows:

Class A: Establish contact with one special event station (prefix 6K) and at least one from each of five different call areas, ie HL1-HL5.

Class B: Establish contact with HL stations and compose "SEOUL" with the last letter of call signs including one QSO with the Olympic Special Event Station (prefix 6K) or any HL stations with the call number 88.

Class C: Compose the words "SEOUL OLYMPICS" with the last letter of call signs from any five or more DXCC countries including at least one QSO with an HL station.

HOW TO APPLY:

GCR plus 10 IRCs or US$5 and one of your own QSL cards will be charged for the award.

Proof of contacts/reception made on/or from January 1 to October 5, 1988 will be accepted.

Endorsements for specific bands, modes and other pertinent data may be applied for.

The application will be accepted during the period October 1, 1988 to October 5 1989.

Special even stations and other commemorating stations described in the above are as follows, and will be operating for 35 days covering the period from September 1, 1988 to October 5, 1988.

CALL SIGN	QTH
6K24SO	Olympic Village Seoul
6K88SO	Olympic Park, Seoul
6K88YC	Busan Yacht Center, Busan
HL88. . .	Individual HL stations in Korea

Applications for all the above awards are to be mailed to: The Korean Amateur Radio League, CPO Box 162, Seoul 100, Korea.

NEW ARRL DXCC AWARDS

See April AR, *How's DX* column for the findings of the ARRL DX Advisory Committee and the refinements and modifications to the DXCC.

MINNET THE MINING NET AWARD

This 300 by 200 millimetre sand coloured award is available to any amateur operator or shortwave listener who gains 25 points to qualify for the basic award.

Contact points awarded:

Basic	Two points
Silver	Three points
Gold	Five points
Founder member	Five points
DX contact with Award (any time/ band)	Five points

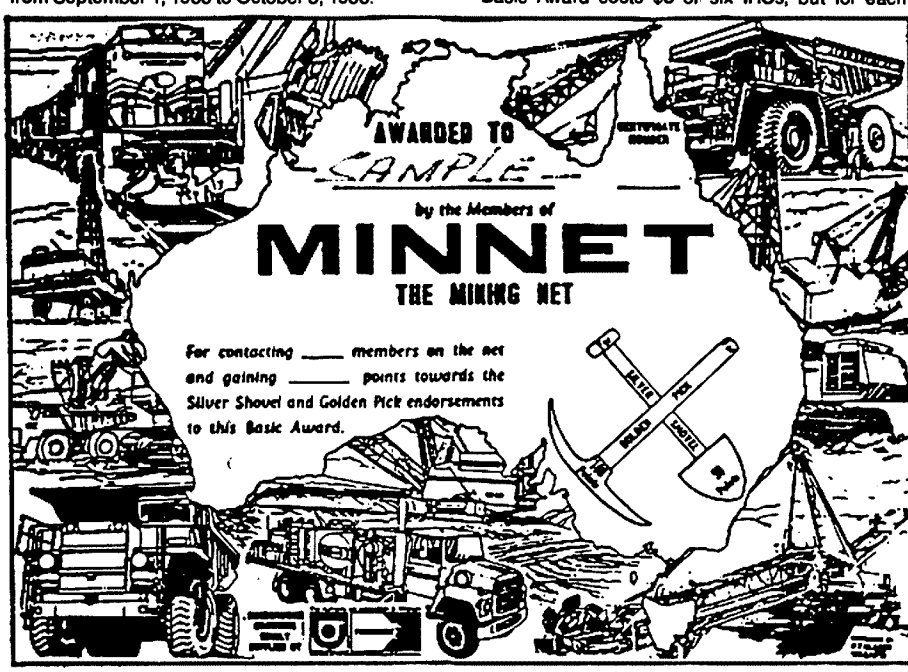
Single contact only for each call sign, which must be on the Minnet Nets. The Basic Award points must include a minimum of three founder members (in more than one State). Minnet Nets on Thursdays from June 1981 to June 1983 are also valid.

A further endorsement, the Diamond Drill, is available for 100 single contacts of 'five point' stations only, ie Founders, Gold and DX Contacts.

Founder members:

VKs — 1KAA/GL, 4IR, 4YG, 4KDM, 4VAO/AHF, 4VHP, 4VHQ/KHQ, 4VIT/VEF/APJ, 5ABS, 5AJW, 5AMH, 5APB, 5GAS, 5NIC, 5NKM, 5PVT (included as second operator), 6PA, 6ANW, 7KTN, 8AC, 8DH and 8NDL.

Log details must include contact date, members call sign, award number and points claimed. The Basic Award costs $3 or six IRCs, but for each



upgrade claimed a new endorsed award is sent for the cost of postage only.

Nets are currently held around 3.580 MHz from 1030 UTC on the 13th of each month.

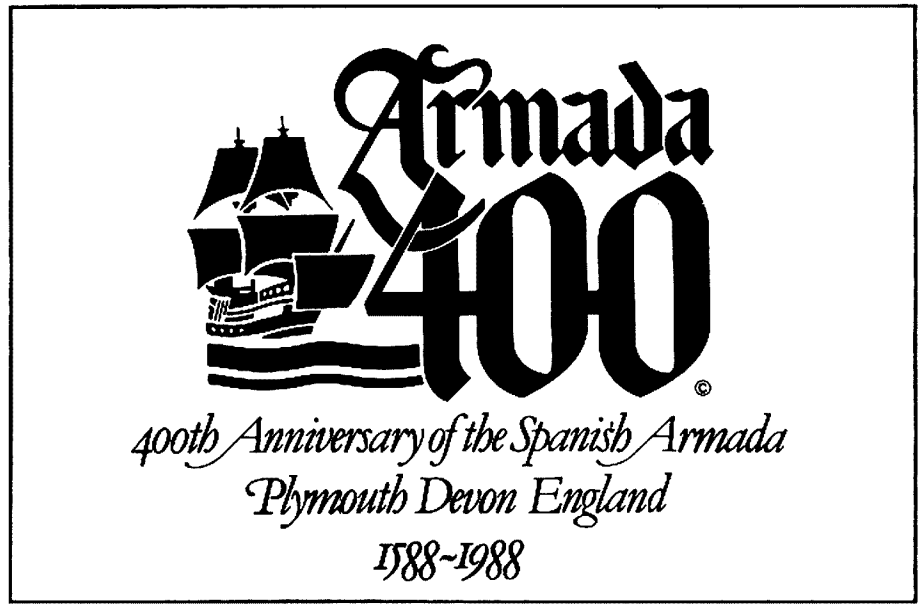
Applications should be forwarded to Minnet Award, Moomba Radio Club, Moomba Camp, PO Box 563, Adelaide, SA. 5001.

ARMADA 400

In 1588, the might of Spain was sent against England. Fires lit up along the English coast to warn that the Spanish Armada had been sighted. In Plymouth, Sir Francis Drake calmly finished a game of bowls before embarking against all odds, to fight the world's most fearsome fleet in a battle that remains among history's best remembered.

In 1988, Plymouth England, and the surrounding area will again be the focus of attention when the 400th anniversary of the Spanish Armada is marked by a month of celebrations. Elizabethan banquets, ox roasts and strolling minstrels will be the backdrop to a Grand Finale on July 28, 1988.

During the period July 1 to July 28 1988, if you work at least two members of Plymouth Radio Club and the Special Event Station GB400A on any band you qualify for an Armada 400 Award. Claims plus three IRCs should be sent to the Awards Manager, G3VCN, QTHR,



GOLDEN ANTENNA AWARD

For the seventh year in succession, the town of Bad Bentheim will symbolically award one radio amateur with the Golden Antenna for outstanding humanitarian achievement in the field of amateur telecommunication.

This year, the winner will receive the award during the German Dutch Radio Amateur Week (DNAT) from August 25 to 28.

Organisations of radio amateurs are requested to submit proposals for this award to Stadt Bad Bentheim, Schlobstrabe 2, D-4444 Bad Bentheim, by May 15, 1988.

Applicants should have achieved an outstanding humanitarian feat in the field of amateur telecommunication. The winner will be decided by a committee consisting of representative of the town of Bad Bentheim and the Presidents/Chairmen of the International Amateur Radio Union. Vereniging van Experimentee Radio Onderzoek (Netherlands), Vereniging Radio Zend Amateurs (Netherlands), and the Deutsche Amateur Radio Club (DARC).

The town of Bad Bentheim will defray all expenses incurred in connection with the journey and accommodation of the winner. The decision on the award is not subject to the jurisdiction of courts.

—Contributed by Karl Taddey DL1PE, President DARC

1988 POLAR BRIDGE DIPLOMA

The Canadian Radio Relay League is pleased to announce the 1988 Polar Bridge Diploma to commemorate the joint Canadian-Soviet Union trans-polar ski expedition from Severnaya Zemlya, USSR, to Ellesmere Island, Northwest Territories (NWT), Canada.

This attractive, oversize bilingual (English and Russian) commemorative diploma will be awarded to amateurs and SWLs who fulfill the following:

REQUIREMENTS:

Three different calls from NWT, Canada (usually VE8)

Three different calls from Asiatic RSFSR, USSR (usually UA9 or UA0)

One base camp station call from either the USSR or Canada

One station from the national capital region of Ottawa, Canada

One station from the national capital region of Moscow, USSR

A total of nine two-way QSOs or loggings.

Contacts must be made between February 15 and June 15, 1988.

Applications, certified log data (no QSLs), 10 IRCS or $5 should be forwarded to the CRRL National Awards Manager, Garry V Hammond VE3XN/VE8XN, 5 McLaren Avenue, Listowel, Ontario, Canada, N4W 3K1.

The Canadian DOC has given special permission for radio amateurs in the Northwest Territories (NWT) to use the special prefix CI8 from February 15 until June 15 to publicise the expedition.

The Canadian Base Camp at Resolute Bay, NWT, will use the special call sign CI8C for the duration of the expedition. The station will be manned by a series of operators working in two-week shifts.

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Radio Amateur Old Timers Club

Kevin Duff VK3CV
PUBLICITY OFFICER
RAOTC
10 Stanley Grove, Canterbury, Vic. 3126

The Radio Amateurs Old Timers' Club held its annual dinner and get-together at the City and Overseas Club in Melbourne on March 10, 1988. This was well attended with 45 members present and apologies were received from eight members who could not attend. President, Bill Gronow VK3WG, welcomed members and suggested that, as we have only two social events per year, there should be plenty of time for gossip, which was very well received. During the dinner, members changed tables to have an "eyeball QSO" with old friends.

Later, the President spoke of the passing of John "Mac" McConnell VK3RV, who was a Committee Member and the Victorian Net Co-ordinator for the RAOTC monthly net. Bill said, "It would, I think, be remiss on my part if I didn't mention "Mac" McConnell's name. I'm sure you will join with me in your expressions of sorrow and regret for Mac's passing. He was a most loyal and efficient member of our group and I'm sure those who listen regularly to the monthly broadcast will miss his friendly voice."

Allen Dobell VK3AMD, spoke about television line-frequency interference on amateur and other frequencies and he said, "For some time now, the Federal body of the Wireless Institute has been represented on the Standards Association by Allan Foxcroft VK3AE. One of the projects there is to establish an Australian standard that would limit the emission of television line oscillator harmonics.

"The objectives are to get some idea of how wide this interference spreads ad to get quantitive measurements of real standard that can be measured in micro-volts per metre. When you hear this interference on 40 metres, you are not listening to the first, or second or fifth harmonic, you are listening to the 484th harmonic, so we are stuck with the problem."

Allen then played two tape recordings to demonstrate how bad television line interference can be. The first one Allen had recorded showed the effect on a frequency in the 7 MHz band and that was a complete loss of signals. Lay Cranch VK3CF recorded the second tape which was a recording of severe line interference on the VIM frequency of 2.201 MHz. This is the traffic channel of the International Distress Frequency of 2.182 MHz, used by Melbourne Radio, VIM. For people who suffer this television problem, Allen had questionnaire forms that amateurs can fill out and return to him so they can be collated.

Ken Matchett VK3TL, spoke about the QSL cards that he is collecting for posterity, and he said that this was going very well. He now has about 75 000 cards which are catalogued. The collection has about 2500 prefixes and well over 300 countries. Ken would like to have some cards from DXpeditions from the years 1946 to about 1953. If you can contribute any QSL cards, contact Ken at PO Box 1, Seville, Vic. 3139.

After a very enjoyable evening, President Bill Gronow declared the meeting closed at about 11 pm.

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Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

JOAN AND JAPANESE

I recently received the following article, taken from the Mildura newspaper, featuring Joan VK3BJB. Joan's involvement with the Japanese language and the Okera Net was documented in the ALARA column, *Amateur Radio*, May and June 1987.

JOAN'S HOBBY WITH A DIFFERENCE!

Having a hobby as an amateur radio enthusiast is anything but relaxing, according to Mildura's Mrs Joan Beevers.

Mrs Beevers' afternoons, spent monitoring a Japanese radio network, Okera, had her recently embroiled in a search and rescue mission for a lone Japanese sailor.

Mrs Beevers keeps in daily contact, via the network with sailors of competition and pleasure craft, which check in with the network.

It was during one of these sessions that Mrs Beevers made radio contact with the lone sailor of a 31-foot double-masted ketch, Masao Sato, 38.

Mrs Beevers was the sole radio contact with Sato, who had set out from Fukushima, Japan, in October for Sydney.

He had spent 10 years single-handedly building the yacht, *Akizora*, for the trip, which he expected to take three months.

Mrs Beevers spoke daily with Sato, but lost contact on January 13.

His position at that time was south of Sydney, and he was thought to be heading for Bateman's Bay.

After three days of not hearing from Sato, Mrs Beevers started to hold fears for his safety.

The weather reports she had received indicated rough conditions, and she feared the boat had capsized or that Sato had been swept overboard.

"My thoughts were that he was hanging on to a piece of wood in the middle of nowhere," she said.

Three days can be a long time especially when you're sailing single-handed, so I thought I'd better check on him and be on the safe side."

Mrs Beevers reported the situation to Federal Sea Safety, Canberra, on January 16, expressing her concern for the skipper.

She was relieved to discover Sato had sailed to Sydney. A sea search had found him safe and well at Rosebay.

As a result of her part in the saga, Mrs Beevers was contacted by the Japanese press. Fukushima News and the Sydney branch of the Kyodo News.

"They were surprised how far Mildura was from the coastline," she said.

Mrs Beevers has been involved in amateur radio for 17 years, and spends up to three hours a day monitoring the international radio networks.

In recent years, she has concentrated on the Japanese network, through which she has learned the language.

"It takes me a half a page to say what they can in one sentence, but I get through," she said.

However, her language proficiency was helped by the captain of a container ship who gave her Japanese lessons via radio.

Since joining the network in December 1986 she has witnessed two other sea rescues.

"Oh well, you have to do something to make life interesting," she said.

Joan says that her knowledge of the Japanese language was really put to the test recently when she became "temporary" net controller for the Okera Net on several occasions. The net always seemed to become longer when she took over. It is probably most unusual for a VK YL to control a Japanese maritime net.

Many of the Okera group members telephone Joan when they arrive at Australian ports, and most of them speak little English. As Joan says, "Now that really tries out my Japanese, as I can't check my note book or dictionary when I am on the telephone and their coins are running out quickly."

Some of the Japanese fishing boats are away from Japan for up to 18 months at a time, so amateur radio plays an important part in keeping them in touch with friends and family. Joan is happy to play her part in keeping the lines of communication open.

ZK2 YL DXPEDITION

Mary Lou Brown NM7N and Jan Scheuerman WB2JCE were very much in demand when operating as ZK2MB and ZK2JS respectively from February 21 to 27.

Subsequently, they visited New Zealand and Australia, and met several of the VK3 ALARA members at the QTH of Mavis VK3KS and Ivor VK3XB. Those present included Bron VK3DYF, Bonnie VK3PBL, Raedie, Gwen VK3DYL, Kim VK3CYL and Liz VK3JQ.

Mavis, the ALARA Awards Custodian, presented Mary Lou and Jan with the ALARA Award, for which they had both qualified during their Niue operation. Mary Lou is the current president of YLRL, Jan is a past president.

Unfortunately, Jan suffered a back injury which resulted in her having to cut short her trip and return to San Francisco.

ANOTHER "HOW I GOT STARTED IN AMATEUR RADIO" STORY

This is how Jan VK6PJL started:

"I first became interested in amateur radio when my son put a CB in my home, under a lot of protest from me, but he insisted so he could talk to me from Manjimup, about 20 miles away. I was really amazed to hear over east and up north, it was then that my son told me all about amateur radio.

"It sounded good to me, so I made some inquiries and met a couple of amateur operators, then began to study with the novice kit early in 1985. A class opened in July 1986 at Manjimup High School, but because of poor attendance it was put back to every second week, so when 12 months were up we hadn't completed the course, so with the notes from the school, and the novice kit, I finally passed the Morse and regulations in February 1987, sat for the theory in August — 62 percent — failed! While holidaying in Melbourne I sat for the theory in November — passed!

"So after almost three years I am finally on the air and all the time and study was well worth it. I appreciate the help from Trevor VK6ATB and Bob VK6KRC. Also, I found the WIA Morse tapes and text excellent for learning the Morse code."

BITS AND PIECES

Congratulations to our hard-working secretary, Jenny VK5ANW, and OM Mike VK5AMW, who celebrated their Silver Wedding Anniversary in March.

Congratulations also to Liz ex-VK3PSG now VK3JQ, after upgrading in February.

Zdena OK2BBI, enjoyed her visit to Tasmania. She is now back on air from her home QTH with the familiar call sign.

It was good to work Bev VK6DE, with the Bicentennial call sign, VI88WA, in early February, and Gwen VK3DYL, signing VI88VIC, in early March. Both were in great demand.

Propagation is certainly improving. On the 220 net recently I worked G4, OK2, WT4, SM5, I5 and ZL, all YLs, and most with strong signals. It is good to catch up with some of our DX friends again.

The call sign VK3EEL, on the 80 metre ALARA net, March 14, had us all guessing. It was Mary Lou NM7N from the QTH of Mavis VK3KS, with whom she was staying for the night.

ALARA now exchanges newsletters with the Dutch YL amateur radio group.

NEW MEMBERS

Welcome to Chris ZL1BQW.

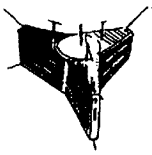
ALARA membership continues to grow, and we now have 203 financial members.

Best 73/33, Joy VK2EBX

Joan VK3NLO.

Poppy VK6YF.

Margaret VK4AOE.



AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SOUTH WEST PACIFIC
2200 UTC Saturday
14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian Elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

SURREY TO BUILD NEW UOSAT FOR 1988 LAUNCH

by Doctor Martin Sweeting G3YJO, University of Surrey

The UoSAT Spacecraft Engineering Research Unit at the University of Surrey (UK) is now building a third UoSAT OSCAR spacecraft: UoSAT-C. NASA has agreed to provide a launch for UoSAT-C on a DELTA launch vehicle currently scheduled for late 1988. The DELTA should place UoSAT-C into a 43 degree inclination, 500 kilometre circular orbit.

UoSAT-C will carry experimental engineering, science and communications payloads developed in close collaboration between international professional engineering and amateur radio communities. These payload experiments develop further the mission objectives supported by the highly-successful UoSAT-1 and 2 (UoSAT OSCAR-9 and UoSAT OSCAR-11) satellites which are still operational after six and four years in orbit respectively. The UoSAT Program and series of satellites are intended to complement the AMSAT OSCAR, RS and FUJI OSCAR amateur radio communications satellites. They provide a space science and engineering facility readily available to both amateur and professional experimenters. Greater mutual awareness and collaboration are thus promoted.

In common with prior UoSAT missions, UoSAT-C will have a strong element of international collaboration — specifically with members of AMSAT-UK, AMSAT-NA in the US and Canada, VITA, Quadron, NASA, the British National Space Center and the European Space Agency.

UOSAT-C PAYLOADS

Store-and-Forward Communications

Since 1983, UoSAT has played a major role in an international collaborative project developing cost-effective digital store-and-forward satellite communications techniques. The UoSAT OSCAR-11 Digital Communications Experiment (DCE) — funded by the Volunteers in Technical Assistance (VITA) and built by VITA/AMSAT volunteers in the USA, UK and Canada — provided the first operational tests of store-and-forward PACSAT communications within the Amateur Satellite Service. Drawing on the operational and engineering data gained from the DCE, UoSAT and VITA are developing a high performance digital store-and-forward communications payload specially tailored for use by inexpensive ground stations. To test this payload, UoSAT-C will carry the PACSAT Communications Experiment (PCE). The PCE will be openly accessible to radio amateurs operating in the two metre and 70 centimetre bands (Mode J). VITA is seeking additional frequency allocations outside the amateur bands to allow limited use of the UoSAT-C PCE by VITA ground stations in remote areas to provide technical assistance and disaster relief.

Radiation Studies Experiments

Microprocessor-controlled payloads such as the PCE cannot be built without VLSI semiconductors, and most recent and affordable VLSI devices have not yet been tested for space use. UoSAT-C will host several experimental payloads studying the effects of the space radiation environment on VLSI devices:

Cosmic Particle Experiment (CPE)

Comprising an array of large area PIN diodes, will detect energetic particles which cause single event upsets (SEUs) in VLSI circuits (such as high-density RAMs).

CCD Single Event Upset Experiment

(CCD-SEU) comprising an enclosed Charge-Coupled Device (CCD) array, will detect energetic cosmic particles and evaluate the effect of SEUs on CCD imagers. This data is of particular importance for scientists using sensitive CCDs as star sensors.

Total Dose Experiment (TDE)

Using special FETs located around the spacecraft, will measure the total radiation dose accumulated by the on-board sub-systems and payloads. These dose measurements will allow engineers to assess the shielding properties of the spacecraft structure, and to correlate changes in LSI-device power consumption and performance with total radiation dose.

Satellite Technology Experiments

UoSAT-C will carry a range of satellite technology experiments associated with power systems, on-board data handling (OBDH), attitude determination, control and stabilisation (ADCS) and RF modulation.

Power

The spacecraft will be powered from GaAs solar cells and will include experimental patches of novel GaAs, InP and Si solar cells with a variety of newly-developed cover-slides. The performance of these cells will be monitored throughout the mission as a function of radiation dose. The spacecraft onboard computers will constantly and adjust the Battery Charge Regulator and Power Conditioning Module to optimise power conversion and storage efficiency.

OBDH

UoSAT-C will include several computers. In addition to the primary RCA 1802 on-board computer (OBC-1) running diary-type software, there will be a more powerful 80C86-based OBC-2 supporting complex attitude control algorithms and spacecraft data networks. Four transputers in a parallel-processing array will be available for highly sophisticated on-board image and data processing, and the PCE will employ an 80C186-family computer to manage high-speed communications links and several megabytes of RAM.

A wide range of memory devices using different technologies and architectures will make up a total on-board capacity of around five megabytes of RAM. The radiation-induced effects on the processors and associated memories will be monitored and evaluated throughout the lifetime of the spacecraft. The network of computers on UoSAT-C will make this spacecraft the most computationally powerful of its class and will support demanding experiments in advanced spacecraft attitude determination and control, data communications and image processing.

ADCS

The 43 degree inclination, non-sun-synchronous nature of the UO-C orbit will necessitate the use of new attitude determination and control mechanisms to maintain accurate Earth-pointing. In addition to more complex attitude control algorithms executed by OBC-2, improved analogue and digital sun sensors and Earth horizon sensors are being developed at UoS for the mission.

DSP

If time and resources permit, a Digital Signal Processing Experiment may be include on UO-C to evaluate modulation/demodulation schemes.

A new concept of highly modular construction has been developed and is under test for UoSAT-C. This new, modular structure should result in much improved utilisation of the available spacecraft envelope, greater ease of assembly and integration, and allow a more rapid response to future launch opportunities.

FOR THE USERS

Like UO-9 and UO-11, UoSAT OSCAR-C will support a world-wide user community of engineers, scientists, educators and communicators. If all goes according to plan, UO-C will provide spacecraft housekeeping telemetry, long-term telemetry surveys, results from on-board experiments, news bulletins and communications facilities on a single downlink through packet-radio techniques. We will finalise and publish communications modem and protocol details as soon as possible, to allow ground-stations to equip themselves.

Whilst numerous international teams are already collaborating on UO-C, UoSAT is interested in hearing from others interested in possible collaboration, especially in the area of user ground-station support.

The UoSAT team are happy to be able to make a public announcement of the UoSAT-C mission, and we hope that it will contribute to the long history of successful and technically important OSCAR and RS missions and maintain the tradition of international collaboration in the Amateur Satellite Service.

IARU TO JOIN INTERNATIONAL COMMITTEE ON RADIO INTERFERENCE

The President of the International Amateur Radio Union (IARU) has applied through the Central Office of the ICE for the admission of IARU as a Member Body of the Committee on Radio Interference (CISPR). The IARU is the international organisation of amateur radio societies, representing approximately 125 such national organisations.

The President of IARU has stated that through membership in CISPR they could on the one hand share some of the knowledge accumulated by the members of IARU and, on the other hand, could benefit from the interchange with the members of the CISPR. IARU would intend to be an actively participating member of CISPR.

This application was considered by the Steering Committee at its meeting held in Cagliari in June 1987, and it was decided to recommend to the Plenary Assembly that the IARU be admitted as a Member Body of CISPR.

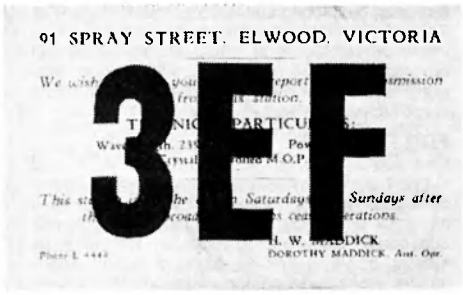
The WIA is already a member of the Standards Association of Australia and, through it, contributes to the work of the IEC and CISPR. The direct representation of the Amateur Service on the international body will assist in the presentation of the amateur viewpoint at the highest level.

—Contributed by Allan Foxcroft VK3AE

QSLs from the WIA Collection

Ken Matchett VK3TL
776 Warburton Highway, Seville, Vic. 3139

Before the allocation of the A (for Australia) and later, the OA prefix (at the time referred to as an "intermediate" standing for Oceania-Australia), our experimental stations were allocated call signs simply consisting of a numeral (representing the Australian State) together with two letters. The call sign 3EF belonged to the late Bert Maddick. He was one of the experimenters in those early days to operate on the commercial broadcast bands.

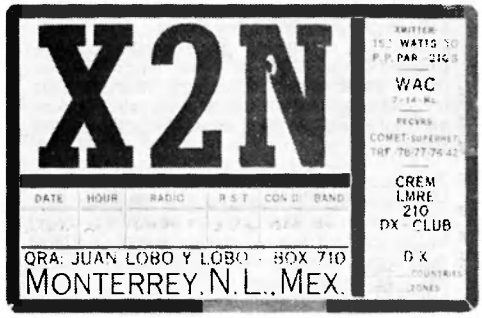


Note the comments on his QSL card about his period of operation. In those times one usually referred to wave lengths rather than frequencies. His station's wave length of 239.9 metres corresponds closely to 1.250 MHz, just below Broadcast Station 3AW on the dial. Power used was only 150 watts to the crystal-controlled master oscillator power amplifier (MOPA). In those days crystals for a given frequency were issued to certain stations by the WIA. Transmission of music was permitted but there were strict laws governing the conduct of the station. The story of Bert and his talking parrot is well-known to many old timers. It would seem that Bert was minding the bird for a friend who must have neglected to tell him that it could swear like the proverbial trooper. Imagine the consternation of all when the wretched bird, in an unguarded moment, gave an impromptu performance over the air. Bert was "hauled over the coals" and may have been fortunate in retaining his licence. History does not record what Bert said to the bird.

The QSL card, 3QT from the United States of America, dated 1926, is one of many of this period in which the station call sign gave no indication of the country of origin. Transmissions in the early 1920s were really local affairs, so country designation was not an important factor.

After all, it was not until 1924 that the first QSO took place between Australia and New Zealand. Even when DX was firmly established, many station operators still preferred to retain their old call signs rather than use letters in their call signs to indicate the country, such as U3QT (USA), A3QT (Australia), C3QT (Canada), and so on. C Coleman states on his QSL card he had worked DX over 11 000 miles, together with all States and call districts of America. This QSO with the late Alan Hutchings A3HL, of Victoria, must have been, nevertheless, quite an achievement for him.

The QSL, X2N from Mexico, dated October 10, 1935, might seem to be missing in E from the usual XE prefix. The provisions of the 1927 International Radio-telegraph Convention (IRC) became effective from January 1, 1929. The allocation to Mexico was XAA to XFZ, and it was left to the Mexican Government to allocate to amateurs in that country the actual prefix to be used.



The Government decided to allocate the prefix X. The 1929 edition of the ARRL *Radio Amateur's Handbook* states in a footnote on page 189 that this prefix was "improperly assigned by Mexico. Should have two letters to distinguish from China".

It should be noted that China's allocation was, at that time, XGA to XUZ. Later, Mexican amateurs were assigned the prefix XE used to this day, but the Government was free to have used a range of prefixes. It has used the XF prefix too, XF zero being used for club stations and XF4 for the rather rare ARRL DX country, Revilla Gigedo.

The XE4J QSL card, dated March 1973, is from the Benito Juarex Island of the Revilla Gigedo archipelago. This ARRL DX country is situated approximately 19 degrees north and 111 degrees west, which puts the four island group in the Pacific Ocean some 800 kilometres west of the Mexican coast.

Its coasts are very steep and there are few sand shores, the island being mainly formed of volcanic lava from its extinct volcanoes, the QSL indicating their position on the island. Revilla Gigedo was added to the ARRL countries list in August 1956, credit being given from October 1, 1956, for contacts on or after November 15, 1945.

The prefix was XE4, later to be changed to XF4.

It is probable that the island group derived its name from Count Revilla Gigedo, an early administrator of Mexico under the Spanish Conquistadors.

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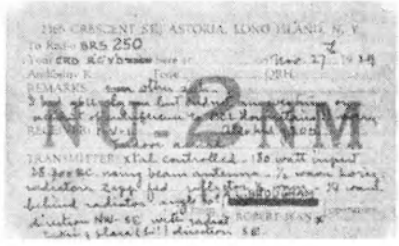
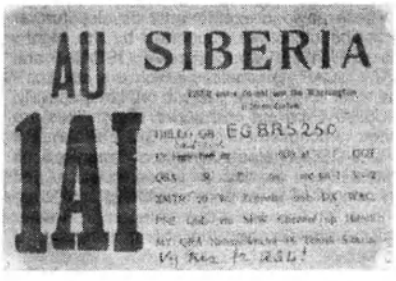
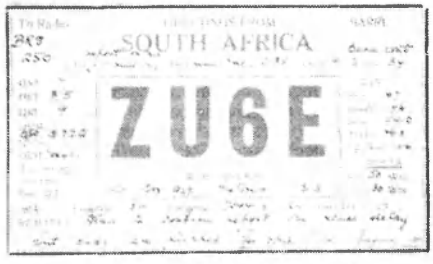
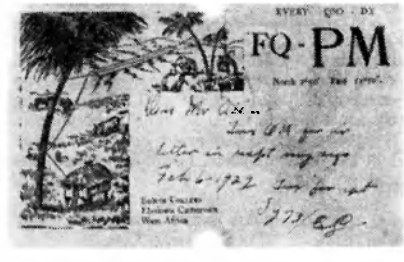
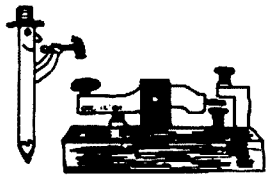




Antique QSL cards courtesy VK6NE & VK3AH







Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright. Vic. 3741

I am writing to you from downtown Bright where the whole countryside is sparkling after the recent rain. It is the week before the John Moyle Field Day Contest and I am in a panic. I do not know whether to carry on with this month's column or get all the equipment ready for next Saturday. We have a new member of the family to look after as well, a rescued joey (joeyette?) of about six months, named Min, because our first joey was named Eccles. Believe me, they take more looking after than children!

Now, the contest! My worry list this year starts with having to make a table to fit in the van, all the power leads for two sets of batteries and two solar panels, and an antenna for the higher bands as well as an 80 and 40 metre dipole used last year. But where is it? Not to mention that, if it were a real emergency, there would be other things to worry about as well. But, of course, that is the whole purpose of a field day, fun and games. Anyway, that is past history now, and I hope you all enjoyed yourselves. I know I will although it does not seem that way right at this time!

Consequently, this month is going to be a hodge podge. Do you remember I mentioned that I have joined the CW operators QRP Club? The latest newsletter has an advertisement for the "club communicator kit-set" by Don VK5AIL. I am not going to try and trick you into joining, but if this is the sort of benefit they provide, then I think you could maybe think twice about it. The problem is that the kit is only available to members of the club and I have not spoken to Don about mentioning it in *Pounding Brass*. You can negotiate with Don or the club yourselves.

The Club Communicator is an 80 metre band QRP CW transmitter, maximum power up to 5 watts. The full kit set comprises four modules and a set of miscellaneous components.

The modules are:

VFO . . . Variable frequency oscillator, 7.0 to 7.4 MHz, adjustable by you.

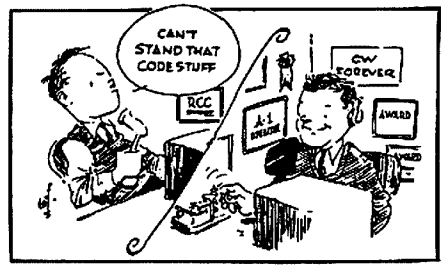
BDT . . . Buffer, divide by two, timer.

PA . . . Power amplifier.

QSK . . . Keying board.

You can buy the full kit set or individual modules.

My suggestion is for you to contact Don for more information. Even if you include a year's membership in the cost of the kit I think you will find it money well spent. Building such a kit is the best



way to learn and you will not have to chase all the separate bits as I did for my QRP transmitter. (And, mine is still not operating properly, either!).

THE SPANISH MORSE TEST

from Morsum Magnificat by Mike Molina EA3FHC

Until 1978, there was an amateur Morse test in Spain the same as in every country in the world. But, in 1979, the administration launched a bombshell . . . deciding that the Morse test was no longer necessary for an amateur radio licence.

Most people were delighted with this news, especially those wanting to become amateurs. There were those who spoke up against the change, but not too many. The fact is, the majority were happy with the new arrangements. It is sad, but true, that they dislike the Morse test.

The administration made its decision without consulting amateur organisations, although a few people believed there was some sort of agreement with the principal associations. Naturally the national society, URE, as a member of the IARU, objected but many of us thought they did not protest vigorously enough.

Why it was decided to abandon the test despite the international regulations I cannot say. Why do governments do what they do? Nobody knows exactly, but everyone has their own ideas. It is hard to understand, however, how the Spanish administration could subscribe to WARC-79 and abrogate the amateur Morse test in the same year.

The result was a doubling of amateur radio licences in three years from 15 000 to 30 000. We are more, but not better, and may be worse in some ways. Since then there has been a "cold war" between Morse defenders and non-Morse amateurs who accuse us of being "a minority wishing to impose an obsolete mode of transmission on the majority." They are right about one thing. We are a minority, but we want to keep the spirit of amateur radio alive. We have had to swallow all kinds of accusations.

Despite all this, there have been a number of groups fighting for the return of the amateur Morse test. One such group is the Hispania CW Club (HCC) which came into being as a result of the administration's action, and we have two hundred members.

In May 1986, came another bombshell. Morse became obligatory again for amateur radio! There was more controversy than ever before! There are now three licences, Class A, requiring 12 words per minute code; Class B, no code, VHF only; and Class C, novice, eight words per minute, although those who gained their licence earlier do not have to take the new Morse test. Since 1979, however, many of us have taken a voluntary Morse test to demonstrate our disagreement with the administration.

Amateur radio opinion was taken into account in framing the new regulations and, as a result, we now have one of the more progressive licence structures in the world. During the non-test period it was the opposite, and many countries refused to recognise the Spanish licence.

Now Morse telegraphy is on the increase in Spain. Morse courses are full with long waiting lists, but a few months after the Morse test came back, out of 30 000 amateurs, there were still only 400 who knew Morse code!

For my final this month I do not really want to mention it but I am very disappointed. Back in October last year, I said that Bill VK7NRV, had suggested to me that we take up a collection for a memorial trophy for the late Clive VK3CQL. I have had no replies. So Bill, it is up to the two of us. I will therefore arrange a trophy as soon as possible and we can have it presented to the Novice CW Winner later this year.

CUL ES 73 VK3CQ

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IONOSPHERIC SUMMARY

The IPS summary for January contains the following information.

The monthly values are as follows — 10 cm flux 108.9, Sunspot number 59.6, A index 10.3, and three flares.

IPS predicted sunspot numbers from August 1987 to July 1988 are August 35, September 38, October 41, November 43, December 46, January 49, February 53, March 57, April 60, May 64, June 69, and July 74. An interesting observation is that for January 1988 they predicted 49, whereas earlier the monthly average was given as 59.6. More about this later.

General comments are — solar activity was low in January with the exception of an X class flare on January 2, and two M class on January 14. The X class flare came from a region which had threatened energetic flares in late December, but did not produce anything until the above mentioned flare.

The monthly averaged 10 cm flux value was the highest since May of 1984 continuing the rapid rise of the new cycle. The daily flux value of 127 on January 16 was the highest single dally value since May 23, 1984.

The first half of January was disturbed with several disturbances including a very severe disturbance on January 14 and 15 when two M class flares occurred. There was a sudden commencement in the field at 2328 UTC. The field continued at storm levels through to 1200 UTC on January 15.

For Sydney there was a strong shortwave fade out late on January 2 due to the X class flare. On January 3, MUFs were moderately depressed until 1200 UTC, but were higher than predicted values for the day. January 6 and 7, MUFs were severely depressed until around 1100 UTC on January 7. On January 14 and 15 there were very disturbed propagation conditions due to the intense geomagnetic storm and MUFs were severely depressed from 1800 UTC on the 14th to 0700 on the 15th.

HF propagation conditions were generally good because of the strong solar flux values throughout the month.

The way the sun is behaving it is possible we may be in for a record cycle. Doctor Thompson of IPS, observes that there are a number of aspects which are shaping up for this cycle to be the most active solar cycle since observations began about 300 years ago. If this does occur, there will be other things besides amateur radio that will observe the effects.

—Compiled by Frank Hine VK2QL

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Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

This EMC-Report is reprinted from a very informative paper published in the RSGB magazine* Radio Communication, *June 1987, and is a continuation from last months article.

"Were you on your radio last night?"

Angus McKenzie, MBE, FIERE, FAES, CEng, G3OSS
57 Fitzalan Road, Finchley, London, N3 3PG

Part 2: EMC TESTING OF TELEVISION SETS AND TYPICAL RESULTS

LAST MONTH I explained how RF breakthrough can get into a television installation, and I also gave details of the typical performances of some filters which can be used to cure many breakthrough problems. In this second part I describe how my friends and I set about testing nine television sets in the four areas referred to last month; direct coaxial inner pick-up, braid pick-up, mains lead pick-up and direct pick-up on the chassis.

THE TEST EQUIPMENT

I was fortunate enough to have the loan of a Philips professional video waveform generator and transmitter, which was used to generate excellent static pictures with every conceivable kind of colour and grey scale indications. This transmitter had a 50 ohm output impedance, and could be switched to various channels used in the testing. The output level was high, and was attenuated with high quality Marconi UHF attenuators, such that the final level reaching the set was of the order of 1mV (EMF/2). A Marconi 2019 signal generator was used as a breakthrough signal source, amplified by a Marconi wideband RF amplifier of 50 ohm impedance. The signal generator was modulated at 1 kHz, 80 percent AM. The output from the amplifier passed through a Marconi UHF attenuator into the injection system.

A large, thick metal sheet was securely mounted on the test bench, and a terminal banana socket soldered on to its end, so that this could be interconnected with the earth connections of the various injection boxes. Each television set in turn was placed on the sheet, and connected to the mains injection box, and to either the coaxial inner injection or the braid injection system.

For the chassis injection tests, each set was placed in the cradle, which allowed the set to be rotated horizontally and vertically in the transmitted field. Off air signals had to be used for these tests, as the Philips generator was slightly disturbed itself by the strongest fields. Extremely good filtering was employed, both on the inner and outer, to ensure that a completely clean signal on Band 4 was reaching the antenna socket. The mains was also extremely well filtered at the set, so that any breakthrough was clearly caused by direct pick up within the set itself.

A Surrey Electronics active antenna system was used for measuring the field strengths induced in the neighbourhood of the sets, the active antenna output feeding into a Marconi 2382 spectrum analyser. Field strength at 144 Mhz were estimated by using back to back balanced dipoles, and comparing the levels transmitted from a Trio TS711E with the level received on the Marconi 2382 analyser. These levels were compared with calculated field strengths, and proved to be very close to them.

For the low frequency field tests, I used my three band trapped dipole — which goes over the roof of the house for the 1.8, 3.5, and 7 MHz bands. For HF tests, I rotated my high-gain TH6 to create the highest field in the set's vicinity on the 14, 21 and 28 MHz bands. I used my Trio TS940S transceiver through a Drake L7 linear, with a Bird throughline watt-meter in the antenna feed for measuring power, also noting this on a separate PEP meter.

COAXIAL DIRECT INJECTION TESTS

I chose to use an MCL 50 ohm hybrid transformer, rather than a resistive pad, for coupling the television signals with the interfering signal, as the system loss would be lower. This allowed higher breakthrough injection levels to be achieved. The output from the hybrid was resistively matched to 75 ohms, and the cable to the television set was kept as short as possible, consistent with the hybrid transformer etc being well earthed to the earth plane. Either a BNOS 150 MHz lowpass filter, or a Microwave Modules 432 MHz bandpass filter was used in series with the breakthrough source. This ensured that there was no significant noise or generator harmonics being injected from the wideband amplifier in Bands 4 and 5 when the intended breakthrough signal was from 1.8 to 150 MHz, or at 432 MHz.

Each set was adjusted to give the best possible picture from the fixed transmitted pattern, and the audio gain was set in a typical position required for a reasonable reproduction level. Modulation from the Philips generator was then switched off, and the breakthrough injection switched on at a high level. Not only did we check the picture grading at pre-set breakthrough levels, but we also varied the level to see at what point picture quality would be Grade 2, and on the borderline between Grade 4 and Grade 5. Grade 2 represents what we all agreed was an unbearable degree of breakthrough on what was a reasonably-discernible and stable picture. Grade 4 was described as very slight breakthrough which would not be considered serious at all. Not only were all the amateur radio bands checked between 1.8 and 432 MHz, but the generator was also swept slowly from 1.8 MHz to 150 MHz, particular attention being paid to frequency bands in which there is a likelihood of strong commercial, public, military and PMR transmissions being received in a domestic environment (eg general shortwave frequencies, Band 2 FM radio, air band, and various PMR bands). For the sake of time, the generator was stepped in 100 kHz intervals up to 30 MHz, and in 1 MHz steps above this frequency. Apart from some predictable problem frequencies, such as 6 MHz, the video/audio channel spacing, previous tests had shown that spot frequencies in between the megahertz steps always correspond with the results achieved on the 1 MHz step points, breakthrough vulnerability generally being fairly broad banded at VHF.

COAXIAL BRAID INJECTION TESTS

One of my helpers constructed a box in which the interfering signal was injected in series with the braid. The input coaxial cable was earthed to the box, and this was bonded to the earth plane and to the earth on the mains injection box. A 50 ohm screened dummy load was plugged onto either the mains injection box input or the braid injection box input when these were not in use at the time.

Various filters were placed in the leads between the injection boxes and the set in order to check that they were appropriate, and both the braid and inner filter systems worked very well on each set. We often found that the position of a braidbreaker was critical, bearing in mind that the braid could itself radiate directly into the set's chassis. Sometimes it was better to put the braidbreaker at the injection box end rather than on the set's antenna socket, and this is an important guide to a solution in many typical cases.

MAINS INJECTION TESTS

The mains injection box, again a screened metallic one, has an IEC mains input socket at one end, and a feed socket at the other, allowing it to be inserted in series with the mains. The injection signal, fed via a 50 ohm chassis mounted BNC socket, was fed onto live and neutral lines, the earth being directly connected to the metal earth sheet underneath the set. Note that all the television sets had only a two wire mains connection lead, which was kept as short as possible. This was achieved by folding them haphazardly, but with care, to avoid inserting any significant amount of inductance between the injection point and the set, as the organisation which loaned the sets was not too keen on us shortening the mains leads! Injection levels corresponded to draft recommendations being discussed in Europe at the moment.

VIDEO AND AUDIO BREAKTHROUGH

Pre-prepared forms were filled in on the spot, and a distinction was made between picture deterioration and breakthrough of the interference modulation into the audio circuits. No attempt was made to effect any improvements within a set itself, nor was there any time to determine precisely where, within a set, which particular circuit was causing a problem. In general, Fiona, my wife, graded the picture quality, and I graded the audio. However, quite frequently one of my friends joined in the evaluations, and we were all pleasantly surprised that judgments were very consistent.

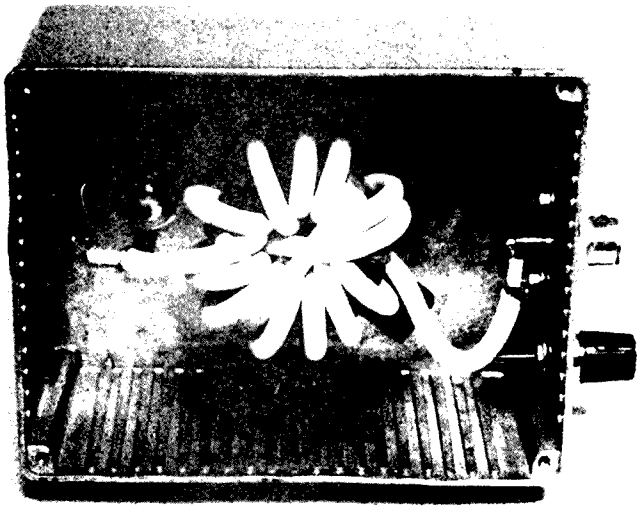
RF FIELD/CHASSIS PICK UP TESTS

These tests were carried out in three separate groups, the lower frequency band tests being done over one period, the HF ones on another and finally the 144 MHz breakthrough tests. Note that each set was individually rotated horizontally and vertically in the cradle for the worst pick-up for each band, and this position was used for the measurements. The following maximum field strengths were used for the various bands:
1.8 MHz — 5V/m, 3.5 MHz — 8V/m, 7 MHz — 10V/m, 14 MHz — 10V/m, 21 MHz — 9V/m, 28 MHz — 5V/m, 144 MHz — 6.5V/m.

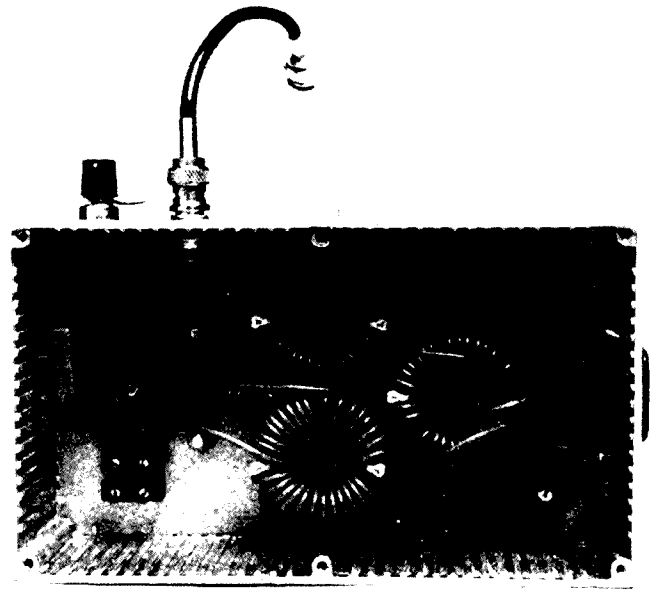
The total amount of time taken over the actual tests, and in report writing, was about one month, although many weeks of preliminary work was carried out earlier in the year, the main tests being in October 1986, for publication in a consumer magazine in January 1987.

THE TESTS RESULTS

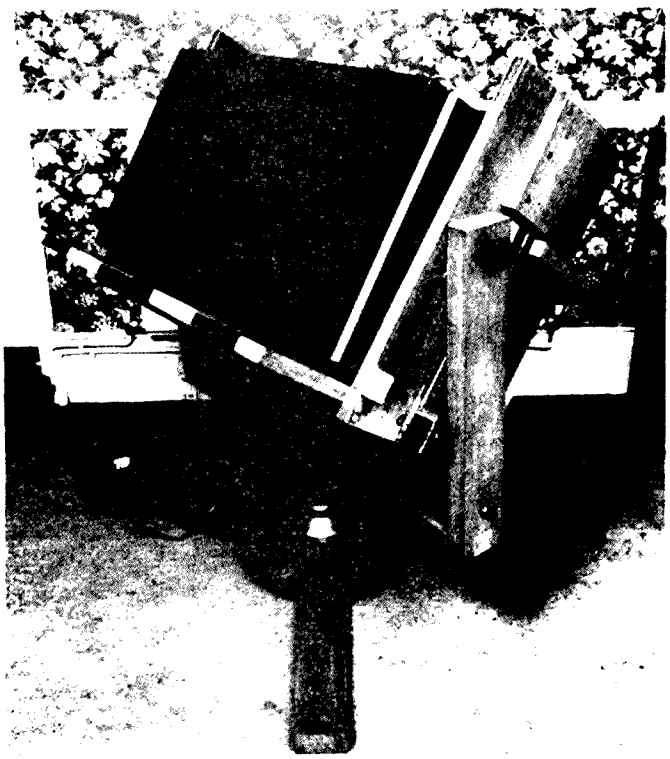
All the sets tested would be classed as being made by well-known television manufacturers and there was good representation of Japanese, German, Dutch, British ad other European-made sets. After much consideration, I feel that it is correct to name the two best sets, but the identity of the remainder will not be disclosed. Only one sample of each set was tested, and I am totally satisfied with a good result, but poor results can occur on a one-off basis — although I am reasonably confident that the results are typical of each brand. In this article, I am primarily concerned with the EMC of the different sets with reference to amateur radio bands, but vulnerability to any of these bands will almost inevitably cause a set to be just as vulnerable to other transmissions as well in the same frequency region.



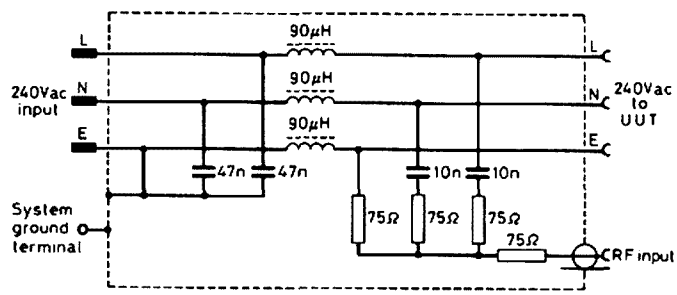
Interior view of Braid Injection Box.



Interior view of Mains Injection Box.



The Testing Cradle.



AC Mains RF Injection Box Circuit Diagram.

Set	1·8 to 14MHz	21MHz	28MHz	144MHz V/A grades for 6·5V/m	Comments	144MHz video for 3·2V/m	Audio for 3·2V/m	Field for Grade 5 V&A V/m
B & O LX2500	5	5	5	4/4		5	5	3·5
Toshiba 26154B	5	4	5	4/1	Almost entirely audio breakthrough on 144MHz	4·75	2	0·75
A	5	5	5	0/0		2	2	0·35
B	5	5	5	1/2·5	Almost entirely video breakthrough on 144MHz	2·5	5	0·5
C	5	5	5	0/0	Set muted	3	4	1
D	5	3	5	0/0	Very bad video and audio breakthrough on 144MHz	0	0	0·25
E	5	2·5 (V&A)	4·5 (A)	1·5/1·5		2·5	3	0·4
F	5	4 (V)	5	1/5	Picture degrades fairly slowly with increased level at 144MHz	2·5	5	0·28
G	5	5	5	2/1		3·5	2	0·26

Table 1: Field Test Performance.

The Bang and Olufsen LX2500

Direct injection: From 1.9 to 30 MHz this set gave a superb performance, no breakthrough being noted to video or audio, even at 1.4 volts, the maximum level used in this test. However, above 48 MHz problems were noted; at 50.2 MHz the performance was bad, while at 70.2 MHz results were poor. The onset of breakthrough was very rapid indeed above 48 MHz, for only a 6 dB increase was required to degrade the picture from five down to two. The vulnerability was also poor up to Band 2, but had improved markedly by 144 MHz to become good. At UHF, a fairly low-level signal caused a marginal deterioration, but an extremely large increase was required to create a really serious problem. Even a one volt signal did not cause really serious break up, and there was no audio breakthrough at UHF Thus, the only bands likely to cause a real problem would be 50 and 70 MHz, but a highpass filter should completely cure any breakthrough, and for this reason the set's immunity was considered excellent, the best of any set tested.

Braid Injection: The set was excellent up to 30 MHz, with just a very slight breakthrough at 14.2 MHz with the highest interfering level. A tendency to audio breakthrough was not a problem. A braidbreaker should amply sort out the audio problem.

Mains Injection: The only problem noted in this test was at the 6 MHz spot frequency, thus showing first-class mains filtering within the set.

Field Immunity: The performance was spectacularly good on all amateur bands tested, (1.8, 3.5, 7, 14, 21, 28 and 144 MHz). A set that shows no discernible trouble at 3.5 V/m and only marginal trouble at 6.5 V/m on 144 MHz SSB is one that might be considered a standard against which others might be judged. This is the type of performance that we are all looking for in a television, showing considerable care and attention being taken at the design stage.

As this set wa so good, and both the picture and audio quality was among the best noted by my family and others, I actually decided to purchase one of these models. and here has not been a peep from Fiona over the months that we have had the set, despite my being active on all bands.

Toshiba 26154B

Direct injection: This set was remarkably good right across the board from 1.8 up to 432 MHz, the antenna circuit clearly having an excellent highpass filter action.

Braid injection: All the lower frequency bands had excellent immunity, and just slight audio breakthrough was noted at HF at extremely strong injection levels. On the 50 and 70 MHz bands, immunity was quite good, but with a slight tendency to audio breakthrough from strong interference levels. Although breakthrough on 144 MHz, primarily on audio, was fairly good, more breakthrough was noticeable around 139 MHz. 432 MHz rejection was excellent.

Mains injection: Audio breakthrough was slightly noticeable here and there between the 3.5 and 21 MHz bands, although by 28 MHz there was no problem even at high levels. Strong injection signals were required to cause any audio breakthrough on the 50 and 70 MHz bands. Even at 144.3 MHz, the immunity was quite good at the highest levels, and a ferrite ring braidbreaker should be sufficient if placed very near the set. No problem was noted at 432 MHz.

Field immunity test: Immunity on the lower frequency and HF bands was excellent, and some 9 V/m were required at 21.2 MHz to cause very slight audio breakthrough, which is considered remarkable. On the 144 MHz band, video immunity was very good, but audio breakthrough became progressively more and more marked when the field strength was increased above 0.75 V/m. Audio breakthrough was annoying above 1 to 1.4 V/m, and this is a pity on an otherwise superb set.

Set A — A Far-East Company product made in the UK

Direct injection: This set performed adequately at lower frequencies and well at HF and VHF At UHF, performance was clearly better than average. However, this particular set showed bad picture deterioration after about half-an-hour from switch-on, and the picture without breakthrough was itself no better than Grade 4.

Braid injection: This set was very poor overall above 4 MHz up to UHF The set could be said to be disastrous between 6 and 8 MHz, and extremely poor at HF and at 144 MHz. This is one of the worst sets tested in 1986 in this parameter, and it is quite clear that it could give trouble in many areas from many different types of local transmitters. An unfortunate example of a set with good rejection on the inner, but very serious problems in the complete earth plane within the set.

Mains injection: This set proved to be more than usually troublesome over a fairly broad lower frequency and HF spectrum, although by the 144 MHz band there was almost no trouble at all. Some audio breakthrough was picked up at 432 MHz. Strange problems were noted at 6 MHz together with its harmonics, eg 18 and 24 MHz. This set might very well require an efficient ferrite ring mains filter near the set, as well as a very effective braidbreaker on the antenna lead.

Field Immunity: The chassis immunity was surprisingly good on lower frequencies, HF and lower VHF, but at 144 MHz strong signals did cause quite a severe problem, especially to the video. The field strength had to be reduced to only 0.35 V/m on 144 MHz for breakthrough to be eliminated.

Set B — Made in the UK by a British Company

Direct injection: This set performed admirably from 1.8 to 100 MHz, no trouble showing up either on video or audio. However, at 144.3 MHz video breakthrough was extremely bad at the one volt level, but the signal only had to be reduced by 10 dB to obtain a perfect picture; audio showing no deterioration. At 432 MHz the set muted completely, and Grade 5 video required a breakthrough signal reduction by 15 dB to only 55 mV. The picture was as bad as Grade 2 at 125 mV, muting occurring at 250 mV. The problem is clearly that of insufficient front end selectivity, and reception was perfect with a one volt input signal when a six-section filter was inserted on the antenna input socket, a tuned notch filter giving an almost perfect picture. All the problems were video rather than audio.

Braid injection: This set showed serious problems on almost all bands from 7 to 144 MHz in varying degrees, 144 MHz audio was mainly affected. Even a good braidbreaker on the input socket was insufficient to effect a cure, as re-radiation from the coaxial lead braid to the chassis created a problem.

Mains injection: There were no significant pick up problems below 30 MHz, and above 30 MHz the performance was quite acceptable, although very high injection levels on 144 MHz did breakthrough, the onset of the problem being quite sudden, primarily onto audio at VHF and UHF

Field immunity: Chassis immunity was excellent on the lower frequency and HF bands, but on 144 MHz breakthrough to video was very bad at high field strengths, and did not clean up until the field was reduced to 0.5 V/m, audio breakthrough being somewhat less marked. Although this set is not the worst, it would definitely be regarded as a troublesome one at 144 MHz.

Set C — A West German-made Set

Direct injection: Video immunity was good up to 21 MHz, but from 28 to 150 MHz it was fairly poor; however, no audio breakthrough was noted. Surprisingly, 432 MHz presented no problems at all, showing the set to have a good highpass filter in the front end.

Braid injection: Although this set was satisfactory at lower frequencies and on 14 MHz, there was a serious problem from 18 MHz upwards, fairly strong signals on 21 and 28 MHz, and only fairly strong signals on 50 and 70 MHz causing complete video muting. At slightly lower levels, the video turned on and off repeatedly. At 144 MHz the problem was much less severe, but strong pick up levels could still cause a problem. At 432 MHz the problem was fairly marked again. One would need a very efficient braidbreaker to effect a cure for this strange phenomenon.

Mains injection: The video muting problem again occurred from breakthrough on the 28, 50 and 70 MHz bands, but it was absent on 144 MHz and 432 MHz. A good ferrite ring mains filter should cure the problem.

Field immunity: Immunity was excellent on the lower frequency and HF bands, and an extremely high field was required to cause video muting on 144 MHz, normal strong signals being coped with fairly well. It is curious that video muting usually occurred long before the picture was degraded to as poor as Grade 2, so it seem that this set is a go/no go one, and I suspect that an EMC component or two might have been omitted from UK market models.

Set D — Made in West Germany by an international company

Direct injection: Excellent immunity throughout the spectrum, including 432 MHz.

Braid Injection: Immunity was good from 1.8 to 70 MHz on video, but audio breakthrough was noted on HF, becoming very serious at the top end of Band 2. PMR AM breakthrough could be very bad on this set. Video was poor and audio bad at 144 MHz, but there was absolutely no trouble at 432 MHz. I again suspect that some EMC component might have been omitted from sets marketed in the UK.

Mains injection: Although there were no video breakthrough problems, audio breakthrough was very bad from HF up to 100 MHz, 50 and 70 MHz being particularly vulnerable. 144 MHz was not serious, and no problems were noted at 432 MHz.

Field immunity: All lower frequency and HF bands were excellent, except for 21 MHz, where audio breakthrough was noted above field strengths of 3 V/m. The set was extremely vulnerable to both video and audio breakthrough from 144 MHz, and the field had to be reduced to below 0.25 V/m to remove the breakthrough completely. Note that this borderline is some 22 dB worse than that for the Bang and Olufsen set, so woe betide PMR, as well as 144 MHz operators, if there is one of these sets close by!

Set E — Made in the UK by a Japanese company

Direct injection: Although this set had excellent immunity from 1.8 to 150 MHz, there was a bad problem at 432 MHz — a level on the inner of only 0.16 volts was sufficient to reject very strong signals, while both the old Post Office/DTI FS72A and special six-section filters completely eradicated any problem.

Braid rejection: This set's immunity varied from quite poor to very bad between 7 and 144 MHz bands, both video and audio breakthrough being noted, the latter being particularly bad on the 28 MHz band. Slight audio breakthrough was also noted at 432 MHz. This set will need a very good braidbreaker, or even a combination of two types to resolve serious problems.

Mains Injection: Video immunity was generally good, other than on 28 MHz, where it was fairly poor. However, audio immunity was very poor generally, although no problems were experienced either for video or audio on 144 and 432 MHz. A good ferrite ring filter system on the mains lead near the set should be sufficient to remove any problem.

Field Immunity: Video and audio immunity was very good on the lower frequency bands and on 14 MHz, but slight breakthrough from strong fields was noted on 21 and 28 MHz. Bad audio breakthrough was noted on 144 MHz, and the field had to be reduced to 0.4 V/m to clear it completely, although video breakthrough was not so severe, but still a problem. Set orientation dramatically changed the vulnerability rather more than usual. This set was considered fairy poor overall, but not the worst.

Set F — Made in the UK by a Japanese Company

Direct injection: This set gave an excellent performance in this test between 1.8 and 144 MHz, but serious problems occurred on 432 MHz. A Grade 5 picture was not obtained until the injection level was decreased to 0.1 volt; above this level, video blurring and colour blotching occurred with considerable severity above 0.5 volt, the audio muting completely at above 280 mV. Possibly an FS72A would remove the problem, but a six-section filter would probably be needed for the installation to be completely free of trouble from 432 MHz.

Braid injection: Immunity was excellent up to the 28 MHz band, and 50 MHz was fairly good, but on 70 MHz serious audio problems were encountered with high level injections. The onset of trouble was very sudden at around 1.25 volts, and at levels only slightly higher than this both video and audio completely went, and did not recover when the interference was withdrawn, the set having to be turned off for a while and turned on again to perform normally! Transformer-type braidbreakers near the set did not offer sufficient protection to overcome the problem completely when used on the antenna input, so there was clearly re-radiation from the feeder into the chassis. Results on 144 MHz were poor, and dependent on the coaxial cable positioning. No trouble was experienced from 432 MHz.

Mains injection: The set performed well right across the board, with only very minor problems showing up here and there with very high injection levels.

Field immunity: All bands tested from 1.8 to 28 MHz were very well rejected here, other than 21 MHz which was only a minor problem. At 144 MHz there was absolutely no audio breakthrough even at 6.5 V/m, but video breakthrough was bad, the field having to be reduced to only 0.3 V/m to eradicate any breakthrough completely.

Set G — Manufactured in the UK by a European Multinational Company

Direct injection: Immunity was excellent all the way from 1.8 to 150 MHz, but at 432 MHz immunity was very poor, and while an RBF1/70 might give adequate rejection, a six-section filter would be advisable for rejecting very strong received signals.

Braid injection: Video immunity was very good up to 100 MHz, fairly good on 144 MHz, and excellent 432 MHz. However, audio breakthrough varied from very poor at HF to very bad at VHF This set has a serious problem in the audio area, and strong fields picked up by the downlead braid from any VHF, AM, SSB or CW transmissions could introduce marked audio breakthrough. Such transmitters could include police, fire and ambulance AM services, and even AM PMR. Radio amateurs could well be picked up as breakthrough when they were on the 28, 50, 70 and 144 MHz bands, the last three being particularly troublesome. Ferrite-ring braidbreakers might well help a lot, but it would also be worth trying in-line transformer braidbreakers.

Mains injection: Mains rejection was good on this set at all frequencies except 144 MHz, where it was just fair, but a simple ferrite ring filter should fix the problem.

Field immunity: Immunity was excellent on the lower frequency and HF bands, but audio breakthrough was a serious problem from high-level fields on 144 MHz, although video breakthrough was somewhat less serious. The field had to be reduced to only 0.26 V/m for the breakthrough to be completely insignificant. The main trouble with this set was breakthrough to the audio section, and it seems highly probable that components normally inserted in continental sets were omitted in the UK version to reduce manufacturing costs.

CONCLUSIONS

Although it may seem that I have given a lot of details on each of the sets, I have to admit that I have only scratched the surface, since we actually noted nearly 200 measurements for each set, and I have had to leave out many laboratory notes for the sake of space. Even a quick perusal of the results for each set will show that the types of problem that may be encountered are usually very different between various models, but there are some broad conclusions which can be drawn. You are unlikely to have EMC problems directly attributable to antenna pick-up on the lower frequency bands, and most sets were surprisingly good at HF Furthermore, even braid and mains lead pick-up of strong 1.8 MHz band signals is unlikely to occur. Braid pick up in general is most likely to be a problem on lower frequency and HF bands, but some of the sets were very poor at 144 MHz. Mains breakthrough will probably not be encountered so frequently, especially if the television installation is on the ground floor. I am fairly certain that careful attention to the use of filters should give adequate protection to a television set, and please check back with Part 1 of this article for details of the use of filters. I am most concerned about direct chassis breakthrough, and here it is clearly VHF which causes the biggest problem, often to audio rather than video.

Inquiries made during 1986 have confirmed that many earlier sets designed or made on the Continent for Continental markets, sometimes have EMC components left out of sets made for the UK market because of the absence of satisfactory legislation. In Germany, legislation is very strict, and so there are far fewer EMC problems there. It is to be hoped that manufacturers will co-operate with the RSGB and many other bodies, so that models can be developed with far better immunity. Even the excellent Bang and Olufsen set would not quite meet the latest draft proposals as far as the lower VHF spectrum is concerned, and Bang and Olufsen most certainly took my comments seriously, and stated that they would strive further to improve their sets immunity.

It is to be hoped that a similar project might be undertaken one day on video recorders, because while the television set itself may be excellent, the video recorder may well be the weak link in the chain. The field is very wide, and I would like to see EMC reports on various models of telephones, hi-fi and radio and computer installations — the last including measurements of breakthrough transmitted as well as received.

ACKNOWLEDGMENTS

I would like to acknowledge not only the considerable help of individual members of the EMC Committee, but the assistance given by many engineers in the television industry, who were keen to see the testing carried out fairly, and with approved techniques. In particular, I would like to thank Les Robotham G8KLH, for making the enormous cradle platform to hold the television sets around the house. Peter Tucker G4DWZ, and his wife Nikki, kindly let us use their house for many field trials. John Armstrong G8MVH, and his colleague Roger Wagstaffe, also gave much help, not only with the testing, but in making up, at short notice, two well constructed, balanced, 144 MHz dipoles for use in the field tests.

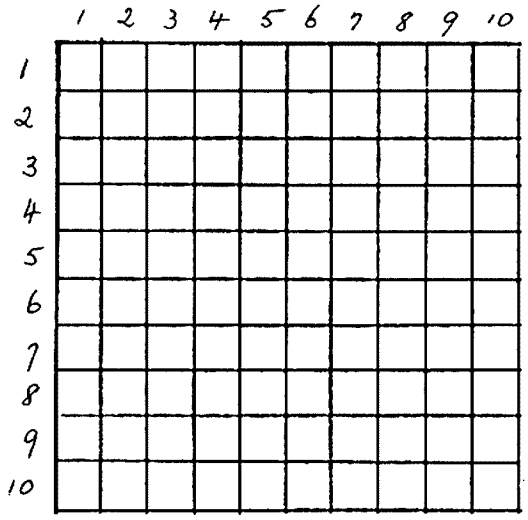
BR

MORSEWORD© 15

Compiled by Audrey Ryan

30 Starling Street, Montmorency, Vic. 3094

ACROSS		DOWN	
1	Skin	1	Massage
2	Exits	2	Welsh girl's name
3	Inheritor	3	Dandy
4	Fibbed	4	Chief
5	Prevalent	5	Ear (colloq)
6	Examined	6	To have placed down
7	Girl's name	7	Cuddle
8	Aspirin (abbr)	8	Prescribed amount
9	The (Spanish)	9	Handle
10	Employs	10	Knocks

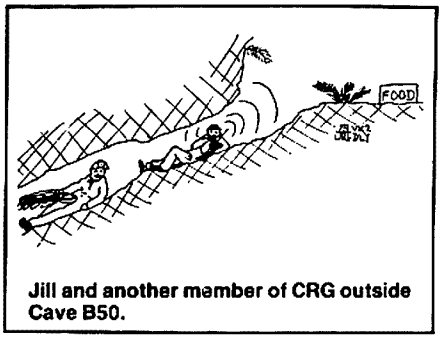


Solution see page 55 . . .

WICEN News

BUNGONIA CAVE RESCUE — Weekend March 12-13, 1988

Jill Rowling VK2DLY
42 Pemberton Street, Parramatta, NSW. 2150



Jill and another member of CRG outside Cave B50.

The weekend following the second Tuesday in March is the Cave Rescue Exercise, organised annually by the Cave Rescue Group (part of VRA) in conjunction with the Police Rescue Squad, State Emergency Services, ambulance personnel, WICEN and others.

The object of the exercise is for the various groups to gain experience in rescuing injured people from difficult caves.

Bungonia is chosen because of its relative closeness to Sydney, and because it has "a bit of everything" to hamper a cave rescue: mud, foul air (CO_2 concentrations in certain areas), pitches (large holes), squeezes (tight spots), and mazes of twisting little passages, all different. The role of the WICEN operator is to relay messages between the cavers and headquarters, using a controlled net.

Eight WICEN operators were present this time: Morton VK2DEX, was co-ordinator for this exercise Jeff VK2BYY was the "overworked" net controller Jim VK2BZD, Alan VK2DPM, Peter VK2EMU, Jill VK2DLY, Noel VK2YXM and Alan VK2DQP.

The police rescue squad provided all the food and refreshments, plenty of 240 volts, lights, portable toilets and showers. Also the Saturday night's film.

Jeff brought the portable WICEN repeater (147.150 MHz) which performed admirably for the entire exercise and was set up atop a mast on a nearby hill.

Noel and Jill discovered that two-metres VHF works well, even inside caves to a certain extent (but it does depend on the cave!). Other operators found their equipment could not get out of deep dolines (roughly circular depressions in which caves are often found).

The following is a personal account of the exercise:

You are rudely awakened by a horrible alarm clock on the other side of the bedroom. You struggle out of a warm bed — it is 4.30 am, cold, dark and you now have to drive 190 kilometres. Maybe it would have been better to have left last night!

You leave Parramatta at 5.30 am and get lost at Marulan. Somehow you arrive at Bungonia by 8.10 am.

Other WICEN people are already up on a hill. Jeff VK2BYY, is setting up a repeater. Morton VK2DEX and Jim VK2BZD, are passing traffic on simplex.

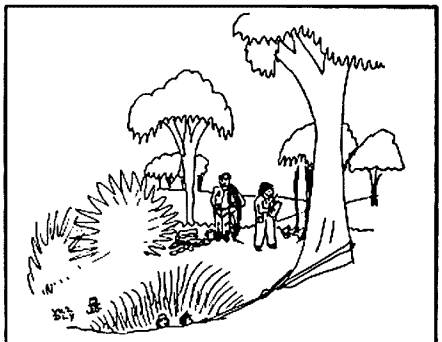
Morton delivers a briefing.

You go to your assigned Cave Rescue Group (CRG) leader and introduce yourself. Morning tea is served. (You have missed breakfast by arriving late!). You sit through informative and interesting lectures on caving equipment and safety.

Then the police serve lunch of sandwiches, fruit, tea/coffee/juice. After lunch it is time to rig up and join your assigned group. There are 16 CRG teams.

Today, you are looking after CRG teams Red 1 and Red 2 together because there are not enough WICEN operators and the two caves are close to each other.

Some groups go off to their caves in pickup trucks. You walk because it is not very far to your cave and it is a lovely day. You pass the general public camping ground and startle family groups who are enjoying family picnics.



Grace Matts, a member of CRG, shows Jill VK2DLY, the way to enter Cave B22 (acoustic pit).

(What's this? People wearing overalls, caving helmets, ropes etc, and some character in green overalls with a radio. . .).

You join the WICEN net officially, using appropriate call sign, eg; Red 1. Upon arrival at the cave, the Red 1 group are briefed then disappear underground through a small hole. You remain outside and wait for the Red 2 group to arrive.

Eventually they arrive (they had gone the wrong way) and the exercise begins. You are left sitting in the bush, on a rock in the dappled shade of a large tree, near a deep, dark hole in the ground. Birds are singing in one ear and the activities of the WICEN net in the other.

You become aware of a thumping and panting sound emanating from the hole. A breathless, grubby caver emerges and hands you a muddy note. "There's been an accident in the cave!" she pants. "Can you get help?" At this stage you double check to ensure it is a simulated accident and not a real one. Some cavers can put on quite an act. The note lists medical information about the "patient", plus whatever else is needed in the way of assistance. The message is copied onto a WICEN message form, prefixing certain words to indicate it is an exercise, together with the time and a serial number. There is a lot of traffic on the net and you have to wait until someone else has finished their message.

You inform the caver you will send the message as soon as you can get into the net.

There is a break on the net. "Control, this is Red 1".

Net control replies: "Red 1, control, send, over."

You send your message clearly and slowly with plenty of breaks to allow the control operator to write it all down.

You then tell the caver that you have passed the message on.

Meanwhile, the control operator (or his assistant) rings headquarters and repeats the message, and maybe receives a reply. Later you hear: "Red 1 from control". You acknowledge his call and write down the replied message. You give it to the caver, who then disappears underground.

There is a thumping from behind, bushes are parted and another caver appears from a different party — Red 2. This time it is a verbal message and you write it down as the caver remembers it. You verify the message with him, then follow a similar procedure to before but this time with a different call sign.

He requests a pretend ambulance.

"Control, this is Red 2!". Halfway through the message, your batteries go flat. "Stand by!" you tell control. You unclip the battery pack and plug in the second set. Control is taking another message from another group by this time. When they have finished you call, "Control, this is Red 2!" Control acknowledges, and says, "Repeat all after 'Green Ambulance'." (A green ambulance is a pretend one, for exercise purposes). You repeat the necessary message as requested. (This is another good reason why all messages should be written down).

After quite a number of messages have travelled back and forth, the "victim" eventually emerges, usually giggling or over-acting, assisted by fellow cavers.

There is a de-briefing, and refreshments are devoured. The groups then swap caves and the exercise is repeated again until dinner time.

You call for a pick-up truck (a real one, not a green one) to take the last weary group of cavers (and yourself) back to camp. Suddenly you are extremely popular. The truck arrives in no time. All clamber aboard and merrily return to camp. You resume your normal call sign.

Delicious smells pervade the camping area. The police have excelled themselves in the catering van. You untangle yourself from your equipment, grab some eating utensils and join the crocodile that has suddenly formed.

During dinner it gets colder and someone lights a bonfire which proves a godsend to everyone.

Later, the police set up their film projector and all thoroughly enjoy Police Academy 4. Halfway through the film a CRG leader calls for volunteers for the Yellow group which has still not returned! Everyone groans, and reluctantly members of the SES leave (or maybe they were volunteered by their squad leader?).

Morton VK2DEX is still out there and you feel a prick of conscience. The net controller is also still there but he had his dinner earlier. Eventually, after the film has finished, three pickup trucks arrive in succession, each with its share of cold and tired (but elated) cavers — and there is Morton! The police serve up another set of dinners! Everyone stands around the bonfire and swaps outrageous stories until well into the night. Many new friends are made.

Eventually, everyone retires for the night. What a day!

There were two real caving accidents that weekend, thankfully both were minor. (One caver fell four metres and gashed his leg whilst the other suffered hyperventilation after demonstrating what hyperventilation was!).

These mishaps were passed through the WICEN net. WICEN were later congratulated on the speed and efficiency of their message handling, because it was all over and sorted-out before the other cave groups knew anything about it.

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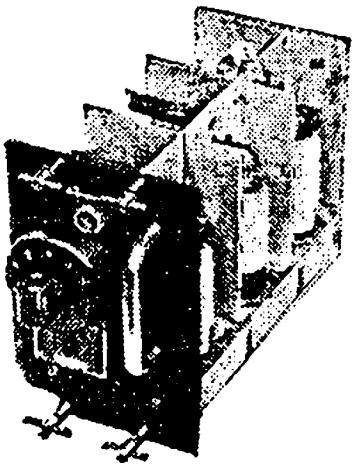
A R Showcase



UNITED KINGDOM DISPOSALS REFERENCE

(excludes US equipment)

This booklet consists of a listing of over 300 items of disposal radio and associated equipment advertised in the United Kingdom during the years 1945 to 1960.

The original advertisements are featured, with the equipment type being listed numerically where possible.

This booklet is a valuable reference for new, as well as established collectors, for nostalgic buffs and for those who used the equipment.

The project of compiling the booklet came about following complete frustration of not having any extensive reference of equipment of UK origin. The obvious source, magazine advertisements, was available, but retrieval was not so easy!

To make the listing more interesting, the original prices have been included. Quite some mouth watering bargains!

Equipment from the 1945 to 1960s era is beginning to resurface. Perhaps you have as item you wish to identify — here is a useful source.

The booklet is available from the author for $6 per copy. Also the NSW Division is holding limited stocks.

For further information contact the author, Ian O'Toole VK2ZIO, 222 Old Northern Road, Castle Hill, NSW. 2154 or telephone (02) 680 2112.

TELEX RADIO

Using modern technology and a specially designed modem for the land mobile radio channels, *Dataradio* have released the "Telex Radio".

Telex networks of up to 256 can be set up using Telex Radio. For over-the-horizon applications, store and forward digital repeaters are used to keep data integrity. Multiplexers are available to connect many terminals into one communications line. It is possible to mix data with telex in the same network allowing computer communications to occur with Telex traffic.

Applications will include ship-ship, ship-to-shore, remote location networks and mixing of Telex traffic on the normal land mobile voice channels.

For further information contact the Australian distributor: Mastatek Pty Ltd, Suite 1, 245 Springvale Road, Glen Waverley, Vic. 3150. Telephone (03) 233 6677 (Vic) or (02) 477 6120 (NSW).

CL-20 RADIO MODEM FOR 9600 bps ON MOBILE RADIO CHANNEL

The FM Land Mobile Radio Channel can provide an economic data channel for data communications. The new CL-20 modem, designed by Dataradio (Canada) provides a 10 dB sensitivity increase over their widely used CL-10 model. In addition, it will be possible to use the modem with existing two-way radio's and provide a network speed of 9600 bps. Modem lock time is only a few milliseconds making it ideal for packet radio applications.

Store and forward repeaters are used to allow transmission over-the-horizon. Other options include five port multiplexer, 32 bit digital identification for SCADA applications and intelligence for networking. The CL-20 is ideal for mobile applications where high throughput is important.

Dataradio is manufactured to stringent commercial requirements with a design MTBF of some 25 000 hours.

For further information contact the Australian distributor: Mastatek Pty Ltd, Suite 1, 245 Springvale Road, Glen Waverley, Vic. 3150. Telephone (03) 233 6677 (Vic) or (02) 477 6120 (NSW).

ICOM IC-575A

With the release of the Icom IC-575A, a 10 metre and 6 metre dual band companion to the IC-275A two metre and IC-475A 70 centimetre all-mode transceivers, the circle is complete.

All the features of the IC-275A, the two metre all-mode base/mobile transceiver which has become the benchmark for transceivers above 30 MHz, are now available on 70 centimetres, 6 and 10 metres.

The IC-575A is an SSB/CW/FM dual band transceiver capable of continuous reception from 26 to 56 MHz and transmitting between 28-29.7 and 50-54 MHz, with a built-in 240 volt AC 100 percent duty cycle power supply and 13.8 volts DC mobile operation.

It features the unique Icom Direct Digital Synthesis (DDS) frequency generation circuitry, the modern successor to phase-locked-loop (PLL), completely replacing all PLL circuitry with an advanced, computer designed digital synthesis circuit for extremely fast (5 mS) lock-up, fast switching for advanced digital modes, a superb frequency stability through the mixing of DDS-generated source frequencies in an advanced double-PLL system.

Inside the IC-575A is the same advanced HD64B180 ROP central processor unit as is found in the IC-275A and 475A, providing 99 user-programmable memories plus two priority channels, each storing frequency, mode, duplex offset and direction, and sub-audible tone data (where used).

The advanced microprocessor inside the IC-575A also provides equally advanced remote control capabilities using Icom's unique Computer Interface-V (CI-V) standard, connecting via a rear panel connector to any standard RS-232C serial port.

Four independent scan modes provide easy and convenient monitoring of the six and 10 metre bands. Programmed Scan-mode repeatedly scans a selected portion of either band between two user-defined limits (stored in memories 1 and 2) with selectable stop-on-busy or stop-on-clear. Mode-Selective Memory Scan monitors only those memories programmed in the same mode as the main display. Skip Scan allows temporary avoidance of unwanted memory channels.

A high-integrity liquid crystal display (LCD) with soft orange illumination provides maximum visibility, even in bright sunlight. The display unit of IC-575A constantly monitors the VFOP in use, the selected mode, frequency split or duplex offset, scan mode, current memory channel, RIT offset, sub-audible tone (if used) and operating frequency.

Receiver sensitivity is claimed at less than 0.13 uV for 10 dB S/N (SSB/CW), while selectivity is claimed at 2.3 kHz for -6 dB.

Transmitter power is continuously adjustable from 1 to 10 watts (1-4 watts AM) for the front panel. Spurious outputs are suppressed by more than 60 dB, while carrier and unwanted sideband in SSB mode are reduced by more than 40 dB (1000 Hz AF tone input).

Other features include IF passband tuning, deep notch filter, noise blanker, selectable AGC, speech compression plus many optional enhancements.

A rear panel AFSK jack provides easy access for advanced mode operation and the unit is equipped with a Data switch to reduce PTT switching time for fast-switching applications like packet and AMTOR.

The Icom IC-575A is available for inspection now at your nearest authorised Icom dealer. For details of your nearest dealer, contact Icom Australia, 7 Duke Street, Windsor, Vic. 3181 or phone toll-free on (008) 33 8915.

QSP

IC CARDS HERE

Westpac Bank has begun a trial use of Smartcard technology and other banks, including the Commonwealth, ANZ and National Australia, are looking into the use of the cards.

Invented in France 14 years ago, the Smartcard includes an integrated circuit (IC) and has a wide range of uses.

The cards provide a self-confirmation of ownership and authority without having to access on-line computer networks as is the case with conventional plastic cards.

SUPER-CONDUCTOR RACE

Research continues into superconductivity with IBM discovering a ceramic compound it claims offers no electrical resistance at minus 148 degrees Celsius.

Superconductors are being developed to improve devices that use electricity, but so far none has been found that can be used at warm enough temperatures to have widespread use.

IBM is keeping the formula of the new superconductor secret but its operating temperature is roughly 20 degrees warmer than the previous record.

Scientists are trying to make materials that become superconducting at as high a temperature as possible, to make them practical for uses in high-speed computers, bullet trains and other applications.

LAND FORCES AMATEUR RADIO GROUP

The Second Annual General Meeting of the Land Forces Amateur Radio Group was held on 3.590 MHz, at 8.30 pm on March 16, 1988. There were 10 members present.

Office bearers for the following year are:
President — Murray VK3DOV
Vice-President — Vic VK3CQP
Secretary — Sam VK2APK
Treasurer — Bob VK7NBF
Committee — Joe VK3AXM and Alan VK2ELE

The Group meets each Wednesday evening on 3.590 MHz ±QRM, at 1000 UTC. Membership is available to any amateur or SWL from any Armed Service. Details are available on the net or by contacting the Secretary, QTHR.

—Contributed by Murray Bloomfield VK3DOV, President, LFARG
ar

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BARCFEST 88

The Brisbane Amateur Radio Club will be conducting it's Sixth Annual Barcfest (Hamfest) on Saturday, May 7, 1988.

The venue is the same as previous years, ie the Indooroopilly State High School Assembly Hall, Ward Street, Indooroopilly.

Features include displays by retailers, specialised amateur groups, antique radio collectors and the WIA Queensland Division Bookshop. Lectures will be held and there will also be some Art and Craft displays for the ladies.

A large amount of disposals equipment is expected to be available for sale. Anyone wishing to dispose of surplus equipment is invited to do so. No fee or commission is charged for such sales.

Refreshments will be available in the hall.

—Contributed by David Prince VK4KDP, President, BARC
ar

* * *

GOLDFEST 88

Once again the Gympie Amateur Radio Club is holding an amateur get-together at the Chatsworth Hall/Chatsworth School venue, just a few minutes out on the northern outskirts of Gympie City.

Why 'Goldfest'? Gympie grew on gold, turned to other means of livelihood and is now again, with the aid of BHP, mining from as deep as 900 metres. "Goldfest 88" will usher in the annual "Gold Rush" festivities and will offer something a little different from the 'big city' style of Hamfest.

Come and sample clean air, country hospitality, fellowship, and cooking and win a Gold Award.

Keep Saturday, October 8, 1988 free so you may attend this event. Commencing time 9 am.

—Contributed by Alan Gardner VK4BWG, Secretary, GARC Inc
ar

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DISABLED RADIO AMATEURS' CLUB

General meetings are held on the first Saturday of each month (unless otherwise indicated) and commence at 2 pm.

Dates for the rest of this year are as follows:
May 7; June 4; July 2; August 6; September 3; October 1; November 5; December 3 (this is the Christmas break-up and begins at 12 noon).

Dates may alter according to public holidays.

Other club functions are held every other Saturday afternoon between 2 pm and 5 pm and each Thursday evening after 7.30 pm.

If members wish to use club facilities at other times approval must be gained beforehand. NOTE: Transmitting equipment must only be used under the supervision of respective licenced operator.

Field Days and Social Activities are arranged from time to time as suggested at meetings.

Annual membership is due in May and is currently $5.

To alleviate phone calls and postage it is appropriate to keep in touch by being present at meetings and making contact with fellow members.

Club call sign is VK3ZZ.

The club has a saying: *You QSO with us and we'll QSL with you!*

—Contributed by Kelvin Lee, Honorary Secretary, DRAC
ar

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GEELONG AMATEUR RADIO CLUB ANNIVERSARY

This year, as Australia celebrates its bicentenary, radio amateurs in Geelong have further cause to celebrate. This year, 1988, marks the 40th anniversary of the Geelong Amateur Radio Club.

The inaugural meeting of the club was held at the studies of radio station 3GL, in James Street, Geelong, just three years after the end of WWII. Among those present were:
Alec Bell VK3ABE, Alf Forster VK3AJF, Arch Woolnough VK3BW, Bill Barrott VK3WT, Ed Kosseck VK3AKE, Fred Freeman VK3ALG, Bill Brownbill VK3BU, Harry Selman VK3CM, Bob Wookey VK3IC, and Jack Matthews VK3SY. Unfortunately, incomplete records do not allow us to be certain of the details surrounding the club's formative years and much of the early history has been lost in the mists of time.

Notable in the list of founding members are Bill Brownbill VK3BU, believed to be the first amateur to hear signals from Sputnik 1, Ed Kosseck VK3AKE, who was the first to span Bass Strait on two metres and, of course, Alec Bell VK3ABE (SK), the founding president. Perhaps even more notable is Alf Forster VK3AJF, who is currently serving his second consecutive term as president.

For some years the fledging club met at the premises of the Geelong Budgerigar Club, eventually moving on to various premises around Geelong. Today the club occupies its own clubrooms, which was built by members in the early 70s, in Storrer Street, East Geelong.

During its 40 years the club has achieved much to be proud of. In the late 60s it installed one of the first two-metre FM repeaters (the forerunner of what is now the Mount Anakie repeater, VK3RGL). It currently operates two two-metre repeaters, VK3RGL and VK3RGC, a UHF CB repeater and a six-metre beacon, VK3RGG. The club has also constructed its own brick building on Mount Anakie and is developing the site as a first-class facility to serve the local amateur community.

Among the projects nearing completion are a 70-centimetre repeater, two-metre beacon and the club's amateur television station, due to be operational by the end of March.

To mark the occasion, the club will celebrate its 40th anniversary at a dinner on June 18, 1988. It is expected that more than 150 people will attend.

—Contributed by C Gnaccarini VK3BRZ
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Q R M from VK7

John Rogers VK7JK
VK7 BROADCAST OFFICER
1 Darville Court, Blackman's Bay, Hobart, Tas. 7052

The first three months of 1988 proved to be an extraordinarily busy time for WIA Branch members in Tasmania. Apart from the usual meetings each month, there were the Annual General Meetings plus Divisional Meetings.

We were then faced with the special meetings to discuss the devolvement of the AOCP examinations. The Divisional Broadcast service expanded to include an updated repeat of the Sunday morning news bulletin, broadcast on Tuesday evenings at 1930 hours, 80 metres only, preceding the long-running Devil Net on 3.590 MHz. This was mentioned earlier in the year as a possibility and is now an established fact.

The number of operators involved in the compilation and transmission of the VK7WI Broadcast is now 30 — a very encouraging sign! The Federal Tape is not the only tape-insert either — interviews have been carried out with visitors/amateurs from Canada and America. These have proved very popular.

The next step — a few minutes on air to put forward your own particular point of view?

Noel VK7EG, who recently publicised a scheme to assist would-be radio amateurs, must have felt things were really going his way when the subject of devolvement of AOCP examinations by the DOTC was discussed in Launceston. Certainly it must mean *greater participation* by the WIA, *not* only in running courses, but in setting up the actual examinations! At a subsequent meeting of the Southern Branch, the point was made, very strongly, that unless the WIA became the focal point of all the amateur training and testing, it would forgo any claim it might have had to being the leading organisation for radio amateurs in Australia. We must be at the forefront of all bodies moving to replace the DOTC in the examination field.

Everyone concerned with amateur radio expects the WIA to take the lead, and we would lose all creditability if we remained apathetically on the fringes of this, to us, new field.

TASMANIAN MEETINGS FOR MAY

SOUTHERN BRANCH: at the Activity Centre, 105 Newtown Road, Hobart, at 8.15 pm on Wednesday, May 4.

NORTHWESTERN BRANCH: at Penguin High School, 7.30 pm sharp, on Tuesday, May 10.

NORTHERN BRANCH: at Launceston Maritime College, at 8 pm, on Friday, May 13.

Bob VK7NBF, wishes it be known that, if you are thinking about tackling the Tassie Devil Award, don't be put off at the idea of sending out batches of QSL cards. QSL cards are not necessary for the award. So, go to it, and start on the Devil trail. You may be emulating YB0XX who, by this time, should have the appropriate number of VK7s to attain the award.

Lew VK7LJ, is very proud of his AMTOR equipment and is always on the lookout for contacts, especially since he recently accepted the challenge of originating a VK7WI broadcast — the more news he gets, the easier the broadcast becomes.

With the onset of the colder weather, many of our amateur friends will be braving the warmer climes of VK4-land. With this in mind, our 20 metre relay of the 0930 hours, Sunday VK7WI, will be recommencing soon. Listen for details before you set off on that holiday jaunt, and keep in touch with what is happening at home. Even let us know of your travels!

73 from John VK7JK

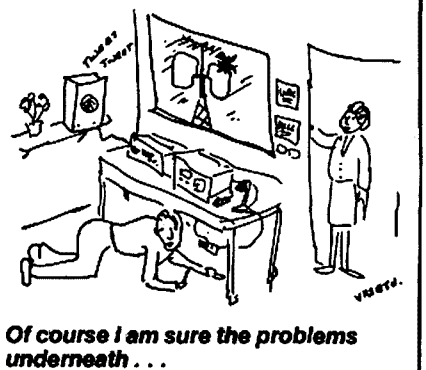
INTERNATIONAL TRAVEL HOST EXCHANGE

Ash Nallawalla ZL4LM/VK3CIT
Federal Co-ordinator of the International Travel Host Exchange
PO Box 539, Werribee, Vic. 3030

I am pleased to see the steady flow of new members in the ITHE program. At the time of writing participants are VKs: 2BSR, 2CWS, 2CXX, 2DXR 2SU, 2NET, 2SW, 2YXM, 3CE, 3CIT, 3PZA, 3OM, 3QQ, 4AKU, 4CWB, 5NOT, 5QJ, 6LT, 7HK and 8AV. We now have members in almost all call areas (how about it, VK1s and VK9-0? I ?). We have been able to help VK and overseas participants to make contact with amateurs at their destination, but remember that your name need not be on the list in order to gain the same benefits. Please send me a SASE if you want such help.

Some participants put additional information on their registration forms or in amplifying letters. The ITHE scheme is administered by the ARRL and we have to abide by their set format, therefore individual variations are difficult to incorporate.

Please give the ITHE another thought!



Of course I am sure the problems underneath . . .

—VK3BTU

VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

NEW MEMBERS

The following applications were received for the month of February 1988 and were accepted by council on February 25, 1988. A warm welcome is extended to all.

Peter Broughan VK3PJB	Traralgon
Kelvin Date VK3TBZ	Box Hill North
Steven Fuller VK3MAS	West Preston
Kenneth Fuhrmeister VK3MBD	Watsonia
Leonard Harper	North Balwyn
Colin Howie VK3ZXT	Monbulk
Stephen Hunter	Shepparton
Andrew Kurtze	Mount Eliza
Jonathan Lipton	North Balwyn
Peter Morrison	Boolarra South
Sean Neylon VK3SN	Maidstone
Max Oppy	Mount Waverley
Glenn Sampson VK3KSG	Bayswater
Robert Sibson VK3JBC	Kaniva
Bruce Sparks VK3TCM	South Mildura
Owen Twist VK3DZN	Vermont South
John Waters VK3PXJ	Tatura

THANKS

The WIA (Victorian Division) would like to express its thanks to the following for their donation of QSL cards towards the WIA collection:

Bill VK3AD, Eric VK3KF, Fred VK3ARK, Ray VK3JI, Tom VK4OD, Frank VK3FC, Percy VK2EPW (courtesy Kelvyn VK4VIM), Mrs Margot Tomich, daughter of the late George Turner VK3GN, Mrs Miriam Gilder, widow of Don VK3AHG, Bill VK4BIL, for QSLs of Silent Key John VK4ASP, Keith VK3SS for QSLs of Silent Key Jock VK3DOJ.

The WIA has also received QSL cards from Bob W5KNE in Texas and Jim W0JRN in Colorado.

There have been some very generous donations of QSLs towards the collection but it is a little disappointing that a few of our best DXers (both present and past) have not offered to help. We depend upon such successful DXers to make the collection a first-rate one.

—Ken Matchett VK3TL, Honorary Curator

Solution to Morseword© 15

Across: 1 peel 2 gates 3 heir 4 lied 5 rife 6 tested 7 Nora 8 APC 9 los 10 uses.

Down: 1 rub 2 Megan 3 beau 4 head 5 lug 6 lain 7 hug 8 dose 9 feel 10 hit

	1	2	3	4	5	6	7	8	9	10
1	•	—	—	•	•	•	•	—	•	•
2	—	—	•	•	—	—	•	•	•	•
3	•	•	•	•	•	•	•	•	—	•
4	•	—	•	•	•	•	•	—	•	•
5	•	—	•	•	•	•	•	—	•	•
6	—	•	•	•	•	—	•	—	•	•
7	—	•	—	—	—	•	—	•	•	—
8	•	—	•	—	—	•	—	•	—	•
9	•	—	•	•	—	—	—	•	•	•
10	•	•	—	•	•	•	•	•	•	•

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

NEW COUNCIL

By the time these notes appear the AGM will have been held and the new council in office. As these notes were being prepared during March, it appeared that there would be sufficient nominations to form a new council but not enough to require an election.

Full details will be given on the AX2WI broadcasts. The morning session commences with the technical tape at 10.45 am followed by the news at 11 am. The evening has the tape at 7.15 pm and the news at 7.30 pm. If the times are such that you are unable to listen, catch up with the news headlines by telephoning (02) 651 1489. Most of the news items in the broadcast, other than those on tape or by direct submission, may also be obtained on the VK2AWI packet bulletin board on channel 4850 in Sydney or the networks on 7575.

VI88NSW

Groups registered (as of March) for operation during May are the Orana Region ARC on May 2 to 8; and Castle Hill RSL RC May 9 to 15. The week from May 30 to June 5 is available to any amateur in a series of three hour time slots. If you have not, or will not get a chance to operate in one of the club weeks, then you may assist the Division to keep the call sign activated. Further details may be obtained by contacting the Divisional Office, via the postal address above, or telephone (02) 689 2417 weekdays between 11 am and 2 pm or on Wednesday evenings from 7 to 9 pm.

BLANK QSL CARDS

A new range of cards were added this year as part of the Bicentenary. You only need to overprint or use a rubber stamp. The is a range of colours. Cost is $6 per 100 plus package and postage. Check with the office for stock and all-up cost. The VK2 Division has been appointed by the Bicentenary Authority to act as their agent to check designs for QSL cards and awards if you wish to use references to the Bicentenary. This service is available to Institute members from any Division in Australia. Further information from the Divisional Office or just send the design along. We will do the rest for you. It is normally about a two week turn-around on approval.

NEW MEMBERS

A warm welcome is extended to the following who became members at the March intake:

J G Garland VK2XJG	Tingira Heights
D W James VK2DOR	Wagga Wagga
C I Parry Assoc	Gorokan
C Small Assoc	Loftus
K J Smith VK2UH	Taralga
A Solomon VK2NVS	Randwick
R A Stephenson VK2PZZ	Naremburn
B M Tunnicliffe VK2EBT	Bayview
R G Turner VK2DWA	Horsley Park
J F Watson Assoc	Stokers Siding
A Willys VK2FLY	Blayney
G Worraker Assoc	Westmead
Z Zurynski VK2XJL	North Parramatta

EVENTS IN THE NEXT FEW WEEKS

May 17	ITU Day. Operation of the special AX(VI)2ITU station by the Division. Similar special stations will operate in most of the other Australian call areas. QSL card available.
May 22	Postcode Contest — two metres SSB from 9 to 11 pm. (See Contest Column). Logs to PO Box 1066, Parramatta, NSW. 2150 by June 11.
May 29	Trash and Treasure Sale at 2 pm (Sunday) in the Amateur Radio House car park at Parramatta.
June 4	Annual Fireworks Evening at VK2WI Dural. Details on broadcasts.
June 11/12	Annual Field Day of the Oxley Region ARC at Port Macquarie. Details from their Secretary at PO Box 712, Port Macquarie, NSW. 2444.

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Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

Just a few short notes at this juncture, as most of the column will be taken up with the President's Report to the AGM (April 26, 1988).

Firstly, my grateful thanks to Peggy Muxlow, the wife of Cyril VK5KEM, who has agreed to do the buying and organising for the Clubs' Convention (and to Cyril who will, no doubt, be involved also). Thanks also to Pam Bruce, Gill Wardrop, Lorraine Maddern and Brenda Mallabone who have offered to cook, or help at the Convention, or both! (By the time you are reading this of course, it will be past tense).

Also, I am delighted to say that I think we have someone willing to take over this column. I will not name him just yet, in case it does not eventuate, but I certainly think he would be very good at it. Don't forget though, that having something to write depends a great deal on being fed information, and that is something that you can all help with.

DIARY DATES

Tuesday, May 24 — Ray Dobson VK5DI on "Thick Film Hybrids" 7.45 pm.
Tuesday, May 31 — Buy and Sell night 7.30 pm (no ESC etc).

PRESIDENT'S REPORT TO THE ANNUAL GENERAL MEETING OF THE VK5 DIVISION — April 26, 1988

The past year seem to have been one of "winding down" and "gearing up". The first half seemed to be spent getting out breath back after the hectic activity of the Jubilee Year and now we are beginning to get active again for the Bicentenary. Australia Day saw the VI88SA call sign get a huge "christening" with over 1000 contacts being made, it will be heard again when the First Fleet sails in to Port Adelaide (we hope to have a station down there for eight days) and later in the year from the *Murray River Princess* and the Grand Prix. The VI88SA and VI88NT call signs will also be used by various affiliated clubs throughout the year. A group using the call sign AX5WIA, worked EI1000 and several other "Dublins" around the world, to help Dublin, Eire, celebrate its Millennium (1000 years). The initial contacts were made on March 17 (Saint Patrick's Day) but they will try again on July 10, which we believe was when Dublin received its Charter. Bicentenary cards are available for both clubs and groups using the VI88SA/NT call signs and for individuals to use with their own call sign.

This year the subject of the Devolvement of Examinations and the question of Novices being granted permission to use two-metres (or some other common band) created a great deal of discussion. The examination question was discussed with speakers from DOTC Canberra at our February meeting and will no doubt be the subject of much more discussion before it takes effect in 1989. The 'common band' question forced up to send out a questionnaire to all members in this Division but unfortunately, even then, we did not get any clear-cut answers. Giving the member more for his/her money (or conversely giving the non-member less) has been one of our aims this year. As from next year, non-members will not be able to send cards overseas or interstate through the QSL bureau, although they will be able to receive cards coming from overseas, etc. The printing of membership cards, which might gain you discount at certain retail outlets, is also being looked at. Bankcard facilities is another service which might make things easier for members.

During the year the Council played host to a couple of members of Thebarton Council, who were interested in finding out what we did. As a result of this we almost got a mention on the Lionel William's television show, but in the end only the BGB rated a mention! Also, during the year we hosted afternoon tea for a group of ALARA members and their OMs who were attending the National Get-Together in Adelaide. In the presence of Council members and other VK5s, ALARA President, Marilyn VK3DMS, presented the Florence McKenzie Trophy, which this Division has agreed to house for ALARA. We were very pleased that Sir Mark Oliphant agreed to accept Honorary Life Membership of this Division. Although not an amateur himself, Sir Mark has had connections with amateur radio dating back to the earliest experiments conducted by Professor Rutherford.

At the last AGM, Alan Mallabone VK5NNM and Hans Van Der Zalm VK5KHZ, were elected to Council. Alan became Education Officer and Assistant Membership Secretary and Hans was the Clubs' and Country Members' Representative. John Anderson VK5ZFO became Program Organiser from May until November and we had some very interesting speakers. David Clegg VK5AMK, was forced to relinquish ESC due to other commitments, and we were pleased that Ian Bedson VK5ZBI, was able to take over from David. We were also sorry to accept the resignations of Ray Bennett VK5RM, as our Historian, but Ray subsequently agreed to stay on for a while and now John Hampel VK5SJ, has agreed to take over in a few months time. We have not lost the many talents of Bill Wardrop VK5AWM, nor of Graham Iles VK5AT. Bill has agreed to stay on as Treasurer of the Division, but has relinquished the position of WICEN Director to Graham. This means that we shall need a new Auditor to replace Graham.

Amongst the many technical projects with which we have been involved (albeit only slightly, for the most part) perhaps the one that has "dragged us towards the 21st century" the fastest, has been the Packet Radio Bulletin Board which is now housed in the BGB. The other spin-off from this has been the formation of SAPUG (South Australian Packet Users' Group) which we are pleased to welcome as another affiliated club.

Needless to say, there is not enough time or space to mention all the activities, nor all the people that have been involved in making them happen, during the year but if you did anything that helped this Division, benefitted your fellow amateur or advanced amateur radio in any way, we thank you.

On a personal note, I would like to thank the members of Council who have been so supportive and given me a great deal of encouragement over the past two years. It has been a great honour and privilege to have been the first lady President of this Division.

Jennifer Warrington VK5ANW
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VK4 WIA Notes

David Jones VK4NLV
18 Browning Court, Strathpine, Qld. 4500

Due to the lead time required for AR, these notes are being prepared prior to the two most important events on the WIAQ Calendar, those being the Radio Club Conference followed by the Federal Convention.

Why do we place such emphasis on these events?

It is unfortunate that, despite the high level of sophistication we have achieved technically, we still have a basic communication problem. In some other Divisions, it is almost an offence to discuss the politics of amateur radio in an open-air manner, and this breeds ignorance. An unhealthy ignorance of the problems of other amateurs.

In VK4, this problem of ignorance has been largely overcome by our Radio Club Conference, where all our local problems and future thoughts are ironed out, so that Queensland amateurs at least understand each other. For a Division as decentralised as ours, this achievement is no mean feat. It requires a healthy percentage of our annual income just to find out what we are all thinking — not to mention the logistics of putting together a Conference of over 60 persons in a live-in format for two days.

This year, the CQ Branch has been responsible for a substantial part of the organising of the Conference,and was the host for the 1988 Conference held at Yeppoon, in Central Queensland. Congratulations and thanks, CQ Branch. This is yet another example of your Council's commitment to hearing the voice of the "grass roots" amateur. This year also saw a delegate from the monthly general meeting attend to represent those not represented by clubs, and it was also attended by individuals, as distinct from official club delegations. Our official guests included Terry ZL3QL, President of NZART, and in the past, has usually included representation by DOTC — indeed the sophisticated equipment made available to Doug VK4ADC, in his capacity as DOTC representative in 1985 is reflective of the Department's ongoing interest in our affairs.

So why do we do it? So that your Divisional Council is aware of your thoughts and needs, and can give adequate instruction to your Federal Representatives on your thoughts regarding issues of a more national interest, and, indeed, our future as a radio service.

Can I help? Please. By advising your club of your thoughts, or if you are not a club member, then by calling in to the Queensland Net on 3.605 MHz ± QRM, on Thursdays at 2000 UTC, or by writing to us at GPO Box 638, Brisbane, Qld. 4001.

This year sees six Old Timers on Council, and welcomes Jack VK4AGY, Don VK4KDT, Claude VK4UX, Jim VK4ZML and Bill VK4MWZ. It is a Council full of experience and will be very responsive to your needs — if we know them!

So, why do we place such emphasis on these conferences and communications services? Because we care!

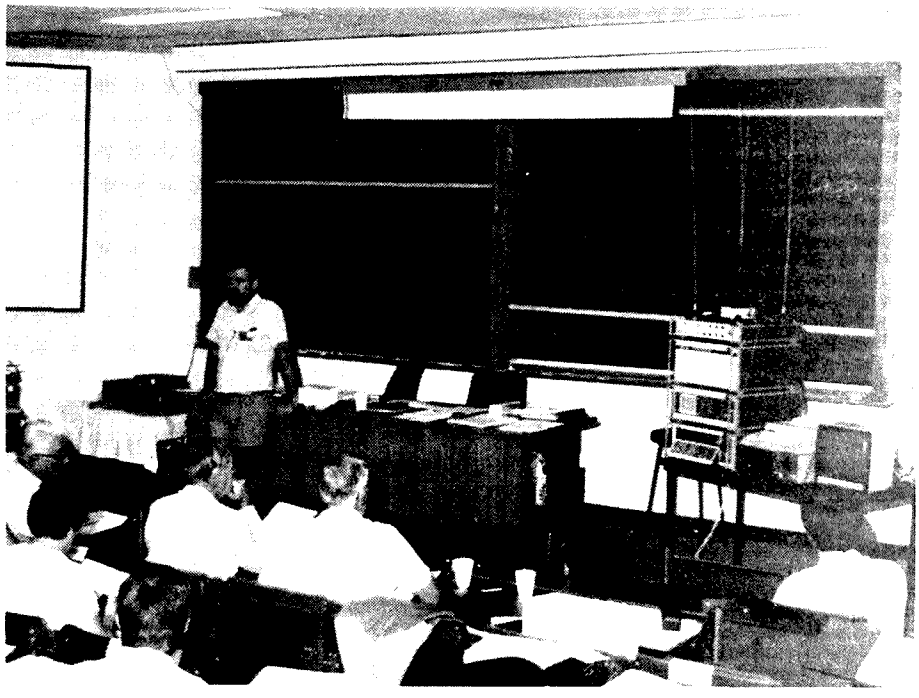
EXPO 88

At the time of writing, it would appear that there has been no change in the status quo. Your Council is attempting to get the call sign to air, and if you hear AX4XPO, you will know we have met with limited success. More (maybe) later.

RD CONTEST 1987

Congratulations to all the amateurs who participated in last year's contest — two years running is quite an achievement for VK4. Unfortunately, the weighting factor will now start to work against us, so we will need an even better effort this year if we are to retain the Trophy (see photograph VK4 Notes, AR March 1988).

Equipment displayed by DOTC at the 1985 RCC.

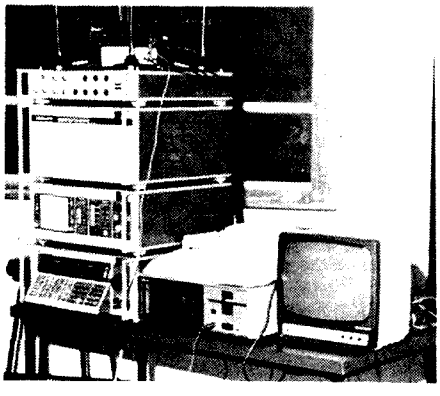


Doug VK4ADC, at the 1985 RCC. Doug was the DOTC representative and gave a lecture on new tracking equipment. The lecture was so good we were late for dinner!

WIAQ COUNCIL FOR 1988

The following Council members were elected on March 9, 1988.

President	David Jones VK4NLV
Senior Vice-President	Harry Standfast VK4ASF
WICEN Liaison Officer	
Junior Vice-President	Murray Kelly VK4AOK
Honorary Secretary	John Aarsse VK4QA
Ex-Officio Member	
Assistant Secretary	David Jerome VK4YAN
Alternate Federal Councillor	
Honorary Treasurer	Ross Mutzelburg VK4IY
Club Liaison Officer	Claude Singleton VK4UX
QSL Liaison	Bill Dalgleish VK4UB
WIAQ Liaison	
Service Liaison Officer	Jim Smart VK4ZML
Editor *QST*	
Research Officer	Bill Horner VK4MWZ
Disposals Officer	Don Thomson VK4YI
Federal Councillor	Guy Minter VK4ZXZ
Ex Officio Member	



WIAQ OFFICERS 1988

The following Officers were appointed on March 9. 1988.

Federal Councillor	Guy Minter VK4ZXZ
Alternate Federal Councillor	David Jerome VK4YAN
Council Member	
Membership Secretary	Madge Dalgleish
Manager VK4WIA	Jack Gayton VK4AGY
Council Member	
Manager VK4AWI	Claude Singleton VK4UX
Council Member	
Manager WIAQ Bookshop	Anne Minter VK4ANN
News and Information	Bonney Pounsett Bud Pounsett VK4QY
WICEN State Co-Ordinator	Ken Ayres VK4KD
Manager Qld Awards	John Moulder VK4YX
Manager Qld Contests	Joe Ackerman VK4AIX
Manager QSL In/Out	Bill Dalgleish VK4UB
Council Member	
Manager VK4 IARUMS	Gordon Loveday VK4KAL
QTAC Chairman	Paul Hayden VK4ZBV
QTAC Secretary	Guy Minter VK4ZXZ
QTAC Committee Member	Brian Rickaby VK4RX
WIAQ Meeting Convenor	Laurie Blagbrough VK4ZGL
WIAQ Historian	Allan Shawsmith VK4SS
WIAQ Education Co-Ordinator	Ron Smith VK4AGS
Minute Secretary Council	John Aarsse VK4QA

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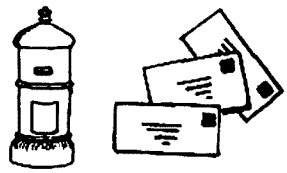
Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Over to You!



MULTI-CHOICE EXAMINATION QUESTIONS

Following the decision of the Department of Transport and Communications to hand over the examining of candidates for Radio Amateur Certificates to others, it is probable that some of the new examiners will write their own questions. Well written questions of the multi-choice type are not easily produced. However, a skilled examiner can write a paper that defies the efforts of the "guessers" to obtain a pass. It is reasonable to set the pass mark at 70 percent since a candidate with no knowledge of the subject can produce about 20 percent of right answers.

Although I do not claim to know all I should about writing this kind of question, I have had some experience and have fallen into some of the traps. So, here I set down some comments based mainly on questions I have come across recently. You may not agree with all: you may have some comments of your own to add to them. This should all contribute to a better standard of examination paper in the future.

1. The "stem" of the question and the response should form a statement. For example:
"Two 100 ohm resistors in parallel will have a total resistance of: 50 ohms."
rather than
"What is the total resistance of two 100 ohm resistors in parallel?"

2. Numerical answers should be arranged in ascending (or descending) order rather than random order.

3. Avoid negative questions. For example:
"The frequency bands on which the holder of a Novice Licence is permitted to operate are."
rather than
"Which of the following frequency bands may not be used by holders of a Novice Licence?"

4. Avoid long questions. Frequently a circuit diagram can be used to good effect. Sometimes several questions can be asked from the one diagram.

5. Never use "Larger than, Smaller than" or similar comparisons, (Increases, Decreases, Minimum, Maximum), as possible answers. Usually the alternate answers are not probable, and it gets down to a guessing game with a 50/50 chance of success. For example:
"One milliwatt is:
(a) larger than one microwatt.
(b) smaller than one microwatt.
(c) larger than one watt.
(d) equal to one millionth of a watt."
or
"In a series resonant LC circuit the:
(a) current is minimum.
(b) voltage across C is minimum.
(c) impedance is maximum.
(d) current is maximum."
or
"Tropospheric propagation is normally encountered:
(a) below 3 MHz.
(b) below 30 MHz.
(c) above 30 MHz.
(d) on all AM bands."

The above problems may be avoided by what I call "the double bunger". For example:
"When a resistor is connected in parallel with a parallel LC resonant circuit, the effect of bandwidth and Q respectively will be:

	Bandwidth	Q
(a)	increase	decrease
(b)	decrease	increase
(c)	increase	increase
(d)	decrease	increase

6. Don't provide responses that can be eliminated by logic.
"A semiconductor diode will conduct if the:
(a) anode is negative with respect to the cathode.
(b) cathode is positive with *respect* to the anode.
(c) cathode is 0.1 volts more positive than the anode.
(d) anode is more positive than the cathode."
(a and b state the same thing, so both must be wrong. If c is correct, then b is also correct. Thus, d is the only possible right answer).

Another problem with this question is that, technically there is no right answer. Assuming a silicon diode, the forward voltage must be above 600 mV for useful conduction.

7. Where a question requires a candidate to identify a circuit symbol, the symbol should be as set out by the Australian Standards Association. It is not fair to expect candidates to recognise unofficial symbols.

This symbol appeared in a recent examination.

The correct symbol for a Zener diode is:

Voltage regulator diode or reference diode Zener.

Noel Jackson VK3CNJ
(Retired Teacher at RMIT)
25 Edenhope Street
Kilsyth, Vic. 3137

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OWNING AN FT-102

I read the article in the March 1988 issue with great interest. I feel I should record my own short story, as an FT-102 owner.

I purchased my FT-102 in November 1982, and since that time, it has had, on average, a good daily "thrashing" on DX/CW, at full output power. I have never experienced any trouble whatsoever with it.

Yours sincerely,
V H A McBratney VK5YD
PO Box 151
Blackwood, SA. 5051

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DO IT! — BE AN AMATEUR

It is hard to believe all the nonsense that has been written lately is "fair dinkum". Do people join a cricket club and complain because there is no net, as in tennis? Or want the rules changed to provide a string on the ball to save all that running about?

Yet people are joining, or trying to join in amateur radio, and attempting to change it to something more like CB!

Surely they must realise that the amateur service has been built up over the years by technically minded folks, practical folks, intelligent folks! It is not just a cheap "talk show" — buy a rig and talk. Businesses wishing to sell amateur equipment would have us believing their black boxes to be the essential stepping stone to talk, talk, talk — the licence being the only hindrance — and guess who is pressing for more sales — more money — greed. That is about the size of it! Greed by business people and greed by the less technically-minded, less practical members of society.

To sum up, if you have a genuine interest in radio theory and practice, the desire to build up some equipment and make it work — better and better as your experience teaches you, then go to it — tackle the Novice level and work your way up to the Full Call. Never mind if you do not achieve the final goal — you are doing it, being an amateur — every day more technical, more practical and more intelligent. Have a go, or try another pursuit, like bowls or even an amateur theatre group — there's plenty of talking there!

Yours faithfully,
K G Griffiths VK2BGG
10 Anne Street
Wauchope, NSW. 2446

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OLD QSL CARDS

I was most interested to see a reproduction of an old QSL card published in the March issue of AR, namely "OA5WS".

When I had occasion to hear this station back in the 1930s, the call sign was then VK5WS, and it was owned and operated by a very interesting personality by the name of Vic Coombe, whose original call signs were A2WS and OA5WS.

Vic had been bedridden for some years and operated his equipment on the 200 metre band, from his bedroom. He was regularly heard of on a Sunday morning dispensing cheer and recorded music, always preceded by melodious sounds emanating from his bird aviaries at the rear of his house. Kookaburras were a specialty.

One night each week, Vic could be heard in a program broadcast by the ABC station, 5CL, in which he would talk to some hundreds of boys in a club which was formed by the station, 5CL, of which Vic was Patron. He always began his broadcast with the greeting "Is everybody happy? That's the jolly idea!"

I think my old friend, VK5DC, who was around in those days, would have nostalgic memories of the above happenings, and perhaps could recall more of the era I have described. How about it, Shep?

John G Lyons VK2NDR
56 Bowral Road
Mittagong, NSW. 2575

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JACKET MAKER PROGRAM

February, page 12

Despite all precautions and careful checking, gremlins did find their way into my program.

For those of you who had the courage to type the program in yourselves, the following line should be altered:

1880 IFCH = 6THENC = 80:RETURN

For those who sent for the program:

If you have a disk monitor program such as DISKMON or DISK DOCTOR, alter Byte 88 on the 34th block of the program from 58 to 50 and rewrite the block to disk.

If you have a ML monitor program, alter $2973 from 58 to 50 and re-save the program. (Start add $0801 — End add $2CB7).

The error is only evident if you have more programs then will list on the jacket.

Yours in amateur radio
Bob Richards VK7NRR
14 Kinross Road
Invermay, Tas. 7248

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MORSE CODE — TO BE OR NOT TO BE

The anti-CW lobby wants WIA/DOTC right now, unilaterally, to discard the Morse requirement for

the NAOCP and AOCR Approximately nine years ago, against URE protests (URE is the equivalent of WIA), Spain took this step. The EA population was then roughly that of VK, so the Spanish experiment can be taken as a precedent.

Amateur radio licenses doubled in three years from 15000 to 30000 — the theory requirements appeared to be somewhat lower than ours — however, the number of new members joining the URE did not come up to expectations; many existing URE members resigned and formed a 'splinter' group of mostly A1 moders with good technical and operating skills.

The end results were that the URE found itself with more operators but operating standards fell noticeably, the newly-formed 'splinter' society became a vocal outlet against the URE's shortcomings and many countries refused to recognise the Spanish EA licence. This cause various problems including those of reciprocal agreements. The worst blow of all was the attitude of certain groups of amateurs in other countries: they rubbished EAs on air, accusing them of being 'pseudos', second class operators, even 'trash'. This downgrading of recognition by their peers was the last straw. The Morse code requirement has now been reinstated in Spain and three classes of licences are issued.

Why did Spain make this hasty, foolish unilateral decision? Most private opinions were that URE objections were purely cosmetic and the Government's decision was influenced by a vocal but largely ignorant minority group. History never repeats itself exactly, so the Spanish misadventure must not be taken as a model for what might happen here in Australia, but the sequence of events may be very similar should the WIA agree to unilaterally discard the Morse code requirement. There is certain to be a drop in membership and a new society formed as interest in A1 mode is definitely greater than the anti-CW lobby understands. Polls show that some 60 to 80 percent of amateurs in the world use it to advantage.

Under present circumstances a reasoned definitive argument against Morse is difficult to sustain. The anti-CWers claim that the effort needed to obtain code proficiency is not worth the final reward would be rejected by every proficient A1 moder. The lobby falls back on words such as primitive, obsolete, antiquated — all meaningless in themselves, unless clearly qualified.

Each mode has its own particular value and virtue. A phone QSO out-performs CW in speed and intimacy — but only marginally, as can be proved by studying the results of big contests where SSB and CW scores often compete for the top placings. Popular opinion is that it is easier to talk for an hour than it is to 'punch a key' for the same period: another misconception. A well-balanced electronic keyer almost goes on its own and, at a relaxed speed, creates neither strain nor fatigue.

All aspects considered, CW is superior rather than inferior to other modes. It is simple to comprehend, is highly accurate (known as the Immaculate Reception) and has no equal when the circuit is critical. It is the sharpest of NB modes, usually around 200 cycles, which is why the RTTY operators prefer to work with it rather than with SSB. TVI is minimal and weaker signals are more easily picked out of the big pile-ups. It is the most economical way to transmit and no great QRO is needed. On most days, CW activity equals that of SSB — sometimes more so! CW creates a bilingual communication system for those who also use phone and, because of speech and language problems, more than 10 0000 amateurs are forced to depend on A1 mode entirely. If AR's code of ethics is really what it purports to be, the activities of this latter already deprived group should never be further down-graded.

Morse code and wireless operators are beginning to be discarded by some (only some) commercial services, mainly marine where the prime aim is to reduce overhead costs. Anti-A1ers try to use this fact to argue that amateur radio should do likewise. The argument is specious. Commercial radio exists primarily for monetary profit — amateur radio's aim is to socialise. Marine services have set sea routes with determined land stations and, when voice is used, the language spoken is known. Amateur Radio operation is entirely different; the majority of QSOs are truly international and a 'CQ' is usually sent to anyone, anywhere.

The 'Z-calls' are directing their frustrations against the wrong target. They may have a valid argument for use of some part of the SSB spectrum, but no argument for abolishing CW.

Regarding DOTC devolvement, if Morse examinations are to be conducted by private groups, the opportunity exists for less stringent Morse testing without down-grading in any way. An opportunity such as this should not be missed. The actual modifications are too detailed to outline here, but they would permit a greater number of errors, a shorter test period and allow the examinee to choose the best of three runs with time to correct his mistakes. This might appear to downgrade the Morse examination but precedent and past experience with the final product show it will not. The modified procedure would give the examinee more confidence (a very vital factor) and allow those who have failed previously to obtain a pass.

I am on air daily. For the past three months I have recorded all the new VK calls appearing on the bands and am amazed at the number which is steadily growing!

Alan Shawsmith VK4SS
35 Whynot Street
West End, Qld. 4101

ar

❑ ❑ ❑

PRINTERS DEVIL

Thank you for publishing my article on the M100 Speed Controller. Unfortunately, the "printers devil" has omitted two resistors from the circuit diagram.

There should be a 47k resistor in series with the moving arm of the meter adjustment potentiometer.

There should be a 220k resistor between the emitter of the 2N297 and the inverting input of the operational amplifier preceding it. The circuit shows a short circuit for this which would be quite disastrous.

Morris Odell VK3DOC
84 Hill Road
North Balwyn, Vic. 3104

ar

❑ ❑ ❑

PERSONALISED LICENCE PLATES FOR AMATEURS

For many years, American radio amateurs, and more recently amateurs in some other overseas countries, have enjoyed the privilege of having their car licence plates display the owner's call sign.

For some time, several States and recently also Victoria allow people to have personalised licence plates with various combinations of letters and numbers. On applying for a VK3 plate however, I was informed that such a combination was not included in those allowed.

I feel that as a Bicentennial goodwill gesture the Government should reconsider the use of VK plates nationwide, or at least in the States where personalised plates are already in use. It would be interesting to see how many amateurs would be concerned with this issue. From inquiries in the Geelong area, it appears to be a very popular topic.

If enough people are interested it may be possible to tackle the matter as a Federal WIA issue. In the meantime, I would be happy to receive brief supporting correspondence to start the ball rolling. As I am not a lawyer, some legal advice may be needed in the future.

Keith Vriens VK3AFI
204 Myers Street
Geelong, Vic. 3220

ar

❑ ❑ ❑

NOW, I'M AN AMATEUR TOO!

Just over a year ago I went to a friends house on a social visit and discovered that he was an amateur radio operator.

I spent some time with him in his shack and an interest in radio, that I had as a child, was rekindled.

When I was about 10 years old, I built a crystal set and a battery operated single valve radio using round powder cleanser containers to wind the inductors on.

With this interest renewed, I bought myself a secondhand unit, acquired a set of Novice Notes and began studying theory and regulations. I also practiced CW.

My heartfelt thanks goes out to all of the operators on the VK2BWI practice net for all their efforts. Without them, the task of learning CW would have been much more difficult. Also, after I received my novice call, the advice and assistance received from these operators greatly assisted me in passing the 10 words-per-minute examinations.

I was able to pass the novice examinations on the first attempt and have had nothing but enjoyment out of the hobby since. I have made friends around this great country and I correspond with some of my DX contacts.

I have found that fellow operators will go out of their way to be of assistance when a problem arises. I was having problems getting a home-brew ATU to function correctly. I mentioned it to one of my radio friends, "Put it on a train and send it up to me" he said. "I'll have a look at it and see what can be done." We have never met face to face, but a friendship has developed through our radio contact.

Aside from the experimentation that is carried out, to my way of thinking amateur radio is about friendship and helping others. This brings me to the point of CW qualifications for radio operators.

I have read arguments for and against the CW requirement for the AOCP and NAOCP and my vote must go to its retention.

I do not use CW very often, most of my contacts are on SSB, but I still listen to the Morse Broadcasts to keep in touch.

I believe that as licensed radio operators we are morally obligated to be of assistance to the authorities and the public in times of emergencies, whether the emergency be either national or international in nature. And, as we know, the vagaries of propagation may make SSB operation all but impossible whilst a CW signal will still get through. Keep the CW requisite, it may someday save someones life.

As far as novices on other bands are concerned, I do not personally require any more band space at this time. I fully enjoy what I have. My yard is not large enough to erect any more antennas (my wife would object anyway), and I do not want to go to the expense of purchasing any more equipment until I pass my Full Call. I am content with what I have, and quite a few novices that I have spoken to are content too!

Ray Coleman VKMBW
18 Suttor Street
Bathurst, NSW. 2795

ar

❑ ❑ ❑

Des VK3CO, and the late Chitary Moriyama.

Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

G — General
C — Constructional
P — Practical without detailed constructional information
T — Theoretical
N — Of particular interest to the Novice
X — Computer program

HAM RADIO — November 1987. Annual receiver issue (G). Receiver buzz words (N). Low noise receiver techniques (G). Tomorrow's receivers (G). Voltage comparators (G N). RF Volt meter (C).

QST — January 1988. Direct conversion SSB receiver (C). 432 MHz Yagis (C). VFO and accessories (C). Measurements (G N).

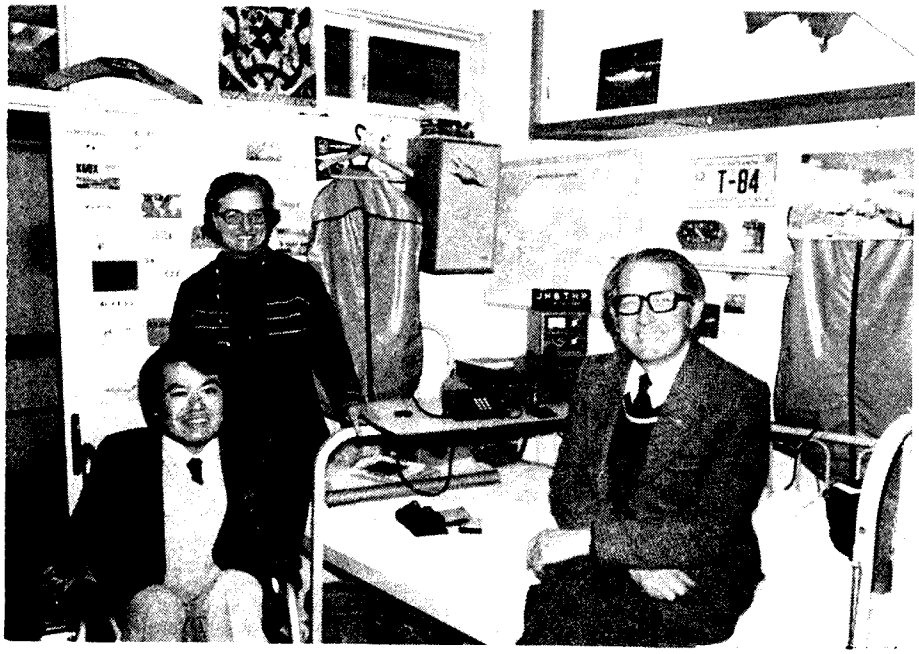
SHORT WAVE MAGAZINE — January 1988. General information for the shortwave listener. Broadcast times and frequencies etc (G).

RADIO COMMUNICATION — February 1988. All band HF mobile antenna (C). Kite borne antennas (P). Annual index for Volume 63.

73 MAGAZINE — January 1988. Special DX issue. W87PAX games operation (G). Propagation prediction program (X). Lists of countries and general DX information. Computerised readout for the FRG-7 (P X).

QST — FEBRUARY 1988. Receiver using two ICs (N). Selcall system (P). Simple power supply (N). ASCII — Braille decoder for the blind (G). QRP transmitter design (P N).

HAM RADIO — January 1988. Battery backed power supply (P). Uses for television tuners (P). QSO "beeper" (P). Frequency drift (G N).



PACIFIC RADIO CLUB

I was shocked to learn of the death of my friend, Chitary JH6THP, from Kawatana, Japan.

I first met Chitary on 15 metres many years ago and had the pleasure of meeting him in person during a visit to Japan in 1975. Chitary was a great organiser and formed the Pacific Radio Club, also a club in the hospital where he was a resident. Bill VK2WT was the first member of this club whilst I had the honour of becoming the second.

Chitary was a wonderful man with a remarkable spirit. Through his efforts and enthusiasm he was able to fulfill one of his dreams several years ago — visit Australia.

The photograph shows Chitary's shack in his hospital room.

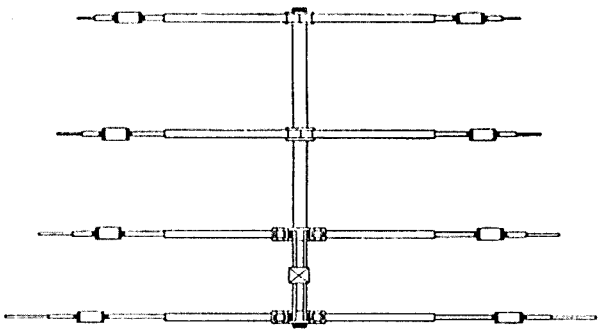
Yours faithfully,
Des Greenham VK3CO
16 Clydesdale Court
Mooroopna, Vic. 3629

SYDNEY — MELBOURNE — BRISBANE

Made in Australia TET-EMTRON ANTENNAS

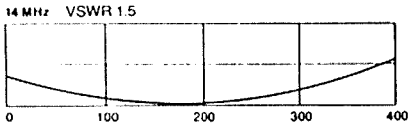
Dr MAC TANIGUCHI of TET Japan has now joined EMTRON INDUSTRIES and improved his already famous "phase-feed" matching system based on the "HB9CV" concept. This new matching system provides an increase in gain, roughly comparable to adding another element to the antenna, while significantly improving the front to back ratio. The performance exceeds even conventional YAGI-UDA design and these new TET-EMTRON multiband beams exhibit extremely flat VSWR over a wide frequency range.

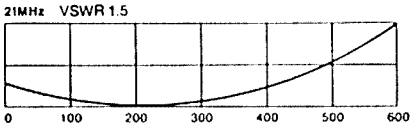
Our new antenna factory "TET-EMTRON" a division of EMONA ELECTRONICS is now producing a range of antennas aiming specially at the export markets of Japan, U.S.A. and Europe.

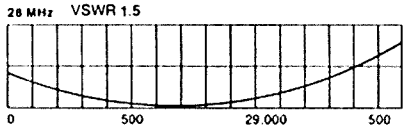


SPECIFICATIONS:

	HB33DX	HB43DX
Frequency	14/21/28 MHz	14/21/28
No of Elements	3/3/3	4/4/4
Gain (dBd)	8.5/8.7/8.3	9.4/9.5/9.8
F/B Ratio (dB)	22/24/21.5	24/24.7/22
VSWR	1.5 or better	1.5 or better
Power Rating	2 kW	2 kW
Impedance (ohm)	50	50
Element Length (metre)	8.25m	8.25m
Boom Length (metre)	4.0m	6.0m
Turning Radius (metre)	4.54m	5.1m
Wind Surface Area (m^2)	0.58m^2	0.74m^2
Wind Load (EIA STD 80 MPH)	56.7 kg	72.7 kg
Weight (kg)	15 kg	19.2 kg
Price	$449	$549







NEW 1KW EMTRON TUNER
EAT-1000A Only $549

NEW 300W EMTRON TUNER
EAT-300A Only $349

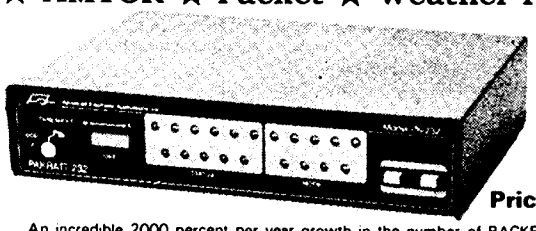
OVER 1000 FAMOUS EAT-300 SOLD

JOIN THE PACKET REVOLUTION!

New PK-232 Breakthrough

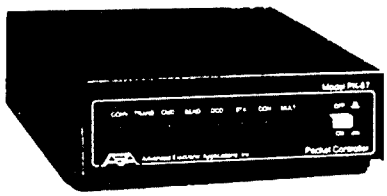
A new software enhancement makes the AEA PK-232 the only amateur data controller to offer six transmit/receive modes in a single unit.

★ Morse Code ★ Baudot (RTTY) ★ ASCII
★ AMTOR ★ Packet ★ Weather FAX



WITH FAX
Price $699

An incredible 2000 percent per year growth in the number of PACKET RADIO OPERATORS has been recorded in the USA. This packet revolution is fast coming to Australia and EMTRONICS is ready to serve you!
NEW PACKRATT PK-232 — Morse, Baudot, ASCII, AMTOR, and packet data controller in stock now! This six mode machine goes with any RS232 computer or terminal. Call for full specs.



PK-87™ PACKET CONTROLLER $399

The PK-87 is not just another copy, it's much more. With all the packet program features of the Multi-mode PK-232, the PK-87 is an economical new TNC designed to bring you enhanced, completely compatible packet software plus new hardware features for improved packet operation.

Software Enhancements
★ AEA's exclusive MBX Mailbox Monitor command lets you read and save received data without confusing headers, callsigns, or repeats ★ New commands let you restrict the use of your station for connects and digipeater functions ★ Host mode for improved terminal program operation and development of specialized programs and applications ★ Compatible with existing W0RLI/WA7MBL PBBS/Mailbox/Gateway programs, with complete software command for remote selection of link rate, modem tone, etc ★ Autobaud routines for terminal data rates from 300 to 9600 baud (programmable down to 45 baud), and software control to set on-air data rates from 45 to 9600 baud. While the PK-87 can be used for HF operation, AEA recommends the PM-1 packet modem as a high performance front end for best results in HF packet service. Only the new AEA PK-87 has all these features. Contact your local AEA dealer and join the packet revolution today by ordering the new PK-87.

Hardware Enhancements
★ Eight front panel status indicators show Converse, Transparent, and Command modes, Multiple Connects, Data Carrier Detect, Push to Talk, Status, and Connect ★ High sensitivity (5 millivolts RMS), and dynamic range from 5 to 770 millivolts RMS ★ Rear panel AFSK output level adjustment from 5 to 100 millivolts RMS ★ One minute hardware watchdog timer provides system security in unattended VHF/UHF PBBS/Mailbox and digipeater operation ★ Modem disconnect circuits guarantee compatibility with future high speed modem applications and developments ★ Zilog 8530 SCC provides dependable hardware HDLC for higher speeds, and AMD 7910 for reliable modem performance without calibration.

EMTRONICS

THE AUSTRALIAN RADIO COMMUNICATION CENTRE!

Silent Key

It is with deep regret we record the passing of:

MR ARTHUR S HECKENBURG VK2AHL

Obituaries

GILBERT CHARLES SHERRIN-MOODY VK4AK

Gil Moody VK4AK, Ex-VK3ZR 1934 — 1970

Gil passed away suddenly at his home in Paddington, Brisbane on March 15, 1988 aged 73 years.

Gil was born in Hobart, and worked at Channel 9, Melbourne in the early days of television; and later at Channel 2, Brisbane before his retirement.

A much travelled and knowledgeable gentleman, Gil was one of our top DX men, and always willing to pass on the latest DXpedition information.

I consider it an honour to have been a close, and long-time friend of Gil. He will be sadly missed by his wife, Joan, family and many mates far and wide.

Fred Lubach VK4RF
ar

GEOFFREY CAMPBELL VK2ZQC

Geoff Campbell was a quiet, unassuming person who over his all-too-short lifetime had been involved in a diverse range of interests of which flying and electronics were his twin passions. His considerable technical skills were applied to help many organisations and people over the years. Geoff's ability to fix just about anything was legendary amongst those who knew him.

He passed away quietly at home in the arms of his loving parents. It was his 48th birthday . . . December 17, 1987. His brave and unyielding nine month battle against cancer was over. His life had been full of all the things that were his challenge and his achievement.

From around the age of 10 Geoff was enthralled with flying and radio. He flew solo gliders at a very young age and went on to fly various powered aircraft at Camden aerodrome . . . one of his favourite places. His interest in model aeroplanes ran parallel to real flying.

Geoff lived all his life in Drummoyne, attended Drummoyne Primary School and then Ashfield Technical High. He had little patience or interest in the written word for it was practical things that begged his involvement. His entire working life was spent with Telecom . . . some 33 years after starting with the PMG, working at the Sydenham Workshops and, more recently, in the Telecom Materials Testing section at the AWA Ashfield manufacturing plant. His working career was driven by unshakable personal and professional integrity along with a refusal to subscribe to the "near enough is good enough" approach.

While his father gave Geoff many of his own skills, particularly in woodworking, it was his uncle that brought the enthusiast side of radio communication into his life. So, in 1950, Geoff was able to tap the world of amateur radio through VK2IE This was the call sign of the "R-9 Radio Club" created in 1934 by C E Winch. Crystal sets and one-valve home-built radios were their pastime. Little did they realise then what a Pandora's box would open onto the field of radio and electronics as the decades rolled by. Fortunately, Geoff was able to live through a time of incredible technical advancement which impacted across all of his many interests.

Geoff's more recent radio activities included communications set up on the *Dick Smith Explorer* and many hours devoted to the establishment of radio station facilities at the Museum of Applied Arts and Sciences. In addition, he carried out experimental activities in the UHF and GHz bands.

Geoff is survived by his parents, brother and sister and grandmother. The many friends and organisations who were fortunate in his acquaintance are deeply saddened by such a productive, yet humble, life taken from us all too soon.

Richard Norman VK2BDN
ar

SID BRYANT VK3CI

On February 13, 1988, the amateur radio fraternity lost a good and valued member when Sid passed away in the Nagambie hospital, aged 87 years.

Sid, a personal friend, was well-known in the Nagambie area for his television service business and later for his activities on two-metres FM and sideband.

In the 1940s, Sid together with Allan VK3UI, was one of the first to work VK7 on two-metres FM from the Foster area. Sid, on recalling this incident, always remarked that the first words uttered from the VK3 end were "you . . . . . beaut."

Sid had been on the air from 1947 and also held the call of VK5SB for two years when in Adelaide some years ago.

In his early years, Sid raced motor-bikes on the "cinders" and his wife still has a scrap book of cutting from the newspapers of that era, portraying his exploits.

His favourite band was six metres and he had just completed a six metre beam in August 1987 when he broke his leg and was hospitalised.

Sid's shack and house were always open to visitors who invariably were treated to scones and tea. They were sent on their way with a piece of radio equipment and a bag of lemons.

Sid is survived by his wife Ivy (Bobbie), and daughter Jan, to whom his amateur friends extend their deepest sympathy.

Bill Currie VK3AWC
ar

JOHN FRANCIS O'DEA VK5KOP

John O'Dea VK5KOP, passed away after a long illness aged 54.

John was born in Streaky Bay, South Australia, in 1934. He was educated in Adelaide and joined the railways as an apprentice motor-fitter in 1949. In his time as an apprentice he was called-up for nine months national service, spending that time in the Navy.

John joined the St John Ambulance in 1951 after taking a first aid course with them. Whilst a member of the Prospect Ambulance division, part of John's duties involved manning the police ambulance. From there he developed an interest in police work and joined the police force as

a motor mechanic, took a 12-week adult training course and became a uniformed policeman with the Unley division.

He then spent years on country duty in the State's north, working from Port Augusta, Oodnadatta and Maree. It was in Port Augusta, in 1959, that he married his wife, Barbara.

During that time he established himself as a firm, but fair policeman and a community minded citizen becoming involved with many community groups such as the SES, fire brigade, St John Ambulance, Victor Harbour Yacht Club, football tribunal and Scouting. John's long and dedicated community service was recognised through awards and medals.

Due to a severe stroke at the age of 47 John was forced to retire. He did not recover well enough to upgrade his amateur licence.

To his wife Barbara and their three children we extend our deepest sympathy.

Compiled from the *Victor Harbour Times* and contributed by Bill Crawford VK5XB
ar

JOHN MCCONNELL VK3RV

April 17, 1915 — February 8, 1988

John, Jack or "Mac" to his radio friends, was first licenced as a radio amateur in 1936.

He served an apprenticeship with the Melbourne City Council Electric Supply Department (MCCESD) where he worked for many years in the Meter and Standards Laboratory, followed by a period at one of the Council's Rotary Converter substations. Later, he was involved in customer relations and advice at the Melbourne Town Hall.

In 1940, he married Nonha and was father to five children.

Between 1941 and 1945, he lectured at the Royal Melbourne Institute of Technology (RMIT) on Radar and Communication maintenance.

During the 1950s he worked with the Utah Company constructing the Eildon Reservoir where he was involved with communications.

Beside his family, his next greatest love was amateur radio. However, in the early years of his hobby he had to make the best he could with components taken from old radio receivers and surplus Army equipment. Even until the early 70s Mac's station was entirely home made — including the power transformers.

Mac had a great sense of humour.

During the 60s, commercial amateur equipment was becoming freely available in many countries and brand names such as Swan, Drake and similar "bird-type" brands were frequenting the amateur bands — especially in the USA.

One day, whilst working an American station with a recently constructed "junk box" low powered sideband transceiver, a good report was received. After telling Mac about his "super" Swan transceiver, the American inquired as to what "beaut" piece of equipment was being used in Melbourne.

Quick-as-a-flash, and with a twinkle in his eye, Mac replied, "Oh, it's a Gander — mark

you!" to which the American allegedly said; "I haven't heard about that make before — it must be good because your signal is so good — I must inquire about it at the local radio store tomorrow!"

Many of us have had the pleasure of working Mac on his "Gander" — such was his ability to make the best out of any situation.

Mac returned to the MCCESD after completing work at Eildon. He retired from the Council in 1978 and was able to travel overseas with his wife Nonha on three occasions. There he met many of his radio friends and made many new ones!

Closer to home, Mac was an active member of the community. He was always helping others whenever he could. He was involved with Meals-On-Wheels and was a member of the Moorabbin Radio Club and the WIA.

Of recent years he was a very active member of the RAOTC where he held the position of Broadcast Net Controller for the Eastern States.

Vale John, loving husband, father and friend.

—Peter Wolfenden VK3KAU
ar

RAYMOND LESLIE NIELSEN VK4CRN

Townsville amateurs were saddened by the recent passing of Ray Nielsen VK4CRN. A large number of radio club members were among the almost capacity congregation who gathered at the Woongarra Crematorium for the funeral service. The service was conducted by Barry Hill VK4KCD and a short address was given by Club President, Evelyn Bahr VK4EQ.

Ray had been restricted in his movements for a number of years, and confined to a wheel chair for the past two years. He was a relative newcomer to amateur radio, which helped to provide a link to the outside world. Rays previous call signs were VK4MUN and VK4JUA.

Ray was always listening on the amateur bands, ready for a chat or to help someone in trouble. He assisted quite a tew local amateurs to increase their proficiency in Morse code with his on-air and in-house practice sessions.

He also assisted in the preparations for the last two North Queensland Conventions which were hosted by the Townsville Amateur Radio Club.

To his wife Margaret VK4JMN and sons, Rodney and Kevin VK4MUK, we extend our deepest sympathy.

—Peter Renton VK4PV on behalf of the Townsville Amateur Radio Club
ar

PHIL LEVENSPIEL VK2TX

With regret we announce the death of Phil Levenspiel VK2TX, on December 5, 1987, aged 83. Deepest sympathy is extended to his wife Rene and sons, Max, David and Mark.

Phil was one of seven children, London-born of Polish parents. He obtained an Aeronautical Engineering Certificate and migrated to Australia in 1927. There was no work in the aviation field available in Newcastle at the time so he transferred to the automotive field. He managed a local garage at Wyong, which later became Wyong Motors Holden.

In 1962, he handed the business over to his son, Max (now VK2CDF), and retired.

Phil was a member of the Wyong Masonic Lodge, Rotary Club (he was a past-president and Paul Harris Fellow) and Probus Club.

He became an amateur at Wyong in 1930 and had a close association with Owen Chapman VK2OC, Geoff Warner VK3CK and Jeff Thompson VK2XR He was an excellent mechanic, turning out impressive items on his workshop machines: hand Morse keys, bug keys, condenser microphones and variable condensers. More recently, upon losing his hearing, he turned his activities from amateur radio to mechanical clock making (he made 13 masterpieces for his children and grandchildren).

Phil was a clever organiser and, with Owen's help, staged the 1931 and 1932 Wyong Field Days at the Wyong Showground. He was one of the early experimenters on five metres about that time.

In 1930-31, he journeyed by car to Meekatharra (Western Australia) with Reverend Stan Collard, to the Methodist Mission Station. Phil, the radio operator for the trip, provided communications using an OV1 receiver and Hartley oscillator with Telefunken modulation transmitter.

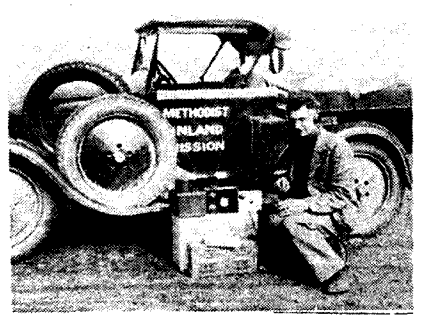
Phil was a keen supporter of the Central Coast Amateur Radio Club, in Gosford, from its inception in 1956 to the present day.

Upon his retirement in 1962, Phil built a new home on a hilltop at Ourimbah, which overlooked the Tuggerah Lakes. He then proceeded to construct a monster four element triband quad antenna. Mechanical construction was no problem and DX was readily available.

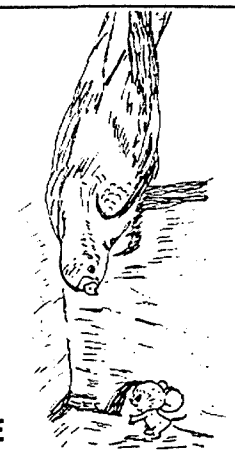
We will miss Phil very much.

—Lindsay Douglas VK2ON

Tuning a Sussor movement clock in 1986.



Crossing the Nullabor en route to Meekathara in 1931.



DEADLINE

All copy for inclusion in the July 1988 issue of *Amateur Radio*, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, May 23, 1988.

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write *each* on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. *Please do not use scraps of paper.*

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to *Box 300, Caulfield South, Vic. 3162*
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS**, Box 157, Mortdale, NSW. 2223. (No inquiries at office please . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

COMPONENTS: Wide range of parts for receiver, transmitter and other electronic equipment. Semiconductors, valve, plate bypass capacitors, coaxial connectors and many more. Mail inquiries welcome. Sorry, no catalogue available. D Dauner Electronic Sales, 51 Georges Crescent, Georges Hall, NSW. 2198. Telephone: (02) 724 6982.

EQUIPMENT COVERS: hand-made to suit your radio, computer, printer. No more dust or static problems with cotton dust covers made to fit your equipment. Send SAE for prices and ordering information to Collins & Duncombe, 15 Celebes Street, East Maitland, NSW. 2323.

VALVES: ask for our special prices, selling 3-500Z at $298 plus tax. Contact us for data and more prices.

BROAD BAND ANTENNA 50 MHz-1.3 GHz 200 watt — $298 plus tax.

UHF BROAD BAND ANTENNAS 470-830 MHz, MX43 16 dB gain (also usable for 70 cm band) — $42.60 plus tax.

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EXCHANGE — NSW

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WANTED — NSW

CIRCUIT: Handbook, service manual for Telequipment D54 oscilloscope. Will pay costs, photocopying, etc. Please send details to Tom VK2ZHR. Ph: (049) 30 7671. Or Craigrannoch Park, New England Highway, Lochinvar, NSW. 2321.

ICOM IC-720A TRANSCEIVER: Also communications receiver with digital readout preferred. Chum VK2CWF, QTHR. Ph: (02) 407 1628.

ICOM IC-730: or Kenwood TS-130S HF transceiver. Prefer original owner VG condition. Contact Norm VK2ENT, C/- PO Wyndham, NSW. 2550 or Ph: (064) 94 2192.

KENWOOD TS-830S: or TS-930S in mint condition. Reasonable price. Lawrie VK2FIF. Ph: (066) 28 0418.

VHF RECEIVER: Older valve type Eddystone, Hallicrafters or ex-disposals. Must be continuous tuning. VK2ZD. Ph: (02) 427 3281.

WANTED — VIC

CIRCUIT DIAGRAM & DETAILS OF EX-RAAF WWII RECEIVER: Type R1155. Photocopies or will photocopy and return. Contact George VK3XEC, QTHR. Ph: (03) 728 3597.

INFORMATION FOR JIL SX-200 SCANNER: Photocopies/circuit diagrams of possible modifications. Eg increase frequency ranges, interfacing to external control, any improvements, etc. Will pay for photocopies and postage by return mail. VK3ZRN, QTHR.

ARRL ANTENNA ANTHOLOGY: Copy of same required. Michael VK3OX. Ph: (059) 82 1652.

KENWOOD MB-100 MOBILE MOUNTING BRACKET: to suit TS-130S. VK3EJR. Ph: (03) 796 8469.

YAESU FT-ONE: Any condition considered. Ian VK3MZ. Ph: (03) 763 0595.

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DOW-KEY ANTENNA SWITCH: Relay operated or similar type. Ron *Croucher* VK4KNZ, 282 Boston Road, Belmont, Qld. 4153. Ph: (07) 390 7762.

EC-10 RECEIVER: Working or not, with circuit diagram. AKG Type-K50 headphones, tunnel diodes. Len VK4JZ, QTHR. Ph: (07) 398 2002 after 6 pm.

HUSTLER 5BTV VERTICAL HF ANTENNA: HF wattmeter. Mic/headphone headset. Details to John VK4SZ, QTHR. Ph: (070) 61 3276.

KENWOOD MA-5 MOBILE ANTENNA SET: David VK4MQC, 27 Dee Street, Mount Morgan, Qld. 4714 or Ph: (079) 38 1263.

KENWOOD TS-130S: or similar HF transceiver for radio club use — reasonable price. John Jones VK4KJJ, PO Box 1030, Gladstone, Qld. 4680. Ph: (079) 72 2930. Gladstone Amateur Radio Club.

FOR SALE — NSW

ANTENNA ROTATOR EMOTATOR 502SAX: $495. Yaesu FP-757HD heavy duty power supply for continuous high power transmit. $450. Yaesu FT-209RH 5 watt output 2 metre transceiver with all accessories. $550. Hidaka VS-33 Triband Yagi antenna for 10, 15, 20 metres. Heavy Duty. $550. All items brand new in carton, purchased as spares, no longer required. Manfred VK2RV, PO Box 120, Vaulcuse, NSW. 2030. Ph: (02) 371 8854.

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LAWN BOWLS: set of 4 Henselite 5 inch super grip (black) bowls. Engraved VK2. Price $75. VK3IS, QTHR. Ph: (03) 707 4985.

KENWOOD TS-520S TRANSCEIVER: Excellent cond, inc mic, user manual. $525. Kenwood AT-230 antenna tuner to suit TS-520S. Excellent cond, inc dummy load for tune up off air. $160. Shure 444D mic. Good quality desk mic. Good cond. $85. Must sell to meet full time Uni expenses as well as support 3 children, wife, & house payments. Will sell separately or the lot for $750 ONO. Contact Glen VK2AGM, QTHR. Ph:(02) 77 8407.

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TOWER: Hills two section, crank up to 50 feet. With 20 foot extension, guys, turnbuckles. $200. Model 15 teleprinter. $5. Weller soldering station, needs new element. $40. VK2AZN, QTHR. Ph: (02) 868 3551.

TRANSFORMERS: 2 off — Prim 220/240/260. Sec 500/CT/500 x 175 mA. Sec 5V x 3A. $35 each ONO. 1 off — Prim 220/230/240/260. Sec 310/CT/310 x 170 mA. Sec 5V x 3A. Sec 6.3V x 7.5A. Hermetically sealed. $45 ONO. 1 off — Prim 220/230/240/260. Sec 248/CT/248 x 140 mA. Sec 5V x 3A. Sec 6.3V x 4A. Hermetically sealed. $45 ONO. 1 off — Prim 240V. Sec 115V x 17.39A (2000VA). What offers?
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YAESU FT-101E. Good condition, no mods. $400 ONO. VK2EL. Ph: (044) 55 5825.

YAESU FT-101ZD: as new condition including handbook & spare set of valves. $750. Rank RV33 colour video camera with cable, handbook & accessories. Near new condition. $500. Realistic DX-160 comm receiver, good condition. $70. Realistic DX-300 comm receiver, good condition. $150. VK2AOI. Ph: (047) 57 1609.

3 KVA 240V MARKON ALTERNATOR: double bearing free standing unit. Never used. $450. VK2FW. Ph: (063) 65 3410.

FOR SALE — VIC

PRINTER: The Victorian Division has one Sakata 15 inch IBM compatible printer for sale. The unit is unused and comes complete in original carton with the users manual. Asking price $500. For further information contact the President Barry Wilton VK3XV. Ph: (03) 555 6281 between 7.30 & 8.30 pm AH.

YAESU FT-101Z: in immaculate as new condition complete with 600 kHz CW filter, handbook, DC leads (for portable use) & little-used Astatic low & high impedance dynamic desk microphone specially built for SSB. $800. Also ETM-IC-Mos-Keyer (without paddle). $25. Geloso heavy duty microphone desk stand which stretches from 34 cm to 49 cm. This gear has worked more than 200 countries over last 3 years in extremely poor conditions. Roth Jones. Ph: 725 3550.

YAESU HF TRANSCEIVER: (with manual) FT-301 in good working condition with matching FP-301 power supply/speaker & match extern VFO. Orig $1100 now $680. Japanese 4 el 15 m monoband, 10 dB forward gain, weighs 9.5kg. New one over $430 with freight (used only 1 yr). Must sell for $280. American 27 ft high (3 sectioned) galvanised radio tower. Ideal for CB or amateur antenna. With hinged base plate & guy wires. New one with US freight over $840. Now must sell for $350. Ph: (03) 338 5080.

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FOR SALE — QLD

COLOUR MONITOR: Kaga RGB Vision 1 with Apple II colour card interface. Monitor is only compatible with IBM-PC, NEC-PC & Apple III machines. $300 ONO. Tower. 33 foot free standing, triangular cross section with approx 3 foot base. Very good condition. $350. Brisbane, Brisbane/Ipswich area. Geoff VK4CET, QTHR. Ph: (077) 73 7179.

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KENWOOD R-1000: 100 kHz — 30 MHz general coverage receiver, 12V/240V, as new. $590 ONO. Yaesu FL DX-2000 HF linear amplifier. $780. Barlow Wadley XCR-30, .5 to 30 MHz, portable gen cov receiver. $230. Kenwood-Trio TX-599 & JR-599 tcvr. $700 ONO. Datong RF speech clipper/processor, fits into any Mic-Line $145. Yaesu FT-501, 400W tcvr, needs repair. $130 ONO. Jeff VK4ABJ. Ph: (079) 28 1105.

KENWOOD TR-7800: 2m FM transceiver. Mint condition. Manual, orig carton. $350. Kenwood TR-8400 UHF FM transceiver. Mint condition. Manual, original carton. $350. Kenwood TS-530S with CW filter. Mint condition, manual, orig carton. $700 ONO. Kenwood VFO-230. Mint condition, orig carton. $200 ONO. VK4SV, QTHR. Ph: (07) 398 6732.

RECEIVER: Drake R2B w/manual. Full coverage capability. 50 kHz IF with steep-sided LC filter. (Excellent for CW). $180. John VK4SZ, OTHR. Ph: (070) 61 3286.

9M HILLS TELEMAST: $25. Rigging kit. $25. Belco AC bridge measures R-C-L. $25. J-beam 70 cm antenna 18 element — Parabeam $30. 2m turnstile antenna. $20. Buyer to collect or carriage extra. Norm VK4ZFQ (not QTHR). Ph: (077) 72 5535.

FOR SALE — WA

TOWER: Free standing. To your specifications. Gay VK6ZQ. Ph: (097) 97 1062 for further details.

FOR SALE — TAS

KENWOOD TM-221A: VHF 2m FM mobile, as new, unmarked. 50W output (H) — 10W output (L). $495. Yaesu h/held access. YH-2 headset, PA3 charger adaptor, CSC11 soft leather case. What offers. VK7AN. Ph: (003) 31 7914.

STOLEN EQUIPMENT

The following equipment has been stolen. Any members being offered this equipment or being able to assist with its recovery are requested to contact your WIA Divisional Office, or your local police station.

Stolen from Swansea, NSW — KDK Multi-7 two-metre handheld. Drivers licence 3002JW on base plate. Four channels in use, 6500, 6800, 6900 and 7000. Owner Barry VK2TJB. Reported at Swansea Police Station.

Stolen from Seven Hills, NSW — Icom IC701, serial number 8001039 transceiver. Spare crystal taped under adjustment lid. Icom IC701PS, serial number 7800978 power supply. Owner N Cuppitt. Reported at Seven Hills Police Station.

❖

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THIS SCREEN CAN TELL YOU AS MUCH ABOUT THE IC-781 AS WE CAN.

The huge CRT display on this new HF transceiver will show at a glance all the functions we're about to describe here.

That's because it has a built in spectra scope for the first time, for programmable, multi-functional central monitoring.

Plus there's a VFO, A/B contents, memory contents, two menu screens, band scope, and 15 operational screens.

It also has a sub display, and its DDS system offers a lock-up time of just five milliseconds. So it's ideal for data communications systems like PACKET and AMTOR.

The dual watch function is a huge advantage on DX-peditions or when chasing DX-stations. And its computer-controlled twin PBT with high efficiency IF filter eliminates interference.

Maximum frequency stability is achieved at ±15Hz (0-50°C), which is more efficient than other transceivers on the market.

Also, the delay control noise blanker system is adjustable by up to 15 milliseconds.

There's a full and semi break-in function that can output up to 100 words per minute. And a p.a. unit that outputs 150W of power.

However, just because the IC-781 has so many state-of-the-art features, don't think ICOM haven't made it simple to use.

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This lets you control your transceiver via a personal computer or other compatible equipment. Plus you have a 2 way sleep timer, and 5 separate automatic weekly timers.

For your nearest ICOM stockist, just call (008) 33 8915. And they'll tell you everything you need to know about the IC-781. Then once you've got one, the CRT display will tell you everything you need to know about what it's doing.

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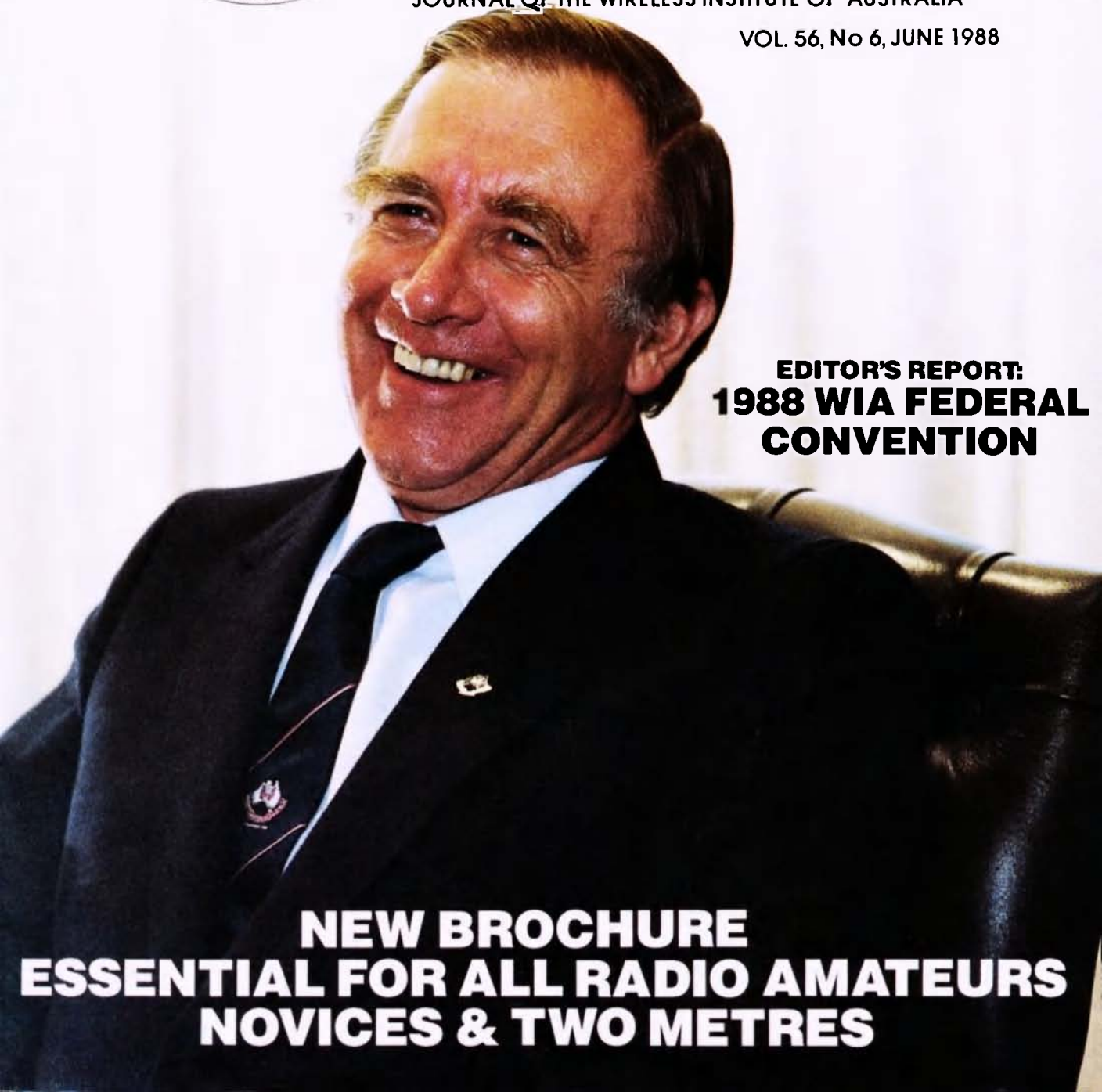
Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

VOL. 56, No 6, JUNE 1988



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1988 WIA FEDERAL CONVENTION

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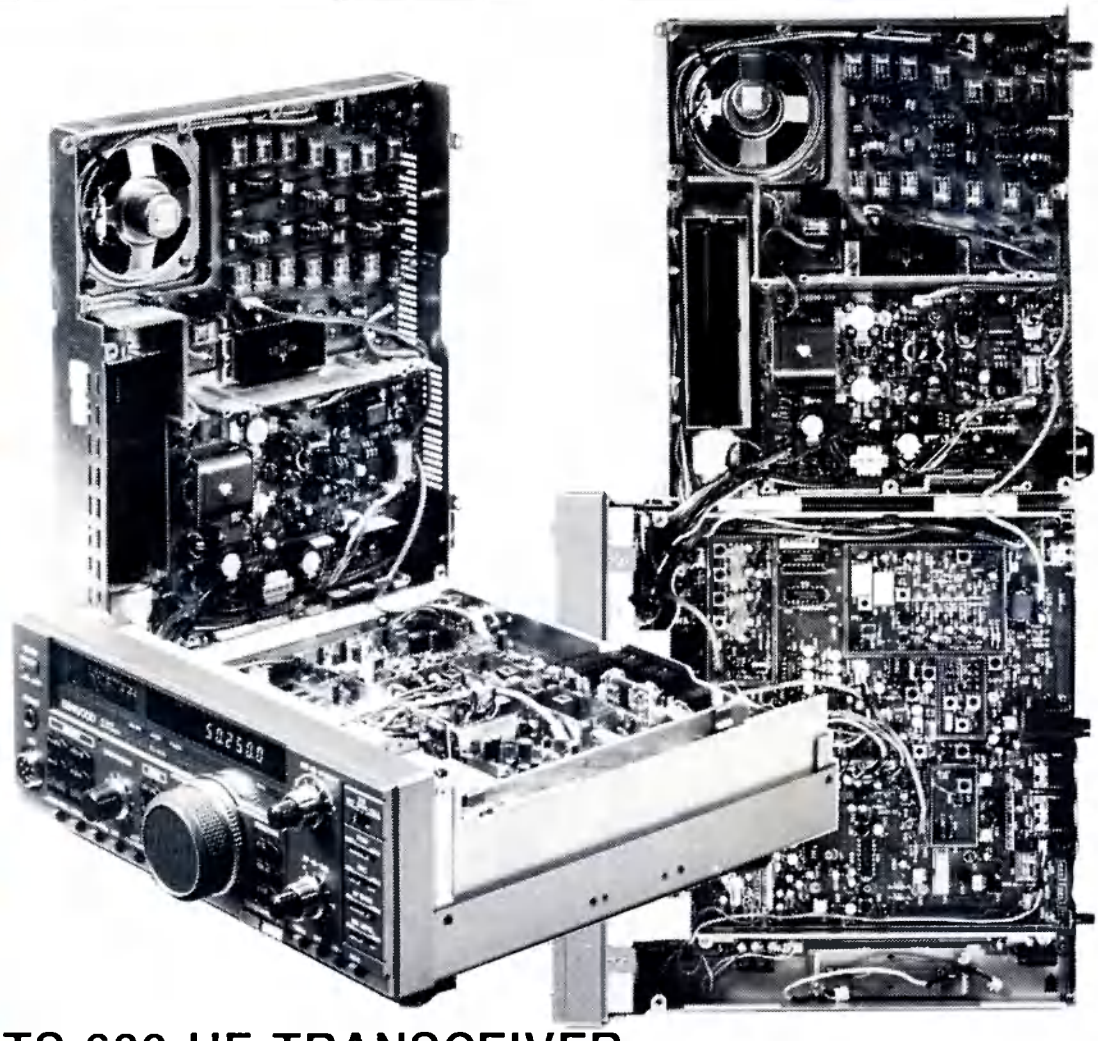

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Amateur Radio

—Photograph courtesy Ken McLachlan VK3AH

Front Cover: David Wardlaw VK3ADW, Retiring WIA Federal President. (See page 20).

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Amateur Radio

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HAMADS should be sent direct to the same address, by the same date.

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Editor's Comment

ANTENNAS AND THINGS

This month has been no different from usual in that I have had to think for a long time as to what might be a good topic for "Comment". It has actually been harder than usual, because at the time of writing (April 17) the big item on everyone's mind has been the Federal Convention. As you read in the April issue, big things are expected of the 52nd Convention. But by the time you read this the Convention will be history! Some of that history is in fact elsewhere in this issue, where by a special stop-press, never-to-be-repeated arrangement you may read my account of the discussions to take place next weekend, which was five weeks ago by the time you read this! Confused? So am I! Obviously, for editorial purposes I must talk about something which evolves more slowly.

One thing which has been keeping me very busy for the last week or two has been antenna construction (of course, as this month's bylines show, the magazine has kept me busy too!). Until last November, my only DX type antenna was a somewhat decrepit version of a VK2ABQ beam, just for 20 metres. That, plus an 80 metre dipole with tuned feeders, and a smattering of six metres, two metres and 70 cm Yagis, comprised the VK3ABP backyard antenna farm.

The 2ABQ beam used bamboo radials which had seen better days. One had been replaced with plastic tubing, and the three bamboos were patched and splinted. They had been home-grown, but to avoid the yard evolving into a bamboo jungle we had dug them out, roots and all, some years before. Pride of place in the yard was the 30 year old weeping willow. We didn't know its tremendous trunk was rotten at the base! On November 23, 1987, there was a strong north wind, and the willow fell over, demolishing all the HF antennas in a few seconds!

As some of you may know, I don't have a lot of time for working DX on 20, so there was no hurry about fixing the 2ABQ. After clearing away most of the horizontal willow, the 80 metre wire was re-strung. We went to New Zealand for a month. Time rushed on. But suddenly a DX incentive appeared. Ron VK3OM, went to North America for a month, and I needed some antenna gain on 20 and 15 metres to keep scheds. To cut a long story short, not only have I once again demonstrated that the 2ABQ is a jolly fine antenna, but I have also realised that there must be almost as many ways to build one as there are people to do it! Materials, wire attachment, even type of wire. And rigging procedure! Without some careful forethought you can finish up with an impressively useless airborne tangle!

There has been a good deal published by VK2ABQ and others (notably G3VA) since the first description in *Electronics Australia* back in October 1973. But I have yet to see an article which covers in simple practical detail, how to build it, how to erect it, and how many alternative ways there are of going about it. What is its feed-point impedance in one, two or three band versions? Has anyone looked at its radiation patterns? What gain can one really expect from it? Unless I'm much mistaken, we could publish a new and different article on the 2ABQ every month for a year. I don't have time at present, but some of those articles may be half-written already by those of you who enjoy playing with antennas. Do I guess right? Let's see!

Bill Rice VK3ABP
Editor

VNG USERS FIGHT BACK

Attempts are being made to revive Australia's national frequency and time signal service, VNG. The service previously operated by Telecom was closed on October 1, 1987, for financial reasons.

But a group calling itself the VNG Users Consortium vow VNG will be back on air, either through private or government funding.

It estimates VNG would cost less than $40 000 a year to run. A submission is being prepared to the government for funding.

The VNG Users Consortium was formed after nearly 100 VNG users met last December and resolved that the important service should be revived.

Further information can be obtained from the consortium's secretary, Dr Marion Leiba, Earthquake Seismologist, 26 Fimister Circuit, Kambah, ACT. 2902.

52ND FEDERAL CONVENTION REPORT

Novices get FM 146 — 148 MHz

DOTC Releases Brochure on Licence Conditions

WIA Restructure Evolutionary, not Revolutionary

Announcements regarding a Novice VHF allocation, and release of the licence conditions brochure, were made by the DOTC representative Mr David Hunt at the WIA 52nd Federal Convention, held over the Anzae Day weekend. Also, after hours of debate on the future of the Institute, the very democratic decision was made to hasten slowly and seek members' views regarding the present Divisional versus a more centralised Federal administration.

In formally opening the Convention on Saturday morning, the Federal President, David Wardlaw VK3ADW, referred to the difficulties which had been experienced by Executive during the year. He hoped that this Convention would improve the situation, and make possible increases in membership and extension of services to members. He also made special reference to the excellent relationship we have continued to enjoy with DOC (later DOTC) throughout the year.

The formalities of receiving and adopting the minutes of the 1987 Convention, the profit and loss and balance sheets and the auditors' report were supported unanimously. David then moved on to presentation of the President's Report. He made particular reference to the loss of three Executive members during the year. Michael Owen VK3KI, has been sent to London by his firm for three years, Allan Foxcroft VK3AE, has indicated his intention to retire at this Convention, and Ross Burstal VK3CRB, resigned due to health problems towards the end of 1987. Among questions which David was asked were what was the present position regarding examination devolvement (Executive has applied for accreditation) and Customs duty on imported transceivers (we are negotiating to change the mechanism of certification).

INTERNATIONAL AMATEUR RADIO UNION (IARU)

The President then presented his second report, this time in his capacity as WIA delegate to the IARU. He announced that there would probably be a World Administrative Radio Conference (WARC) in 1992. There is definitely to be a Region 3 conference of the IARU at Seoul, South Korea, in October this year. He also welcomed our visitors from New Zealand, Terry Carrell ZL3QL, President of NZART, and Alan Wallace ZL1AMW, and invited them to contribute to the discussions whenever they thought a New Zealand viewpoint would be appropriate. David also reiterated the familiar theme of world wide commercial pressure for spectrum space and the necessity for continuing defence of amateur frequency allocations. Peter Gamble VK3YRP, remarked that spectrum pressure tends to be cyclic. Once it was strongest in the HF area until relieved first by cables and then by satellites. A few years ago microwave towers were being built on every hilltop, but now the big expansion is in fibre-optics.

The acting Federal Treasurer, Bill Roper VK3ARZ, then presented his report. He described the almost-balanced budget for 1987 as very gratifying in view of earlier indications that there could be a serious over-run. He has introduced a comprehensive computer-based analysis of all financial factors into management of the Federal Office. He mentioned the need for increased advertising in *Amateur Radio*, and suggested that Councillors should seek advertisers in their home States. The size of the market in a State such as Queensland was queried by Guy Minter VK4ZXZ, using the phrase "branch office state", but Bill was of the opinion that it is still possible to deal with branch offices! He hoped soon to be able to distribute a "how to do it" brochure on selling advertising space.

Your Editor then gave a brief introduction to the Publications Committee report, the main point noted being that the Committee's terms of reference have been broadened to give it more direct financial responsibility. There were questions on payment for columnists (and Editors?) (we cannot afford it yet), the cost of returning to colour covers (which will give potential advertisers a better impression, and perhaps attract potential members, in both cases helping to offset costs), and the likelihood of a 1988 Call Book. (Mr David Hunt, from DOTC, announced the next day that the call book contract would go to the WIA, so there should be one this year). There was considerable discussion about magazine finances, mainly involving VK4ZXZ and VK3ARZ.

Peter Gamble, as chairman of the Federal Technical Advisory Committee, presented the FTAC report.

Peter commented on the repeater and beacon situation and the loss of the Telememo facility which had been used to link FTAC members in the various States. The question of 23 cm repeaters in VK4 and VK5, not in accordance with the WIA band plan, was also mentioned, as was the additional Telecom charge incurred by those who installed approved phone patch line isolating units.

Allan Foxcroft introduced his report as Standards Co-ordinator by stating his intention to retire. He was disappointed that no successor to him had yet been found, and spoke vigorously of the importance of standards, particularly on appliance immunity to RFI. In the following discussion wireless video transmitters (WVTs) and cordless telephones were quoted as examples of interference to the Amateur Service which were now under control because of the issue of relevant DOTC standards.

WICEN

The Federal WICEN Co-ordinator, Ron Henderson VK1RH, said 1987 had been a quiet year for him, but WICEN had already been involved in a number of Bicentennial activities and had proved vital to the running of the Castrol World Rally.

The Intruder Watch report, from Bill Martin VK2COP, was noted and discussed. Bill has given notice of intention to resign, and the VK7 IW Co-ordinator, Robin Harwood VK7RH, had also resigned. Both will be difficult to replace. All those present agreed on the value of IW, but also that it has always been difficult to involve more than a few in its operation. VK4 Division has some hope of finding another Federal Co-ordinator.

Reports were accepted from the previous Contest Manager, Ian Hunt VK5QX, and the current manager, Frank Beech VK7BC. Frank's report included recommendations about the four main contests. Councillors had some differences of opinions regarding the recommendations, and a Working Party was established to review them. When the Working Party reported its actions on Saturday evening, the recommendations had been revised as follows:

1. That the John Moyle Memorial Field Day and the NZART Field Day be coincident, and their rules mutually compatible.

2. That the JMMFD be on all bands as at present, not split into separate HF and VHF sections as had been proposed.

3. That multipliers be adjusted as seen fit by the Contest Manager.

4. Entrants in the JMMFD on VHF and higher bands be encouraged to participate in the Ross Hull Contest also.

Ian's report referred mainly to delays in the presentation of the Contest Championship trophies. These delays will be investigated by Executive.

Reports were also received from the Awards Manager, Ken Hall VK5AKH, and the Federal QSL Manager, Neil Penfold VK6NE, who is also the VK6 Federal Councillor. The Federal Education Officer, Brenda Edmonds VK3KT, presented her report, which was mainly on the topics of the recently completed Novice Study Guide, and the progress of examination devolvement. The latter was discussed extensively. Executive and some Divisions have applied to DOTC for accreditation as examining bodies, and the VK2 Division has built up a bank of 1000 examination questions.

AGENDA ITEMS

Early on Saturday afternoon attention was transferred to the agenda items, of which 32 were listed. The first to be tackled was that the six reports and 13 recommendations of the Future of Amateur Radio Working Party (as published in AR between September 1987 and April 1988) should be reviewed and adopted. Some disagreements emerged about the wording of several of the recommendations, particularly about the need or otherwise to retain Morse code as a qualification for HF operators. This was debated for over an hour, and it was over three hours before all the recommendations had been considered. Re-wording of some was placed in the hands of a Working Party. The Convention split up into working parties from about 5 pm. The party responsible for finance spent nearly two hours reviewing the 1989 Budget.

One report notable by its absence was that of the Federal Historian. No successor has yet been found to the late Max Hull VK3ZS, who died in July 1987. On the *motion of* Alan Hawes VK1WX, the Convention observed one minute's silence in memory of Max.

The four reports which remained were then AMSAT, Graham Ratcliff VK5AGR, Videotape, John Ingham VK5KG, the Federal Tape and the Federal Office, the latter two being presented by Bill Roper. Some of those present, and probably most members, were unaware of the difficulties under which the office has laboured during the year, due to health problems of one kind or another affecting the three office managers over the period, Tony Heawood, Earl Russell and Ann McCurdy.

RE-STRUCTURING

The remainder of Saturday night was devoted to the two constitutional motions which had been given considerable publicity over the previous month. Both proposed by VK3, these were:

a. To establish machinery for a poll of all members, and

b. To make use of such a poll to obtain members' views on ways in which the Institute's structure might be modified.

Since the latter motion itself called for a poll, the other was redundant and lapsed without a seconder. The re-structuring motion was eventually withdrawn and replaced by a motion arising, in which the wording was substantially revised. One of the most impressive speakers in this debate was George Brzostowski VK1GB, whose main point was that changing structure alone would have little effect if the organisation's problems were caused by people.

Effectively, the result of all this was that while re-structuring of the WIA may eventuate, it will take place only with a great deal of input from the membership, and will occur slowly rather than quickly.

The first part of Sunday morning's activities drew parallels between a 1987 Convention motion, in which an extensive review of the Institute's structure and functions was called for, and the 1988 re-structuring motion. The two are closely related, and the redrafted 1988 motion incorporates those parts of the 1987 motion not yet implemented.

A motion was discussed to review the accepted band plans in preparation for the IARU Region 3 Conference in October. This was passed with a few minor additions to the policy list.

DOTC VISITORS

The President introduced Mr John McKendry, Assistant Secretary, Operations, and Mr David Hunt, Manager, Regulatory, of the communications element of the Department of Transport and Communications. Mr McKendry began his address by outlining the profound changes in the departmental organisation which have taken place over the last 12 months. The previous Departments of *Communications*, Transport *and* Aviation had been amalgamated in July 1987, and there were subsequent internal re-arrangements. The present Government, in moving towards more and more devolvement and deregulation, was following a world-wide trend.

Passing on to more directly radio-related matters, Mr McKendry referred to the problems involved in interference situations, particularly in suburban locations. He made it clear that there can be situations in which an amateur station is not guilty of any technical or legal deficiency, but will still have to reach some kind of compromise to satisfy the neighbours. Amateurs can still expect co-operation from the Department towards finding the best solution (usually technical) but "people will be people!"

Mr McKendry then referred to the demand for spectrum allocations, and the difficulty of justifying some amateur segments in the face of commercial pressure, particularly in Eastern bloc and/or developing countries. He also mentioned the next WARC (perhaps in 1992) and

advised the Amateur Service to "get their act together, get in early and establish their ground!" In the lengthy question time which followed, VK1WX asked about the progress of interference immunity standards. Mr McKendry agreed that such standards were needed for many devices, not only domestic appliances. There are economic limits as to how immune an appliance can be made, and the Department is attempting to introduce requirements which are reasonable and balanced. Each case is judged on its merits.

VK3AE queried whether the Department was in fact lagging somewhat in the drafting of standards, and could the WIA do anything to help? In reply, Mr McKendry admitted there were delays, partly due to the proliferation of susceptible devices and the length of the necessary consultative programs, but also due to continuing erosion of the Department's resources.

Bruce Hedland-Thomas VK6OO, referred to statistics from the Western Australian branch of DOTC showing that of 20 000 interference complaints only seven involved amateurs, and only two of these were actually at fault. Nevertheless, he himself was suffering severe power line interference to television reception and wished the electricity authority could be threatened with shutdown! Mr McKendry emphasised that of course an essential service does take priority over a hobby. VK1GB commented from a legal viewpoint about nuisance legislation, cost of lawyers, standards, consumer protection, and need for compromise between conflicting parties.

The President made reference to amateur bands which are shared with other services. In some cases the amateur preference might be for a narrower, but exclusive, band. Would DOTC like to comment? In reply, Mr McKendry thought such adjustments might be possible on a domestic basis, but international agreement would be unlikely. Comments were made on this and related topics by VKs 3YRP, 7PF and 4ZXZ. Mr McKendry concluded by remarking that spectrum management was a rapidly changing field, and handed over to his colleague, Mr David Hunt.

Mr Hunt began by thanking the WIA for the support it had given the Department in a number of regulatory areas. Examination devolvement, handbook preparation, licensing and third party traffic conditions were all areas which placed heavy demands on DOTC's limited resources. Negotiation with the WIA is more productive than with individuals, he said. Examination devolvement was on target for June 1. Rules have been established for international third party traffic. Temporary international agreements can be arranged quickly, but must be requested formally.

NOVICES AND LICENCES

On the subject of Novice access to the two-metre band, Mr Hunt said a decision had now been reached. There had been a great deal of discussion, but most viewpoints were now known. It appeared that any decision would upset someone! He was therefore pleased to announce that, *effective from June 1, Novices were permitted to use FM voice between 146 and 148 MHz with an output power of up to 10 watts.*

As regarded the future amateur use of 576-585 MHz, Mr Hunt was less definite. It is hoped that a UHF television channel can be provided as a substitute, but almost certainly not the same channel in different areas. Whether a channel is available anywhere cannot be guaranteed. On a different topic, the new free brochure on licence conditions, partially replacing the old regulations handbook, will be available from June 1. (A review of the brochure is published elsewhere in this issue).

The question time which followed Mr Hunt's address covered a wide area of topics and involved numerous questioners. Some queries were about licensees' obligations in interference cases (depends on particular case) and legality of Novice on two-metre repeater being relayed on 70 centimetres where this used as a link (needs investigation). (This was legalised by a change of wording later. Ed)

There was an extensive discussion about conditions and definitions applying to third party traffic, both in Australia and as currently understood in New Zealand. This has become a much more complex question with the advent of bulletin boards, mailboxes and packet systems, and will need to be discussed at the IARU Region 3 Conference.

Another point raised for clarification by David Hunt was whether amateurs requested by DOTC to cease transmissions indefinitely have any legal recourse. They have, to the Administrative Appeals Tribunal, but it is a long and costly process. There was some further discussion about "difficult" interference cases, and then an announcement by Mr Hunt that the "other party" who had sought the Call Book contract had now withdrawn, leaving the way clear for a 1988 Call Book on terms soon to be decided.

The President thanked Messrs McKendry and Hunt for "giving up" their Sunday morning to the WIA, and described the discussions as very helpful. Some appropriate mementos were presented to them by VK4ZXZ and ZL3QL, and the Convention reverted to agenda items at midday.

BACK TO BUSINESS

Between midday on Sunday and the close of the Convention at 2.30 pm on Monday, 39 items of business were dealt with. Of these, 30 were listed agenda items. Some took little time, as seven lapsed without a seconder and seven were withdrawn. Two were absorbed into others. There were also recommendations from four reports, two new motions and three statutory actions, ie to elect the Executive, accept the Budget, and fix the date and venue of the next Convention.

Some of the more interesting results of all this discussion were:

a. The 13 recommendations of the Future of Amateur Radio Working Party were accepted in amended form. One of these proposes a new licence grade structure which removes an anomaly in K-call privileges. Accordingly, a VK2 motion requesting negotiation to remove the anomaly became unnecessary and was withdrawn.

b. The annual reports from all office-bearers are to be published in AR. As many of these are very long, abbreviated synopses will suffice.

c. On the subject of third party traffic, negotiations to take place to restore earlier definition regarding repeaters and bulletin boards. In general, reaffirm IARU (1985) and WIA (1984) policies.

d. Packet radio above 14.100 MHz. Support present VK band plan, and IARU 1987 policy.

e. Preparations to begin immediately for a WIA delegation to the IARU Region 3 Conference, Seoul October 1988. Delegates to be VK3ADW and VK1RH.

f. The new President is Peter Gamble VK3YRP and Vice-President, Ron Henderson VK1RH. Other Executive members are David Wardlaw VK3ADW (IARU Representative), Bill Rice VK3ABP (Editor), Brenda Edmonds VK3KT (Education), George Brzostowski VK1GB, Ray Roche VK1ZJR, Peter Page VK2APP and Bill Wardrop VK5AWM. Because of the number of non-VK3 members, the full Executive will only meet quarterly (in Melbourne).

g. A special general meeting of Council (possibly by tele-conference) will be held in August to review both Executive performance (in view of its decentralisation) and preparations for the IARU Region 3 Conference.

—Report compiled by Bill Rice VK3ABP
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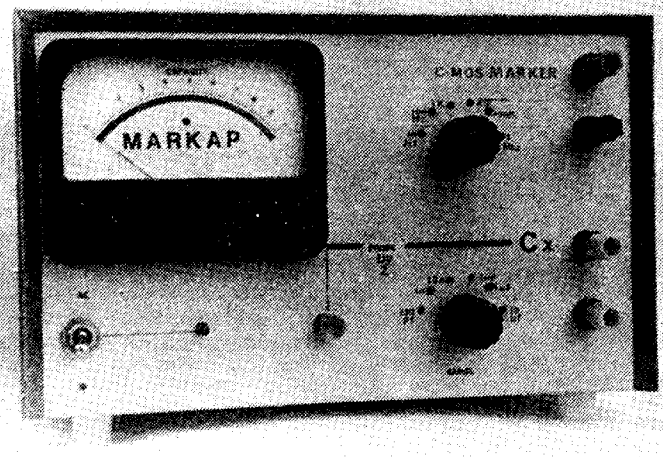
One of David's final duties as Federal President of the WIA was to present the RD Trophy to the VK4 Division — the winning Division for 1987. Guy VK4ZXZ, VK4 Federal Councillor, accepted the Trophy on behalf of the Division.

—Photograph courtesy Barrie Bunning

INTRODUCING THE "MARKAP"

Ken Kimberley VK2PY
21 Nicoll Street, Roselands, NSW. 2196



This unit should become a useful addition to any amateur's shack. Readers are referred to an earlier article in AR dealing with a capacity measuring module (October 87).

This device was designed to go with the author's Square Wave Generator (AR November 1986), and, as such, performed very well indeed. However, it was not long before it became apparent that the "umbilical" cord between them was an annoyance.

Hence, it was decided to develop a free-standing unit which ultimately became the *Markap*. Several factors, apart from the above, influenced this decision. One being that independent use of the two units would be advantageous, and another, that the reader may not have access to a suitable signal source.

Would the *Practical Wireless* version be used, after all? No! Why not? For one thing, this design used six multi-turn trimpots; ie one for each range, thus making the "set up" very tricky. Also, the author has always been a little reticent when it comes to using potentiometers to set so many ranges. Experience has shown that instabilities may arise at future time due to mechanical design shortcomings.

CAPACITANCE METER BASIS

A revision of the relevant part of the previous article concerning the operating theory, etc, would now be appropriate. The idea here is not unlike the common ohmeter and *Ohms Law*. It goes something like this:

"For a given voltage and frequency, the current through a capacitor is indirectly proportional to its capacitance." So, 10 Hz and 12 volts CMOS were selected as the test parameters, a combination which produced "Full Scale Deflection" (FSD) with 10 uF applied.

In addition to the above statement, it follows that "the current through a capacitor is also directly proportional to the frequency, provided that the C and E are held constant" ie a 12 volt CMOS signal at 100 Hz produced a FSD with 1.0 uF

Hence it is possibly to change the instrument's sensitivity in decade steps by selecting the excitation frequency accordingly.

DIVIDER CHAIN CRYSTAL FREQUENCY

Suddenly the idea came, why not use a crystal oscillator and a string of dividers. Surprisingly this approach proved more economical than the original potentiometer method.

A search through various catalogues gave an average price of $2.50 for the multi-turns, as against $1.00 for a TTL divider chip (74LS90) and socket.

The cash saved would more than pay for a crystal. Originally, it was planned to use a 27 MHz CB-style crystal operating on it fundamental. Hence frequencies in the approximate 9 Hz to 9 MHz series would be available from the 74LS90s.

Then again, why not use 1 MHz (or 10 MHz)? This way, the instrument would now have the additional function of a decade marker generator! Consequently, a little more effort was put into the design of the oscillator to enhance its stability properties.

THE "MARKAP" IS BORN

One megahertz crystals had been advertised for around $13.00, whilst 10 MHz units were advertised for approximately $5.00. Therefore it would be more economical to use the higher frequency. Accordingly the circuit was designed to accommodate either.

The author employed the lower frequency version as he happened to have an old 1 MHz quartz plate in the Junk Crystal Collection. If the purchase of a crystal is intended, ensure it is calibrated to operate in the parallel mode. A series type would give rise to a light frequency error (see AR, September 1986). However, the capacity function would remain unimpaired.

It is odd how little jobs at the VK2PY QTH seem to escalate into major projects! Anyway, this one can now be presented as a self-design, not merely a copy.

ATTRIBUTES

1. Economical to build.
2. Initial set up is simple. Once one C-range has been calibrated, the remainder follow automatically.
3. Good repeatability.
4. Excellent long term accuracy due to superior oscillator design.
5. Versatile; ie the TTL CMOS and capacity functions may be operated independently.
6. Construction is quite straightforward. No PCB is required.
7. Mains operated. No more flat batteries.

CIRCUIT DESCRIPTION (see Figure 1)

(Refer to the block diagram). The oscillator is the focal point of this unit, therefore the description will commence here.

CRYSTAL OSCILLATOR (see Figure 2)

This is a basic *Parallel Mode* type employed in the traditional Colpitts circuit. It uses two bipolar transistors (Q1 and Q2) connected in a Darlington configuration.

The idea here was to take advantage of the extra stability attainable (see AR September 1986). The improvement over a single stage is due, in the main, to the extra gain available. This in turn allows for much larger capacitor values (C4 and C5) around transistors, etc. This effectively swamps out adverse reactions within and around the active device.

SD2 (IN4004) is used as a varicap and permits remote frequency trimming.

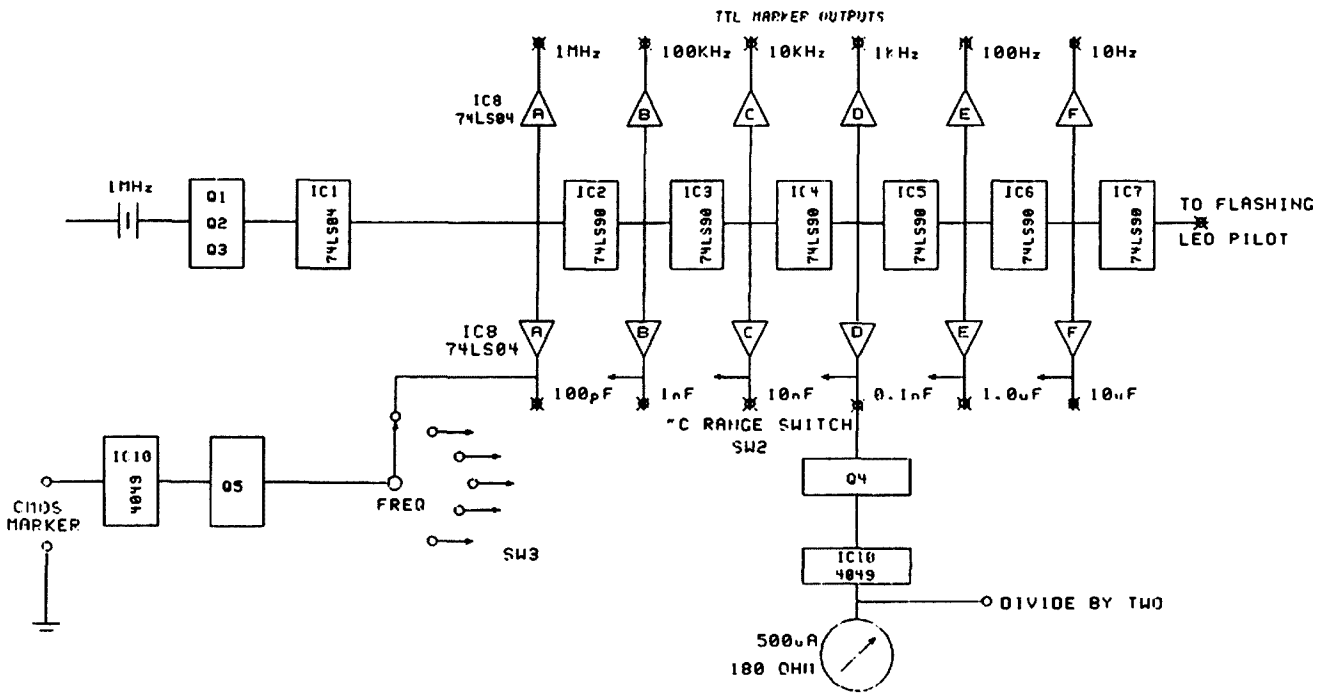


Figure 1: Block Diagram.

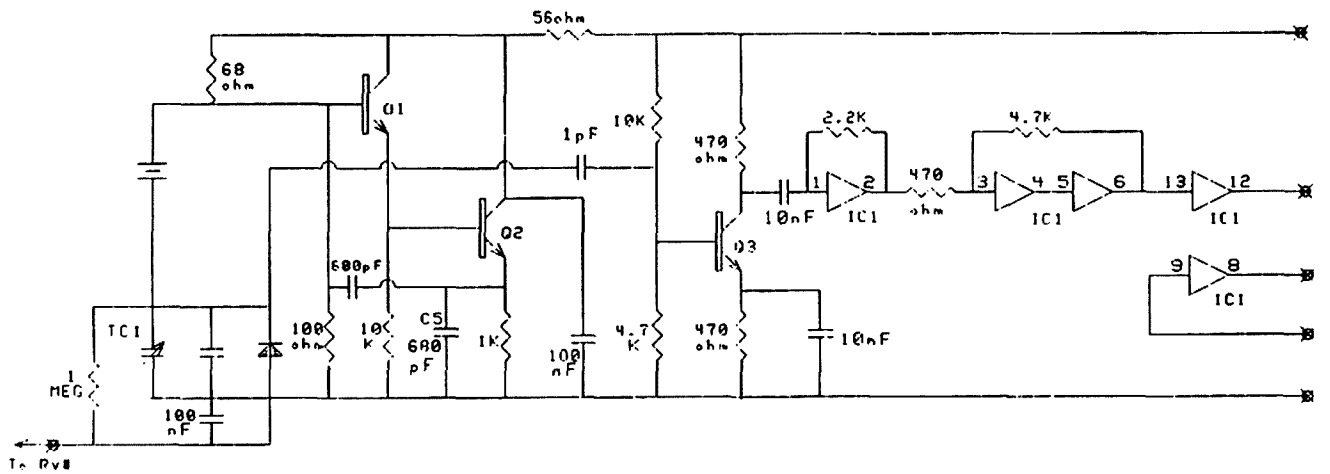


Figure 2: Board 1 — Crystal Oscillator/ Shaper.

BUFFERING AND WAVE SHAPING

Transistor Q3 serves as a buffer/amplifier and, in turn, feeds signal to IC1 (74LS04). This chip is a Hex Inverter with five sections used. Remember to tie the sixth input to ground.

The early stages are biased for linear operation, enabling adequate gain and buffering. The signal then progresses onto stage four which acts as a waveform shaper. Inverter five is a buffer between the TTL and CMOS circuitry. It is not connected with the oscillator at all.

Some eyebrows may be raised at the choice of the oscillator output point. Indeed, better isolation would be available from the Q2 collector. This was, in fact, tried. However, the distorted output signal could not be correctly processed by the 74LS04. The output from it was an asymmetrical TTL level square wave. Because its average voltage was different to the driver chain outputs, it caused serious errors on the 100 pF range.

Advantage was taken of the fact that the crystal, together with its associated series tuning capacitors form a very effective narrow band filter. An excellent sine wave signal is available at their junction.

Although very light coupling (1 pF) was used, sufficient gain and buffering was realised from the Q3, IC1 combination which, in turn, produced a nice TTL square wave with a 50 percent duty cycle.

THE ONE MEGAHERTZ VERSION (see Figure 3)

Here the signal goes to the first 74LS90 (IC2) divider. The 100 kHz output is then cascaded to IC3, thence through to IC7 (all 74LS90) where the output frequency is one Hertz.

With the exception of IC7, each output is fed to a set of two parallel "Inverter/Buffer" gates, IC8 and IC9, (both 74LS04) as is the 1 MHz signal. Consequently, six pairs of buffered outputs are available, at frequencies from 10 Hz through to 1 MHz in decade steps.

Therefore, the load on one buffered output has virtually no affect on the other, thereby ensuring complete independence of operation; ie all functions may be used simultaneously. The 1 Hz output from IC7 is used to drive the LED pilot indicator.

10 MHz OPTION

Here the original function of IC7 is deleted. It is now connected as a decade divider, between IC1 and IC2, thus feeding a 1 MHz signal to IC2 as in the low frequency model. The 10 MHz option called for TTL logic rather than CMOS, therefore 74LS90s were used instead of 4017s.

SIGNAL PATHS

Returning to the six output pairs — the first pair is arbitrarily identified as 1A and 1B, the next 2A and 2B, etc.

Each of the A outputs is connected to the appropriate TTL level output terminal on the rear panel; ie 1A to 1 MHz, 2A to 100 kHz, etc.

The B outputs are routed in two directions, firstly via selector switch (SW3) to a level converter (Q5) and buffer (part IC10-4049), finally to be available, at CMOS level, for the front panel mounted terminals.

Hence it is possible to have two independent decade outputs available at different logic levels; ie TTL and CMOS.

CAPACITANCE FUNCTION (see Figure 4)

The second destination of the "Bootput" is the capacity measuring circuitry. This is via the C range switch (SW2) and level converter Q4, then finally yet another buffer (part IC10).

Before continuing, the reason for the CMOS conversion will be given.

It was not possible to achieve a linear scale with the chosen frequency and TTL level. All was fine up to around 60 percent with errors increasing as FSD was approached, where the uncertainty exceeded an intolerable 10 percent. Considerable experimentation and frustration revealed that the "Resistive" components within the circuit were the culprits. Neglecting the "Equivalent Series Resistance" (ESR of the CUT, the main contributors to this unwanted condition were, the output impedance of the LSTTL devices and the metering resistance.

In other words, the 3 volt TTL level was inadequate. The change to 12 volts CMOS overcame the problem nicely.

CAPACITANCE DISPLAY

Readers will, no doubt, recognise the circuitry here as being similar to that of the module described in AR, October 1987. Its function was then fully described hence only a brief outline will be necessary here.

The signal is applied to CX via the DC blocking capacitor. The resulting alternating current flow is then rectified by Ge1 and Ge2 germanium diodes (not silicon) which are connected in a voltage doubling circuit.

The DC voltage so obtained charges up C2 to a voltage governed by CX. SD1 limits this to a maximum of around 0.6 volts.

The main purpose of this silicon diode is for meter protection. It is aided, in this direction, by the meter movement damping capacitor (C3).

This is an adjust on test component, its choice must be a compromise between protection and practicality. In the author's unit, a 1000 uF capacitor did the job nicely.

Resistor Rp is fairly critical in that it sets the point at which S)1 becomes conductive. If it is too high, scale linearity is impaired and conversely lower values degrade protection. The actual value must be found on test and depends upon the characteristics of individual diodes as well as meter resistances.

POWER SUPPLY (see Figure 5)

A voltage doubling circuit was used, rather than the more conventional bridge type. This was due to poor planning, rather than any real technical superiority. You see, a nine volt transformer was procured to obtain five volts for the originally proposed TTL circuitry.

However, the additional CMOS facility required 12 volts for its supply, so it was either a voltage doubler or a costly new transformer.

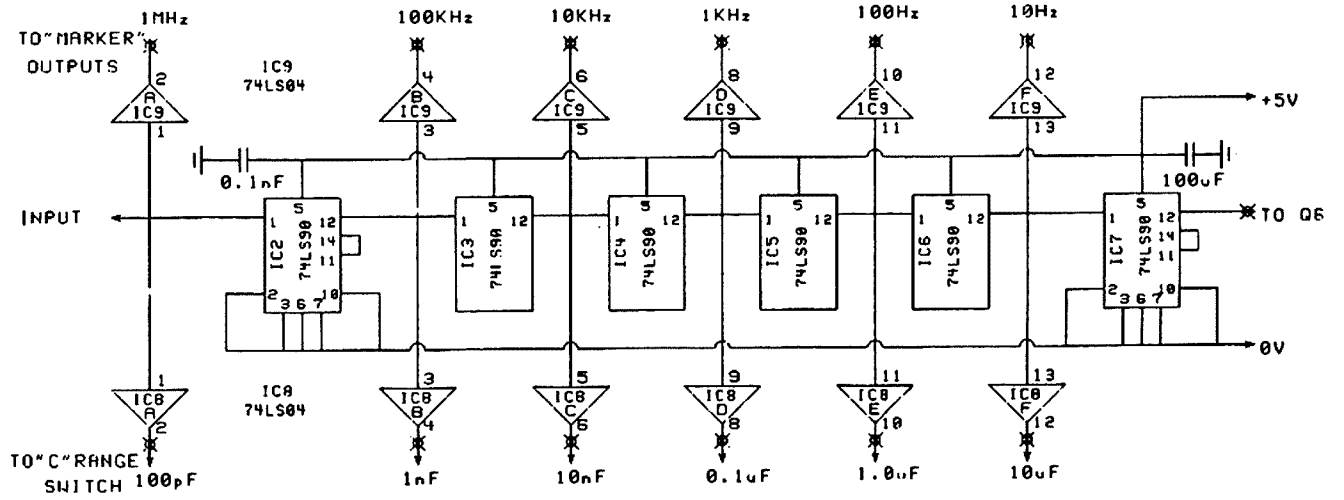


Figure 3: Board 2 — Decade Divider, etc.
NOTES:
IC8 = 74LS04
IC9 = 74LS04
Pin 7 = 0V
Pin 14 = +5V
All 74LS90s are wired identically

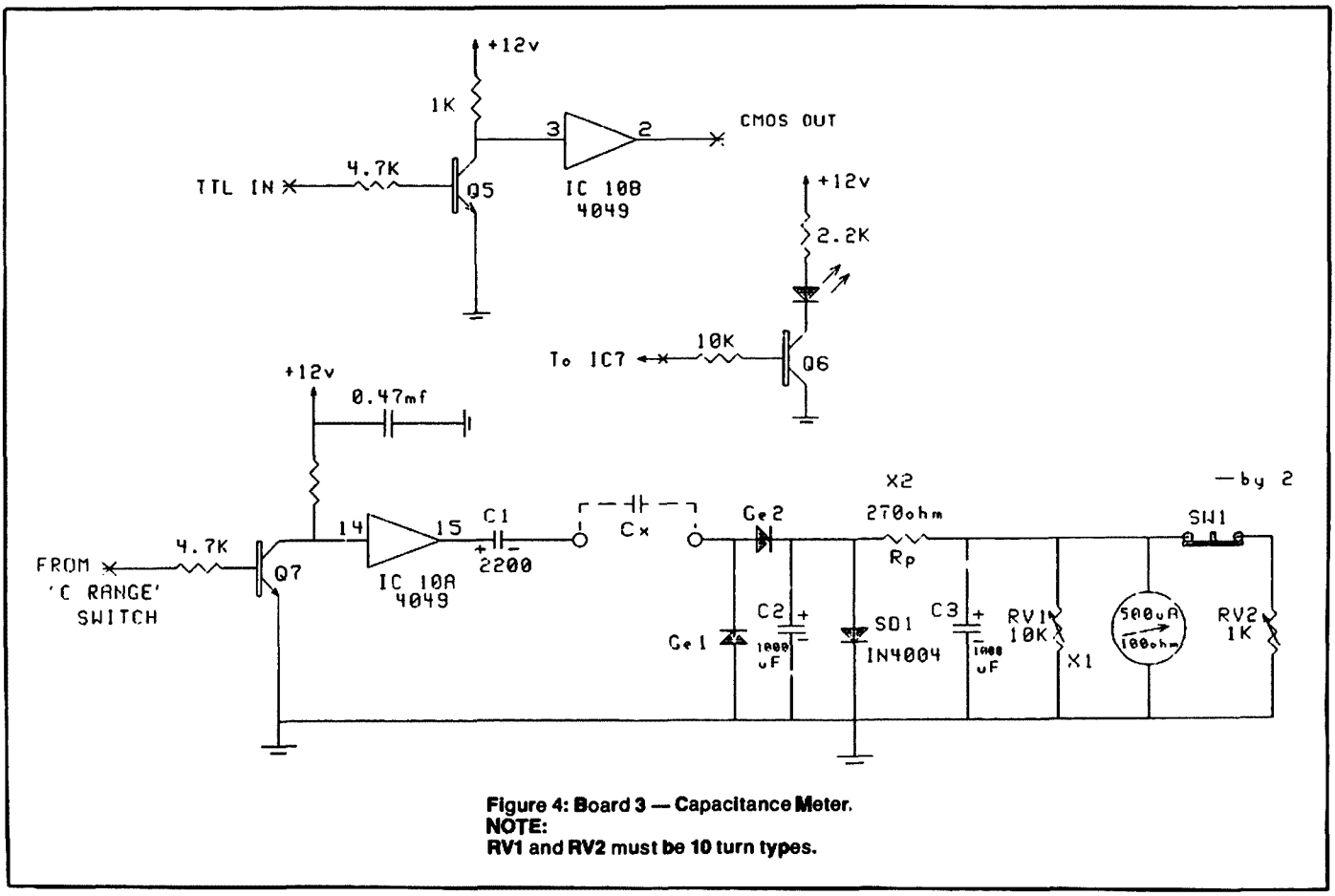


Figure 4: Board 3 — Capacitance Meter.
NOTE:
RV1 and RV2 must be 10 turn types.

The resulting higher regulated voltage also enables a greater capacity swing from the varicap, which would, if required, produce a wider trimming adjustment.

The 240 volts AC is applied to the transformers primary via the usual fuse/switch combination and is then stepped down to nine volts in the secondary. This is, in turn, fed to the doubler (C6 and C7 plus SD3 and SD4).

These two capacitors have a total effective value of 500 uF and, together with the fairly light loading, provide adequate filtering. The 0.47 uF bypass was fitted to lower the high frequency output impedance.

Five and 12 volt output is provided by two three terminal regulators (IC11 and IC12). Note that the lower voltage circuit is sourced from the 12 volt "bus". This gives extra supply regulation to the oscillator and possibly better frequency stability.

A small scrap of two millimetre sheet aluminium was used a a heatsink on both regulators. All of the above components were mounted and wired to a 80 by 40 millimetre board fashioned from perforated, non-copper, bakelite sheet.

CONSTRUCTION — MECHANICAL

This facet commences with the metal bashing and must not be rushed. Great care and forethought should go into the planning stage. The idea is to achieve an aesthetically pleasing appearance coupled with an ergonomic control placement, and at the same time a viable electrical layout. It is very frustrating and difficult filling a wrongly drilled front panel hole!

The instrument is housed in a type C1066 case (available from Jaycar, etc). Its size is just about right for the job.

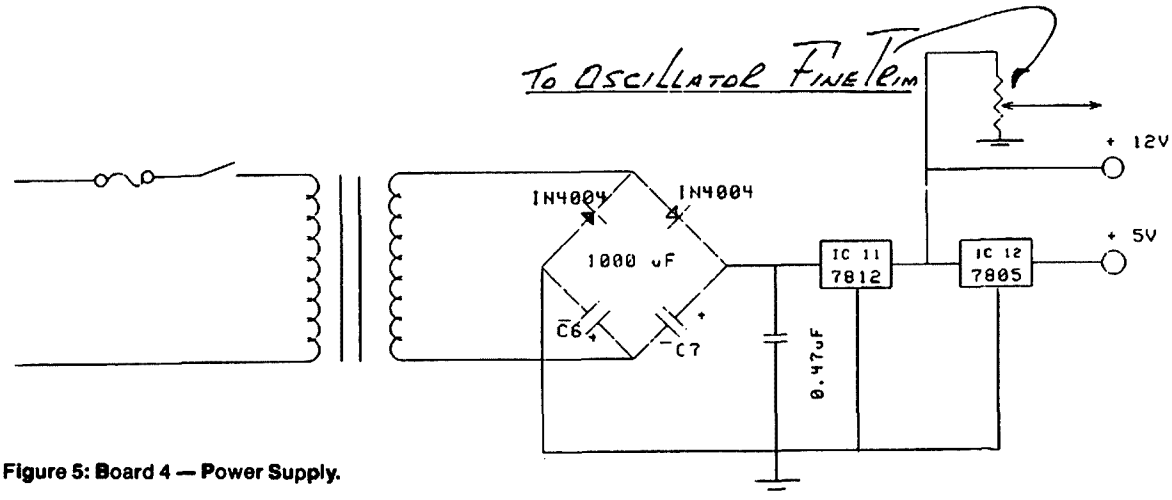


Figure 5: Board 4 — Power Supply.

The front panel layout (Figure 6), was mentally divided into quadrants and the control positions designed and allocated as follows:

Quadrant 1 ..... CMOS Marker Function
Quadrant 2 ..... Capacitance Meter
Quadrant 3 ..... Power Control
Quadrant 4 ..... Meter

REAR PANEL

This carries the six pairs of terminal for the TTL outputs, RV3 Frequency Trim, the mains fuse and the input cable grommet. The placement of these parts are left to individual preference.

The front panel of the C1066 case comes with a beautiful satin finished appearance. It was decided to utilise this and thus save spray painting. Great pains were taken to preserve the satin finish. So much so, that the original plastic wrapping was left in place throughout the marking-out process and subsequent drilling. This proved reasonably successful as the end product was almost free of blemishes.

After completing the two panels, attention should be then directed to the base. Arrangements are required here for mounting the electronics; ie mounting holes to be drilled in the requisite places, etc. These details are left to the individual constructor. However, boards two and three should run parallel and close to the front panel. Board number two should be immediately behind the "range" switch and board three should be adjacent to the meter. This arrangement makes for reasonably short wiring runs. Adequate space must be left for the front panel hardware.

Label the front and rear panels with Letraset or similar and finish with a light spray of clear lacquer. Unfortunately, this protective layer modifies the satin finish, but the appearance is still quite attractive.

After allowing the lacquer to harden for the stipulated time, mount the various hardware items.

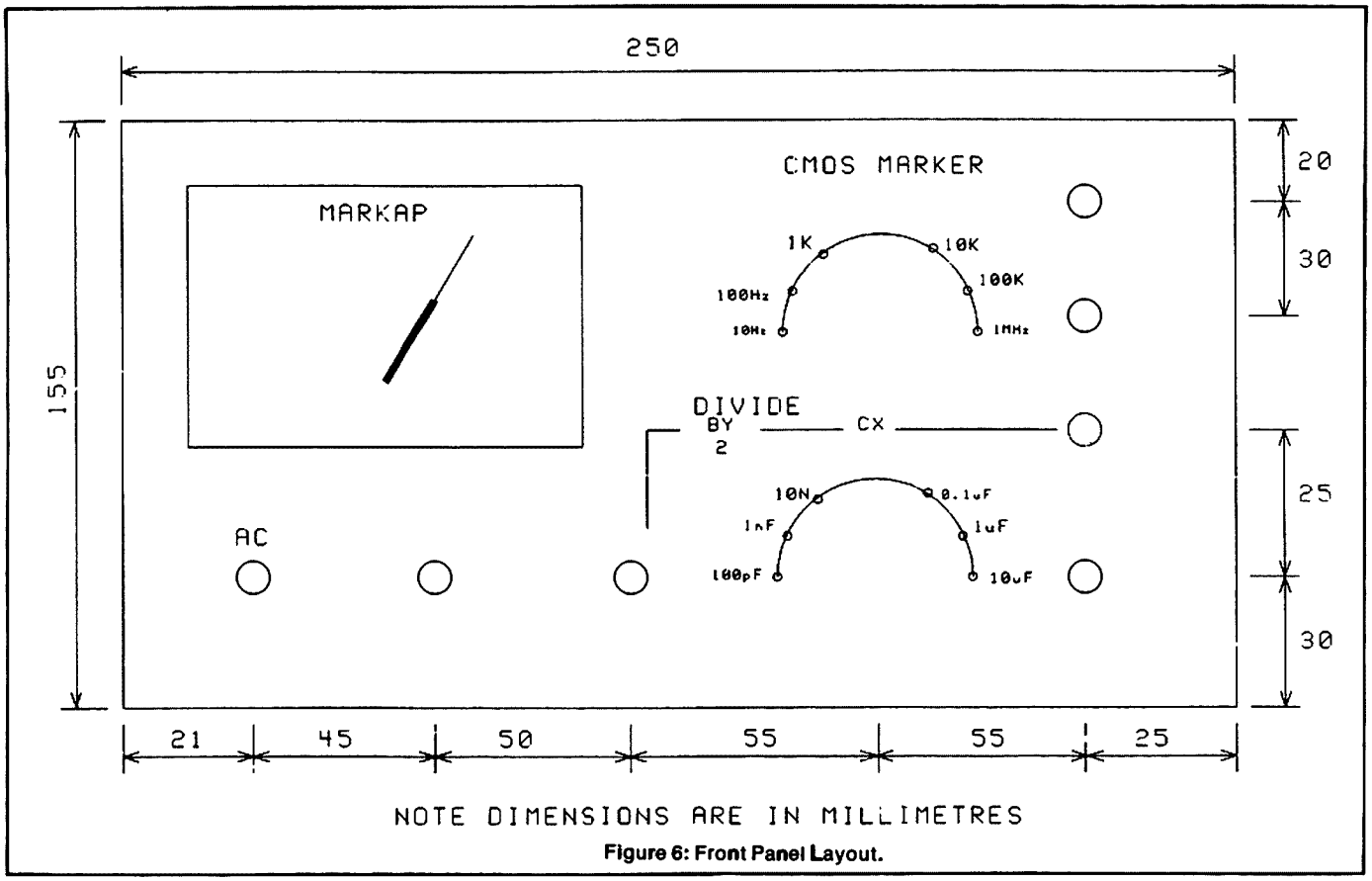


Figure 6: Front Panel Layout.

CONSTRUCTION — ELECTRICAL

The modular method is used here, in that the main electronics are built onto four individual boards. Boards numbering one through to three are hard-wired onto IC Boards (Dick Smith Catalogue Number H5610) whilst the last utilises a small piece of plain perforated bakelite sheet.

The contents of each are itemised below and are enumerated mainly from left to right.

BOARD NUMBER ONE	CLOCK OSCILLATOR — Fig 2
a) Q1 (BC108 or similar)	Part of crystal oscillator
b) Q2 (BC108 or similar)	Part of crystal oscillator
c) Q3 (BC108 or similar)	Buffer amplifier
d) IC1 74LS04 (Hex inverters)	Buffer/shaper
e) SD2 IN4004 (or similar)	Varicap
BOARD NUMBER TWO	DECADE DIVIDER — Fig 3
a) IC2 through IC7 all 74LS90	Decade divider
b) IC8 74LS04 (Hex inverter)	Buffer
c) IC9 74LS04 (Hex inverter)	Buffer
BOARD NUMBER THREE	CAP READ IYT etc — Fig 4
a) Q4 (BC106 or similar)	Level conversion
b) Q5 (BC108 or similar)	Level conversion
c) IC10 4049 (CMOS)	Hex inverter
d) Ge1 or Ge2	Germanium diodes
e) SD1 IN4004 etc	Meter protection
BOARD NUMBER FOUR	POWER SUPPLY — Fig 5
a) SD3 and SD4 IN4004 etc	Voltage doubler
b) IC11 7812	12 volt regulator
c) IC12 7805	5 volt regulator

CIRCUIT BOARD WIRING

The same method is used for each board, and to avoid being repetitious, the construction of one will be detailed here.

Free use is made of Circuit Test Pins (Dick Smith Cat No H5590), and are shown by an asterisk on the circuit diagram. They are used for transistor connections, power supply feed, all buffer inputs and outputs, signal in and out from each IC and other points as and when required.

Sockets are provided for all DIL circuits and are the first items soldered onto the boards. Next are the supply lines, positive along the upper edge whilst the negative runs along the lower. Solder lugs are organised so that their holes coincide with the board mounting holes and are positioned so that they may be soldered to the earth pins.

Run the IC earth leads, using bare tinned copper wire and/or any convenient tracks. Do likewise with the interconnection links, not forgetting the VCC (Positive) supply, followed by the

inter-chip wiring using insulated wire. Wherever possible, signal wiring is run along the upper surface and soldered underneath or to circuit pins.

Earth the unused buffer inputs (not outputs), fit resistors and capacitors.

Before proceeding further, inspect your work under a strong light. Remove possible shorts and re-solder any joints which appear dubious. When completely satisfied, wire in the transistors.

The IC pin spacing must now be adjusted to suit that of the socket. This is done as follows:
Hold the chip firmly using both hands, press down gently against the bench top and tilt the IC slightly. The opposite side is treated the same way. This must be done very carefully. It is better to make two or three attempts than to mangle the pins of the first attempt.
Carefully insert the chips into their sockets, making sure that you have them polarised correctly. The board is now complete and is, hopefully, without errors and omissions. If confident, mount the board into its appointed place on the chassis. It maybe wise, however, to make one final check prior to mounting. It is surprising how simple errors creep in when one is in too much of a hurry.

The remaining boards are handled in a similar manner.

INTER-WIRING

This is done in discrete stages. As each step is completed an additional function is commissioned and is ready for testing. This tends to make fault-finding relatively easy. Hopefully the trouble, if any, must then be relative to the latest section completed.

STAGE ONE — POWER SUPPLY

Complete the 240 volts AC input wiring and then run the two secondary wires from the transformer to the supply board.

Check your work and, if satisfied, apply the "smoke-test". If all is well both 12 and five volts should be available from the respective regulators. At this stage, switch off and then fit safety covering (insulation tape, etc) over all exposed 240 volt points.

STAGE TWO — CRYSTAL OSCILLATOR-DIVIDER

Firstly run plus five volts to Boards One and Two. Route the output from one to the input of two. Wire and loom the wires from IC9 (74LS04) to their allocated rear mounted terminals.

The wiring to the trim pot may now be done and harnessed into the above loom.

The stage is now ready for testing and should preferably be done with a CRO, however, it is possible to use the station receiver and multimeter.

STAGE THREE — CAPACITANCE METER

This requires the wiring of the IC9 (74LS04) outputs to the C-range switch and the moving arm to the level converter on Board three.

Other connections to this board are the plus 12 volts supply, the CX terminals and the metering wires.

The capacity function is now tested. Do not, at this juncture, spend too much time with the calibration, etc. An operational verification is all that is required. The full set-up technique will be explained later.

STAGE FOUR — CMOS LEVEL MARKER

Run jumper wires from the C-range to the CMOS frequency switch. Remember, position one goes to position six and so on. The moving arm of this switch connects to the input of section five on IC1, and the output goes from here to the remaining level converter on Board three. Next, pin 2 of IC10 (4049) is directed to the relevant front panel terminal.

Finally, the output of IC7 is wired to Q6 which in turn drives a red LED. This flashes at one second intervals, thus performing as a very noticeable pilot indicator.

Stage four is tested in a similar manner to that of the second. The "Markap" is now ready for final testing and calibration.

TEST EQUIPMENT

Before proceeding, a few words about test equipment. For setting up the "Markap", ideally it is an advantage to have the following equipment:

a) A *good* frequency counter
b) A calibrated CRO with time base set to about 0.5 uS/div.
c) An accurate capacitor decade box.

However, if the above are not available, you can improvise. The average amateur is resourceful and can usually manage to find a satisfactory alternative.

In place of the counter, the station receiver is quite adequate. These days, the modern set is usually synthesised, ie the local oscillator is locked to a crystal ensuring high accuracy which is the same over its entire range.

A multimeter may, in part, be used in place of a CRO. The decade box is a little more difficult, however the problem is not impossible to solve. One alternative is the obtain a 47 uF capacitor with a stated tolerance of, say, ± one percent. Another is to procure a wide tolerance 47 uF unit and organise to have it measured on a friend's bridge. It thus becomes a "transfer standard" of sorts. For further information on this method see AR, October 1987.

SETTING UP

This is straightforward and quite simple. The first task is to place the crystal oscillator on frequency.

Note, if using a synthesised receiver, set it to 30 MHz (or the highest exact Megahertz frequency). The reason for this is that, one Hertz change in the crystal frequency will be multiplied by 30, thus making it easier to detect small changes.

Proceed as follows:

1. Make and fit a temporary cardboard cover for the C1066 case. The purpose of this is to simulate the actual one and allows the circuitry to warm-up. Therefore, the adjustments may be made at near normal operating temperatures.
2. Switch both counter (or receiver, etc) and "Markap" on.
3. Allow it to stabilise for about one hour.
4. Set trimmer (TC1) to approximately mid-travel.
5. Ascertain the frequency excursion available from the trim pot (RV3).
6. Temporarily set it at mid-point.
7. With the counter on the one second time base range, adjust TC1 to give a reading of 1 MHz (± 1 Hz).
8. Change the counter to 10 seconds and fine trim with RV3.
9. Let it run for another hour or so and, if necessary, readjust.

TTL LEVEL MARKER

No adjustments are required to commission this function. It either works or it doesn't! As explained earlier, it is preferable to employ a CRO to verify this feature. However, the station receiver may be used instead.

1. Set the CRO controls in the following manner:
   a) Probe 10:1 (for better high frequency response).
   b) Volts/Div 0.1.
   c) Time/Div 0.5 uS.
2. Connect the probe to the 1 MHz terminal. The screen should now display a square wave of about 3.8 divisions, peak to peak, (3.8 volts) with a repetition rate of two divisions (1.0 uS).
3. Move the probe along to the next terminal and change the time base to 5 uS. If all is well, each cycle will still be two divisions of display width.
4. Similarly, move one down through the remaining outputs.

CAPACITANCE METER

The range setting potentiometers originally used were useless and very unstable. This was despite their apparent solidly sealed construction. Thus it became necessary to raid the junk box again. Fortunately, two usable multi-turn units were located.

It was then necessary to remove Board three, construct a 90 degree bracket to mount the new pots, and with a little rewiring, the board was re-installed.

Continue as follows:

1. Turn the CX-Range switch to the 1.0 uF position.
2. Connect the 0.47 uF reference to the "unknown" terminals.
3. With SW1 depressed, adjust RV1 until the meter indicates 470 microamps, ie 94 percent of Full Scale Deflection (FSD).
4. Release SW1 and adjust RV2 to give an indication of 235 microamps (47 percent FSD).

The capacitance measuring function should now be ready for service, however, it would be wise to check its operation on the remaining ranges. Inadvertently, some of the switch wiring may have been transposed.

CMOS LEVEL MARKER

This is proved in a similar manner to the TTL function with the exception that the CRO is set to 2.0 volts per division. The display should be around the 5.5 division (11 volts).

The adjustments are now complete, and the two parts of the case may now be screwed together.

OPERATING INSTRUCTIONS

MARKER GENERATORS

These require a short warm-up period, the length of which depends upon the accuracy required. For most crystals, 10 minutes should suffice.

All seven of the marker outputs may be used simultaneously, however, be warned — the high signal levels (up to 11 V P/P) may cause some receivers to overload. Hence, it is essential to use very light coupling in this type of application.

Any, or all, of the TTL outputs are enabled by connecting to the rear mounted terminals. CMOS level is available from the designated terminal having rotated the selector switch to the required frequency.

CAPACITANCE METER

This function is operative at all times regardless of the "Marker" status. Its use is quite straightforward.

1. Set the "Range" switch at 10 uF
2. Connect an unknown to "CX".
3. Observe the meter reading (if any).
4. Rotate the switch anti-clockwise until a scaleable reading is obtained.
5. To obtain "CX", simply multiply the meter indication (significant figures) by the range switch setting.
6. Any readings below 50 percent FSD may be doubled by pressing "Divide by 2". However, the indicated value must be halved. This feature makes for better accuracy for capacitors lower than "5" on any range.
7. It is prudent to return the "Range" switch to 10.0 uF after each measurement.

Check the oscillator frequency every three months or so, and if necessary, adjust RV3 to compensate for crystal aging.

In conclusion, I must thank Nancy Baker of AWA Clerical Services for typing this manuscript.

POSTSCRIPT

After this article was completed, it wa discovered that Dick Smith Electronics had capacitors in stock which were quite suitable as references for use in setting-up the "Capacitance" function.

They are 0.1 uF one percent 63 volt Polystyrene units, Catalogue Number R2780 and sell for a little under a dollar.

It is recommended that two of the above be purchased. With two capacitors, three reference values are obtainable; ie 0.1, 0.2 and 0.05 uF These values are realised by using them in parallel, series or singularly.

It is possible, using the divide by two control, to obtain meter checkpoints at 1, 2, 4, 5 and 10 on the meter scale.

That concludes an alternative cost-effective set-up procedure. Perhaps it would be an idea to store the two 0.1 uF capacitors inside the "Markap" case. Then you would know where to locate them at a later date!

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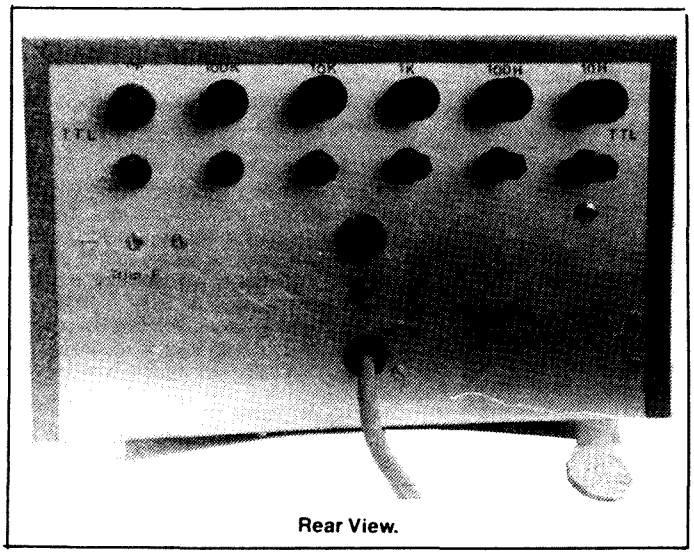
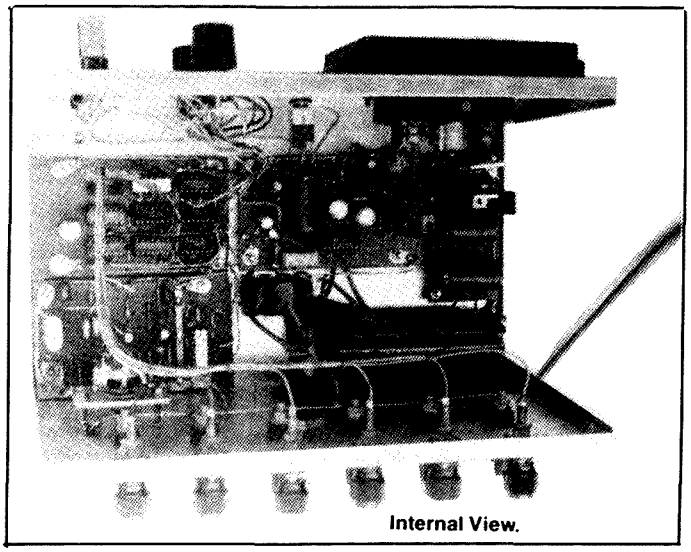


Rear View.


Internal View.

Try This!

HALFWAVE DIPOLE

An antenna which began as a halfwave dipole and has gradually g-r-o-w-n!

Do you have plenty of space? Do you have some strategically placed trees or tall poles? Do you want to work DX on 40 metres? How about a two or three element Yagi!

At this QTH a three element Yagi, 15 metres high, is used. Its elements are made from copper wire, insulators and rope. The driven element is 20.06 metres long. It is split in the middle with an insulator and has coaxial cable to each side. A "hairpin" match is used, consisting of a coil of heavy gauge copper wire, seven turn, 30 millimetres diameter, 100 millimetres long, and joined to each side of the driven element at the centre. The reflector is 20.93 metres long and spaced about seven metres behind the driven element. The director, if used, is 19.30 metres long and about seven metres in front of the driven element.

This antenna began life as a halfwave dipole to which a reflector was added. The original height was eight metres, and it gradually grew higher as the trees, which support it, grew, and a director was added. Trees are used on one side of the antenna and poles, made from pipe, are one the other side. A pole is at the centre of the driven element to support the coaxial cable and matching unit. A 1:1 balun or gamma match could also be used to feed it.

The biggest problem with this antenna is chafe on the ropes where they pass over tree branches, Thicker rope is used where it touches.

My antenna points a little to the north of west, towards North America. A good compromise would be due west, which would give Central America and Europe quite well, whilst South and North America would still be okay. Wherever it points, there will be DX to work!

If you have the space and time, it is worth the effort!

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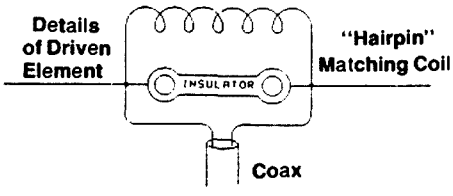
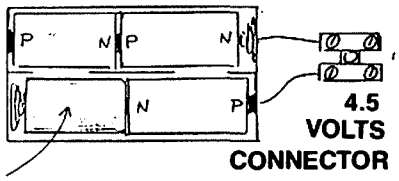


—Contributed by VK3YH

NO FUSS 4.5 VOLT BATTERY HOLDER

As 4.5 volt batteries are difficult to obtain, or battery holders for that purpose, I used a non-destructive method to convert a six volt battery holder to 4.5 volts as required for an old, but useful instrument I had on hand. It has worked out better than the original set-up.

SIZE C BATTERY HOLDER



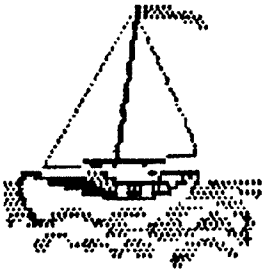
INSERT BLANK DISTANCE PIECE TURNED FROM ALUMINIUM ROD THE SAME SIZE AS ONE C CELL

—Contributed by VK2ADI

TOPICAL TECHNICALITIES

Lindsay Lawless VK3ANJ
PO Box 112, Lakes Entrance, Vic. 3909

Use separate batteries for the radio on a ship, if possible.



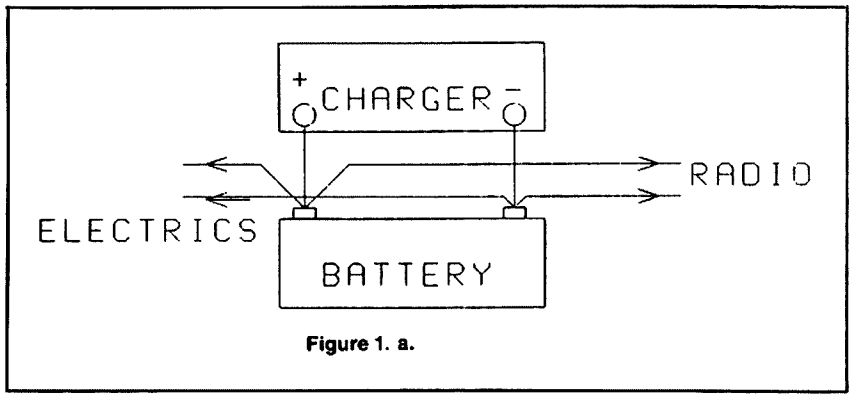
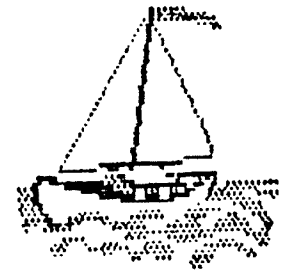


Figure 1. a.



I passed the time of day with some "blue water" yachtsmen recently. The conversation was mainly about their communication and navigational aid radio. This was very interesting and an article on the subject from a knowledgeable member would be appreciated.

One skipper wondered why the brilliance of his binnacle lamp followed the modulation of his SSB transmitter. A very distracting happening while steering at night.

The fault is in the ship's wiring caused by the installer not observing some simple maxims which apply to all mobile radio installations.

1. If possible, use separate batteries for the radio.
2. If 1) is not possible, use separate wiring for the radio direct to the common battery (Figure 1a.).
3. Choose wire size sufficient to limit voltage drop to an acceptable level.

Figure 1a is a wiring scheme for 2) above. Hash from the charger and the vehicles electrics is not coupled to the radio via common wiring. The volts drop caused by the electrics does no affect the radio and vice-versa the radio does not affect the electrics; eg the binnacle lamp.

Figure 1b is the worst and most popular wiring scheme.

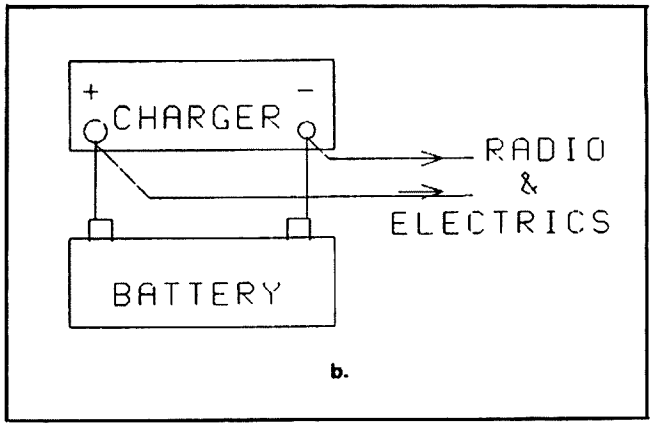
Figure 1c is marginally better than 1b if, for some reason 1a is not possible.

Wire current capacity has to be sufficient to prevent heat deterioration of the insulation. A reasonably accurate estimate of the safe capacity of PVC insulated wire is $4.7D^2$ amps. D is the diameter of the *conductor* in millimetres.

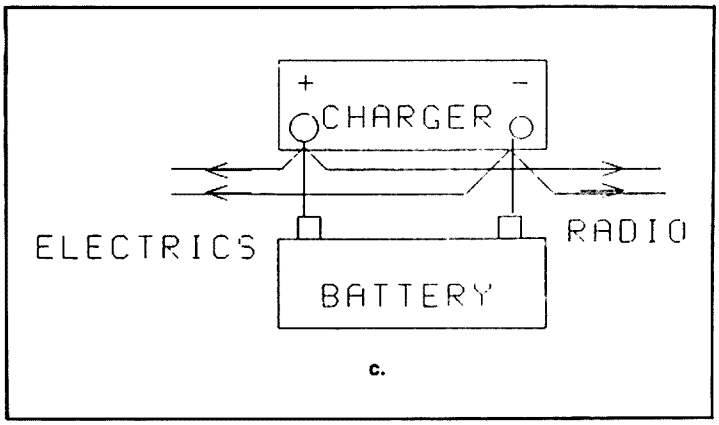
Wire tables list resistance per kilometre for each diameter, this can be converted directly to millivolts drop per metre per amp; eg one millimetre copper conductor has a resistance of 22 ohms per kilometre; read this as 22 millivolts drop per metre per amp.

The drop per metre per amp for other diameters is $22/D^2$ mV. The following is a design example:

Length of wiring run, vehicle battery to radio — 4 metres



b.



c.

Length of wire required (avoid chassis return) — 8 metres

Maximum current — 30 amps.

Required conductor diameter — $(30/4.7)^{1/2}$ = 2.53 mm, use 3 mm

Volts drop = 8 x 30 x (22/9) = 587 mV, say 0.6 V

0.6 V drop in a 12 V installation is just acceptable. Seven watts is dissipated in the wiring. Four millimetre conductor would be a much better choice.

Tinned copper conductors are better than bare copper which oxidises quickly and, in marine environments, oxide soon creeps beneath the insulation.

Wiring is best installed in open looms; the source of a fault is much easier to find.

Yachts are making more use of photovoltaic (solar) cells and these have possibilities for other mobiles.

Output is approximately 100 watts per square metre when oriented normal to the Sun's direction. One such panel exposed to full sunlight for N hours will store in a battery 80N watt-hours. (Lead acid batteries are 80 percent efficient).

An FT-707 receiver uses 20 watts, therefore 15 minutes full sunlight would replenish the battery energy used to run the receiver for one hour.

An FT-707 on transmit requires 360 watts, therefore 15 minutes transmit time would require 67.5 minutes full sunlight to replenish the battery.

It has possibilities but someone should invent a watt-hour meter to sum energy incoming and outgoings and register the favourable or unfavourable balance.

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THE STORY OF AX2SWJ

Ted Brien VK2PTB
Gerry McCulloch VK2BMZ
6/10 Epping Grove, Epping, NSW. 2121

During the first 10 days of January this year, Australia played host to 17 000 members of the world-wide Scouting fraternity, during the 16th World Scout Jamboree.

Held at Cataract Scout Park, about 70 kilometres from Sydney, between Campbelltown and Wollongong, it attracted Scout contingents from some 88 countries. As usual at Scout Jamborees, an amateur radio station was established as one of the many activity bases connected with the Jamboree.

The station, using the special bicentenary prefix AX, was allocated the call sign, AX2SWJ, (for Scout World Jamboree) and succeeded in remaining on air 24 hours per day for the duration of the Jamboree. Besides being one of the activity bases (others included absailing, orienteering, overnight camping and water safety awareness) during the day, the station was also available for visiting licensed amateurs to use at night, and enabled Scouts to make contacts to their home country on prearranged scheds.

As an activity base, amateur radio was introduced into a broader context of communication (in keeping with the Jamboree's theme of *Bringing the World Together*). The one hour long activity visit began in a large tent which had a working display of Teletext (courtesy of Television Station ATN7), displays by AUSSAT and the CSIRO Division of Radiophysics showing Australia's involvement in space research, and a display of old radio receivers and other communications equipment (courtesy of Harold Burtoft VK2AAH and Brian Pierce VK2FCXG). Also displayed were two old mechanical Teletype machines functioning together as a sending and receiving pair (courtesy of VK2ZOI) and nearby a contrasting VHF RTTY station using a Commodore 64 computer on the Sydney RTTY repeater, VK2RTY, (loaned by John VK2MDH). Other displays included a shortwave receiving post using two FRG-8800s (courtesy of Dick Smith Electronics), an old AR7 receiver usually tuned to the local Jamboree AM broadcast station, and a VCR continually showing the ARRL film *Introducing the New World of Amateur Radio*. After viewing these exhibits, the visitors moved into a small theatrette, where a short talk about radio propagation, time and time zones, and an introduction to the hobby of amateur radio was given. This was followed by the viewing of a specially produced videotape showing a short amateur radio contact.

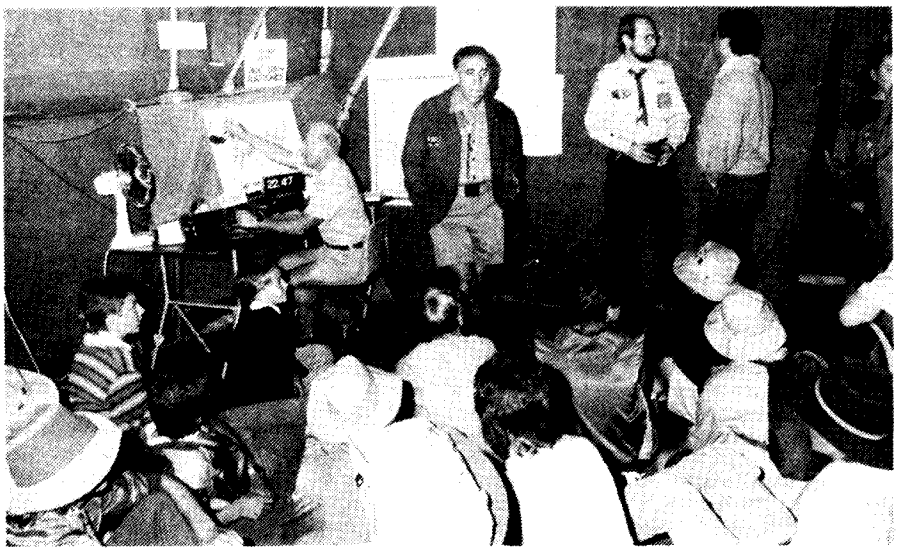
After this presentation, the Scouts were then free to explore the tent in more detail, asking questions of the people in attendance, or of moving on to the nearby permanent shack and watching, or perhaps taking part in, amateur radio in action. Depending on the size of the group, one of the amateurs on the staff of the station would give a talk about the hobby, covering such topics as the requirement for a licence, the excitement of not knowing who might reply to a CQ call and some of the famous people who are amateurs. All were reminded that they were able to use the stations around them, in any language, and were able to study and obtain a licence on their own.

Preparation for establishing AX2SWJ indirectly began two years previously, when a station was established on the same site for the Australian Jamboree. For this Jamboree, the site of the station was chosen to be at the highest part of the Park, and three 21 metre timber poles were installed to support antennas. A triband beam and rotator were left at the top of one of the poles after the event, but they suffered the ravages of time and the strong winds that prevail at the site. By the beginning of 1987, only half of the beam, a weather-beaten rotator and a damaged feedline remained as evidence of what had been. This forced us to start "from scratch" to plan the station.

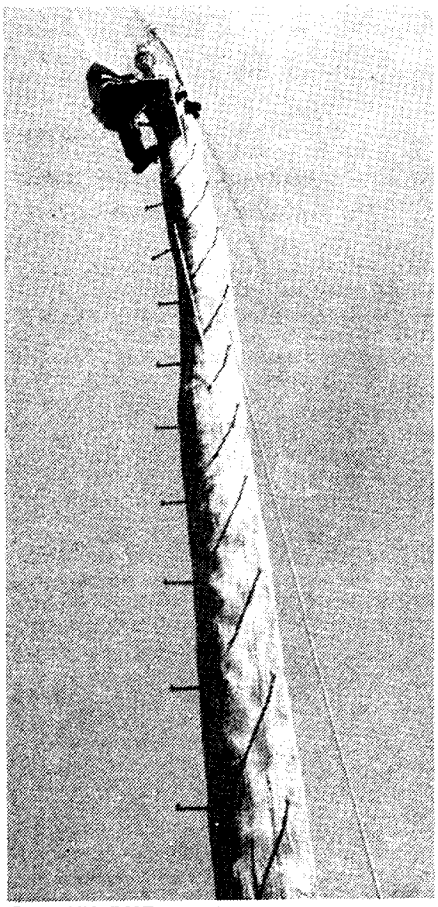
The first step was a visit to inspect the site. No records seemed to exist of the planning of the original antenna installation, so the pole spacings and orientations were measured and calculated. Curiously, despite the large amount of space available, the poles were not evenly spaced, and were placed in orientations which did not seem to readily favour the main population centres of the world. However, because they would not be moved, we now knew what we had to work with.

A couple of "brain-storming" sessions followed to decide the parameters of the station. Because neither of us had operated a station at such a large and international gathering, we were somewhat unsure of just what we were trying to achieve. Finally, a list of goals were agreed upon.

1. The station was primarily for use by and for the Scouts, so we would discourage operators from simply "playing radio".
2. We would use only the most common mode-phone, with perhaps CW by visiting operators if they wanted to, after-hours. We felt that, by using modes such as satellite, packet, etc, we could have difficulty in attracting sufficient operators experienced in these modes for the full ten days of the Jamboree, particularly as it would be running during the peak holiday season. We also thought that these modes could serve to confuse and baffle people who had just been introduced to amateur radio, and could perhaps violate (1) above.
3. We would use only the main HF amateur bands, ie we would not use any of the WARC bands. This was again in line with (1), and it was thought it could simplify equipment requirements. It was decided also to give VHF a very low priority, because the type of contact heard on repeaters etc, was felt to be a very poor advertisement for the hobby. Also, by having VHF too readily available, the temptation could be to talk to friends and exclude the Scouts, the reason for establishing the station.
4. Because it was anticipated that many operators would use the station during the Jamboree, it was preferable that operation be



Shelly K2BS, explaining what amateur radio is to a group of scouts whilst Nev VK2ZA continues to operate.



Gerry VK2BMZ, erecting the 80 and 40 metre antennas atop one of the 20 metre poles.

as simple and as free of adjustments as possible. Ideally, it was hoped antennas could be used that did not require antenna tuners.

5. There would be three separate stations (one on 80/40 metres, one on 20 metres and one on 15/10 metres), each being connected to its own antenna system.

6. After considerable thought and discussion, it was decided not to use linear amplifiers. This decision was made on the grounds that the extra power could overload receivers on the other bands, and primarily we were looking for solid received signals that visitors could easily listen to. It was felt that if a linear was required to make a contact, chances would be that conditions would be marginal, making it very difficult for visitors to listen to anyway. Also, by adding a linear to the chain, it meant that all the visiting operators had to be shown how to tune it up properly, before they could be left to operate the station.

7. Third party traffic would not be encouraged. We would reluctantly accept any traffic for us, but we would not generate any. This was done for several reasons — there were not any experienced operators, there could be difficulties delivering messages to one person in 17 000, and, in any case, the site had many public telephones with ISD facilities, which accepted cash, credit cards or user dialled reverse charges.

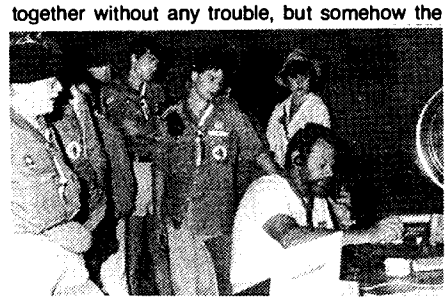
It was then necessary to decide how to implement these aims. It was assumed that 20 metres would be the main band for overseas contacts, so it made sense to have as good an antenna as possible for that band. We assumed that 80 and 40 metres would be used mostly for local contacts ad that some form of wire antenna would suffice. This left 15 and 10 metres which we thought could use a duoband beam. Because of the strong winds at the site, it was decided to purchase locally made antennas designed for strong winds. Ultimately, it was decided to use antennas from Chirnside Antennas — a CA4 four element for 20 metres and a CE42 four element for 15 and 10 metres. (The wisdom of this decision was confirmed on the second last night of the Jamboree when a very strong wind storm hit the camp. Tents were blown into trees and branches snapped from trees, but the two antennas escaped damage completely!).

With the two higher frequency antennas decided, all that remained was to make something for 80 and 40 metres. This took quite some thinking as an antenna which did not require tuning was needed, but band switching could be easily arranged from within the shack if necessary. After discarding many possible ideas, a compact loop was chosen. (See end of article for a full description of this antenna and balun, complete with SWR plots obtained on the two bands). This antenna proved very successful and two were installed with the tops about 20 metres high, oriented approximately at right angles. The only problem experienced with them was that the match deteriorated quite markedly during periods of rain. Unfortunately, there was no opportunity to investigate this and it will have to be examined at a later date.

Whilst the preliminary work for the antennas was being done, we set about arranging the other equipment. Dick Smith Electronics was approached, and readily agreed to help in any way possible. Ultimately, they loaned four FT-757GX transceivers and power supplies (one as a spare), an automatic tuner and a manual tuner, microphones, headphones, coaxial cable and rotator cable.

Because of the wind at the site and the weight of the antennas, particularly the 20 metre one, strong brackets were made to support the rotator and take most of the sideways thrust exerted on it by the antenna moving about in the wind. VK2PTB manufactured three of these, and had them hot-dip galvanised. He also made three weatherproof galvanised boxes, in which to terminate the coaxial and rotator cables. These were attached to the poles about three metres from the ground.

Although VK2BMZ had regularly climbed the poles to attach the pulleys for the wire antennas, he balked at attaching the rotators, their support brackets and the antennas. Therefore, one weekend in November was devoted to installing the beams. Saturday was spent assembling them, and putting a protective finish over all the nuts and bolts. The 10/15 metre antenna went together without any trouble, but somehow the dimensions for the 20 metre antenna did not seem quite right. Finally, just on dusk, with the antenna slung in a tree about two metres off the ground, a quick SWR check revealed that it was tuned too high in frequency. There was not sufficient tubing available to lengthen the driven element, and reduce the frequency to about mid-band. Finally, it was left tuned as low as we dared and we hoped that it would improve once it was at the top of the pole.



Mawa DL8SCW, with some of his contingent talking back to Germany during the Jamboree.

Promptly, at 7 am the next morning, the cherry picker complete with 70 feet of reach, arrived and we swung into action. Firstly, the remains of the old antenna from the previous Jamboree were removed and the rotator inspected. Unfortunately, it showed signs of being over-tightened, so it was decided to take it down for maintenance and simply install the rotator bracket. On all poles a length of pipe was installed so that an arm with a pulley in the end could be inserted, which it was hoped could be used for future maintenance on the rotator and/or antenna. As the first pole was intended for the lightweight two metre antenna, we thought the antenna and rotator could be installed at a later date without the cherry picker.

The next pole was to carry the 15/10 metre beam. Firstly, the bracket was installed, then the rotator and finally the antenna, all without a hitch. The final pole was for the 20 metre antenna. Again brackets were attached, and the rotator installed. This time, however, despite all the careful preparation, some difficulty was experienced in juggling the heavy antenna through the bracket and into the rotator. Finally, in just three hours, it was all in place and we were satisfied with the result.

A couple of weeks later, another day was spent at the site checking the two 80/40 metre antennas and making measurements on the beams. This confirmed that the 20 metre beam was still tuning too high in frequency but we decided that there was nothing we could do with it before the Jamboree. In the meantime, we confirmed that it possessed directional properties and, by using the automatic antenna tuner, it would be possible to feed power into it. Unfortunately, this violated one of the requirements set earlier, but at this time we were pleased to have an antenna in the air, and at least partially working. Fortunately, the 15/10 metre antenna appeared to be working without any problems.

Experience gained in several Jamboree on the Air weekends convinced us of the merit in having separate microphones for the main station operator and the guest Scouts, with a switching arrangement between them. In addition, headphones had proved useful in combating the noise which inevitably accompanies people observing proceedings. Therefore, three sets of outboard audio boxes were also built. These had active filters to individually tailor the response of the two different microphones loaned for the Jamboree. In addition, they had low power audio amplifiers and separate volume controls to drive the headphones for the main and guest operator. These were both independent of the rig's volume control and external speaker.

By mid-December, the Jamboree was beginning to take shape and logistics of actually manning the station were being considered. The Jamboree administration allocated us several leaders who indicated that they held amateur radio licences. Thus we knew we could have assistance within the camp from Nev VK2ZA, Andy G4VMQ, Bill WA2GNA, Greg VE7EKB, Mawa DL8SCW and Jan LA2BBA. At the same

Outside the Shack — Rear from left: Richard and Miriam.
Centre: Jan LA2BBA, Gerry VK2BMZ, Andy G4VMQ, Hilton and Peter VK2EMU.
Front: Greg VE7EKB, Nev VK2ZA, Brian VK2FOG, Mawa DL8SCW, John VK2MDH and Shelly K2BS.
Absent: Ted VK2PTB, Roy VK2VRB and Bill WA2GNA.

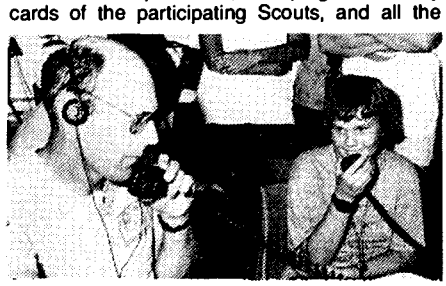
time, we received word that some people wanted to be part of the Jamboree and help-out, but they would not be part of the official contingent nor would they be living on-site. In this way, there was Roy VK2VRB, Peter VK2EMU, Brian VK2FOG, Richard PA3BAR (and Miriam), and Shelly K2BS, to help out. In addition, Bert VK3VFX, Phil VK3NXI (and Jenny) and Hank PE1CIW (who flew in especially from Singapore for two days) gave what time they could during their special visit to Sydney for the Jamboree. Because the other display tent also required the services of people who were not part of the contingent, and other parts of the Jamboree needed extra people, arrangements were made to set up accommodation in Appin, a small town about 10 kilometres from Cataract Park. (For the duration of the Jamboree, the Appin Community Hall was renamed the 'Appin International Hilton"! It had a "No Vacancy" sign out for most of the time and, at its peak, provided sleeping space, hot showers and three meals a day for about 70 people).

Whilst all the work was being done on the antennas and the rest of the preparation, another group of people were working equally hard erecting a concrete building amongst the trees and poles. This was to be a lasting memorial to the World Jamboree having been held on the site, and took the form of a radio shack. It has a storeroom and large operating room, complete with power and water, and operating benches around three sides. As well as a wide veranda in front, it has a wide roller shutter door at the back which allows a tent to be erected right up next to the building, giving a feeling of one very large shack. It was opened officially be the New South Wales State Governor (and Chief Scout of New South Wales), Sir James Rowland, on Sunday, January 3, during the Jamboree. This permanent shack will be a lasting asset to the Cataract Scout Park facilities.

Finally, the Jamboree was ready to go, and so were we! The equipment was set up in the shack and tent and AX2SWJ was "on the air". All that remained was to devise a roster of operators, ensuring that everyone had at least two full days off to look around the camp, that three people were available for three hours or so after dinner, and someone was available all night, particularly to make any of the prearranged scheds. Shelly soon surprised all of us, with his dedication to CW, operating and Scouting, and not necessarily in that order! We all soon learned that he travels to every US national and world Jamboree, just to operate the amateur station set up there. He had set a personal goal of trying to work 100 countries during the duration of the Jamboree, but not at the expense of explaining amateur radio to all the visitors, and trying to meet all the sched obligations. As the days rolled past, it became a real point of interest as to how many countries Shelly had worked, and what the current score was. Before leaving home, he had notified various DX lists and newsletters that we would be on the air and looking for contacts. On about day seven, there was great cheer when Scotland was worked for country number 100. Some of the other countries worked were Nepal (9N), Saint Vincent (J88), Guantanamo Bay (KG4), ITU Geneva (4U1), Uganda (5U) ad Reunion Island (FR).

To assist in keeping track of all the contacts being made, a Commodore Amiga, provided by The Micro-Computer Spot of Parramatta, had been set up in Appin. Every day, the log sheets from the station were taken there, and all details of the contacts entered into the computer. At the same time as special QSL cards was filled out. At the end of the session, we were presented with a listing by time of all the contacts made during the previous day and, at the end of the Jamboree, each operator was given a log of all the contacts he had made.

Slowly everyone slipped into the routine of the station and the Jamboree; explaining amateur radio to *Scouts and other* visitors, placing scheds on the Schedule Board, keeping the "Countries Worked" list up to date, stamping the activity cards of the participating Scouts, and all the other things necessary to keep the station running smoothly. The New South Wales Division of the Wireless Institute, through Roger VK2ZIG, arranged a full day mini-bus tour of Sydney for all the overseas operators, and some of the country visitors. The tour included stops at the Department of Transport and Communications)for visitors who wanted to arrange a reciprocal licence), to Dural to see the facilities of VK2WI and to Parramatta to see the main administrative office of the Institute. A piece of paper on the notice board of the shack soon had over 50 names and call signs of other operators who were in camp, but not part of the station. One of the visitors from the camp who visited several times was Hiroshi JH4FAX. His contacts in Japanese, giving many more Japanese operators the chance to obtain a QSL, were very much appreciated.

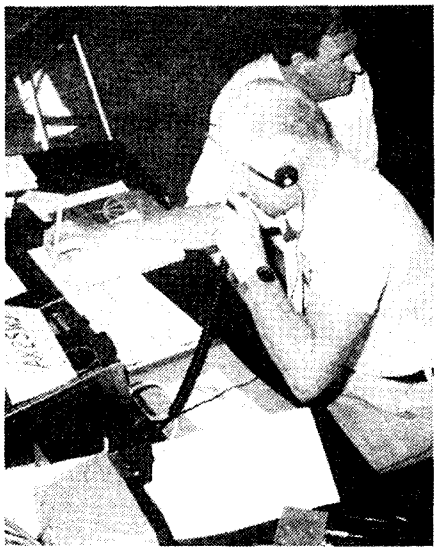


Gerry VK2BMZ, helping a visiting scout to talk to his "amateur father" in California.

For the operators, some of the most rewarding times were *when prearranged scheds were* successful. Some visitors found talking in monologue very difficult, but for those who mastered the technique, the experience became an ideal introduction to amateur radio. Once the visiting Scouts recognised the voice at the other end, they usually wanted to keep talking, and to arrange another sched for another day. We also received considerable publicity during the Jamboree. The Jamboree newspaper carried a photograph of Miriam helping one of the visitors to the shack; the *Illawarra Mercury* ran a feature story complete with a photograph of Shelly in one of its daily Jamboree supplement pages; and Radio australia carried an interview with Hilton *Ormerod and Dean* 8P6SH, who was a member of the Barbados contingent.

On Saturday, January 10, at 9 pm, the closing ceremony of the Jamboree was held. This was a sad affair for everyone in the camp, signifying the end of 10 fabulous days. For all at AX2SWJ it marked the end of a very enjoyable, but sometimes hectic, activity. By the conclusion of the Jamboree the station had made over 1450 contacts, worked 123 countries, stamped over 1800 activity cards, and welcomed twice that number of casual visitors to the shack.

Now that it is all over, what would we do differently, if we had to do it all again? In short, the answer is "Not very much." We did find that a linear would have been useful on a few occasions. Shelly particularly found this when he was trying to break into some of the pile-ups. If we did have a linear available it would have been kept for times when it was really necessary, would have been reserved for one band only (probably 20 metres), and would have been available for only a few of the main operators. If time (and suitable local components) were available, we would liked to have made some filters (bandpass for 20 metres, lowpass for 80/40 metres and highpass for 15/10 metres), to assist in keeping transmitters out of receivers. Although we suffered very few of these overload problems, we did find that 40 metres, particularly, broke through into the 20 metre rig. Sometimes, turning off the RF preamplifier solved the problem, but this was now always an acceptable



Nev VK2ZA.

solution. If it were possible, a low power FM repeater operating below 146 MHz and just serving the camp would have been useful. Some of the European visitors who brought their hand-helds with them were not able to access any of the Sydney repeaters because they did not cover above 146 MHz. Such a repeater would have been an ideal way for all the visitors to keep in contact with each other. Lastly, we would have insisted that all scheds posted on the Sched Board have both the time and the date in UTC! We had some difficulties in trying to decide which day a particular combination of local and UTC time and date referred to.

Aside from all the people mentioned who assisted during the event, we also have to thank Betty and Dorothy who put in many hours entering data into the computer at Appin. To "Norm" and his crew from Toongabbie Rovers who fed and generally looked after us at the Appin Hilton, to Hilton Ormerod who looked after the organisation of the whole amateur radio activity base, and finally, to Andrew Davis, of Dick Smith Electronics, who arranged the loan of all the equipment used and assisted with the purchase of all the other bits and pieces needed.

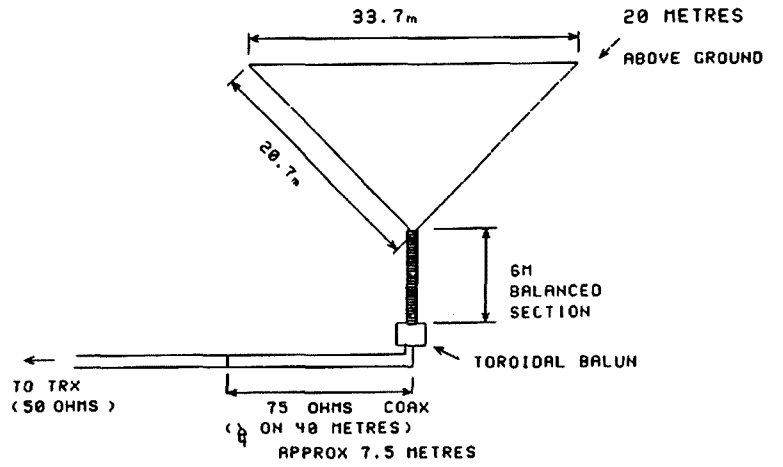


Figure 1: The 80 and 40 Metre Antenna used.

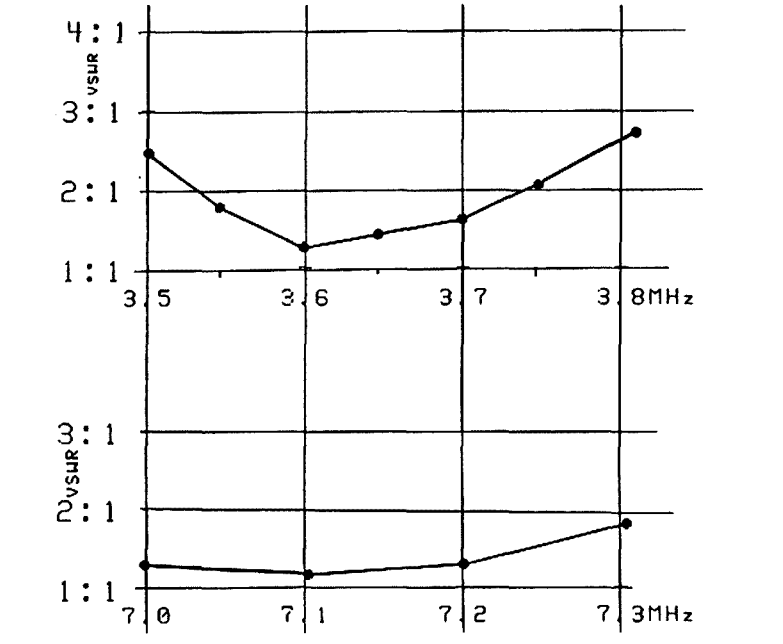
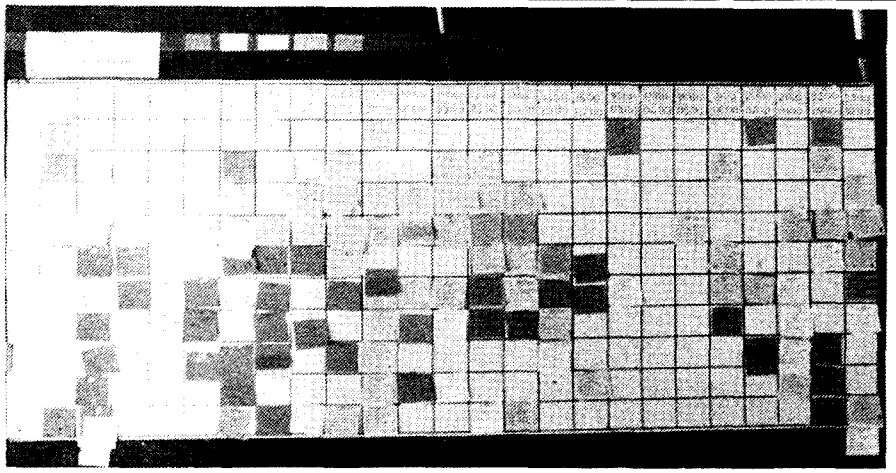


Figure 2: VSWR Plots of the 80 and 40 Metre Antenna.



The overworked Sched Board. Colour was used to indicated frequency.

THE 80/40 METRE ANTENNA

The compact loop antenna used was based on one described in *Ham Radio* a few years ago[1]. It is a full wavelength loop on 80 metres and two wavelengths on 40 metres using a total wire length of 87 metres. This was made in the shape of a delta loop, with a short length of open feedline, see Figure 1. At the end of this open feedline was a balun made with ferrite beads slipped over the outside of a short length of coaxial cable. (This form of balun is described in detail in reference 2). Following the balun was a length of 75 ohm coaxial cable, cut to be one quarter wavelength long on 40 metres. This was fed by 50 ohm coaxial cable from the shack.

The antennas were made using standard household insulated copper earth wire. The balanced line section was made using spacers of 15 millimetre grey plastic conduit, cut about 130 millimetres long. Holes of four diameter, 15 millimetres from each end, were drilled through the plastic, and longitudinal saw cuts made into them from each end. The wire was then forced down the saw cuts and into the holes. The last two spacers at either end of the open section had wooden dowels forced into the conduit before drilling and sawing. Holes about eight millimetres from each end were drilled into these to take M2.5 screws. After the wire was in place, screws, nuts, and washers were added and tightened. These clamped the wire firmly in place and provided some strain relief, particularly at the bottom of the Vee. The spacers were placed at about 600 millimetre intervals.

The quarter wavelength matching section was cut to length using a noise bridge. The bridge was initially calibrated by setting the receiver in the middle of the 40 metre band, and a good RF short circuit placed at the "Unknown" terminal. "R" and "X" were adjusted for a noise balance, and then were not touched. The short circuit was replaced by the 75 ohm cable, already prepared with a coaxial connector on one end. The far end was left open-circuit. The receiver was then tuned below 7 MHz until the noise suddenly went through a minimum. This was the frequency at which the line was presently a quarter wavelength. Small pieces of cable were cut off, and the receiver retuned upward to find the frequency of the new length. This process was continued until the null occurred in the 40 metre band. A second connector was then put on the cable.

Five ferrite bead baluns were made — two each for the beams and the 80/40 metre antennas (and one for a third, future wire antenna). These consisted of 60 Amidon ferrite beads, type FB-75-2401, slipped over a length of RG-58 cable with the outer jacket removed, and fitted into a length of 40 millimetre OD plastic conduit. For convenience, the beads were held together inside some heatshrink tubing. (See Figure 3). The input end was first soldered on to an SO-239 socket, crewed to an aluminium bracket and fixed inside the tubing. This bracket was located sufficiently far up into the tube, so that the connectors were protected from the weather. The beads were then placed on the cable and the inner and dielectric and outer braid separated. Small lugs were then soldered to the inner and braid. These were placed under the heads of brass screws protruding outside the tube, and then locked in place with flat washers, shake-proof washers and lock nuts. Epoxy glue was used to secure an end cap and to waterproof the holes where the brass screws protruded outside.

The antenna was trimmed by adjusting the length of both the top and open feeder section, until acceptable matches were found on both bands. The results finally obtained are shown in Figure 2. Compared with the original article, the top is some seven metres longer and the open line section four metres shorter. After making and adjusting the first antenna, the second one was made to the same dimensions, and gave almost identical results.

REFERENCES

1. BADGER, George M W, W6TC. Compact Loop Antenna for 80 and 40 Metre DX, *Ham Radio*, October 1979, page 24.
2. MAXWELL, Walter, W2DU. Some Aspects of the Balun Problem, *QST*, March 1983, page 38.

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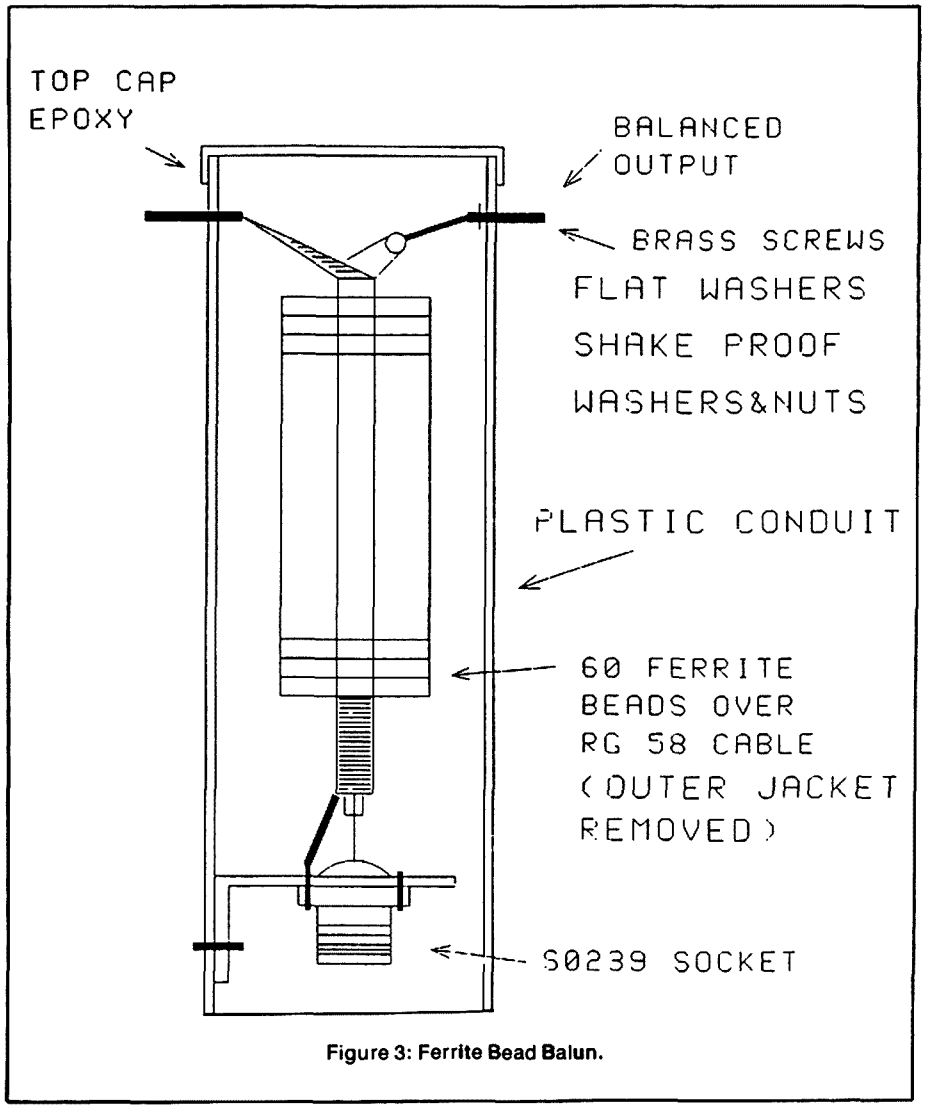
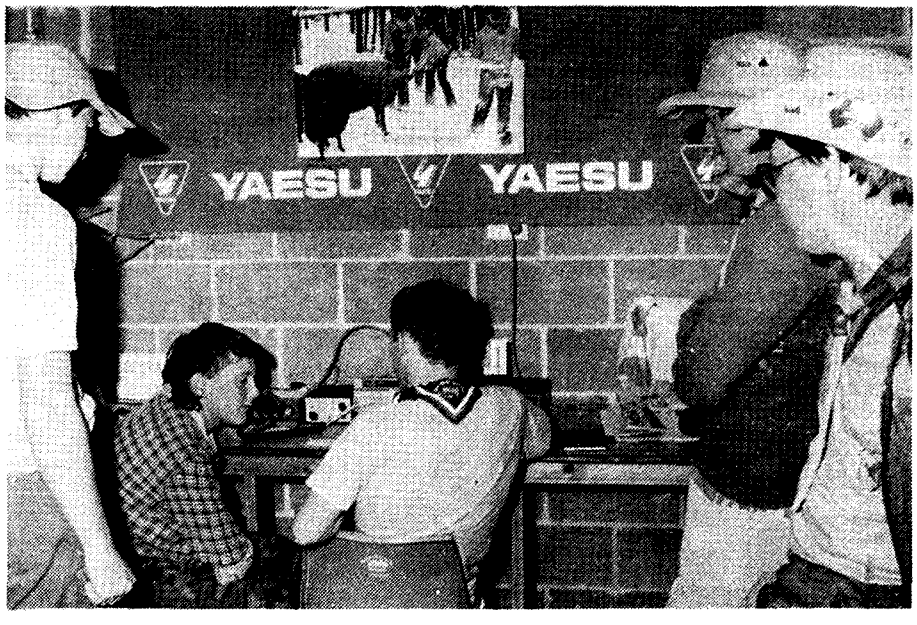


Figure 3: Ferrite Bead Balun.



Andy G4VMQ.

TOPICAL TECHNICALITIES — 6

Lindsay Lawless VK3ANJ
Box 112, Lakes Entrance, Vic. 3909

Loudspeakers and earphones, like microphones, are neglected by the amateur text books.

Most amateurs buy these items off-the-shelf on the salesman's 'say-so' and without sufficient knowledge to argue if the purchase is a 'lemon.'

The manufacturer of a good earphone set will specify the sensitivity in dB.SPL per milliwatt at 1000 Hz. My best earphones produce an output of 102 dB SPL per milliwatt. If I wear the set properly the coupling to the ear is almost 100 percent efficient and to produce conversational level (70 dB SPL), the driving power required is one microwatt to each earpiece, about four millivolts to an eight ohm set. My preferred listening level is about 6 dB higher, probably because of my aging receptors.

The earphone/ear combination is certainly a very sensitive detector. I can hear the lowest level 1000 Hz 'beat note' possible from my receiver which is about 1.5 nanowatt. The design logic which provides a maximum output of a half watt or more at the earphone jack is questionable. What would be wrong with a maximum of 10 milliwatts; and why can't we have a separate earphone volume control?

To get conversational level from a loudspeaker at the operating position is a little more complicated, I will use the following assumptions to illustrate.

(a) Speaker efficiency one percent
(b) The speaker is mounted in a perfect baffle which allows only a frontal hemispherical radiation
(c) The most usual listening distance from the speaker is one metre.

The speaker is therefore required to distribute 70 dB above 10^{-12} watts per square metre over every square metre of a surface of a hemisphere with radius one metre. The drive required is:

$$(4\P R^2/2) \times 100 \times 10^{-12} \times 10^7 = 6.28 \text{ milliwatts.}$$

This is about 220 millivolts to an eight ohm speaker and by a remarkable coincidence it tallies almost exactly with my preferred listening level at the operating position.

Why do we buy receivers with maximum output of two watts or more?

INTRODUCE A FRIEND TO AMATEUR RADIO!

LONGEST SERVING WIA FEDERAL PRESIDENT

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

The Wireless Institute of Australia's elder statesman, and Life Member, David Wardlaw VK3ADW, stepped down as the WIA's Federal President at the Institute's 1988 Federal Convention.

The 58-year-old dentist, and father of three, had served as President for a total of 11 years — in two terms — making him the longest serving in that office.

While on an overseas holiday with his wife Judy this year, he represented the WIA at the Radio Society of Great Britain 75th anniversary celebrations.

After returning to Australia, he soon had to pack his bags for a trip to Seoul, South Korea, the venue of the annual IARU Region 3 Conference.

David is to remain on the WIA Federal Executive out of a personal desire to contribute further and maintain continuity in Federal and International affairs.

He is the WIA's IARU Region 3 Liaison Officer and a member of the International Telecommunications Union CCIR (International Consultative Committee on Radio) Australian study group on the mobile and amateur radio services.

"I still feel I can contribute in the IARU area, and have a fair background of what has happened over the past 30-odd years," he said.

David has been a WIA member since 1947, and served as the VK3 Federal Councillor (the VK3 representative on the WIA's Federal Council) during 1956-57-58.

He was then elected VK3 Divisional President holding the position from 1959-63, before resigning to go overseas to further his studies and experience in dentistry. Whilst overseas he operated as VE3CAY and G3RYW. Since 1967 he has been a member of the WIA Federal Executive.

David was also the WIA's first Federal Intruder Watch Co-ordinator in 1967 and initiated the introduction of co-ordinators to handle IW activities on a regional basis throughout Australia.

While appearing at first glance to be an unassuming character, he has the ability to be at ease with people from all walks of life and is a good listener.

These attributes, plus his wealth of knowledge on amateur radio, have resulted in his endearment overseas where he is highly regarded.

David is not the table-thumping type of negotiator, however, he has displayed a doggedness on certain issues the WIA saw a need for change but were initially rejected by Australia's radio regulatory administration — now called the Department of Transport and Communication.

He participated in a number of IARU preparatory conferences for WARC 79, including a special preparatory meeting of the CCIR in 1978 which set the technical basis for WARC.

"That was where Australia, Canada and the US flew the kite for additional HF frequencies and the need for more satellite frequencies," David said.

The outcome of WARC 79 was a direct result of the ground work put in by the Amateur Radio Service.

"The main thing was that we held our own in a battle for frequencies under a lot of pressure from other services.

"We gained (at WARC) some additional high frequency bands and got a lot more access for the satellite service (amateur) to UHF and up.

"In their first look at some of the frequencies above 50 GHz the amateurs got a reasonable look in with a family of frequencies, although their importance has not yet been realised," he said.

From an Australian point of view, if representation of amateur radio had not been at WARC it was possible we could have lost the top end of two metres, 50 MHz, and half or two thirds of 70 centimetres, he said.

WARC 92 will be equally as important for the future of the Amateur Radio Service in Australia and internationally.

COMMENTS ON THE BANDS

While the 70 centimetre band could be under threat in Australia as it is overseas, David defends the allocations against suggestions that they are not being used. He said the UHF bands were populated in certain areas of Australia and there was a need for them to enable wideband transmissions, such as television.

Pressure could appear seeking the amateur HF bands at WARC 92, but David reminds us that the ARS needs a family of HF bands because of the vagaries of ionospheric propagation. Other services — Aeronautical, Maritime and Broadcast — also have a range of HF frequencies to facilitate communication over various distances.

We need access to frequencies spread throughout the HF spectrum which will enable the radio amateur to communicate and experiment over such a vast range of distances.

The so-called HF WARC 79 bands fit between the traditional DX bands for just that purpose and were increasingly becoming available to the ARS in countries throughout the world.

VK3ADW THE RADIO AMATEUR

David was first licensed as VK3ADW in 1948 and took to the air at a time when the bands were just being opened for use after World War II.

His introduction to radio was in 1937 when, as a passenger on a ship going to England, he was invited into the ship's radio room.

He said: "The ship's Radio Officer was showing me bits and pieces. I didn't understand much about it then but was interested.

"In those days the Radio Officer had to make running repairs, be the operator and run the ship's public address system — you name it they did it."

One thing that is sacred to David is the major annual WIA contest, the Remembrance Day Contest, a contest between the Australian States, which perpetuates the names of 26 WIA members who lost their lives serving Australia during World War II.

David has always been very enthusiastic about taking part in the 24-hour contest held during the weekend nearest to August 15 — the date on which hostilities ceased in the South West Pacific area. Normally the call sign, VK3ADW, features high up in the scores table of State participants.

David says he enjoys contacting people around Australia in this very friendly contest and each year competes against himself to see if he can improve his score from the previous year.

He is very keen on making field day-type antennas and tries them out by participating in the John Moyle Memorial National Field Day Contest (held in memory of John Moyle whose efforts advanced the Amateur Radio Service and pioneered research into VHF).

He also recalls taking to the field in the WIA Victorian Division's hidden 80 metre transmitter hunts held on Sundays in the late 1950s and 60s.

David is an ardent home-brewer and accomplished technician. He built his own sideband equipment in the early 1960s when he was virtually non-existent on the bands.

VIEWS ON THE WIA

"I think it is essential that the Amateur Service has a voice and the WIA is the voice," David said. "It has to have a voice internationally, and probably more importantly, internationally.

"If amateur radio is not viable internationally, and things happen on the international scene that we don't like, the WIA has to be in a position to influence change," he said.

In response to a question asking him to identify the WIA's weaknesses, David said a problem with the Institute is that it grew up as a group of individual divisions. To start with, it was a fairly loose federation, but was strengthened before WWII. The structure was considerably strengthened in 1972 when the WIA Federal Constitution was set up with each Division becoming a member of a federal body called the Wireless Institute of Australia.

David said: "It is, I feel, a little wasteful in personnel, in that, a lot of jobs seem to be duplicated — but it's difficult to work out a structure that would be ideal."

He said the Institute was not the only organisation with similar difficulties, National organisations face problems due to the vastness of Australia, and the different attitudes between the States. The States are individually different — which can be traced to the manner in which the six Australian colonies were formed over the past two centuries, and grew up before forming a Federation in 1901.

"The strength of the WIA is the support it gets from a considerable number of its members," he said.

During the past 30 years the WIA has represented the Amateur Radio Service on a wide range of issues. These included the introduction of television broadcasting, VHF repeaters, satellites, the Citizen's Band Radio Service, Novice licensing and the Radiocommunications Act. Others have been the customs import duty bylaw on amateur equipment, third party traffic and reciprocal licence agreements, negotiations on frequency allocations namely two metres (Television Channel 5a), six metres (Television Channel 0) and 576 MHz (UHF television).

The WIA has strengthened its federal and international activities, upgraded its monthly journal *Amateur Radio*, and computerised membership records, correspondence and office activities.

The WIA has responded to the regulatory and band-planning requirements of new modes and techniques being used by radio amateurs.

The Institute's active representative involvement on the Standards Association of Australia committees, which are setting standards on matters impinging on the Amateur Radio Service has been vital.

Members do respond, particularly to a perceived crisis, as evidenced by the support which was forthcoming for the WIA participation in WARC 79 — and earlier to ensure the Amateur Radio Service was considered at WARC 59.

Other issues within Australia, such as the Television Channel 5A threat to two metres saw a crisis response.

Being the Federal President is an onerous task particularly when so many changes are taking place affecting our hobby, and holders of this and other WIA office bearers positions come in for some criticism.

David said: "Sometimes the membership has probably been a little critical of what has been going on (negotiations), and it's difficult to please everyone.

"There are other users of the spectrum and the ARS gets caught sometimes as the "meat in the sandwich.

"Also, a big problem is political pressures put on by those wanting access to frequencies which is happening more and more these days."

In the past 12 months, the WIA had to deal with pressure from Multi-point Distribution Services (MDS)) a new technology broadcast-type microwave service — which was looking at microwave frequencies now used by the ARS on a shared band. Similar commercial and political pressure exists overseas — particularly in the USA, Canada, and Europe — and our near neighbour New Zealand has lost part of the 70 centimetre band because of such pressures.

DIFFICULT TIMES

The WIA has experienced extreme difficulties in recent years due to Federal Office staff illness. David said the WIA had become dependent upon its Federal Secretary and Business Manager. But four who have held that position in recent years have fallen ill and been unable to continue.

This puts pressure on the voluntary Federal Executive, and in particular the President and Treasurer — and the load has been heavy in the lead-up to the WIA Federal Convention.

Other difficult times have resulted from disputes between the Divisions. David did not want to specify such disputes, but as an example gave one, many years ago, which concerned repeater frequencies. He said it had been internationally agreed that a segment of two metres was to be used as a satellite band. Whilst some WIA Divisions were prepared to change their repeater frequencies out of this segment, some were not. The situation was eventually resolved by all the WIA Divisions working together.

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BROCHURE DOC71 ESSENTIAL FOR ALL RADIO AMATEURS

A review by Jim Linton VK3PC

Australia's radio licensing and regulatory authority has previously issued editions of a publication called *The Amateur Operators Handbook* which set out the rules governing the Amateur Radio Service.

The "Regs Book", as it was fondly nicknamed, has been out of print for several years. The last edition was out of date and did not reflect the changes which came into effect with the Radiocommunications Act 1983.

It had been recognised that material could be presented in a better format. The Department of Transport and Communication decided to split the Handbook into three sections and print a brochure for each.

DOC71 "Licence conditions and regulations applicable to the Amateur Service" was given priority and is now available.

The brochure is easy to read and outlines the licence conditions for every amateur station in the Commonwealth of Australia and its territories.

Two other brochures will be released later. DOC70 "Information for Prospective Amateur Operators" (self-explanatory) and DOC72 "Amateur Service — Operating Procedures" which will cover such things as operating guidelines, calling procedure, the Q-code, and distress/emergency procedure.

DOC71 begins by summarising the ITU definition of our hobby: The use of amateur stations shall be solely for the purposes of self-training, intercommunications of a personal nature and investigation into radio communications.

THIRD PARTY TRAFFIC

The Department sets out the rules governing Third Party Traffic (TPT). "Transmissions by an amateur station licensee, on behalf of a third party, shall be restricted to conversation/messages of a technical or personal nature."

TPT messages shall not: "Be transmitted to another country which had not made a special agreement with Australia for the exchange of such traffic."

Except in the event of a natural disaster or as authorised by the Minister or an authorised departmental officer, the licensee of an amateur station shall not solicit for third party traffic.

DOC71 in its Appendix A "Terms and Definitions" says: "Third Party Traffic" . . . in relation to the communications between two amateur stations means messages passed on behalf of any other person.

The Department has explained to *Amateur Radio* magazine that what it is stating here is "any other person" means anyone, including other radio amateurs not directly taking part in the contact. Therefore, it clearly sets out that, where a TPT agreement is not in force between two countries — the licensees are not permitted to pass a message on to "any other person". For example, an Australia station can, during a contact with one in the USA, take a message for on-passing to "any other person" including another radio amateur, because Australia and the USA have a TPT agreement. But, when such a QSO is between Australia and a station in a country which has not reached a TPT agreement, a message cannot be on-passed.

CONTROL OF STATION

Written authorisation is required before a radio amateur can operate an amateur station in the absence of the station licensee.

The Department explained to AR that "written authorisation" is required under the Radiocommunications Act — and, in the case of an amateur station, can be a simple letter.

When permitting an unqualified person (one who has an amateur operators certificate) to transmit from the station, the licensee shall be physically present to to supervise and control all operations.

UNATTENDED STATIONS

Only stations using packet radio or RTTY modes shall be operated without the licensee being physically present to control the transmitter. The Department does not allow experimentation with unattended telephony stations.

Requirements for watchdog timers and the prompt termination of transmissions in the event of interference caused to other services, a standing requirement for repeaters, also apply to unattended stations.

Stations, when using packet radio or RTTY modes of operation, shall not be connected to Telecom's switched telephone network. This refers to bulletin boards which are not permitted to be accessed, both via a dial-up telephone number and on air.

Phone patch is not mentioned specifically. But reference is made to the (Telecom) ban on amateur repeaters being patched (autopatch) to the telephone network, because Telecom believes this is in competition with mobile telephone services.

STATION REQUIREMENTS

Other sections in DOC71 cover Interference, Portable Operation, Display of Station Licence, Inspection of Stations, Identification (use of call signs), Re-transmissions, Repeaters, Translators and Beacons, and Club Station requirements.

The latter must keep a log book containing full details of all transmissions, and the name and call sign of the qualified person controlling the transmissions. Such stations cannot operate portable without the prior approval of the DOTC State Manager.

EMISSION MODES

The class of emissions, power limits, and frequencies permitted for use by Novices, Limited and Unrestricted licensees are detailed and up to date. They no longer appear on individual amateur station licence certificates. Licensees are expected to refer to DOC71 for that information.

While emissions, modes and bandwidths are specified for bands below 30 MHz, the Department has recognised that to place firm restrictions (for Limited and Unrestricted licensees) on the VHF, UHF and SHF bands could hamper experimentation.

Wideband television or pulse emission modes are to be used only on bands above 420 MHz because the necessary bandwidths are not available on lower bands. However, experimentation with all other modes, including those not yet defined, can take place on bands above 50 MHz provided they ensure the emission mode does not:

Cause interference to other primary/secondary services on the band/s, or inhibit other amateur stations from using the band/s.

Novice licensees are, when operating in the 146 to 148 MHz band, restricted to emission mode 16K00F3E (FM) at a power limit of 10 watts.

Footnotes to a table of frequency bands include frequencies in the 1.8, 3.5, 10, 18 and 24 MHz bands that must be avoided to prevent interference with shared services.

The special conditions applying to operation on the six metre band to avoid interference with Television Channel 0 are listed.

Also included is an extract from the Radiocommunications Act on the conditions all transmitter licences are subject to.

DOC71 contains the conditions and regulations under which all amateur stations operate — your shack cannot afford to be without it.

ar

EMERGENCY VK/ZL THIRD PARTY TRAFFIC

A temporary third party agreement enabled about 100 health and welfare messages to be passed between New Zealand and Australia following storms which struck New Zealand's North Island.

The New Zealand Radio Frequency Service (Department of Trade and Industry) and Australia's Department of Transport and Communications authorised third party traffic handling by the Amateur Radio Service.

Many telephone exchanges in the North Island were affected by the storm.

The temporary agreement lasted from March 8 to 14. There was no indication if a permanent agreement would be sought.

ERASABLE COMPACT DISC

Tandy Corporation has developed an erasable compact disc. The new product, on which music and video or computer data can be repeatedly recorded and erased, is a big advance on existing compact discs, whose contents cannot be changed.

Tandy claim the new disc, called Thor-CD, is a world first and could prove very lucrative for the company marketing it through its retail stores.

DEPARTMENT OF TRANSPORT AND COMMUNICATIONS

Our Reference: 86/1933

Your Reference:

Contact: A Jordan
(062) 48 3844

Wireless Institute of Australia
Amateur Radio Action

State Managers
Communications Operations Division
All States

INTRODUCTION OF NEW LICENCE CONDITIONS FOR THE AMATEUR SERVICE

In accordance with Section 25(3) of the Radiocommunications Act 1983 it is advised that some conditions imposed on Amateur licences under Section 25(1)(k) of the Radiocommunications Act 1983 are to be changed.

From 1 June 1988 reference to the conditions specified in the current Amateur Operators Handbook will be changed to a reference to those specified in the departmental brochure DOC71.

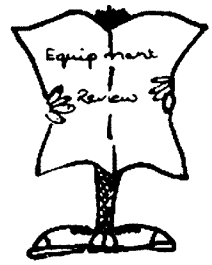
This reflects the introduction of an up to date set of licensing conditions for the Amateur Service.

D HUNT
Manager Regulatory
Radiocommunications Operations Branch
Communications Operations Division

29 April 1988

Australia 1788-1988

GPO Box 594 Canberra ACT 2601 Telephone: (062) 641177 Telex: 62025 Facsimile: 644608



Equipment Review

YAESU FT-747GX

Ron Cook VK3AFW
and
Bill Roper VK3ARZ

Are you one of those amateurs who believes that the modern HF transceiver has become too complex? That it has far too many controls? That the prices are putting this sort of equipment out of the reach of many people?

Then this latest rig from the Yaesu stable may be just the rig for you!

Along with other major transceiver manufacturers, Yaesu have obviously been doing their market research and discovered that many amateurs are asking for "simplicity" of operation in state-of-the-art HF transceivers.

The first impressions of the FT-747GX are the smallness, the light weight and, most of all, a clean, uncluttered front panel with a minimum number of controls.

Subsequent checks showed that this modern, 100 watt, all-band HF transceiver was not only lighter than the ubiquitous FT7, but it was also considerably smaller.

FACILITIES

As you would expect from a state-of-the-art rig the FT-747GX has a general coverage receiver that tunes from 100 kHz to 30 MHz, and provides 100 watts of RF output on the HF amateur bands on SSB and CW, 100 watts peak AM, and 100 watts of FM with the optional plug-in board.

Also, in common with most modern Yaesu transceivers, a significant feature is the RS232 computer interface facility which enables Computer Aided Transceiver operation with an external computer.

There is the usual dual VFO facility, and 20 memory channels which store the mode as well as the frequency. Split frequency operation is possible with 18 of these memory channels. A feature of the memory operation is the ability to move from VFO to memory frequency, and back, without losing the VFO frequency. Further, even while tuning the receiver, it can periodically check a priority channel stored in one of the memories.

Wide band AM (6 kHz) and narrow band CW (500 Hz) filters are available as options.

Because the front panel controls are few in number, they are of a large size, eminently suitable for large, Australian style fingers. The ergonomic layout of these controls cannot be faulted, particularly for right handed operators.

The switch controls, which are all push button, include power on/off, clarifier, dial lock, tuning rate, band selection, mode selection, VFO memory transfer, VFO split, priority channel, monitor, normal/narrow IF filter selection, 20 dB attenuator, noise blanker and manual transmit.

The tuning knob dominates the front panel and tunes in 25 Hz or 2.5 kHz steps for SSB/CW. AM tuning rates are 1 and 10 kHz. FM rates are 5 and 12.5 kHz.

The remaining front panel controls are two concentric sets of knobs controlling receive audio gain, squelch (which operates on all modes), microphone gain and drive level.

An impressive feature of the transceiver is the large, very easy to read, amber coloured LCD display, which shows the operating frequency to 100 Hz, the memory channel in use, VFO A or B, modes, and status of the front panel controls.

The remarkable uncluttered back panel of the rig provides facilities for carrier frequency adjustment, connection of DC powered accessories, external speaker, key, tape recorder, linear amplifier and ATU switching, 13.5 volts DC socket, earth terminal and antenna socket.

Also, unusual in a modern HF transceiver, the speaker is mounted on the front panel.

In order to minimise stray RF pickup and radiation, the entire plastic case has been effectively metallised. The reviewers were impressed by the precision in manufacture of the case, particularly as it does not screw together in the conventional manner but successfully employs a system using two sliding clips.

For extended operation with FM, RTTY, Packet, SSTV and AMTOR, a heavy duty power supply rated at 19 amps minimum is required.

Considerable reduction in the size of the PA heat sink has been accomplished by a unique design, completely contained inside the case, which relies heavily on forced convention cooling provided by an internal fan.

In order to achieve the aim of compactness and simplicity of operation, without sacrificing performance, Yaesu have excluded some of the lesser used bells and whistles features that have almost become standard in modern transceivers, namely VOX, speech processing, IF shift or passband tuning, RF gain control (although a 20 dB attenuator is included), meter switching and a notch filter.

TECHNICAL DESCRIPTION

The receiver is basically a dual conversion, superheterodyne employing up-conversion to a first IF at 47.055 MHz, with the main IF frequency being at 8.215 MHz, where crystal filters provide the appropriate selectivity.

The first mixer has been designed to provide a very wide dynamic range, and yet, at the same time, achieve a low noise figure. Therefore, no RF stage is necessary. A somewhat unusual feature of the receiver is the provision of a surge suppressor and a small lamp fuse in series with the antenna connection to protect the receiver circuitry from high voltage pulses appearing at the antenna terminal.

Extensive bandpass filtering ahead of this first mixer eliminates significant responses to out-of-band signals.

FETs are used almost exclusively in the receiver RF circuitry which undoubtedly assists with the 100 dB dynamic range quoted.

Five voltage-controlled oscillators provide the injection signals. The frequency synthesiser, and other receiver functions, are controlled by an 80-pin micro-processor chip.

The transmitter generates sideband signals in the conventional manner. CW purists will be pleased to note that the CW carrier is generated, not by an audio oscillator, but by pulling the upper sideband carrier crystal into the filter passband, hence giving a very clean CW signal. Semi-QSK operation is provided.

The Microphone demonstrates the compact size of the Yaesu FT-747GX.

Negative feedback is used in the power amplifier stages to ensure very linear operation. Thermal overload and excess reflected power level protection is provided to the final transistors.

ON TEST

The specification on frequency stability quotes 200 Hz without stating a period of time. Our tests showed that the unit took one hour and 15 minutes to reach this amount of drift which is typical of the modem, amateur bands transceiver. A high stability oscillator is available as an optional extra.

Several low level spurious responses were noted on receive, but none were strong enough to register on the S-meter and are unlikely to trouble anyone.

The linearity of the S-meter was only fair, being somewhat generous at the accepted S9 level, and rather "Scotch" at the low signal level. However, the AGC action was very good and we could not find a receive situation that required the use of an RF gain control. The omission of such a control is obviously not a problem with this receiver.

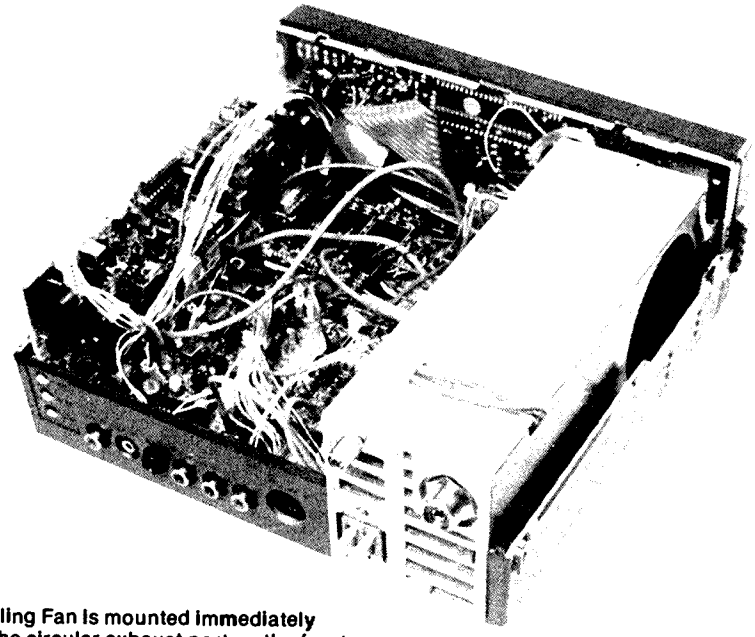
The noise blanker dealt effectively with impulse noise but, as was expected, did not produce any noticeable reduction in the *Woodpecker* on the one occasion we tried.

Although the audio from the miniature, in-built speaker was surprisingly good, it improved noticeably when a large, external speaker was connected. Internally generated noise seemed to be lower than some other similar transceivers.

The transmitter output power was measured on all bands and ranged from 75 watts on the top end of 10 metres to 100 watts on 40 metres. Output on 160 metres was 90 watts.

On-air reports of the transmitted audio quality were very complimentary.

The relay operation was extremely quiet; however, the noise of the cooling fan was louder than one has come to expect from a modern transceiver. The noise was possibly due, as much as anything else, to the unusual placement of the fan on the side of the case, close to the front panel. Because of the small thermal capacity of the heat sink, the fan came into operation after only a short period of transmission, and turned off almost immediately transmission ceased.



The Cooling Fan is mounted immediately behind the circular exhaust port on the front panel end of the Heat Sink.

Although the fan noise was noticeable the reviewers did not consider it to be a problem.

Unfortunately we were unable to check out the CAT capabilities of the unit.

ON THE AIR

At first it seemed strange to be reviewing a new HF transceiver with so few controls on the front panel. Nevertheless, it soon established itself as a very "user friendly" unit and, unlike some other units tested recently, did not require frequent reference to the manual to learn how to use its various features.

This must be one of the easiest to use transceivers on the market today, requiring only adjacent of the frequency and audio levels to achieve normal operation.

An unusual feature is the indented action of the VFO knob reminiscent of some of the channelised VHF transceivers. One of the reviewers felt uncomfortable with the lack of smoothness in tuning, but the other reviewer believed that this form of digitised tuning had a number of advantages, particularly in a mobile situation.

INSTRUCTION MANUAL

As has now become fairly common, the manual addresses operational features with almost no technical information but is quite adequate for the average amateur.

A section at the back gives sufficient detail of the Computer Aided Transceiver facility.

SUMMARY

The FT-747GX transceiver is a surprisingly small and light rig, providing all of the basic facilities expected by today's amateur radio operator. The reviewers consider that it may well become one of Yaesu's classic models.

At the advertised price of $1399, it is excellent value for money.

The transceiver reviewed was kindly supplied by Andrews Communications Systems.

ar

THE REVIEWERS

BILL ROPER VK3ARZ, was first licensed in 1959 and has been active on HF and VHF ever since. He has been employed by the State Bank Victoria for over 35 years and, although spending most of that time in a variety of administrative positions, is currently a senior branch manager.

All his earlier receivers and transmitters were home designed and built until he reluctantly faced the inevitable and gradually changed over to commercial equipment during the early 1970s. Bill is well-known for his many modifications to the commercial rigs he has owned since then, firmly believing that improvements are always possible to mass-produced equipment.

In conjunction with Ron Fisher VK3OM, he has had the opportunity to operate, test and compare virtually every model of commercial HF transceiver sold in Australia in the past 15 to 20 years. Bill's main on-air activity is on 80, 20 and 15 metres SSB, and two metres FM, but he uses all HF bands from time to time, and enjoys antenna experiments and finding new ways of modifying his commercial equipment.

Bill's other hobbies include computers, reading, light classical music and photography.

RON COOK VK3AFW, was first licensed in 1961 and upgraded to the AOCP in 1964. He is a professionally qualified electrical and electronic engineer who has worked at the Government Aircraft Factories, and the Defence Standards Laboratories, transferring to the CSIRO in 1979, where he is presently the Officer-in-Charge of the Melbourne branch of the Division of Applied Physics. This laboratory is responsible for maintaining and disseminating standards of physical measurements and undertaking research in applied physics for industry.

Ever since developing an interest in radio as a teenager, Ron has been involved with radio clubs and the WIA in various capacities, and is perhaps best known for the series of articles entitled Novice Notes which was published in *Amateur Radio* magazine over many years.

Ron's main amateur radio interest at present is in computer aided analysis of antennas, but he maintains an interest in an occasional venture into home built equipment for the shack. Other hobby interests include snow skiing and home maintenance.

RAISING THOSE WIRE SKY-HOOKS

Peter Robinson VK4DFR
PO Box 874, Cairns, Old. 4870

One of the most interesting facets about amateur radio is playing with aerials/antennas!

Ever since I was 11 years old, and Pat the Postman gave me my first cat's-whisker crystal set, and friend John and I went to Waltham Dan's to buy a mile drum of Don 8 army telephone wire for £1.5.6d, which we were unable to carry, and rolled it down Oxford Street scattering angry shoppers, and down the stairs of the railway station, chipping the marble off each stair, and dragging it on to a train home at peak hour, amidst angry commuters, I have had the problem of raising that wire into the sky.

We got it up eventually, well not quite all of it, but every tree and post around my parents' house had wires and insulators attached, it criss-crossed the roof a dozen times at least, and must have looked like some crazy fisherman's net hung out to dry. But it worked, and that little DX crystal set led me to a most interesting career in electronics, and many, many happy years of the fine art of amateur radio.

One of the most interesting facets about amateur radio is playing with aerials (now antennas). One of the most difficult things about aerials is getting them up in the air, the wire ones, I mean. Not being 11 years old any more means not being able to shoot up a tree like a squirrel, hanging precariously to the uppermost branches where that aerial just has to go!

Over the years many methods have been tried for getting that wire up, from flying kites over the tree, balloons filled with gas from Mum's stove (shot down with an air rifle when they dragged the line over the branch) to attempts to train the pet cat and even a monkey in Borneo. All have met with varying degrees of success. but now I use a method or two that are so simple and effective you will wonder why you never thought of it. And many people have not thought of it, because they keep asking me how on earth I got that wire up in the tree!

METHOD 1 — CASTING: Fishing Rod and Reel

Use a light, flexible casting rod, with an open-faced reel. Light line, about six pound will do, and a small sinker. No hook is necessary!

It is important to do a little practice first, out in the open, to get the feel of it all, then, when you are ready, give it a try. With luck, you will get the line over just where you want it. Without luck, you will hit the neighbour's dog, break a window or get hopelessly tangled in Mum's washing. So, be careful!

METHOD 2 — THE CATAPULT

This is the method I prefer, as I find it more accurate than my casting. Good catapults can be obtained from many sporting goods stores. They can also be home-made from a forked piece of wood and some inner-tube rubber.

With this method you also use the open-faced reel, but only use the lower portion of the rod.

Prop the base of the rod in the ground, facing the way you want to fire, make sure the bail on the reel is pulled back, and aim over the branch. Again, it is a good idea to practice in the open first.

SOME IMPORTANT TIPS

1. Do not try to use a level wind reel (common trolling reel). The line will not be released fast enough, you will invariably end with a tangled mess, and possibly a high speed sinker rebounding into your forehead.
2. If your line has been stored unused for some time on you open-faced reel, string it out first, then wind it back onto the reel. Otherwise it may stick and tangle.
3. Practice either method in the open first!
4. Be very careful as to what is in your line of fire. The sinker will be travelling at a high velocity — and it may come off the line if it hasn't been tied on properly. Neighbour's dogs, cats, windows, children, powerlines, police on the beat and DOTC inspectors should be well out of range!
5. Choose the right angle when firing upwards. Do not shoot towards the sun.
6. MOST IMPORTANT — It may take several attempts to get the line over the correct branch. If begins on the wrong one, the line will most likely settle in a fork. Recover the line gently, and the sinker will usually hop back over. If it sticks there, **do not pull harder!** It will spring straight back at you with tremendous velocity, just like a bullet. **Be careful!** If it does stick, cut the line at the reel, and the sinker should fall and be recovered easily.

The rest is more or less obvious. When the light fishing line is over the required branch, use it to pull some heavier line, or light cord over, then attach whatever lines or ropes that are required and haul up the antenna. It is best not to use more fishing line here as birds will fly into it and injure themselves.

Do not forget to fit rubber shock cords or counterweights to allow for tree sway in the wind. Incidentally, if the antenna wire snags on other branches when pulling it up, try casting a line over the wire, to pull it to one side as the main halyard is pulled.

Take care, think **safety always** and good DX!

ar

VHF UHF — an expanding world

Eric Jamieson VK5LP
8 West Terrace, Meningie, SA. 5264

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.005	H44HIR	*Honiara*
50.005	ZS2SIX	*South Africa*
50.011	JA2IGY	*Mie* [1]
50.075	VS6SIX	*Hong Kong*
50.075	ZS4SA	*South Africa*
51.020	ZL1UHF	*Auckland*
52.013	P29BPL	*Port Moresby*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.432	VK0MA	*Mawson*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.445	VK4RIK	*Cairns*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
52.510	ZL2MHF	*Mount Climie*
144.022	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.445	VK4RIK	*Cairns*
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
144.950	VK3RCW	*Melbourne*
145.000	VK6RPH	*Perth*
432.066	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK1RBC	*Canberra*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*Macleod*
432.540	VK4RAR	*Rockhampton*
1296.198	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*
10445.000	VK4RIK	*Cairns*

1. JA1VOK, in his column *World VHF News* from *FIVE NINE* March 1988 confirms the Mie beacon, JA2IGY, is working continuously, but 1 kHz higher on 50.011 MHz. He also reports two other "personal beacons" JE6ZIH on 50 .020 and JG1ZGW on 50.490 MHz. A beacon is also planned for DU. KH6JJK has a "personal beacon" on 50.080 MHz from time to time.

Bill VK5ACY, advises AH6IO, in Hawaii, has a beacon on 50.070 MHz running 170 watts to a five element beam from a good location.

A letter from Jeff Pages VK2BYY, reports the Sydney beacons are presently using the special call sign, AX2RSY, as part of the New South Wales Division's celebrations of the Bicentenary. The call sign change occurred at 0000 UTC on January 26, and will continue until December 31, 1988. A special QSL card featuring the Bicentenary logo is being printed, and will be sent in return for reports received.

In addition to the call sign change, the 10 metre beacon sends the words *Australia Bicentenary* to acquaint overseas listeners of the significance of the AX prefix.

A letter has also come from Randall Lawrence VK2EFA, at Broken Hill, who advises their six metre beacon, VK2RBH, is still under construction and hopes are held that it will be in operation before next summer, as the transmitter is ready and the PCBs for the identification are under construction. Randall invites VHF and UHF operators to remember there are active stations in Broken Hill and pointing beams in their direction may produce surprises!

Via John VK4PU, comes advice from David H44DL (ex-VK4DT) that the H44HIR beacon on 50.005 MHz is fully operational 24 hours a day. If heard, and you want to alert a response, a phone call to Honiara 20051 will suffice. This will alert Graham Richardson H44GR, or Greg Pearson H44GP — just ask for them by name. They also monitor 28.885 MHz.

SIX METRES

Well, six metre has been producing results again! During the latter part of March, contacts were being made over a considerable area, extending from Japan, Hawaii and many points in the Pacific.

Following the collapse of the six metre band around the third week in December 1987, with the collapse continuing right into January, it took the approaching equinoxial period to brighten up the spectrum.

A letter from John VK4FNQ, at Townsville, gives a very good insight into what has been happening. He writes:

"I had contacts on six metres every month in 1987 except for May, via Es. I am still moving around Queensland even though I have a house near Yabula, 25 kilometres north of Townsville. I use an IC-505 with an HL66V amplifier and six element Yagi six metres high. When mobile I use the same equipment with a quarter wave whip on the front of the vehicle. The JA contacts are shown as numbers because there are so many of them!

"16/2/88: 0415 to 0446 JAs; 19/2: 1028 to 1139 26 JAs; 20/2: 0648 to 0700 3 JAs; (Location — mobile near Marathon 60 km west of Hughenden). 28/2: VK3XEX and heard VK3s working JAs; 10/3: 0917 to 1015 14 JAs' 17/3: 1122 to 1158 8 JAs; 19/3: 0410 to 0456 12 JAs (all whilst mobile). From Townsville I worked on 21/3: 1020 to 1123 13 JAs; 22/3: 0520 to 1040 7 JAs; 23/3: 0134 to 1129 2 JAs; 24/3: 1035 to 1051 4 JAs; 24/3: 1049 worked HL9CB on 50.109 to 5x4; 25/3: 0916 to 0937 3 JAs; 0939 HL9CB 5x9, 0944 HL9TM 5x9, 0954 HL2ASH 5x8. All these around 50.109 MHz. 25/3: 0955 HL9TM 5x9 on 52.035, also on FM 5x5. 26/3: 0442 50.107 KH6JJI 5x9; 0550 52.040 VK2XJ 5x5, 0805 50.109 KH6HI 5x5; 0814 50.109 KH6IAA 5x1. 28/3: 0435 50.104 KH6VP 5x9; 0440 50.104 KH6IJ 5x8; 0446 50.104 KH6JJI 5x5; 0501 50.109 KH6HI 5x5; 0551 50.109 KH6IAA 5x7; 1112 50.109 HL9TM 5x9; 0919 to 1011 worked 11 JAs. 29/3: 1023 50.109 HL9TM 5x3; 0128 to 1033 2 JAs. 30/3: 0259 52.040 KH6JJI 5x9 + 60 dB; 0305 52.040 KH6VP 5x9 + 20 dB using 10 watts both ways! 0314 50.109 KH6HI 5x9; 0326 50.109 KH6IJ 5x9; 0330 50.109 KH6JJK 4x1; 0345 52.049 KH6FQ 5x9; 0347 1 JA. 31/3: 0125 1 JA.

"1/4: 0339 50.109 W6DMJ/KH6 4x1, mobile near Warrigal; 1010 50.110 HL9CB 5x1 mobile near Hughenden; 2/4: 0315 50.120 KH6JJI 5x5 mobile Balfes Creek; 0319 50.110 KH6IJ 5x5 mobile near Chartres Towers, also from there at 0343 52.050 KH6JJI 5x1; 0542 to 0634 worked 2 JAs; 0634 50.110 HL9TM 5x3' 0715 50.130 HL9CB 5x5. 3/4: 0219 50.110 VK9NL/KH1 5x1; 0225 50.110 KH6IAA 5x9' 0227 52.050 KH6JJI 5x9; 0232 50.110 N0IZ/KH1 5x1; 0248 50.105 KH6HI 5x9; 0257 50.105 KH6VP 5x9; 0258 50.105 KH6FLD 4x1; 0312 50.105 K6GSS/KH6 5x8; 0329 50.105 KH6JJK 5x3, power 2 watts! 0349 50.120 KH6CH 5x7; 0829 50.112 W4FL/KH3 5x5; 0831 50.122 W6DMJ/KH6 5x1; 0854 50.104 KH6IJ 4x3. Many JAs heard calling FK8, T20, etc. 1035 50.110 HL9TM 5x9. 4/4 heard many JAs throughout the day. 1200 UTC heard KG6DX on Guam working T3V and other stations working Joe."

Thanks for the most interesting letter John.

John VK4PU, reports the opening on 30/3 to Hawaii and Japan between 2030 and 0330. He heard VK2s and northern VK4s working them on 50 MHz. Noticed a beacon, JA7ZMA, on 50.029 MHz. On 52.040, John worked JH0, 1 and 7, also a couple of KH6s on 52.040 MHz. Also, Al KH6IAA, sends his regards to the VHF gang in Australia.

Adding further to reports of good conditions cam telephone calls from my old friend John VK4ZJB, who reported VK4s were working JAs on 25/3 on 50 MHz. On 26/3, JA3 and JA4 on 50 and 52 MHz at 5x9; 28/3 JJ1 and JH6 to VK4; 29/3: John mentions VK4 to W6 and W5. In the absence of other reports, it may be that the stations in question were those mentioned in the VK4FNQ report and operating /KH6; 30/3 JAs to VK4 at 5x9 on 52 MHz.

A further message on 30/3 mentions he big opening to KH6 on 52.050 from 0230 to KH6JII and others. Those to work them included VK4s ZJB, ZAL and ZAA. Later in the afternoon, round 0700, good signals were available from Japan on 52 MHz.

Bill VK5ACY, is another to receive reports from the Hawaiian stations of their considerable contacts to Japan, VK2 and VK4. AH6IO in Hawaii has been worked on 50.050 MHz.

Col VK5RO, was the first in VK5 to break the silence into Japan when he recently worked some JAs late in the afternoon, also to KH6 on 50.050 MHz.

Taken overall, the 1988 autumn equinox has provided many surprises for those who have been watching the bands. It almost seems as though six metres is making up for its shortcomings during December and January by providing so many excellent contacts over such a wide area. It certainly augurs very well for the now gradual climb out of the trough of the cycle to the peak of Cycle 22. In the past the autumn contacts have usually been superior to those in the spring, but it will pay to be around next September and October.

Some late notes have come to hand from Phillip Hardstaff FK1TS, in Noumea, where he has been having a ball on six metres. He reports:

"The following is a log summary of bits and pieces, also my more memorable contacts. I run 25 watts into a two element quad. When I get back from Melbourne I will run 160 watts on two metres (all modes) to a five element quad. I will be scanning from 144.100 to 144.350 MHz as of June 1, 1988.

"I expect to operate six metres from American Samoa from August 11 to 29; as 3D2TS from Fiji 16/9 to 2/10; as ZK1? ? Cook Islands 4/10 to 16/10.

"Between 20/3 and 7/4 FK1TS worked 867 JAs! 19/3: 0424 to 0813 2 JAs, 3 KH6s; 20/3: 0416 to 0451 25 JAs; 21/3: 0800 to 0840 11 JAs, 2 KH6s; 22/3: 0514 to 0613 92 JAs; 26/3: 0614 to 0945 67 JAs, 2 KH6s; 28/3: 0454 to 1002 36 JAs, 4 KH6s; 29/3: 0520 to 1013 7 JAs, 5 KH6s; 30/3: 0519 to 0856 116 JAs, 2 KH6s; 1/4: 0432 to 0945 114 JAs, 2 KH6s, HL9CB, NO1Z/KH1; 2/4: 0223 to 1011 176 JAs, 3 KH6s, HL9CB; 3/4: 0245 to 0738 139 JAs, 3 KH6s, NO1Z/KH1, WY5L/KH3; 4/4: 0220 to 0402 19 JAs; 5/4: 0515 to 0551 5 JAs; 7/4: 0505 to 0811 56 JAs, 4 KH6s; 9/4: 0925 JA5.

"Between 25/12/87 and 3/4/88 the following countries were worked:
VK, ZL, 3D2, JA, HL, KH6, KH1, KH3 and FK — nine countries.

"KH6 stations worked: KH6IAA, KH6IJM KH6JJI, KH6HI, KH6VP, KH6JJK, W6DMJ/KH6, K6GSS/KH6. Plus NO1Z/KH1, WY5L/KH3 and NO1Z/KH1 worked WY5L/KH3 at 0730 on 3/4. FK1TS worked KH6IJ at 0728 on 28/3 with 25 watts received S9+, 2.5 watts S7, 0.25 watts S2. Also worked KH6JJK 3 watts to 3 watts at 0649 on 7/4.

"KH6IJ worked South America during March; KH6IJ and KH6JJI both reported working to USA on 28/3; KH6HI runs 500 watts into four 40 foot Yagis (moonbounce capable); KH6HI worked T22JJ at 0823 on 19/3; VK4FXX to KH6JJI 0709 31/3; VK2XJ worked KH6 30-31/3; VK4JH to HL9CB 0800 1/4; HL9TM to VK4ZJB (mobile) 0639 2/4; JA7WSZ to H44GR 0940 29/3; JAs working KH6 30/3; VK8GF to HL9CB 0521 2/4; VK8LM to JG2BRI 1017 31/3; VK4DO to JA4MBM (mobile) 0919 7/4; VK8ZCU to JF3QJR 1036 7/4; JA4MBM to H44GR 1037 7/4. In addition, numerous times VK4s have been heard working JAs and KH6s, both sides of contact being available!"

Thanks Phillip for that interesting summary of contacts. It certainly is looking good for six metres and Cycle 22 at the moment.

THE OTHER BANDS

The sudden burst of activity on six metres may give the impression nothing is being achieved on the bands 144, 432 and 1296 MHz. To the contrary, these bands have been most active during the past month or so, aided by a very large high pressure system which remained useful for a week or more. (Please refer to last month's AR, page 34, weather charts kindly provided by the Commonwealth Bureau of Meteorology and Ken VK3AH.). Comments on the three bands are interwoven because it is difficult to separate information which originates on 144 and then goes on to 432 and 1296.

Trevor VK5NC, in Mount Gambier, has been putting that place on the map! On 1/3 he contented himself by working Joe VK7JG, at 0900 on 144, 0922 on 432 and 0924 on 1296! On 18/3, Trevor gave the same three band treatment to VK3ZJC between 1129 and 1138 UTC. At 1200, it was VK6AOM, at Esperance on 144, followed by VK6JXX on three bands. At 1231, a contact with VK6AOM on 1296, whilst 432 was quite weak. At 1303, VK6AOM on 432 for a good contact. Then over to Wally VK6WG in Albany, at 1339 on 144, 1342 on 432 and 1600 on 1296 MHz, with signals 5x5.

The big event of the night, of course, were the contacts between Les VK3ZBJ and Roly VK3KXW to Wally VK6WG, on 1296 MHz for Australian and State records. This was reported in some detail last month. It will take some very careful checking to see who does in fact hold the record because VK3ZBJ and VK3KXW are not far apart.

Roly has sent an account of how events transpired around the time of the record breaking contacts. He says:

"On March 18, at 1030 UTC, the Mount Gambier repeater was S9 here at Mount Eliza. Dave VK6AOM, broke in and asked VK5AKJ to QSY to 432 MHz at 1035 UTC. I did too and worked VK6AOM 5x7. Then Ron VK5AKJ, said VK5NC and VK6WG were in contact on two metres and would be trying 1296 later. I worked both stations on 144 and 432 MHz at 5x9 both ways, around 1300 UTC.

"At 1305 worked VK6AOM on 432 at 5x7. At 1342 heard CW ident from VK6WG on 1296 at 5x5 and replayed the signal back to VK5NC and VK6WG on 432. The signals were as good at Mount Eliza as Mount Gambier. First had a crossband contact from 432 to Wally VK6WG, on 1296, his signal was 5x5. At 1548, called VK6WG on 1296 and received 329. Wally finally confirmed my report at 1629. At 1638, worked VK5NC on 1296 at 5x6. Also heard Les VK3ZBJ, having his contact with VK6WG on 1296.

"On 1296, I use an IC-1271A, four 28 element loop Yagis fed with 8DFB coaxial cable at 40 feet, Icom preamplifier.

"On 21/3 worked VK6WG on 144 at 0425 5x7' 0600 VK7JG on 1296 5x5, then FM at 0602 5x9, VK7DC at 0605 1296 FM 5x9 (VK7DC using only a dipole). At 1520, VK6AOM on 144 5x9, then 1296 at 1627 569. Dave VK6AOM, said I was his first VK3 contact out of Esperance also the first on 1296! My 1296 contact to VK6WG is believed to be the first VK3 to VK6. 22/3: 0043 VK6BE on FM at 5x9. 5/4: at 1338 VK5RO and VK5NY on 144 and 432 at 5x9. 6/4: VK6WG on 144 at 0152 5x5, 432 4x5, but no 1296.

"On 144 I use an IC-271H with preamplifier, 12 element crossed Yagi fed with RG213. On 432, IC-471H with preamplifier, 88 element Jay beam fed with RG213 cable.

Thanks for writing Roly, it certainly was an exciting period for all concerned. I note too, that you have received all the relevant QSL cards for the contacts.

The good conditions continued through the weekend of the John Moyle Field Day Contest and a number of stations were out in the field on VHF and had some good contacts. VK5LP even had a CW contact with Graham VK3YEJ/3 on 144.200 MHz, which was worth quite a lot of points to him! The good conditions brought a few stations out of the woodwork. Noted VK5KAF at Millicent having his first two metre contact to VK6. Albany stations included VK6s XY, WG, BE, ZBH, UD and YAB.

It was quite a pleasure for VK5LP, at Meningie, to have contact into Albany at 5x9 on both 144 and 432 MHz. This has whetted the appetite enough for the dust to be removed from the 1296 MHz transverter and to be looking at doing something about the 1296 MHz antenna system.

On 4/4, I received a telephone call from Ian VK5QX saying Chris VK6YAB, in Albany, was getting into the VK5 repeater 7.000 and could I give him a call. This I did and had a contact. Chris was using a small hand-held device and getting into VK5RAD quite well. I was able to work him direct, but later he did in fact have a simplex contact with Carl VK5KCB, at Gawler. Time of my contact was 0649 UTC.

Since then a letter has arrived from Chris, and being a newcomer I will give him some space. He joined the WIA on 22/3/88, and thus came across my VHF columns in AR which prompted him to write. He says:

"On Monday 4/4, I climbed 'Devils Slide' in the Porongurups about 50 kilometres north of Albany and 671 metres ASL, with my TR-2600A hand-held. At 0700, I heard VK5RAD on 147.000 MHz, S3. I successfully worked through the repeater with 2.5 watts, repeating the contact on 300 mW. Worked about 30 VK5s. At 0715, Carl VK5KCB reported hearing me at S1 direct, so went to 146.500 MHz. Carl was using an FT-290R with linear and 25 watts output to a 10 element converted television Yagi, 30 feet high and 140 metres ASL, near Gawler. With 25 watts output VK5KCB was S7, with 2.5 watts S2, with 300 mW just audible. Same reports the other way. By 0730 the signal from VK5RAD had risen to S7, so at 0745 worked Carl again on simplex, hand-held to hand-held with rubber duckies. Carl was running five watts out and standing on the roof of his house. Signals were just audible. Shortly after the Nicads went flat after hearing VK3RWZ in The Grampians!

"Well and truly bitten by the tropo DX bug, next day I climbed Bluff Knoll, 1073 metres ASL, armed with recharged Nicads, two six volt lantern batteries in series and a six element beam. Opened the station at 0030 when VK5RAD was S3, with VK3RWZ just there. At 0215, accessed but could not work through VK3RWZ. VK5RAD was accessible all day at S1 to S5, but only one VK5 contact. At 0830 heard VK7TV via VK7RAD on 146.625 working another mobile so could not access. At 1019, heard VK7KMR working VK3s through VK3RWZ. At 1345, VK3RWZ improved and the first call brought Phillip VK3XSI, and then went on to work about 20 more VK3s through the repeater, but no luck simplex. VK3RWZ still there at 1900, also VK5RAD, but could not be accessed. It was still there at 0015 on Wednesday 6/4."

From the above I think we can safely say we have Chris looked on VHF and the capabilities of enhanced propagation. He said he is only 20 and has plenty of years of mountain-topping left yet! He has received confirmation of his 300 mW QSO with Carl. As time goes on it is hoped that Chris and Carl will both look at the value of extra contacts which can come also by using SSB for QRP contacts and the longer period that they can be maintained with less battery drain than the full carrier FM mode. It is a very good start though and we all wish them well for future occasions. Anyone prepared to climb a high mountain on foot with all the equipment on his back deserves some good contacts!

During one of my contacts with Wally VK6WG on 144 or 432, he remarked that since October 1987, there had been 30 openings on the GHz bands between Albany and Adelaide or elsewhere. VK6WG and Reg VK5QR, were having regular contacts on 2340 and 3456 MHz. Some of the contacts have seen signals rise to S9. They are still trying to make the distance on 5.6 GHz, and as I have said on any occasions, it is only a matter of time. On 4/4, around 2200 UTC, signals were available on 2304 but not on 3456 MHz.

On 5/4, Jim VK5ZMJ, at Port Pirie, scored a two metre contact with Joe VK7JG at 0030 which gave Jim his Worked All States on two metres. It was interesting in that Joe was first audible on six metres at VK5LP, VK5NY and VK5ZMJ. On trying two metres, the signals were weaker at VK5LP, inaudible at VK5NY and enough for Jim to make his contact at Port Pirie. Congratulations Jim, you have been waiting a long time for that particular contact.

Also, on 5/4, for most of the day the band was open on two metres to Albany and continued to be open to VK7 on and off. Roger VK5NY, subsequently worked VK7DC and VK7JG on two metres. Col VK5RO also worked VK7JG at 2330 at S5.

Again on 5/4, Ray VK3BRB in Mildura, worked John VK3YTV/2 whilst on the Cobb Highway, south of Mossgiel; and going back to 4/4, Roger VK5NY was copying Gordon VK2ZAB via meteor scatter, with his beam pointing south. The same day Roger also had a contact with VK6AS who was mobile in Esperance, signals 5x5 on two metres.

The conditions were so good over the Easter weekend that many other contacts were made by different operators, in fact, the bands had been open on 144 and 432 MHz to VK7 on and off for four days. Bill VK5ACY, (ex-VK5ZWP) worked VK7DC at 5x1 on SSB on 145.900 MHz, the higher than usual frequency being sue to TVI problems at the VK7 end.

When conditions are so good, one never ceases to wonder at the multitude of repeaters which become available at all odd times of the day. Here at Menlngie I have noted up to 11 repeaters on the channels up to 7000 — I don't use a beam antenna these days, simply a staked "Ringo" on two metres with about 5 dB gain in all directions. Charles VK5YC, was pleased to work VK7ZFM on 2/4 at 0120, and then on 3/4 worked VK2AKP, and hearing VK3s at the same time, all via repeater 7000.

A RARE CONTACT

VK5LP was having a two metre contact with Mark VK5ZMK, on 5/4 when Col VK5RO broke in and said would I like to speak to an old sparring partner of mine (two metres in the 1960s) and was told Hughie VK5BC, was in contact with others on — wait for it — 160 metresl ! ! Had not fired the FT-101B up on that band for years, the best antenna would have to be the 80 metre dipole. Undaunted, and with judicious use of the antenna tuning unit, the rig loaded up to about 40 watts, and a contact was made! Worked VK5BC, VK5ARK and VK5RO on that band, but some QRN doesn't really help those sort of contacts. Oh, for the quietness of VHFI VK5BC said he was still not able to operate satisfactorily on two metres as he lives in a Channel 5A area. Pity, as he used to be a good contact from the Berri area. Incidentally, Col VK5RO must have been too close as his signals were the weakest at S3, the others S8 to S9. Noted several VK3s at the same time all over S9 so the band was in good shape, and there was not too much wrong with the antenna set-up at this end.

TOWNSVILLE

Had a letter from my friend Wally Watkins VK4DO, now living at Airlie Beach. Wally was previously ZL2TCW, VK5ZWW and VK2DEW, so he has changed locations a few times. He says he has returned to six metres "if only with an IC-505, 10 watts and a two element beam fixed on JA." Said there have been good TEP openings lately. So many stations in the JA dog-piles that he had to resort to calling them in district by district, and working 42 in an hour.

He also worked HL9CB, KH6JJI, KH6VP, and KH6HI. He reports the following beacons during the JA openings:
50.011 JA2IGY, 50.015 JA6YLV, 50.028 JA7ZMA, and 50.020 JE6ZIH. KH6VP advised the KH6EQI beacon has been off air for two years and is no longer licenced. Sometimes KH6JJK runs a three watt beacon on 50.080 during his afternoons. Wally even worked JG2TSL on CW with three watts, signals 559 each way!

Good to hear from you Wally, and once you get the linear going and can rotate the antenna, it should be possible to work you once again from these southern areas.

SOUTH AFRICA

Hal Lund ZS6WB, has sent two more copies of *VHF News* which appears to be published fortnightly, these two being February 12 and 29, although the latter is a VHF Contest issue.

Of interest to VK: The VHF Schedule Liaison frequencies are 3.725 and 7.045 MHz, the six metre DX liaison frequency, and for crossband QSOs is 28.285/28.885 and the DX calling frequency is 50.110 MHz.

In the same way we look to Japan for TEP contacts, the South Africans look towards Cyprus and Malta. ZS6XJ heard the 5B4CY beacon on 50.498 MHz at S4, 1435 UTC on 22/2, and remained there for about 30 minutes.

GUNNEOAH

Barry VK2KAY, writes to say the VK2RGB beacon is in continuous operation and runs 2.5 watts to a horizontal dipole, mode A1 keyed every 25 seconds. He has approached the WIA VK2 Division seeking some help in paying licence fees as all operating costs fall on VK2ZQX and himself. Thanks for the note, Barry.

MELBOURNE

John Martin VK3ZJC, has written to confirm the operation of a number of beacons, including VK4ABP, VK3RTG, VK3RAI, the latter on 432.450 MHz with very low power. He says VK3RMB on 432.535 may exist but it has not been heard. Non-existent beacons include VK3RGI scheduled for 144.535, VK3RTG 432.430, VK3RGG 144.530 and 432.530 MHz.

Of some concern to John is the appearance of a lot of FM operation in the DX part of the band. At times he has heard operation on every multiple of 100 kHz from 144.100 up to 145.000 MHz. One of the reasons could be that no matter how often such matters are raised in publications such as AR, the words are only noted by the dedicated and those who are WIA members, and thus acted upon. Those outside never read about the problems they can cause, possibly don't care anyway, and adopt the view they can operate anywhere they like as long as they are in the band. Such an attitude is correct of course, they can operate everywhere, but if everyone did this then there would be absolute chaos on the bands, at east the presently accepted gentlemen's agreements for portioning of the bands do provide for optimum operating for the maximum of operators.

John VK3ZJC, has also been working VK1 and VK2 using aircraft enhancement and works VK1BG and VK2ZAB regularly. On 432, VK1 signals are often better than on 144. He also has 1296 going with 12 watts of SSB/FM to a 32 element DL6WU beam at 55 feet. Best DX so far has been to VK5NC and VK7DC. John also asks if It would be possible to publish a list of 1296 operators to acquaint those on the band who is around. He lists the following as those he knows as a result of his activities:
VK3s AUX, BBU, KAJ, KXW, KZZ, YLH, YMP, YNB, ZBJ, ZHP, ZJC, ZYN; VK5s MC, NC, NY; VK6s KZ, WG; VK7s DC, HL, JG and ZAP.

To this I could add VK5QR, VK6AOM, VK6JXX and, I think, VK5ZO. If others who are operational would care to write to me I would be pleased to publish this in list-form in due course. While on the subject, why not let me know who is operating on the bands above 1296 MHz as well.

John also reports the following:
6/12/87 worked VK2ZAB on 144 and 432 by aircraft enhancement; 26/12 to 2/1/88: Nightly openings across three States, S9 every night. 144 to VK5NC, VK5AXV, VK5RO, VK5NY, VK7ZOO. 432: VK5NC, VK5MC, VK5NY, VK7DA, VK7JG. 4/1: Portable on Mount Wombat: 20 contacts. 144: VK5NC, VK5NY and VK5CMV. Missed the VK6 opening, probably cue to being above the inversion. 6/1: strong 432 openings to VK7ZHL, VK7ZBT. 8/1: worked VK5NC on 144, 432 and 1296. 9/1: attempted to work VK5NY on 1296, but no go. Both stations worked VK3KZZ in Horsham. 10/1: portable on Wilsons Promontory. 52: VK7JG, 144: VK7JG, VK7ZHA, VK5NC. 11/1: Good opening on 432 to VK7JG and VK7ZBT. 21/2: worked VK5NY on 52, 144 and 432 MHz. 28/2: worked VK5NY on 52, 144 and 432. Also on 144: VK5DX, VK5RO, VK5ZDR. 9/3: worked VK7DC on 432 and 1296 MHz FM. His dish was not up so he just used the feed — a two element Yagil 18/3: worked VK5NC again on 144, 432 and 1296 MHz. John certainly looks like a very active operator.

ALICE SPRINGS

Peter VK8ZLX and Tim VK8KTM, both worked Joe KG6DX on Guam on 9/4 around 0322 UTC with signals peaking to S9 on six metres. So far no VS6 stations. However, he has been hearing cordless telephones from Hong Kong on 48 MHz, using 10 mWl

Peter VK8ZLX has also worked HL9TM, HL9CB and HL2ASH. He further reports many JA contacts, and Hide JA4MBM told him he had so far worked 30 countries whilst operating mobile in Japan! Some effort.

The main reason for my telephone call to Peter VK8ZLX was to follow up a report received from Japan and passed on to me by Bill VK5ACY, that the JAs had been hearing the beacon VK8RAS, Alice Springs, on two metres. Ever cautious about such reports, I phoned Peter and was advised such hearings could not be so as their two metre beacon has not been operational for at least the past two months! As this beacon is only 5 kHz away from VK8VF in Darwin, it is possible this beacon is being heard instead and the JA operators are not careful enough with their CW reading.

Also, from VK5ACY, a report from Robert AH6IO, in Hawaii, that he worked 3D2, VK4, and VK8. Peter VK8ZLX, said he knew of no contacts from Alice Springs to Hawaii but the contact could have been with a station in Darwin. Robert said all the contacts had been made with 10 watts to a vertical antenna on 50.110 MHz!

JAPAN

Hat JA1VOK, in a note attached to other information said on 12/3 he worked P29PL, at 1033 UTC, 13/3 P29ZEF at 1107, 15/3 P29ZFS at 1106, 17/3 YC0UJO at 1233, 20/3 FK1TS at 0415, H44GR at 0905, H44GP 0927, 21/3 VK9LJ (Lord Howe Island expedition by JG3KUT) at 0517, and 24/3 T22JJ (Tuvalu expedition by JH2MBF) at 1018, as well as some VK4, 6 and 8 stations. Quite a good effort.

Information from *Five Nine* sent by Hat JA1VOK, reports: "JA1UT reports Singapore has issued a special permission to Singapore Amateur Radio Transmitting Society to operate on a spot frequency of 50.125 with 10 dBW output power between June 3 and 12, 1988 for propagation research. The call sign will be 9V1ES and a split QSO is proposed by 50.110 (call 50.125). QSL via JA1UT."

Other news from *Five Nine* says LU7DJZ worked KP4EOR around 0000 on November 1, 15 and 30, 1987. Also, KH6JJK has a beacon on 50.080 MHz.

QSL INFORMATION:
FK1TK — Henri Rainer, Box 4608, Noumea, New Caledonia.
5W1GP — Yoshiyuki Yamazaki, via JA6QCF, or Box 1625, Apia, Western Samoa.

Ernest 4S7EA is the only six metre operator in Sri Lanka, using an FT-726 and six element Yagi. He worked JA3, 4, 5 and 6 areas in Cycle 21. and holds a record by working JA1VOK in 1984.

RON WILKINSON ACHIEVEMENT AWARD

It certainly came as a surprise to read in AR that I had received the *Ron Wilkinson Achievement Award* for 1987. As I read the details of the announcement, I found myself saying "have I done all that?"

I am rather a strict disciplinarian, and whatever I undertake I try to do to the best of my ability. Whether I achieve anything approaching perfection can only be judged by others around me.

In the realm of VHF and UHF I see a challenge — something which has been there since my days on 288 MHz in the 1950s. After more than 30 years, the challenge still remains. I only hope I can be spared long enough on this earth to achieve a few more things on the bands above 50 MHz. It has always been my goal to have as many amateurs as possible operating on those bands, sharing experiences both technical and social, with particular encouragement being given to anyone prepared to build some of their own equipment.

Without using too much of the Editor's valuable space, may I say I have always seen my columns in AR as fulfilling a need in the VHF/UHF world, the place where the experiences of others can be shared round, the operators kept alerted of the approach of periods when enhancement of propagation could be expected, keeping the fraternity abreast of new operators or areas coming on the VHF/UHF scene. Much of this has only been possible from the countless numbers of letters and publications I have received since 1969. Everyone who writes does so because he/she has something worth writing about. I may condense what you say, but all letters are acknowledged through the columns of AR. It is this acknowledgment which keeps people writing to me. I am indeed grateful for your continuing interest, and for the many letters and on-air comments speaking favourably of the

columns. The various clubs who send their newsletters also perform a role in that I can often give a wider coverage to something which has special interest. As a matter of fact, my columns go overseas to a number of destinations and information extracted from them for their readers.

I have found quite a deal of pleasure in seeing the results of my earlier exhortations to achieve an Australia-wide beacon coverage, at least on 52, 144 and 432 MHz, and to a lesser extent on the higher bands, but they are appearing there! My trips around Australia and the talking with amateurs in more remote areas has seen the VHF/UHF coverage extended beyond the dreams of most of us That they have responded to my thoughts and suggestions is to their benefit in finding they can in fact cover a lot more territory then their apparent local topography would suggest.

I thank the VK5 Council of the WIA for my nomination and the WIA Executive for accepting it. I think Ron Wilkinson would say I haven't been slacking! I must have words with David VK5KK and Val for the sneaky way they obtained those photographs — Val said: "I have only a few shots left on this film so I might as well take something of you and your shack while we are here!"

Thanks again to everyone; it has been a united effort, albeit a rather costly one over the years, what with magazine subscriptions, postage, telephone calls (mostly STD), repairs to typewriter, etc, etc, but all done for the love of the game — I have many pleasant memories, both of the written word and the personal contacts with the people who have been my correspondents. Thanks also to those concerned with the production of AR over all those years, you have treated me very fairly and this has not gone un-noticed. I still have pleasant memories of the *Higginbotham Award* I received in 1974. Best wishes, and hoping to meet you on VHF/UHF!

CLOSURE

Closing with two thoughts for the month: "Happiness is often the result of being too busy to be miserable" and "A steering committee is four people trying to park a car!"

73 The Voice by the Lake

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DEADLINE FOR AUGUST IS JUNE 20, 1988

EXAMINATION DEVOLVEMENT

— latest progress report

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

The Department of Transport and Communication (DOTC) has refined its planned devolution of amateur examinations following suggestions made at a series of public forums or seminars.

About 200 people attended forums held in February through to the end of March in Sydney, Melbourne, and Adelaide — each attracting 40 to 50, with lesser numbers in Perth, Brisbane, Launceston and Canberra.

Those attending were either keen to be actively involved running examinations or had some concern about the devolution process and sought information to allay their fears.

A few Technical and Further Education (TAFE) educators, who were not themselves radio amateurs, took part in the seminars to see how their college could be involved.

DOTC central office spokesman on devolution, Alan Jordan, said the general response was most positive.

"Many practical ideas came out of the seminars," Mr Jordan said.

A new development is the recent decision by DOTC to make entirely public soon its AOCP and Novice theory question banks and the Regulations examination question bank.

It had earlier been planned to issue the question banks only to examiners. However, Mr Jordan said: "The Department has decided, in response to the seminars, to put the question banks in the public domain — there was unanimous support for the move."

The seminars recognised that the question banks could not be expected to remain secure in the long term and would eventually leak out. But it was realistic to expect security will be maintained for actual examination papers.

The question banks will be available on floppy discs to those conducting examinations — and there will be a program for random generation of question papers.

All examination papers must be approved by the Department before being sat by candidates.

Examiners can write their own examination questions if they wish. However, papers compiled using only the question bank and the DOTC issued random generation program will make the approval process easier.

Mr Jordan told *Amateur Radio* magazine that DOTC would also be happy with the theory and regulations examinations being sat by candidates answering questions as they appeared on a VDU screen.

It was a suggestion which came from one of the seminars, and the Department agreed with this method of sitting an examination as long as there is a "hard copy" of the examinations sat, the candidate's answers, and results, he said.

Some other examination devolution update points arising from the seminars include:

* Approved examinations under devolution expected to occur after June 1, 1988.
* DOTC will supply examination application and result proformas to examiners.
* Indication that the costs of examinations to candidates may come down.
* Examinations to be more frequent and held at a larger number of centres.

One WIA Division indicated it could envisage holding simultaneous examinations at three centres on a Saturday morning, while someone else proposed running examinations weekly.

The approach to devolution varied throughout Australia. The amateur radio community in New South Wales is keen and large enough to take it on, whilst in Western Australia the TAFE system would appear to be the predominant organisation.

In Tasmania, there is some interest in having an Amateur Operators Certificate of Proficiency (AOCP) examination available to school students attempting a planned electronics course.

With a multiplicity of examination venues under devolution, examiners are unlikely to have a heavy workload.

Current DOTC quarterly examinations attract approximately the following numbers of candidates:

AOCP Theory — 330
Novice Theory — 180
AOCP Telegraphy — 210
Novice Telegraphy — 150
Regulations — 240

With examinations likely to be more frequent and held at more centres, candidate numbers should be easily handled.

Recent DOTC examination statistics also indicate a continuing trend to upgrade from the Novice level.

The Regulation examination numbers can be taken as a rough guide to the actual number of people seeking to enter our hobby, since that examination is a prerequisite for all three grades of licence.

Some 30 percent of candidates fail the Regulations examination, but candidates should be better prepared for this examination if they study the question bank and the replacement for the *Amateur Operators Handbook* which is to be issued shortly.

Unresolved matters DOTC are still considering include:

* Should questions generated by teaching institutions be automatically added to the public domain DOTC question banks?
* Are detailed guidelines necessary for examiners on how to write multi-choice questions?

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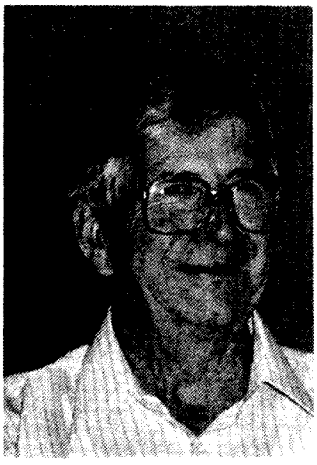
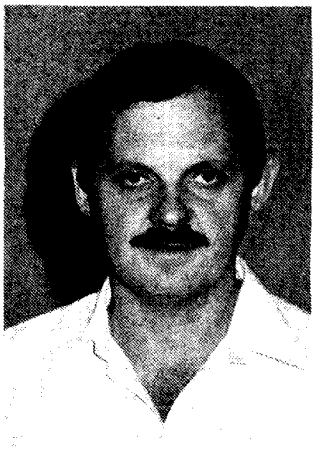
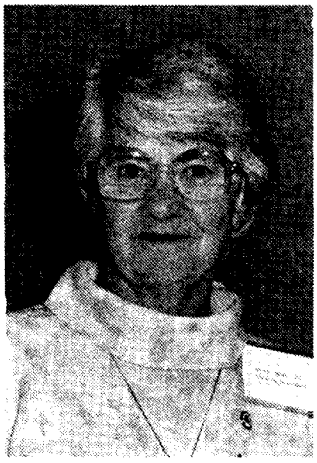
Photographs courtesy Barrie Bunning



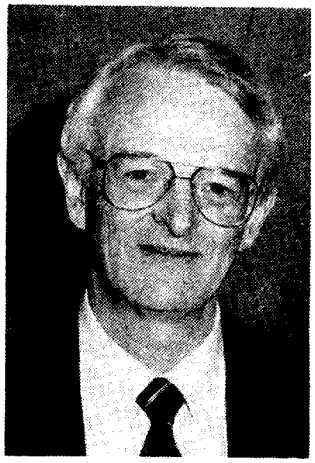
Allan VK3AE.
Federal Executive Member.



Peter VK3ZPP.
VK3 Federal Councillor.

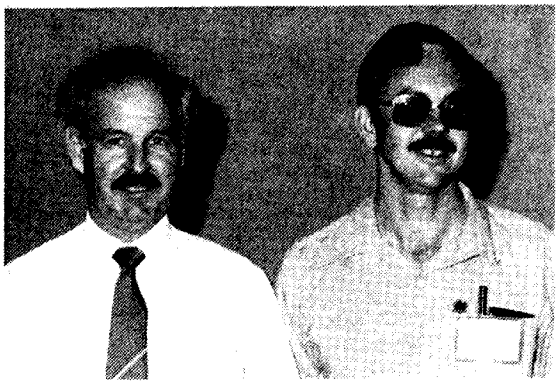


Brenda VK3KT.
Federal Executive Member &
Education Officer.



Bill VK3ARZ.
Acting Federal Treasurer.

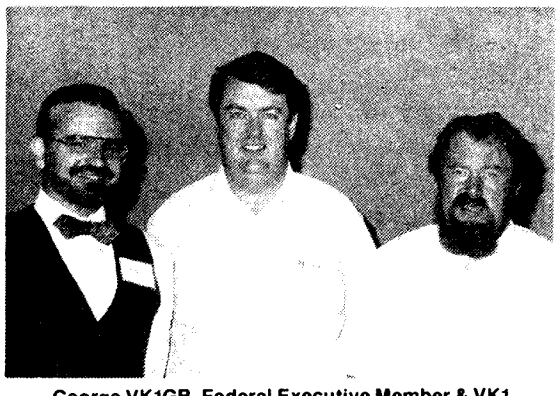
Bruce VK6OO, VK6 Alternate
VK6NE, VK6 Fe



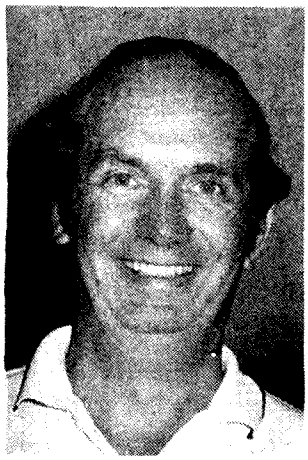
Terry ZL3QL, President NZART & Alan ZL1AMW,
Councillor NZART.

52ND WIA FEDER
YOUR REPRE

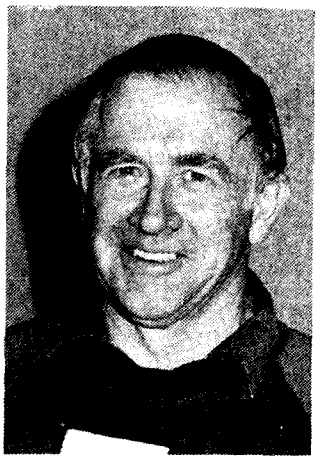
Peter VK7PF, VK7 Federal Councillor & Alan VK7AV, VK7
Alternate Federal Councillor.



George VK1GB, Federal Executive Member & VK1
Official Observer, Kevin VK1OK, VK1 Federal Councillor,
& Alan VK1WX, VK1 Alternate Federal Councillor & VK1
President.

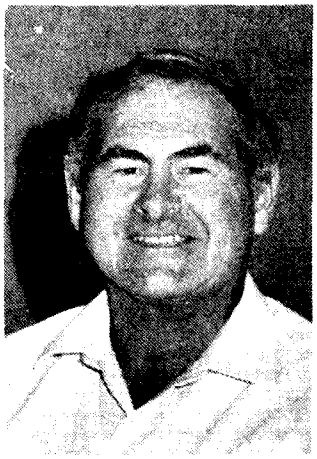


Peter VK3YRP.
Federal President 1988-1989.

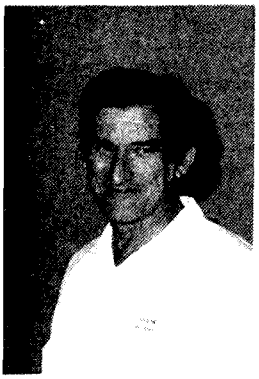


David VK3ADW.
Immediate Past-President &
Federal Executive Member.

Bill VK3ABP.
Federal Executive Member &
AR Editor.



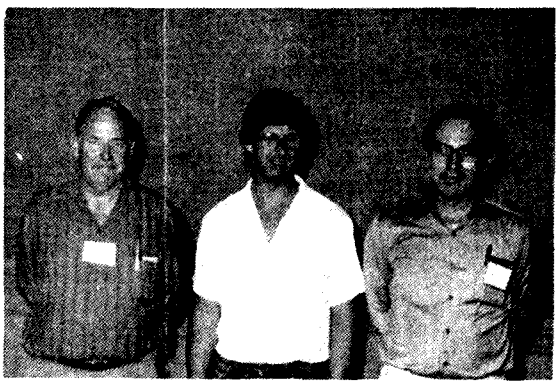
Ron VK1RH.
Vice-President 1988-1989 &
WICEN Co-Ordinator.



NOTE: Barry VK3XV, was not available when the photographs were taken

e Federal Councillor, & Neil
eral Councillor.

AL CONVENTION
ESENTATIVES



Tim VK2ZTM, 1st VK2 Alternate Federal Councillor, Jeff
VK2BYY, VK2 Federal Councillor & Roger, 2nd VK2
Alternate Federal Councillor.

John VK4QA, VK4 Official Observer, David VK4YW, VK4
Alternate Federal Councillor & Guy VK4ZXZ, VK4 Federal
Councillor.

Bill VK5AWM, Federal Executive Member & VK5
Alternate Federal Councillor, & Don VK5ADD, VK5
Federal Councillor.

QSLs FROM THE WIA COLLECTION

Ken Matchett VK3TL
PO Box 1, Seville, Vic. 3139

The two QSL cards featured this month are amongst the most historic documents in the history of Australian radio. The station 8AB-8AC was licenced to the Reverend John Flynn (known as Flynn of the Inland). A5AX was the call sign of Flynn's co-worker, Alf Traeger, pioneer of the pedal wireless.

John Flynn was born at Moliagul, Victoria, in 1880 and rose to become the Moderator General of the Presbyterian Church. His great aim was to establish a network of Australian Inland Mission (AIM) hostels or nursing homes throughout the outback. The 8AB station was, in fact, located at the AIM, Alice Springs. It was what was then called "the Mother Station", that is, the base station, the separate call sign 8AC being allocated to Flynn's mobile station. It was not uncommon in the early days of radio to have one call sign for the home QTH and another one when operating mobile. This obviated the necessity of obtaining the necessary permission from the licencing authorities every time one wished to operate mobile.

Flynn's problem was to provide outback stations with inexpensive, foolproof lightweight wireless sets (capable of both transmission and reception) that could be used by the inexperienced. These also had to have their own power unit so that they could be used anywhere. At the time, no such set was available. Later, Flynn conceived the idea of running a generator off the engine of his old Dodge car, but this was only partly successful. Traeger solved the problem with his pedal generator which enabled the operator to have his hands free.

In 1912, Flynn had written a report upon the need for communication in the outback, which eventually led to the formation of the AIM. In 1919, there was nothing but the AIM nursing hostel at Oodnadatta and one outback Northern Territory hospital, but by 1939, there were 13 hostels and hospitals throughout the Inland. In 1921, John Flynn arranged a wireless demonstration for the AIM and in 1925, he was made a member of the Wireless Institute of Australia. It was in this year that he met Alf Traeger, and in October 1926 Alf joined him as his wireless expert.

In 1930, Traeger commenced investigation into his "typewriter" Morse key, a device which enabled inexperienced operators to send Morse messages. Some 70 machines were produced and, in 1932, ground-air communication was proved to be possible. In the same year, radio telephone was introduced. This was a tremendous step forward and the flow of orders for new sets became so enormous that Alf Traeger founded a company to take care of them. When Traeger was not travelling the outback installing and servicing radios, he was toiling in his Adelaide workshop.

The 8AB QSL shows that the station was using the popular Hartley CKT (circuit) with power of 50 watts. Although the wavelength of the transmission is given here as 36 metres, the station also used spark transmissions on 80 metres with which to communicate with Traeger in Adelaide. The QSL is dated October 1922, but this date must be incorrect for several reasons. The postmark on the reverse side of the card confirms this — it is dated October 1925. The QSO was between Adelaide and Melbourne, the Victorian operator being the late Alan Hutchings, then 3HL, one of the most successful Australian operators of the period. The QSL is signed by Harry Kauper who, like John Flynn and Alf Traeger, played a most important role in the field of experimental radio. It was Harry Kauper who, during World War I, invented a timing mechanism that enabled bullets to be fired through the revolving propeller of an aircraft. Being the radio engineer at the Australian Broadcasting Commission's Broadcast Station, 5CL, Adelaide, he was well qualified to assist in transmissions between Adelaide and the outback. It was, in fact, through Harry that Flynn and Traeger first met when Kauper recollected that he, himself, had received assistance from the young Adelaide electrician.

Alf Traeger's QSL, A5AX is of a period a little later than the 8AB-8AC QSO, the A (Australia) in the call sign being used by then as a prefix to the simple one numeral/two letter call sign. Traeger was an expert in the design of motors and generators. Interesting is his comment on the QSL, "If u want any dope about Generators just ask".

The QSL was sent in reply to a SWL report by John Heine (now VK3JF) and originated from his factory-home QTH in the Adelaide suburb of Kensington Gardens, where his experimental work did so much to establish a "mantle of safety" for the pioneers of Australia's outback.

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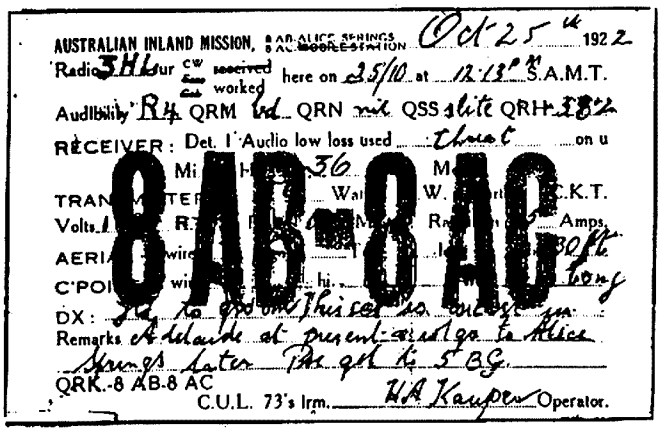

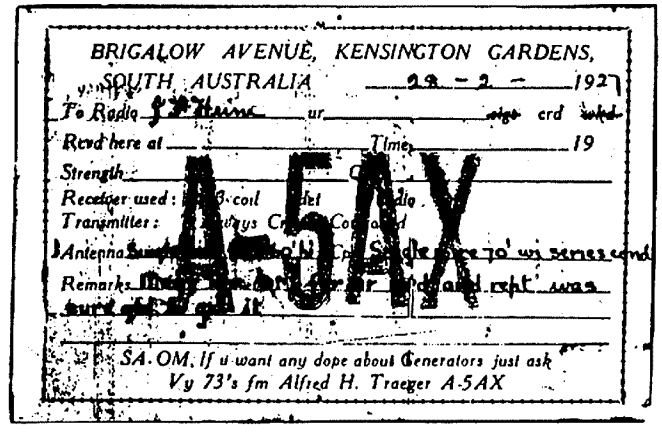

Try This!

Tom Laidler VK5TL
18 Albion Avenue, Glandore, SA. 5037

HOLDING SMALL NUTS IN AWKWARD PLACES

From time to time various ideas have been brought forward to overcome this problem. Here is another!

In most kitchen drawers there is a plastic tube-type device which, when the end is pressed, extends a three pronged claw affair.

Its normal function is that of picking up pickled onions, etc, from the bottom of bottles.

These usually cost less than a dollar and can be used to hold a small nut in place whilst a screw is fed into it.

Alternatively, if you are financially sound and willing to pay the price, a jewellery tools supplier will furnish a similar tool for a higher price. This is if all-metal construction, but the general operation is identical with similar results achieved.

The operation is clean and eradicates the need for an adhesive in any form. These devices also allow penetration to a depth of about six inches (150 mm) which is a little further than individuals fingers.

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Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7251

CONTEST CALENDAR

JUNE 1988
4 — 5 RSGB National Field Day Contest
4 — 6 ANARTS RTTY Contest (Rules this issue)
18 — 19 All Asian Phone Contest
25 — 26 ARRL Field Day Contest

JULY 1988
— 1 Canada Day Contest
9 — 10 IARU HF World Championship
— 10 ARCI QRP CW Sprint
16 — 17 CQ magazine WW WPX VHF Contest

AUGUST 1988
— 6 YLRL YL/OM SSB Sprint
13 — 14 VK Remembrance Day Contest
27 — 28 All Asian CW Contest

SEPTEMBER 1988
24 — 25 CQ WW RTTY Contest

CQ M CONTEST 1987 RESULTS

The results of the 1987 CQ M Contest have arrived. The Oceania winners are as follows:
Single Operator, Multi-Band — VK5BS with 637 points
Sing Operator, Single Band — VK4TT with 4579 points.

Congratulations to you both and your certificates should be delivered shortly.

ANARTS RTTY CONTEST — 1988 RULES

(Courtesy CQ magazine)

PERIOD: 0001 UTC Saturday until 2359 UTC Sunday, June 4 to 6, 1988.

The Australian National Amateur Radio Teleprinter Society is running this contest. Not more than 30 hours of operating time is permitted for single operator stations. Rest periods can be taken at any time and mist be indicated in the log. Multi-operator stations can operate the full 48 hours.
CLASSES: Single operator. Multi-operator single transmitter. SWL.
BANDS: All five bands, 3.5 to 28 MHz, in the portions permitted for RTTY. (No WARC bands).
EXCHANGE: RST, UTC time and Zone.
SCORING: Points as per CARTG Zone Chart (same as the Exchange Point Table in this issue). Multiply point total by the number of countries worked on each band. Multiply that total by the number of continents worked — maximum six.
BONUS: Add 100 points to the above score for each VK worked on 14 MHz; 200 points if on 21 MHz; 300 points if on 28 MHz; 400 points if on 7 MHz and 500 points on 3.5 MHz.
EXAMPLE: Zone QSO points times Countries times Continents plus bonus points for your final score. A station may be worked on each band for QSO and multiplier credit, but continents count once only. Country multiplier is determined by the ARRL list plus VK, ZL, JA, VE/VO and W/K call areas.
AWARDS: Certificates to first three place winners on a world and country basis. Scoring is rather complicated. Therefore a summary sheet showing the scoring etc, is a must.
LOGS: Must be received by September 1, and should be posted to: W J Storer VK2EG, 55 Prince Charles Road, Frenches Forest, NSW. 2086.

RSGB NATIONAL FIELD DAY CONTEST

The RSGB National Field Day Contest will be held from 1500 UTC, Saturday June 4, to 1500 UTC, Sunday June 5. CW only in the 1.8, 3.5, 7, 14, 21 and 28 MHz bands. Contest preferred segments as recommended by the IARU must be used; ie 3.510-3.560 and 14.010-14.070 MHz.
EXCHANGE: RST and serial number beginning with 001.
LOGS: Separate logs must be used for each band.

While overseas stations are not eligible to enter the NFD, check logs are very welcome. A certificate will be awarded to the overseas station on each continent whose log shows the most points contributed to competitors.
ADDRESS: Logs to HF Contest Committee, PO Box 73, Lichfield, Staffs, WS13 6UJ, England.

I have included these details for the RSGB NFD Contest as a reminder to those award hunters who are looking for the British Counties Award. All counties will be activated by numerous stations so this is a once a year opportunity to catch up with those wanted counties the easy was on CW.

WORLD TELECOMMUNICATIONS DAY CONTEST — Results 1987

WINNERS
ITU PLAQUE
Country — Brazil
Association — Liga de Amadores Brasileiros de Radio Emissao — LABRE
MEDALS
PHONE: ZV2BW (16 252 points); H44JA (3780 points); JH4UYB (252 points)

EXCHANGE POINTS TABLE

YOUR zone \ CORRESPONDENT zone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	2	14	10	13	16	18	22	20	25	30	36	37	39	21	22	19	20	17	11	25	29	29	22	22	16	28	25	31	39	35	14	36	25	29	34	39	40	47	44	15
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3	10	15	2	8	11	9	13	14	18	21	28	28	30	26	28	27	29	27	21	32	37	39	32	31	24	37	33	40	43	35	11	32	29	35	35	42	48	50	52	20
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11	36	24	28	22	20	19	15	15	10	9	2	9	7	26	28	33	36	41	43	38	43	50	49	53	50	52	52	49	42	41	37	35	22	29	18	20	28	23	29	27
12	37	30	28	25	24	19	15	18	14	7	9	2	3	35	37	41	45	49	48	39	42	49	53	58	50	52	52	48	37	33	32	27	31	37	34	27	33	27	33	34
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18	17	20	27	26	26	33	36	32	35	43	41	49	48	14	13	8	5	2	7	12	12	12	6	11	14	15	16	20	30	35	29	40	18	15	27	28	24	31	27	24
19	11	19	21	22	24	29	33	30	34	41	43	48	49	18	18	13	2	7	2	18	19	16	10	10	9	18	15	20	30	32	21	36	23	21	33	34	30	38	33	16
20	25	19	32	26	35	34	38	29	29	26	30	39	37	7	6	6	7	12	18	2	6	14	14	20	26	21	26	25	34	43	39	49	8	3	15	16	15	22	20	12
21	29	25	37	33	32	40	40	35	35	42	34	42	39	14	11	10	8	12	19	6	2	9	11	17	24	16	21	20	28	37	40	43	14	6	18	18	11	10	15	19
22	29	31	39	37	38	47	46	42	43	51	42	49	46	21	18	15	12	12	16	14	9	2	6	10	18	17	13	11	21	29	36	35	22	14	26	22	15	22	16	24
23	22	26	32	32	33	40	42	38	41	49	45	53	50	29	17	12	8	6	10	14	11	6	2	6	13	8	12	14	24	30	31	37	22	18	29	26	21	26	22	20
24	22	30	31	34	35	40	44	42	45	52	51	58	56	25	23	18	14	11	10	20	17	10	6	2	8	5	6	18	20	26	26	30	18	22	35	31	25	32	25	25
25	16	28	24	30	31	33	38	37	41	45	52	50	53	27	27	22	19	14	9	26	24	18	13	8	2	13	9	15	23	30	18	27	11	18	41	40	33	40	38	25
26	28	35	37	40	41	46	50	47	50	50	49	52	50	27	25	21	17	15	16	21	16	7	8	6	13	2	6	5	16	22	11	29	29	21	33	29	21	27	20	29
27	25	35	33	38	40	42	46	46	50	52	55	52	52	30	29	24	20	16	15	26	21	33	12	6	9	6	2	7	15	18	25	25	34	27	40	35	27	32	26	30
28	31	40	40	44	45	48	53	51	55	54	49	48	46	32	30	26	22	20	20	25	20	31	14	10	15	5	7	2	10	17	33	24	34	25	36	30	22	26	19	34
29	39	50	43	52	54	47	48	54	52	44	42	37	37	42	39	36	32	30	30	34	28	21	24	20	23	16	15	10	2	9	15	32	42	33	39	31	24	24	20	44
30	35	50	35	44	46	38	40	44	45	37	41	33	34	49	47	42	38	45	32	43	37	29	30	24	30	22	18	17	9	7	24	7	51	42	47	40	33	32	29	48
31	14	25	11	20	22	17	22	24	28	28	37	32	35	34	36	33	32	29	21	39	40	36	31	26	18	31	25	31	15	24	2	22	29	42	46	53	52	56	51	26
32	36	47	32	40	41	32	34	38	38	31	35	27	29	55	54	49	45	40	36	49	43	35	37	30	27	29	25	24	32	7	22	2	57	48	47	42	38	34	33	50
33	25	14	28	21	19	28	26	21	21	28	22	31	29	5	6	10	14	18	23	8	14	22	22	28	32	29	34	34	42	51	39	57	2	9	10	14	16	22	23	10
34	29	21	35	28	27	36	34	30	30	36	29	37	34	10	7	9	10	15	21	3	6	14	16	22	28	21	27	25	33	42	42	48	9	2	13	12	12	18	16	16
35	34	21	35	26	24	30	26	23	20	24	16	34	21	15	15	20	22	27	33	15	18	26	29	35	41	33	40	38	39	47	46	47	10	13	2	7	15	15	19	20
36	39	28	42	33	31	37	33	30	27	29	20	27	24	19	18	21	22	28	34	16	16	22	26	33	40	27	35	30	31	40	53	42	14	12	7	2	8	8	11	24
37	40	33	48	40	38	44	40	38	35	38	28	33	30	21	19	21	20	24	30	15	13	15	21	25	33	23	27	22	24	33	52	38	18	12	15	8	2	7	5	28
38	47	36	50	41	39	43	38	36	32	31	23	27	24	26	25	27	27	31	38	22	19	22	28	32	40	27	32	26	24	32	56	34	22	18	36	30	22	26	19	34
39	44	37	52	44	42	48	44	41	38	38	25	33	30	26	24	25	23	27	33	20	15	16	22	25	33	30	26	19	20	29	51	33	23	16	19	11	5	5	2	32
40	35	6	20	14	13	22	22	18	21	29	27	34	34	6	8	9	12	14	16	12	18	24	20	25	25	29	30	34	44	48	28	50	10	16	20	24	28	32	32	2

Exchange Points Table.

CW: OK2QX (9963 points); K8CW (8720 points); ZV2CW (5670 points)
PARTICIPANT COUNTRIES LIST (by prefix):
BV, BY, CE, CN, CO, CP, CT, CX, DJ, DU, EA, EA8, EI, F, FS, G, GI, GM, GW, H4, HA, HB, HH, HL, HP, I, IS, JA, K/W, KH6, KP4, LA, LU, LZ, OE, OH, OKM ON, OZ, P29, PA, PY, SM, SP, SV, TA, UA1/6, OA0, UB5, UC2, UD6, UP2, UQ2, V85, VE, VK, VP2M, VU, Y2, YB, YO, YS, YU, YV, ZB, ZP, ZS, 3A, 4S, 4X, 5A, 5N, 5T, 6W, 7X, 8P, 9V, 9Y.

LABRE did not supply a list of the VK entrants.

The rules for the 1988 Remembrance Day Contest will be published next month, and, as usual about this time of year, I have taken the opportunity to publish a basic set of ground rules that will apply for future WIA contests and these will be noted by all contestants. Please read them carefully, they are quite straightforward.

CONTEST DISQUALIFICATION CRITERIA

A standardised approach is taken to the disqualification of logs entered in all of the contests which come under the direct control of the Federal Contest Manager appointed by the Federal Executive.

It is suggested that you take note of this particular issue of the magazine for reference to these general rules in the case of all contests for the ensuing year. Details are as follows:

DISQUALIFICATION: A entry in WIA conducted contests may be disqualified if, upon checking the logs, it is necessary that the overall score be reduced by more than two percent. Score reduction does not include correction of arithmetic errors. Reductions may be made of unconfirmed QSOs or multipliers, duplicate QSOs or other scoring discrepancies.

An entry will be disqualified if more than two percent duplicate OSOs are detected as being claimed for credit.

For each duplicate or mis-copied call sign removed from the log by the contest manager, a penalty of the deletion of three additional QSOs of equivalent value to the offending claim may be applied.

The penalty will not be considered as part of the two percent disqualification criterion.

If a participant is disqualified under these aforementioned provisions that operator will be barred from entering the contest for that particular mode in the ensuing year: eg Disqualification from the 1988 RD Contest, phone section will prohibit an entry for the 1989 RD Contest, phone section. However, participation in the 1989 RD contest's CW section would be allowed.

Logs which are very untidy, illegible or incorrect in layout to a major degree may also be disqualified. The call signs of disqualified participants may be listed in *Amateur Radio* magazine, together with the contest results.

GENERAL RULES FOR WIA CONTESTS

CONDITIONS OF ENTRY:

a. Entrants must operate in accordance with the terms of their licence.

b. Entrants may only use one call sign during the duration of a contest.

c. Each entrant agrees to be bound by the provisions, as well as the intent of these general rules and the specific rules published for each contest.

d. All entries become the property of the WIA. In the event of a dispute, the ruling of the Federal Contest Manager shall be final.

e. Entries may be disqualified for failure to observe the general rules or the specific contest rules.

f. Entrants must operate from a single location during a contest.

CLASSES OF ENTRANT

a. Unless otherwise stated in specific contest rules, only single operator entries will be accepted. A single operator station is one manned by an individual operator *who receives no assistance whatsoever during the contest period.*

b. For certain contests, multi-operator entries are permitted. These entries will be accepted subject to the contest declaration form being signed by one operator, who becomes the entrant and is responsible for the entry. The entrant is required to ensure that the operators call sign is shown on the log for the entry for each contact, or group of contacts, made by that operator and that the contest rules have been observed. Failure to observe these requirements will result in the entry being disallowed.

c. Entrants in field day events may not operate from any permanent building or structure, or use power from a public mains supply. Power may only be derived from a portable generator driven by a motor, wind or manpower on the site, or from solar cells, batteries or accumulators.

ENTRY PROCEDURES

a. Each entry will consist of a contest log, a cover sheet, summary sheet. The cover sheet must include a statement that the rules and spirit of the contest have been complied with.

b. Logs must be written or typed on one side only of WIA contest log sheets or on standard A4 sized paper using ink.

c. Logs must be kept and entries submitted in UTC.

d. Any log that is incomplete or illegible will not be accepted as an entry.

FOURTH ANNUAL CQ WORLD WIDE VHF WPX CONTEST

Held from 0000 UTC Saturday, July 16, 1988 to 2400 UTC Sunday, July 17, 1988.

CONTEST PERIOD: 48 hours for all stations, single or multi-operator. Operate any portion of the contest period you wish.

OBJECTIVES: The objectives of this contest are for amateurs around the world to contact as many amateurs as possible in the allotted 48 hour period, to promote VHF/UHF activity, to allow VHF operators the opportunity to experience the enhanced propagation available at this time of year, and for interested amateurs to collect VHF prefixes for award credit.

BANDS: The 50, 70, 144, 220, 432, 902 and 1296 MHz bands may be used, as authorised by local law and license class.

TYPE OF COMPETITION:

Single operator — a. all band; b. single band; c. all band, low power; d. single band, low power.

Multi-operator — a. all band; b. single band.

Portable (with temporary power source only).

FM only.

The "portable" category is for single or two-operator stations. Low power is defined as 30 watts PEP output or less. Stations may select one category of competition only. All transmitters must be located within a 500 metre diameter, or within the property limits of the station licensee's address, whichever is greater. The antennas must be physically connected by wires to the transmitters.

EXCHANGE: Call sign and Maidenhead locator grid square (four digits, eg FN20). If grid square is not known, station location with enough specificity to determine the proper grid may be recorded instead. Signal reports are optional and need not be included in the log entry.

SCORING: One point per QSO on 50, 70 and 144 MHz; two points per QSO on 220 and 432 MHz; four points per QSO on 902 and 1296 MHz. Work stations once per band, regardless of mode. Multiply total QSO points times the total number of prefixes (PX) worked. This differs from the scoring for the CQ HF WW WPX Contest, where a prefix counts only once regardless of band.

Example: W1XX works stations as follows:
37 QSOs and 12 PXs on 50 MHz
45 QSOs and 18 PXs on 144 MHz
26 QSOs and 10 PXs on 220 MHz
38 QSOs and 11 PXs on 432 MHz
6 QSOs and 3 PXs on 1296 MHz
Total Score for W1XX is 234 QSO points x 54 PX = 12 636

MULTIPLIERS: The multiplier is the number of prefixes worked, additive on a band-to-band basis. A prefix is considered to be the number/letter combination which forms the first part of an amateur radio call sign (N1, W2, WB3, K4, AA6, WD8, 4X4, DL7, G3, IT9, NP2, PY7, VK4, Y32, Y33, KT4, JE3, etc, etc). A station in a call area different from that indicated by his call sign is required to sign portable. This applies even for home stations, eg WB2OTK has a licensed station in SC, but is required to sign /4 for contest purposes only. In all cases, the portable prefix is the multiplier. Example: KT2B/3 counts as KT3; WC2K/VE3 counts as VE3; KR2Q/C6A counts as C6A; 4X4FN/W2 counts as W2. Special event, commemorative and other unique prefix stations are encouraged to participate. A station who changes location during the course of the contest is free to contact as many other stations as he wishes; however, the moving station counts as only one QSO and PX unless he changes call areas during the course of operations. Example: K2SMN operates from the NJ/PA border; he may be counted as K2SMN for one QSO and PX (K2) by all those he contacts from NJ. He may be counted as K2SMN/3 for one QSO and one PX (K3) by all those he contacts from PA, including stations previously worked from NJ. Changing "grid squares" does not justify a new contact.

AWARDS: Engraved trophies will be awarded to the top-scoring stations in each category and major geographic area where competition is indicated. Parchment certificates suitable for framing will be awarded to the top-scoring stations in each category and minor geographic area where competition is indicated. Certificates may also be awarded to other top-scoring stations who show outstanding contest effort. Major geographic areas include North America, Europe and Japan as of this writing, but may be extended to include other areas as justified by competitive entries. Minor geographic areas include States (US), provinces (Canada), countries (Europe) and call areas (Japan), and may also be extended to include other subdivisions as justified by competitive entries.

Logs must be postmarked no later than August 31, 1988, to be eligible for awards. Logs should be mailed to the CQ VHF WPX Contest, C/-S C O R E, PO Box 1325, Eatontown, NJ, 07724, or to CQ Magazine, 76 North Broadway, Hicksville, NY 11801.

29th ALL ASIAN DX CONTEST — 1988

Supported by the Ministry of Posts and Telecommunications of Japan

The purpose of this contest is to enhance the activity of radio amateurs in Asia and to establish as many contacts as possible during the contest periods between Asian and non-Asian stations.

CONTEST PERIOD:

Phone — 48 hours from 0000 UTC June 18, 1988 to 2400 UTC June 19, 1988.

CW — 48 hours from 0000 UTC August 27, 1988 to 2400 UTC August 28, 1988.
BANDS: Amateur bands under 30 MHz.
ENTRY CLASSIFICATION:
1 Single operator, 1.9 MHz band (CW only).
2 Single operator, 3.5 MHz band (including 3.8 MHz band, etc).
3 Single operator, 7 MHz band.
4 Single operator, 14 MHz band.
5 Single operator, 21 MHz band.
6 Single operator, 28 MHz band.
7 Single operator, Multi-band.
8 Multi-operator, Multi-band.
POWER, TYPE OF EMISSION and FREQUENCIES: Within the limits of own station licence.
CONTEST CALL: Phone . . . CQ Asia. CW . . . CQ AA.
EXCHANGE
For OM stations — RS(T) report plus two figures denoting operator's age.
For YL stations — RS(T) report plus two figures 00
RESTRICTIONS ON THE CONTEST
No contact on cross-band.
For participants of single operator's entry — transmitting two signals or more at the same time, including cases of different bands is not permitted.
For participants of multi-operator's entry — transmitting two signals or more at the same time within the same band, except in case of different bands, is not permitted.
POINT AND MULTIPLIER:
Contacts among Asian stations and among non-Asian stations will neither count as a point or a multiplier.

For non-Asian stations — Points. . .a perfect contact with Asian stations (excluding US auxiliary military radio stations in the Far East, Japan) will be counted as follows for point scores: *1.9 MHz band . . . 3 points; 3.5 MHz band . . . 2 points; other bands . . . 1 point.*
Multipliers are the number of different **Asian Prefixes** worked on each band, according to the WPX Contest rules. Eg JS1ABC/7 will count for prefix JS7.
SCORING: The sum of the contact points on each band times the sum of the multipliers on each band.
INSTRUCTIONS ON THE SUMMARY AND LOG SHEETS
Summary sheet — write in your declaration and signature to give evidence of following the rules of the contest, together with your DXCC country, call sign, entry class, multiplier by band, point by band and total score.
Log sheets — use a separate sheet for each band and keep all times in UTC. Fill in the blanks of multiplier by countries or prefixes only the first time on each band.
AWARDS: Certificates will be awarded to the highest scorers in each category on each continent and medals will be awarded to highest scorer in the single operator multi-band and multi-operator multi-band sections.
REPORTING: Submit a summary sheet and logs of only one classification to JARL, All Asia DX Contest, PO Box 377, Tokyo Central, Japan. Please indicate phone or CW on the envelope. Envelopes should be postmarked no later than July 30, 1988 for the phone-section and September 30, 1988 for CW.
DISQUALIFICATION: Violation of the contest rules, false statements in the report or taking points from duplicate contact on the same band in excess of two percent by the total will be deemed reasons for disqualification.
ANNOUNCEMENT OF RESULTS: Phone about February 1989 and CW about April 1989.
COUNTRIES LIST OF ASIA: A4, A5, A6, A7, A9, AP, BV, BY, EP, HL/HM, HS, HZ/7Z, JA-JS/7J, JD1 (Ogasawara Island), JT, JY, OD, S2, TA2-8, UA/UN/UV/UW, UZ9-0 (AsRSFSR), UD, UF, UG, UH, UI, UJ, UL, UM, VS6, VU, VU (Andaman & Nicobar Islands), VU (Laccadive Island), XU, XW, XX9, XZ, YA, YI, YK, ZC4, 1S (Spratly Island), 3W/XV, 4S, 4W, 4X/4Z, 5B4, 7O (S Yemen), 8Q, 9K, 9M2 (W Malaysia), 9N, 9V (Singapore), J2/A (Abu Ail)

NATIONAL CW AND PHONE SPRINTS

The Adelaide Hills Amateur Radio Society Inc is pleased to announce the Third Annual National Sprints — a pair of "quickie" contests for CW and phone operators, to be held during July 1988. The rules for the Sprints will be similar to those for last year.

The Sprints are open to all operators in VK, ZL, and P2 call areas.

Sprint period is one hour.

Only VK, ZL and P2 contacts can be scored.

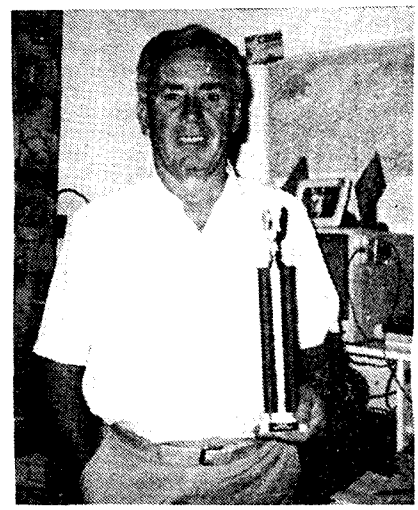
A new section for SWLs has been added to foster interest by a group of radio enthusiasts who the Society recognises may be some of our future amateur operators.

The National Sprints are endorsed and supported by the South Australian Division of the Wireless Institute of Australia which will provide certificates and trophies.

The reasoning behind the National Sprints is simple — there are too many "big" contests each year; they require a lot of time and the rules are complex, thus discouraging many operators from participating. The National Sprints are short,m sharp and simple, requiring a minimum of time while providing a significant operating challenge.
OBJECT OF THE SPRINTS: The operator's basic goal in the Sprints is to make (or SWLs log to hear) as many contacts as possible without duplication during an hour of operation on a single band. Any contact with a VK, ZL or P2 station on 80 metres during the Contest Period can be counted, but a station may be claimed only once.
ELIGIBILITY: The National Sprints are open to any licensed amateur or group of amateurs using a single call sign; eg club stations, or SWL, anywhere in Australasia (VK, ZL and P2 call areas).

CONTEST PERIOD:
1200 to 1300 UTC, July 2, 1988 (CW only)
1200 to 1300 UTC, July 9, 1988 (Any legal phone mode)
FREQUENCIES:
For the CW Sprint, frequencies between 3.500 and 3.700 MHz may be used.
For the Phone Sprint, frequencies between 3.535 and 3.700 MHz may be used.
CONTEST CALLS: CQ Sprint or CQ Test or CQ Contest.

Ian Buchanan VK2KL, was the top score overall trophy winner in the Phone Section of the 1987 Sprint.



John McMillan VK2BAT, winner of the CW Section of the 1987 Sprint as the top overall score trophy winner.

EXCHANGES: Minimum exchange for a valid contact will consist of signal report and a three digit serial number. The serial number may start at any number between 001 and 999, but will revert to 001 if 999 has been reached.
LOGS: Contest logs must show for each contact the time (UTC), call sign of station worked, (both call signs heard for SWLs), report/serial number given and report/serial number received. Each log must be accompanied by a cover sheet showing the date and name of the Sprint (CW or Phone), the total number of contacts claimed, and a statement that the operator has abided by the rules of the contest, signed by the operator/s. Any special conditions such as QRP or mobile operation should be mentioned in the statement. Any comments you may wish to add will be welcomed by the Society.

Logs are to be in the hands of the Society no later than Friday, August 12, 1988, addressed to:
National Sprint Manager, John Hampel AX5SJ, c/-AHARS, PO Box 401, Blackwood, SA. 5051.
Endorse the envelope CW, Phone or SWL Sprint.
AWARDS: Certificates will be awarded to the highest scorer in each Australian call area, ZL and P2 for both the CW and the Phone Sprints. Trophies will be awarded to the outright winner of each Sprint.

Certificates may be awarded to other operators whose performance was, in the opinion of the organisers, exemplary.
SWL: Certificates will be awarded to the highest listener log in VK, ZL and P2 for both the CW and Phone Sprints.

Any entry which is clearly in violation of the rules or spirit of the Sprints, or which contain an excessive number of claimed duplicate contacts (this does not refer to duplicates which have been indicated as such and are not claimed), may be disqualified.

The decision of the Society in respect of the interpretation of these rules, granting of awards, or disqualification will be final.

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PACKET TNC KIT

The Melbourne Packet Radio Group is moving ahead with its low cost, high performance packet radio TNC.

The TNC has reached production prototype stage, and hopefully will be released soon in kit form.

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED IN MARCH 1988

HAVKCA
137 John L Parsons

DXCC UPDATES IN MARCH

VK4AK	314/324 phone	316/326 open
VK5EE	279 phone	
VK2BQS	110 RTTY	173 open
VK1ZL	260 phone	

VANUATU AMATEUR RADIO SOCIETY AWARD

This award is a standard size certificate printed in the four colours of the Vanuatu flag and contains a scale map of the archipelago.

1. The award is offered to all licensed amateur radio operators who qualify.
2. To obtain this award, the amateur operator must have made not less than six contacts with Vanuatu stations carrying the YJ8 call sign who are members of the Vanuatu Amateur Radio Society. Contacts made from Vanuatu Independence Day (July 30, 1980) are acceptable.
3. Contacts may be made by CW, SSB or RTTY.
4. Two contacts with any one YJ8 station will be accepted providing these contacts are made on different days, different bands, or by different modes.
5. A log extract from the applicant showing the contacts claimed and certified by the signatures of two other licensed amateurs will be accepted. This record will be checked with the logs of the YJ8 stations worked.
6. Endorsements for all one mode, all one band or additional stations worked are available.

Cost of the award is US$2 (or near equivalent) or 10 IRCs.

All inquiries and submissions should be addressed to the Awards Manager, VARS, PO Box 665, Port Vila, Vanuatu.

YARC AWARD

The Yeovil Amateur Radio Club are offering a very attractive award to all transmitting or SWL stations.

The rules are as follows:

1. To work or hear any 22 British stations with the last letter of the call to make up the words *YEOVIL AMATEUR RADIO CLUB*. For example: G3. . Y, GM2. . E, etc, etc. They can be G, GD, GI, GJ, GM, GU, GW, or GB special calls.
2. Valid contacts from July 1, 1983, will count — any band, any mode.
3. No QSLs to be sent, only a certified list of OSOs (Copy of Logs) signed by an official radio club or by two active amateurs.
4. This award is open to all licensed radio amateurs or SWLs in any country.
5. Send certified list together with 10 IRCs or US$2 or UK£1 to the Awards Manager, F W Parkhurst, 56 Cromwell Road, Yeovil, Somerset, England. BA21 5AW.
6. A total of 22 QSOs are required and consist of: 3 ending in A; 1 B; 1 C; 1 D; 2 E; 2 I; 2 L; 1 M; 2 O; 2 R; 1 T; 2 U; 1 V; and 1 ending in Y.

—This information was contributed by Joy Collis VK2EBX, of Yeoval NSW, a honorary life member of the Yeovil (Somerset) Club

AUSTRALIAN BICENTENARY 1788-1988 NATIONAL CAPITAL CERTIFICATE

Australia is celebrating the Bicentenary of the first European settlement in 1988. Throughout 1988 there will be numerous major events to commemorate special features of our history or our society. Radio amateurs will join in this celebration through operating in conjunction with other events or staging their own special event and by using special call signs. During 1988, all Australian amateurs may use the AX prefix to replace the VK prefix in their call sign.

Also, during 1988, there have been a limited number of special event call signs issued to help celebrate the Australian Bicentenary. The Australian Department of Transport and Communications has provided one call sign with a VI88 prefix to each Australian State and Territory, as follows:

STATE/TERRITORY	CALL SIGN
Australian Capital Territory	VI88ACT
New South Wales	VI88NSW
Victoria	VI88VIC
Queensland	VI88QLD
South Australia	VI88SA
Western Australia	VI88WA
Tasmania	VI88TAS
Northern Territory	VI88NT
Polonia Radio Club, Victoria	VI88ABC
World Expo, Brisbane	VI88XPO

In Canberra, the ACT Division of the Wireless Institute of Australia has been organising several special events for the Bicentenary. The events that have already passed include:

AUSTRALIA DAY — VI88ACT and many of the other VI88 stations made numerous contacts on January 26, plus all of the VI88 stations talked with each other at 0900 UTC on 14.188 MHz. It was a real "Aussie" get-togetherIpe CANBERRA DAY — On the weekend of March 19, 20, the Annual John Moyle Field Day Contest was held. March 21, was Canberra Day, a holiday in the ACT, and VI88ACT was again active to help achieve success in the contest and to provide many with a special VI88 contact.

The major event was the opening of the new Australian Parliament House on May 9, 1988. Her Majesty, Queen Elizabeth II, opened the new building. Permission was obtained to operate an amateur radio station, and the call sign VI88ACT, from the new Parliament House site on Opening Day.

The ACT Division is offering a special QSL card and Certificate for contacts during the Bicentenary. Each VI88ACT contact will qualify for a QSL. In addition, there is an Australian Bicentenary National Capital Certificate. The artwork of the QSL and Certificate is very similar making the two a "matching set" which should be very distinctive and particularly attractive. The rules for obtaining the certificate follow.

The Australian Bicentenary National Capital Certificate was created to enable amateurs and SWLs world-wide to actively participate in Australia's Bicentenary celebrations from January 1 to December 31, 1988.

The Certificate depicts the Australian continent with images of significant events. 1788 is represented by the tall ships and establishment of the first settlement. 1988 is depicted by the National Capital's magnificent new Parliament House which was opened in May 1988. The test on the Certificate names the recipient, acknowledges participation in the Bicentenary and describes any endorsements claimed by the applicant.

The Certificate is conferred by the 1988 Bicentenary Committee, a sub-committee of the WIA, ACT Division. The aims of the 1988 Bicentenary Committee through its activities are to:

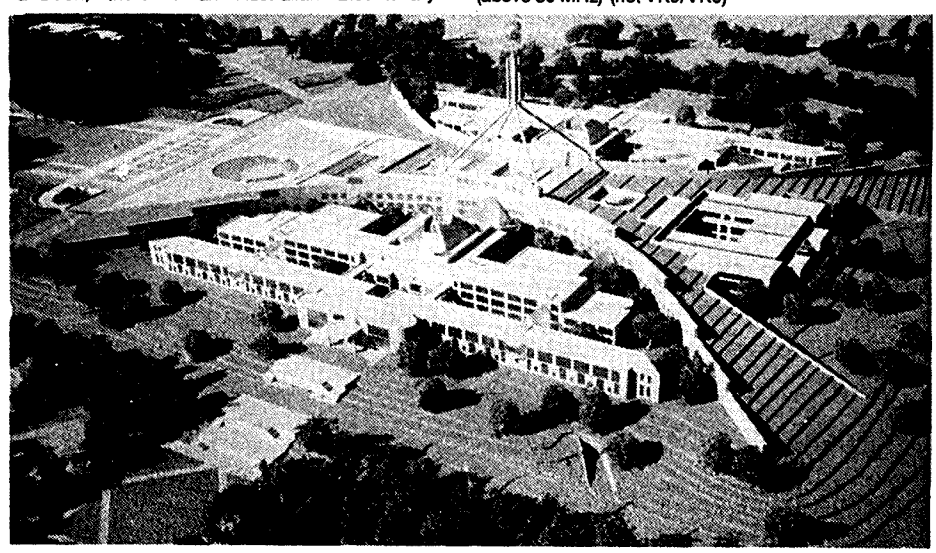
1. Stimulate widespread interest in the Australian Bicentenary;
2. Promote the awareness and use of amateur radio in Australia;
3. Encourage the widest possible use of all amateur modes and frequencies;
4. Encourage all VK1 amateurs to operate the call sign VI88ACT at least once during 1988.

QUALIFICATION

The following table and notes set out the criteria for qualification to receive the Australian Bicentenary National Capital Certificate:

1. POINTS REQUIREMENT

CATEGORY	SECTION	POINTS REQUIRED
1. HF (below 30 MHz)	VK Call Areas (not VK9/VK0)	50 points (Incl VI88ACT)
2. HF	Non-VK Call Areas (incl VK9/VK0)	20 points (incl VI88ACT)
3. VHF + (above 30 MHz)	VK Call Areas (not VK9/VK0)	50 points



The new Parliament House, Canberra.

4. VHF +	Non-VK Call Areas (incl VK9/VK0)	8 points

2. GENERAL NOTES

*Only contacts (or SWL reports) made during the period 1301 UTC, December 31, 1987 to 1300 UTC, December 31, 1988 are valid. (This period equates to 0001 hours January 1, 1988 to 2400 hours December 31, 1988, Australian Eastern Summer Time).

* Each application in Categories 1, 2 and 3 must include at least one of the Australian VI88 special event call signs. Those for HF must include a contact with VI88ACT.

* QSL card confirmation of contacts claimed is not required.

* Any VI88 special event call sign may only be claimed once per band per mode. Eg; Contact with VI88ACT on 20 metres SSB and 20 metres CW can be claimed as two contacts, or 10 points, because it is different modes on the same band.

* Any band and mode within the terms of the applicant's licence, is accepted.

* Requests for endorsements will be considered. Eg; If all points claimed are for contacts on a single band or mode, an endorsement to the Certificate would be possible.

* Contacts made by any terrestrial voice repeater method are not valid. Packet radio contacts using a digipeater or (several digipeaters) are valid contacts.

FOR HF OPERATION

Contact with any Australian call sign counts as one point; and

Contact with any Australian VI88 special event call sign counts as five points.

For VK operators only — All contacts, except for VI88 special event stations, are to be made with call areas other than the area from which the applicant is operating.

FOR VHF OPERATION

Contacts between stations up to 30 kilometres equals one point, and over 30 kilometres equals four points.

Contact with any Australian VI88 special event call sign counts as 10 points, ie VI88ACT or any other "VI88. . ." prefix.

COST

The cost of the certificate will be $A4 or seven International Reply Coupons (IRCs). Please include with application.

APPLICATION

Applications for the certificate should include the applicant's name and call sign (as they want it to appear on the certificate) and their return address.

Applications for the certificate should be in the form of a log extract showing for each contact claimed the call sign, the date and time (UTC) of the contact, mode and band used and the signal reports exchanges. All claims must be certified as a true and correct record of the log by at least one other licensed amateur other than the applicant. This requirement may be waived for applicants in remote areas — piease attach an explanation.

Inquiries for further information should be directed to Philip Rayner VK1PJ, on (062) 92 3260 (home) or at the address below. Applications for the certificate should be sent to:

VI88ACT Awards Manager, GPO Box 600, Canberra, ACT. 2601.

—Contributed by Daniel Steiner VK1ST, Chairman, Bicentenary Sub-Committee

SPECIAL AWARD RECIPIENT

Recently Don Hopper VK4NN, was awarded the Queensland Police Department's Certificate of Appreciation.

The citation reads as follows:

Donald Arthur Hopper is awarded a Certificate of Appreciation for valuable assistance rendered to Police in his capacity as an amateur radio operator.

On October 23, 1987, Mr Hopper learned of an injury sustained by an elderly woman on board a yacht some 200 kilometres off the coast from Brisbane.

Over the ensuing three days he made radio contact with the yacht and relayed reports of the injured woman's condition and the vessel's position to the Police Operations Centre, Brisbane, and the Sea Safety Operations Centre, Canberra. He also took it upon himself to liaise with various other persons, including Customs and Health Department officials, to arrange for the woman's medical evacuation to a Brisbane hospital.

As a result of Mr Hopper's diligent efforts the evacuation was successfully completed without incident on the evening of October 25, 1987.

Mr Hopper's voluntary radio monitoring on this, and numerous other occasions over a number of years, have been greatly appreciated by Police and members of the rescue services. His actions in this role have been of immense help to persons at sea requiring rescue or the provision of other assistance.

By his highly commendable and public spirited actions he is most deserving of this award.

QSP

EXAMINATION EXEMPTIONS

The holders of certain qualifications are exempt from sitting the Novice and AOCP theory examinations.

DOTC advises that those holding BOCP, TVOCP, Bachelor of Engineering in Communications and Electronics, Certificate of Technology in Communications and Electronics, and Telecom Radio Technician Certificates are exempt.

Holders of those qualifications need only sit the amateur regulations examination to obtain an Amateur Operators Limited Certificate of Proficiency.

If they additionally pass the five words per minute Morse code sending and receiving examinations, a combined Limited/Novice licence can be issued, and the 10 words per minute code examinations gives them the Full Call.

Perhaps you know someone with such a qualification? Help them pass the regulations examination and thus create a new radio amateur!

MURPHY'S DEPARTMENT

It was never our intention that this should become a regular feature! But Murphy's Law ("If anything can go wrong, it will") has once again been demonstrated rather impressively in the March and April issues. A letter from David VK2KFU, points out the errors on pages 4 and 28 of the February issue. These were dealt with at some length last month. David also comments on three articles in the March issue, on pages 20, 29 and 37. The latter two were also the subject of a phone call to me from Ron VK3RN.

I am happy to say that in at least one case there is no serious problem. David was of the opinion that some of the component values in the 6AU6, 6AQ5 amplifier on page 20 were incorrect and could lead to failure of the 6AU6. I can assure you all that there is a good deal of latitude permitted in these old valve circuits, and the values shown on the diagram are quite okay. If your shack is a museum like mine and actually contains a valve data book, reference to it may show that the 1M screen resistor could be 1.5M and the 1K cathode resistor could be 1.5K, but the difference in practice is trivial.

All is not so good with the circuit on page 29. The 0.002 uF capacitor shown between pin 9 and the 27K should be between pins 1 and 9. This is almost certainly a post-editorial drafting error, but as David says the result would be HT on the pentode grid, followed by "instant destruction". I might query how instant? Valves in fact are much more "forgiving" devices than transistors, and even if its plate went to the proverbial cherry-red for a few seconds before switch-off the 6GV8 might survive to take more punishment!

Now for the embarrassing bit! The circuit on page 37 is essentially the same transmitter, the only difference being in the details of the tank coil. The 0.002 uF capacitor is now in the right place. Admittedly the triode has one grid too many and the pentode one too few, but this is irrelevant. Also the G in 6GV8 looks more like a 4, but the text makes the type quite definite. The puzzle from our viewpoint, is how did both articles, almost identical as they were, find their way into the same issue? They should have been combined into one. If our faces aren't actually red, they are at least slightly pink!

Moving on to the April issue, page 25. Ron VK3RN and Allan VK3AE, both pointed out a number of difficulties with this tune-up indicator. Some of these are not very obvious to the beginner, so it is worth going through them in some detail;

a. The wire-wound pickup capacitor will have sufficient capacitance to detune the antenna, and also distort its radiation pattern.

b. Even at Novice power levels the RF voltage at the end of an antenna may be high enough to risk RF burn to the fingers if the feed wire or diode connections were touched. Meter burnout is also possible.

c. A diode so closely coupled to the transmitter (provided it survives burnout) could generate a whole spectrum of harmonics of the transmitter frequency, efficiently radiated by the pickup wire and the antenna itself. Result, TVI and signals on other bands where they have no right to be!

d. To overcome all these problems, use as the RFC a coil which will tune 80 metres (or band used) in conjunction with a small variable capacitor. Hard to get? Use a fixed capacitor and tune the coil with a slug. Then use the smallest possible pickup antenna, as far as possible from the main antenna. This also has the advantage of responding only to the wanted fundamental frequency of the transmitter output, whereas the original untuned arrangement could easily lead one to tune up on an unwanted (or even illegal!) harmonic.

Now we can get on to more normal Murphy-type problems, still with reference to the April issue. Typographical errors! Yea verily, Mr Murphy did play us for April fools. The article "A Discussion on Mixers" by Lloyd Butler VK5BR, abounded with them, mostly in those richest of Murphy's pastures, mathematical expressions and formulae. Thanks to Lloyd himself, here are the details:

Page 16 Para 5, line 3. "of f0" not "if f0".
Page 16 Para 5, line 6. "portion" not "position".
Page 16 Para 5, line 12. "of f1" not "if f1".

Page 18 First col, line 9. "f0 + f1" not "f0tf1".
Page 18 First col, line 11. "formed" not "normal".

Page 19 Second col, line 3. "exponential" not "experimental".
Page 19 Second col, line 9. The figures 2, 3 and 4 in the three right-hand denominators should read 2!, 3! and 4!

Page 21. The resultant waveform at the bottom of Figure 11 has been re-drawn incorrectly. The correct diagram is shown below.

The equation in column 1 should read:

$$A1\sin(2\pi f1t)\{1+4/\pi\{\cos(2\pi f0t)-4/3\pi\{\cos(2\pi 3f0t)\}\}\ldots\text{etc}$$
$$= A1\sin(2\pi f1t) + 4A1/\pi\{\sin(2\pi f1t)\cos(2\pi f0t)\}\ldots\text{etc}$$

Page 22 First line. "curved" not "current".

Page 24 Third col, para 2, lines 6 and 7. Delete the sentence "Specification of this point could be reached".

And in Lloyd's other article "Memory Expansion for the VZ200/VZ300 Computers", page 11, column 2, line 2. "B800H" not "8800H".

Page 12. In the diagram, device N2 has four unnumbered pins. The three at lower left, reading from top to bottom, are 1, 3 and 4. The pin on the right is 13. Ignore the figures 4, 3, 2 and 1 shown well to the left of device N1.

Perhaps next month we will need only a normal-size "Murphy's Corner". I most certainly hope so, and I guess you do too.

AX3ABP

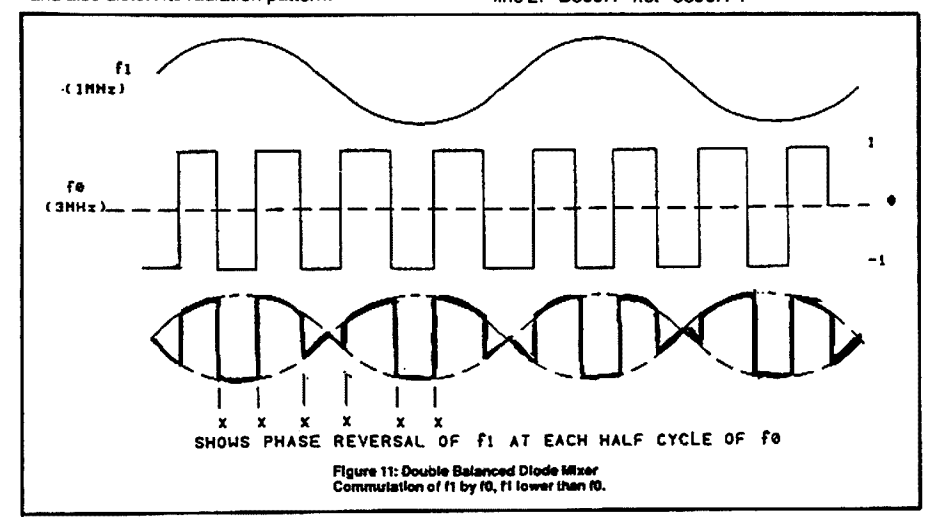


Figure 11: Double Balanced Diode Mixer Commutation of f1 by f0, f1 lower than f0.

SITUATION VACANT

WANTED: Newshounds for the WIA journal, *Amateur Radio* magazine. The only requirement is a news-sense — an easily acquired skill. A definition of "news" is something that is new and of interest to someone else.

In the diverse hobby of amateur radio, things are happening all the time which could, if put down on paper, make interesting reading. Even just a news tip-off or an accurate snippet could lead to a worthwhile article.

Just spend a minute and give thought to whether you know of some news. Is your radio club or group doing something you think would be of interest to others — then submit an article.

If you see something printed about our hobby in a newspaper or elsewhere — take a clipping and put it in the post without delay. Remember to mark the clipping with the name of the newspaper or publication, and the date it appeared.

News offerings from amateur radio equipment suppliers and retailers about new products and industry developments are also most welcome.

Send your material to The Editor, AR Magazine, Wireless Institute of Australia, PO Box 300, Caulfield South, Vic. 3162.

COMPUTERESE NOT NEEDED

London scientists have launched a desk-top computer which accepts commands in English, doing away with the technical jargon of "computerese".

The computer produced by the London firm, Tome Associates, is claimed to be the first of its kind to incorporate "natural language programming".

A new computer program, called the Tome Searcher, is the outcome of five years work by computer and linguistic experts at London University.

ANTI—VIRAL COMPUTER PROGRAM

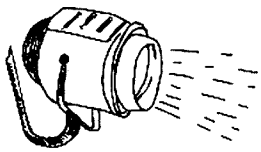
A company in New Jersey, USA, is offering to inoculate computers against viruses, or rogue programs designed to spread from computer to computer and damage data.

Viruses left unchecked can wipe out memory banks and disable computers — but this can be counteracted by the Viralarm system announced by Lasertrieve Incorporated.

Viralarm is a special program to protect another program, creating a software barrier.

Before anyone can use the protected program, Viralarm checks to determine whether the program has been altered since it was inoculated. If there has been any change, Viralarm then blocks use of the altered program, notifies the user and suggests a backup copy of the program be substituted.

Viralarm protection is available for individual personal computers and works for most of the operating systems now in use.



Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

Half the year has almost gone already! Conditions do seem to be vastly improved from 12 months ago, especially on the higher frequencies. However, I do notice that as the Solar Flux climbs, the amount of geomagnetic disturbances also rises, which means that there are often more dropouts on circuits. These are particularly noticeable on polar and Auroral circuits, while equatorial and tropical areas are seemingly unaffected.

I have, of late, been frequently operating the 12 metre amateur allocation and have been pleasantly surprised by the results so far. I am using a humble G5RV multiband dipole about 10 metres high with my FT-707. I have fair reports on my 100 watts PEP, although CW is more reliable from stations in North America. I haven't worked any European or Asian stations from my West Launceston QTH yet on 24 MHz, although I can hear plenty of Asian CB signals on 26 and 27 MHz. It would be a good idea to monitor 24.950 MHz, which has become a calling channel and then QSY.

Results on 21 and 28 MHz from my G5RV have, so far, been disappointing and I am contemplating raising my 15 metre dipole up higher and altering its direction, in an effort to improve audibility, particularly to Europe and Asia. I used to have a Ringo vertical cut for 28 MHz at my previous QTH, and I might have to obtain a 28 MHz vertical in the future.

Signals from Central and South America are beginning to appear regularly on the tropical allocations of 60 and 49 metres. Radio Reloj in San Jose, Costa Rica is easily heard here from 0700 UTC on both its channel of 4.932 and 6.005.5 MHz. It frequently identifies and had typical Latin music. One South American station that comes in reliably is Radio Union in Lima on 6.115 MHz at around 0800 UTC. I believe they are running 15 kW. There are a number of Colombian and Venezuelan outlets on either side of the WWV 5 MHz signal. Frequently they carry networked programming which can lead to wrong identification. I was caught once by one identification as Radio Rumbos although it was not on the listed channel. It was only after I heard the same signal a few kilohertz down the band on the listed channel that I realised that Radio Rumbos is a Colombian network.

At a recent WARC meeting, it was agreed that international broadcasters would eventually use SSB for their programming. The year 2015 was mentioned as a date, but it will take perhaps a little longer. Not many broadcasters have employed SSB so far, yet a few have occasionally experimented with it. One has been Radio Sweden in Stockholm, which has utilised 100 kW senders at Varberg for a number of years. You can often hear them on 21.555 MHz USB with relays of the Swedish Home Service. Now the news has come through that this service is going to cease as from July 1. The Swedish Telecom has been providing it at their own expense and as part of their economic rationalisation, has decided to discontinue it.

However, the use of ISB (B8E) by international stations as feeders has increased. The USSR has, for many years, fed both its domestic networks on SSB and some international programming as well. For example, 6.058 MHz USB carries Radio Moscow Japanese language programming around 0900 UTC. Frequency 12.205 MHz carries Soviet domestic programming on each sideband around 1100 UTC. Other Soviet feeder channels are 13.380, 16.330, 9.905, 7.492.8 MHz, but they can often emerge anywhere on the fixed allocations.

There are also VOA ISB feeders readily heard. One of the easiest is perhaps 9.350 MHz, with one channel in Russian and the other with VOA English. The location of this sender is Delano, California. There is another VOA feeder on 14.398 MHz LSB from the same site with English, beamed to the Colombo, Sri Lanka relay. Although the VOA utilises satellite feeds for their audio, the use of HF feeders is a backup as well as synchronising with State-side transmitters. Another LSB feeder is 18.137.5 MHz, heard in our morning hours, as is 14.398 MHz.

The US Armed Forces Radio and Television Service feeder on 9.377 MHz LSB is actually located in England and is a relay from the satellite link to allow synchronisation with European AFRTS outlets. Both the BBC and Radio Australia used to have B8E feeders until a few years ago, but rely exclusively on satellite links today. Deutsche Welle and Deutschelandfunk also have an USB link on 6.955 MHz around 0530 UTC, to the Portuguese transmitters. The semi-clandestine Radio Liberty/Free Europe also extensively use B8E to link up with senders in both Spain and Portugal. Ironically, it is easier to hear the feeders than the senders within normal broadcasting allocations, because of the constant jamming that RFE/RL experiences. Tune around both 10 and 11 MHz and you will come across these feeders quite easily.

Incidentally, I came across Radio Moscow's DX program over their North American Service in English. It only lasts five minutes and contains "tips" on mainly Eastern European stations, although they did ask for listeners contributions. It is on at 0250 UTC Tuesdays and 9.530 MHz seems to be the best channel.

Well, that is all for June. Until next time, the very best of listening and 73.
—Robin VK7RH

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Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic. 3199

As one result of the devolvement of examinations, we may lose much of the information which we have been used to receiving from DOTC. This applies particularly to the statistics on numbers of candidates, papers used, and pass rates.

Although the Department officers are confident that the procedures for approving papers will maintain the standard of the qualifications, there is not yet an established procedure for collecting and collating information about the results of specific examinations either as a regular occurrence or on an occasional basis.

It seems to me that we should be collecting whatever information we can, so that the whole system can be reviewed after a reasonable time, and we can ensure both that candidates can have confidence in the system and that established amateurs are happy to accept graduates from the new system into their ranks.

The permission to conduct an examination must carry with it the obligation to submit the relevant statistics to the Department, even if there is not yet an established collation system.

Perhaps the Institute could undertake to do the collation and whatever statistical analyses become appropriate.

In response to questions raised at the recent Joint Meeting of the WIA and DOTC, the Department officers emphasised their intention to consider the papers as a whole as well as the individual questions and distribution, to ensure comparability between examiners. Papers composed of all "easy" questions and all "hard" questions may be returned for modification before being approved.

There will also be a need for supply of information about times and locations of intended examinations. At present, the requirement is for this information to be submitted with the papers for approval. Local DOTC offices will then disperse the information on request.

We would like to have this system expanded so that the information also comes to the Institute. Both Divisional Offices and the Executive Office should be able to answer inquiries about future examinations. If inquirers can only be told to contact the local DOTC office, we lose a valuable chance to show intending amateurs what the Institute has to assist them.

I would appeal to all who are intending to run examinations to provide this information to the WIA as a matter of course.

The long awaited revised version of the regulations is about to appear. Please study them, and be aware that they will be the basis for the future regulations examinations.

The finished publications will be as a free leaflet.

73, Brenda VK3KT

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SIX-METRE PROPAGATION TEST

Six-metre propagation tests will be conducted in Singapore from June 3 to June 12, 1988. Co-ordinator for the event will be Yoshi JA1UT.
Frequencies — 50.075 and 50.125 MHz.
Location — Century Park Sheraton Hotel, Nassim Road, Singapore.
Call sign — 9V1ES.

—Contributed by K C Selvadurai 9V1UV, President, Singapore Amateur Radio Transmitting Society

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW, 2868

1988! VK BICENTENNIAL AND YEAR OF THE YL

Here in Australia we are celebrating our Bicentenary in various ways throughout the country.

Who could fail to be moved by the stately fleet of tall ships gliding into Sydney Harbour on Australia Day, the pageantry and colour which has marked so many of our special celebrations in honour of our 200th birthday.

In the amateur radio world, the event has been marked by use of the AX prefix, and the special VI88 call signs for each State are eagerly sought after, particularly by DX prefix hunters.

Many amateur radio clubs have special events and activities planned for 1988.

ALARA members are commemorating the occasion with the Mavis Stafford Bicentennial Trophy (details March AR), which is creating much interest, and the attractive ALARA Award stickers, designed and coloured by Valda VK3DVT.

1988 could also be termed "YL Year" with several YL awards running concurrently, some fairly easy to attain, others more difficult. Among them are:

The Mavis Stafford Bicentennial Trophy
The WARO Century Award (AR, October 1987)
The Dutch YL Year 1988 Award (AR, December 1987)
The Japanese JLRS YL-88 Certificate (Details below)
The Brazilian YL PY 88 Award (Details below)

With the exception of the WARO Century Award, these are all special awards for the year 1988, and should ensure plenty of YL activity on all bands.

Personally, I am getting a great deal of enjoyment working contacts for the various awards, meeting new friends, and catching up with old ones. My main problem is keeping track of my lists for each award, but a general rule seems to be to work YLs whenever possible, and catch up with the paperwork later.

MAVIS STAFFORD BICENTENNIAL TROPHY

To go with the Bicentennial Trophy, we now have a consolation prize. Margaret VK4AOE, has kindly offered a crochet table centre as a consolation prize to accompany the Mavis Stafford Bicentennial Trophy. It will be for the YL who scores the middle position in the points ladder of the YLs who apply for the award. In the event of a tie, the lower score gains the VK4AOE Consolation Prize.

JLRS YL-88 CERTIFICATE

The YL-88 Certificate will be issued for confirmed contacts with 88 YLs between March 3 and August 8, 1988. Contacts must include at least two JLRS members (including DX members)

Contacts with the same YL on different bands or modes will not count as additional QSOs.

Logs must show full date of contact, time, call sign, frequency and mode, full name, address, call sign and signature of applicant. Logs accompanied by three IRCs for postage of the certificate and souvenir to:

Nobuko Wakabayashi JG1QGQ, 5-21-7 Meguro-Honcho, Meguro-ku, Tokyo, 152, Japan, to be postmarked no later than August 31, 1988.

YL PY 88 AWARD

From Labre DS/SP for all contacts in any band and mode for 88 points during the period January 1, 1988 to December 31, 1988 with Brazilian YLs.

Phone Contacts each PY YL — eight points
CW Contacts each PY YL — 11 points

Special Stamp for CW Award, and SWLs can also apply.

PY YL DX Net — from 1900 to 2100 UTC on 14.248 MHz will help. Other times can be arranged.

ALARA AWARD UPDATE

No	Date 1988	Name/Call Sign	Endorse	Endorse Stick	Bicenten Stick
92	Feb 25	Kim Wilson VK3CYL		3	1
100	Feb 25	Kim Wilson VK3CYL	All 2xCW	2	1
119	Mar 3	Alan Hughes ZL3KR		1	1
135	Mar 4	Aimee Tuband FK8FA	All 14 MHz 2xCW		1
136	Mar 4	Dawn Young ZL2AGX		2	1
137	Mar 10	Mary Lou Brown ZK2MB		1	1
138	Mar 10	Jan Scheuerman ZK2JS		1	1

The Awards Custodian, Mavis VK3KS, hopes to issue many Bicentennial Stickers this year, and keep Valda busy colouring them.

YL ACTIVITY DAY

During the past few months, there has been renewed interest in YL Activity Day, held on the sixth of each month. With improved band conditions it could be revitalised as a means of getting together for a rag chew with our DX and VK friends, something more than just an exchange of call signs and reports. There is the added advantage this year of gaining contacts for one of the various YL Awards.

Here is what Diana G4EZI has to say about it:

The idea was born after participating in the YL Anniversary Party in October 1989. I thought it seemed a pity that many YLs only ever came on for YL contests, where there was never really time to chat and get to know any of them. I thought that if we had one day a month when YLs could get together, and be sure of finding other YLs on the bands, it might encourage more of them to get on the air without the pressure of a contest and the QRM.

I discussed the idea with Peggy WB2OHD, and she agreed to spread the word among American YLs. I then circulated the information to all the YL clubs and individual YLs I could think of.

I chose the 6th of the month because Renee F5RC, had already tried to start a YL Activity Day on that date, but it had never really got off the ground (probably because frequencies and times for looking for other YLs had never been specified). I realised we must specify times and frequencies to look for other YLs, as no one can scan the bands all the time, so I thought it was sensible to listen on the hour each hour. The frequency, 14.288 MHz, was selected because

Carol VK5PWA.

Sue VK5AYL.

Gill Wardrop.

this is where the American YL Open House Net already met. 21.188, 21.388, 25.588 and 28.688 MHz were chosen to fit in with this — we had to give two frequencies for 15 metres and 10 metres to fit in with operating restrictions in certain countries. CW frequencies were added later, and had nothing to do with me as I don't touch the key — these all end in 33.

The first YL Activity Day was November 6, 1979, and I worked eight YLs on that day — two VKs, four Americans and two G stations. On December 6, I worked 12 stations from six countries, but I believe quite a few more may have been active. January 6 shows an incredible 30 stations in my log. Only nine YLs were worked on February 6, 20 March, 18 April and 19 in May. Things started going downhill in 1981 — March 12 YLs, April 12, May 9, June 3, July: no YLs worked except on the BYLARA net, August 4, September 1, October not takers, November 0, December 1 YL. January and February 1982 0, but things improved again in March with seven contacts (but no Europeans heard!), 4 in April and 5 in May.

The heyday of YL Activity Day was probably about two or three months after it started, which is about the time the information first appeared in all the YL magazines. Since then, it has gone up and down a bit, staggered along, and I'm afraid I probably didn't bother supporting it as much as I had been doing.

However, I believe the VK YLs still support it — the information always appears in their magazine, and when I used to write regularly to Jos ZL2BAO, about two years ago she still always went on and seemed to find plenty of VK and ZL YLs around the bands on the sixth.

—From BYLARA Newsletter, December 1987

SILENT KEY

Our sympathy to OM Stan, family and friends of Bobbie VK6MH, who became a Silent Key on March 25. Bobbie was an amateur radio operator for 50 years (April AR).

BITS AND PIECES

Several ALARA members have been involved with VI88 call signs including Bev VI88WA, Gwen VI88VIC and Maria VI88SA.

Bev VK6DE, OM Brian VK6AI and son Colin, had a most enjoyable trip to New Zealand and met many of the ZL friends they talk to regularly. Peggy VK6NKU, was also in New Zealand, and it is interesting to note that, although she and Bev live within 200 kilometres of each other, and have had many QSOs, they had never met until they both went to Auckland.

The VK3 Birthday Luncheon will be held on July 31.

Congratulation to Norma VK2DJO on the arrival of a second daughter, Michelle, also, to proud grandmothers, Bobbie VK2PXS and Rae VK3AYL.

Grandchildren seem to be the "in-thing"! Heather VK2HD, has another grandson, and OM Dan and myself another granddaughter, born in February. Ken VK3AH, ex-DX Editor in AR, has two new grandson's born four weeks apart.

Until next time — 73/33 and 88.

Joy VK2EBX

ar

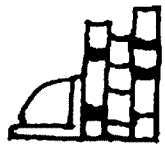
QSP

GREEK SPECIAL EVENT CALL SIGN

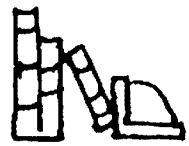
The Radio Amateur Association of Greece (RAAG) is celebrating its 30th anniversary.

To mark the occasion, the special call sign SX1RAAG has been issued to the national radio society.

The station will be active on CW and SSB from 160 metres to 10 metres, until June 30.



Book Review



1988 ARRL HANDBOOK FOR THE RADIO AMATEUR

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

The 1988 ARRL Handbook for the Radio Amateur marks the 65th edition of this most highly respected publication.

The handbook is not only a basic resource for all radio amateurs, but is widely used by technicians and engineers.

This new edition only comes in hard-cover and should last for many years. The previous editions were difficult to handle because they acted like a floppy telephone directory.

The 1988 handbook is, as usual, well indexed, making it ideal as a text book for those studying for DOTC theory examinations or for the experimenter wanting to check on a theory aspect.

New construction projects range from a passive CW audio filter to a synthesised computer controlled receiving converter.

Other projects added to the new edition include a deluxe memory keyer, balanced QRP transmatch, and a 160 metre transverter.

The first five chapters cover the basics of amateur radio, electrical fundamentals, radio design technique and language, and solid state principles.

Vacuum tube principals in relation to high power amplifier design are also presented in the introductory chapters.

There are 12 chapters devoted primarily to radio principles, power supplies, audio and video, digital basics, modulation and demodulation, transmitters, receivers, transceivers, repeaters, power amplifiers, transmission lines and antenna fundamentals.

Another four chapters cover voice, digital, image and special modulation techniques.

The RF spectrum, propagation and space communications are covered in two chapters.

The construction and maintenance sections have 12 chapters of useful projects ranging from power supplies and antennas through to digital equipment.

The final five chapters cover how to obtain a licence in the United States (curiosity value only), station design and operation, interference, monitoring and direction finding.

As usual, the ARRL Handbook is easy to read and well illustrated. It is now available from your Divisional Bookshop.

Radio Amateur Old Timers Club

Kevin Duff VK3CV
PUBLICITY OFFICER
RAOTC
10 Stanley Grove, Canterbury, Vic. 3126

The 20 metre QSO Party, held on March 14, was, as is usually the case, very much subject to skip — if your QTH was not in the right place, you were lucky to work anyone, but Warrnambool always seems to be just perfect! Jack Anderson VK3JA, worked 30 of the 22 VKs and 12 ZLs who seemed to be active and were noted in the logs submitted.

We hope for a better turn-out in the 80 and 40 metre parties on August 8 and 15. See *OTN* March 1988 for details.

RESULTS

CALL	MODE	QSOs	MULT	SCORE
VK3JA	CW/SSB	30	9	1350
VK2AWA	CW/SSB	15	7	525
VK3VF	SSB	13	7	455
VK3XF	CW/SSB	11	7	385
VK7JB	SSB	9	7	315
VK4ALW	CW	10	6	300
VK3YW	CW	8	6	240
VK2BJH	CW	8	5	200
VK3AMD	CW/SSB	9	4	180
VK3XH	SSB	7	4	140
ZL3BJ				960
ZL2AT				920
ZL4AI				480
ZL2AB				330
ZL3AY				200
ZL1VX				140
ZL2AW				60

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DIRECT READING CAPACITY METER

AR, October, page 18

There were two errors in the article, October page 18.

1. The meter should be 500 uA, not 500 mA.
2. SW1 is shown as being normally open — it should be normally closed.

The latest figures on the aging rate of the 10 MHz crystal used in the Frequency Reference, described In AR, September/October 1986 are as follows:

Total continuous running time — greater than two years.

Last major correction and date — January 20, 1987 (≃ 5 Hz).

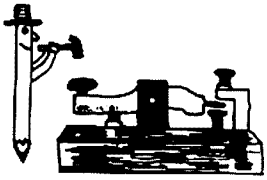
Last reading date — October 22, 1987.

Total days — 275 days.

△ frequency — -6.5 Hz.

∴ aging rate per day — .0024 PPM.

—Contributed by Ken Kimberley VK2PY



Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

What we call CW is the most basic form of radio communication. The test books tell us that it is really Interrupted Carrier Wave (ICW). We can split hairs and call it just about anything, after all we are not interrupting a carrier but sending bits of carrier. Morse Code. Another method is called Frequency Shift Keying (FSK) where the dot or mark and the space are on different frequencies. I may or may not deal with the subject at a later date, but for now I hope to deal with ICW or simply keying.

The bandwidth required by a properly keyed signal is quite small, and directly related to the speed of sending. A simple on/off switch will generate a square envelope, together with its harmonics or clicks. You may hear these clicks while tuning in the CW section of the bands and be able to pinpoint the station involved. On the other hand, a "soft" dot may be hard to copy, especially at high speed.

There are two main components which affect Keying Characteristics. Envelope shape, and frequency stability. Any trouble such as key clicks, ripple, chirp, whoop and spacer waves can be attributed to poor conditions in one of these areas.

The envelope shape is the outline of the pattern that the signal would display on an oscilloscope. You can imagine that getting the shape right is a difficult thing to do properly, let alone getting it right for a number of different speeds.

An unduly "hard" signal will cause key clicks, which are actually unwanted sidebands, taking up more spectrum space.

Chirp is a form of frequency instability which occurs each time the transmitter is keyed, and is recognised by a change in beat frequency at the beginning and end of each character when the signal is monitored on a receiver. About the only place you will hear it nowadays is on home-brew equipment controlled by a VFO (mine!), and there are three main causes:

1. **DC Instability** — which occurs when a common power supply is used for the oscillator and the power amplifier. Even the best designed oscillator will require a regulated power supply, and sometimes a separate power supply, to have the stability needed for today's standards.
2. **Pulling** — refers to the effect on the oscillator frequency of one or more of the subsequent stages whose operating conditions change during the keying cycle. If the stage following the oscillator draws input current or the early stages are tightly coupled, pulling can be expected. If the oscillator is on the same frequency as the PA the likelihood is increased. Be careful design it should be possible to short the output of the oscillator chain without shifting the frequency by more than a few Hertz. However, this sort of dedication is not necessary in a receiver alone.
3. **RF Feedback** — any high level stray signals leaking back to the oscillator will have an appreciable effect on its frequency, especially if it is a VFO. Isolation of the oscillator is of paramount importance. External feedback is only discovered after the transmitter has been built, and the commonest cause is the PA circuitry being close to the oscillator section. A metal screen is recommended as well as bypassing the HT line to RF by means of series resistance and shunt capacitance.

In case you are wondering where I am reading up on all this information, let me assure you that I am having all the above problems with my QRP equipment, so a certain amount of "reading up" is mandatory. I am merely attempting to pass the information along.

All the problems are compounded when attempting a full break-in system (QSK). Not only must the transmitted signal be clean, but the receiver must be muted or attenuated in strict timing with the transmitted signal. Slow AGC circuits, such as are fitted to most commercial transceivers, are characterised by their long recovery time, so the receiver will not be able to recover its sensitivity in the spaces between the signal elements. Even the design of the audio section must be carefully considered to prevent the thumps associated with its switching on and off at Morse speeds.

The feature of a full break-in system is that the operator is able to hear incoming signals in *between* his own dots and dashes. When using QSK, the normal changeover and keying functions are controlled by the key, and they must take place in the right sequence. The station must return to the receiving condition at the sensitivity level required by the operator between each dot and dash of the transmitted message.

It is not easy to install a good break-in system, one of the problems being that of keying the transmitter oscillator stage. This can be avoided by leaving the oscillator running and screening it so well that it cannot be heard in the station receiver, or using a mixer type VFO with a keyed mixer. It is *very* difficult to screen the VFO from the station receiver.

If the transmitter oscillator runs continuously it may be audible as a *backwave* or *spacer wave* between the keying pulses. A strong backwave may indicate the need for neutralising one or more transmitter stages.

RF envelope shaping can be controlled in different parts of the transmitter by many different keying methods. Because on/off keying is a form of amplitude modulation (AM), it generates sidebands whose spacing from the carrier is a function of the keying envelope rise and fall times, which are the highest frequency components of the keying waveform. An untreated keyed waveform looks like square wave modulation, so it consists of the carrier plus all its odd harmonics. The resultant key clicks will extend many kilohertz either side of the carrier. On the other hand, an envelope with a long rise and fall time will sound soft because there is less contrast between the noise and the signal for the ear to respond well at high speeds.

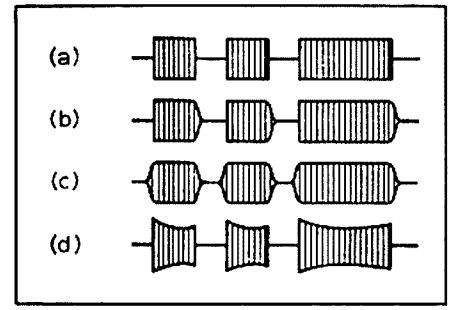


Figure 1: Keying envelope characteristics. (a) Click at make and break; (b) click at make, with click at break suppressed; (c) ideal envelope with no key clicks; (d) effect on keying envelope of poor power supply regulation.

Examining the graph will give an idea of the many adjustments necessary for a proper signal at the appropriate speed. Figure 1 shows the ideal envelope shape (as recommended by the FCC) suitable for speeds up to about 60 words per minute (WPM). Figure 2 show some other keying envelope characteristics.

Weighting provides a method of adjusting the overall shape of a string of Morse elements. It can be used to adjust individual element shapes but this is best done in the actual keying circuits of the transmitter. Slow Morse (five to 15 WPM), can benefit from a *heavier* weight, ie the length of the dots and dashes is increased with respect to the spaces between them. This, according to many operators, gives the signal more *punch*. At higher speeds (25 to ?? WPM), a light weight will give the dots more emphasis, but the conditions must be relatively good for *any* copying at high speeds. It requires a well based knowledge of keying envelopes just to know which knobs to twiddle if you have the latest in weight controlling keyers! Other-

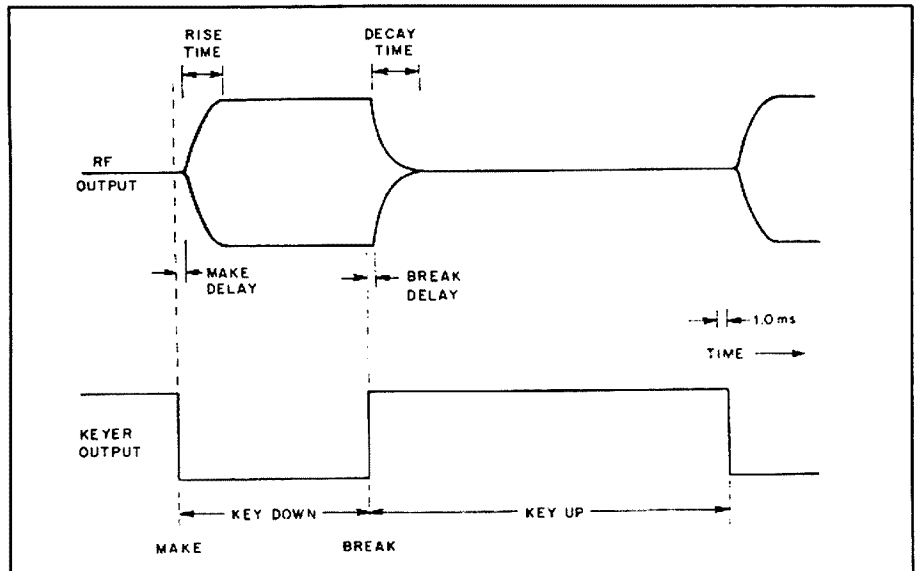


Figure 2: Shaping and timing in CW keying systems.

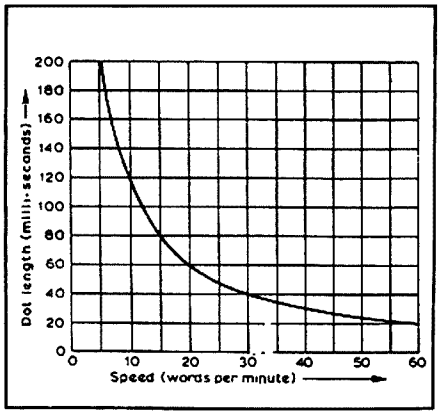


Figure 3: Graph showing dot lengths for a range of transmission speeds. Once the design figure of the maximum speed of sending for a transmitter has been decided, this graph can be used to select the appropriate time delays in keying filter circuits.

wise, you can certainly conclude with some interesting effects.

There are many possible methods of keying, and the choice is largely one of practical convenience, personal preference, and suitability to the station as a whole. Almost any stage of the transmitter may be keyed. If the oscillator is keyed, the requirements of a short time constant to reduce chirp and a long time constant to eliminate click conflict.

If any stage before the PA is keyed with softening, the PA may harden the keying causing clicks. So, keying the PA seems to be preferable. In some cases it is useful to key more than one stage sequentially, and I hope to cover this later on.

REFERENCES

RSGB Radio Communications Handbook, Fifth Edition
The ARRL Handbook, 1986 Edition

The CW Operators QRP Club is, as far as I am aware, the only CW dedicated club in Australia. If you are a Knight of the Key, you should make some inquiries about membership. If you are willing to take the plunge, I thin you will be pleasantly surprised at the fellowship and camaraderie, not to mention the benefits for the small annual fee involved. I believe it is the duty of all dedicated Morsiacs to support their mode against the negative thinking currently in vogue. I do not want to sound pushy, but I am the one writing this column so I feel justified in that regard. Supporting your hobby means more than just firing up the rig once a week. It has probably cost you a fair amount of hard cash already, so why not protect your investment. Get involved in the contests and support the Morse section, send in a log, no matter if you only have time for a few contacts, it will only cost you a stamp. This especially applies to the Novice Contest, *they* need your support too. If you have the time, try your hand at home-brewing, the rewards far outweigh the headaches, and you will keep the parts suppliers in business for the next generation.

If I can help with information, I will be glad to do so. Think of me as a clearing house — I will do my best!

73 for this month,
Gil VK3CQ

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DEADLINE FOR AUGUST IS JUNE 20, 1988

How's DX?

THAILAND GETS AMATEUR RADIO

The hobby of amateur radio has never been legally recognised in Thailand, but a new law has changed that situation.

Thailand has been virtually off the HF bands since 1982, and in the past five years great efforts were needed to convince authorities that private citizens should have radio transceivers.

Under new radio regulations, Thai nationals aged at least 15 years will be eligible for licences.

There will be three licence grades, namely:

☆ Novice Class, offering VHF only on two metres;

☆ Secondary (Intermediate) class, with a Morse code requirement and a better technical knowledge than the Novice, and;

☆ First Class, with Morse code capability and even greater technical knowledge.

A national Security Council or Police clearance is required before an amateur radio licence is issued. Licence applicants need to be a member of the Radio Amateur Society of Thailand (RAST).

The Thai Post and Telegraph Department is keen on reciprocal licensing. This will be the only way non-Thai nationals will be able to operate in Thailand.

RAST International Liaison Officer, Tony Waltham HS1AMB/G4UAV, told *Amateur Radio* magazine that the RAST is officially recognised under the new regulations, and has the role of overseeing amateur radio operations, especially on the HF bands, when this returns.

Tony says at present there is no licenced HF operation. The relative lack of HF activity since 1982 has been due primarily to steps being taken by the authorities to fully legalise amateur radio. Over about 20 years it had been self "policed" by the RAST.

Tony explained that the RAST, at the end of 1982, advised its members to go QRT on HF while the Post and Telegraph and security agencies reviewed the question of amateur radio. But in order to maintain Thailand's presence on the HF bands, RAST members obtained special permission to take part in major international contests — sustained operation to maximise QSOs.

He says in the past five years it has been "a tough task explaining to the national security authorities why private citizens should have radio transceivers." That hurdle has now been overcome with operations expected soon. However, under the regulations, operations will, at first, be only from club stations.

The RAST has elected a new committee to see the smooth return of the hobby. The RAST President is also the Permanent Secretary to the Communications Ministry, and long-term amateur radio enthusiast, Sribhami Sukhanetr HS1SS.

A significant event for amateur radio in Thailand is that they will host the SEANET Convention this year from November 11 to 13. Due to no HF operations, it has been difficult for RAST to publicise this event but hopefully, nearer to the date, information will be available on SEANET, which meets on 14.320 MHz every day at 1200 UTC.

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

On opening this month's column, I refer to my final comments in the February 1988, summary of intrusions reported, and I quote myself;

"28.000 MHz and up — hundreds of Asian voices working all the lower segment of 10 metre band . . . now daily occurrence . . ." unquote.

This problem, now reported daily, has escalated to a height somewhere near where I predicted some months ago. And 10 metres is not really feeling the effects of the new solar cycle yet. This problem will **not** go away. The *Intruder Watch* needs to hear from concerned amateurs on this matter. If you are hearing the Asian stations on 28 MHz, then please send in a report to the *Intruder Watch*.

Reports for February 1988, were supplied by VK2s DEJ, EYI; VK3s AMD, XB; VK4s AEM, AKX, BG, BHJ, BTW, BXC, DA, KHZ, OD; VK5s GZ, TL; VK6s RO, UA; VK7RH; VK8s HA and JF. Thank you gentlemen, for your efforts.

I have received an intruder report from the Faroe Islands recently — OY7ML . . . *Amateur Radio* magazine certainly gets around!

I am still looking for reports on an AM station being heard on 14.025 MHz, and originating in Guam. KTWR is the call sign, and it seems to be producing spurii from 11.805 and 9.585 MHz. *Please drop me a line if you hear this one.*

Vietnam and the USSR continue to transgress, and make up the bulk of our complaints re intruders.

Now to notify a vacancy in the ranks:

For several reasons I have sent notice of resignation as the Federal Intruder Watch Co-ordinator to the WIA Federal Office in Melbourne. I have held this position since July 28, 1982 and I have made many friends and acquaintances in the hobby during that time. I hope to continue to make many more.

Many reasons prompt this decision, and, to paraphrase Winston Churchill, "Into them I will not go." However, I am vacating the position on the appointment of a successor, or until the end of 1988, whichever is the sooner. If you feel that you want to help In the preservation of our bands from intrusions, or you know someone who **does**, please let me know. I stand by to give all the help I can, and can be reached at the address at the top of the column.

Don't mumble to yourself when your QSO is interfered with by an intruder . . . **tell the Intruder Watch about it.**

Have a good month, and see you in July. 73 for now.

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Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

This report shows how competent radio amateurs helped the Department of Communications in West Germany to establish radiation susceptibility standards for video recorders. This should educate the public and prevent the purchase of VCRs which are not compatible with the operation of licensed transmitters in the neighbourhood.

RADIATION IMMUNITY OF VCRs, VCI

by Guenter Schwarzbeck DL1BU, 6917 Schoenau-Altneudorf

Translated by VK2AOU from cq-DL *magazine, April 1987*

SUMMARY: The advent of Video Tape Recorders a few years ago in domestic areas has caused much trouble due to excessive susceptibility to strong electro-magnetic fields.

In this type of equipment, microvolt radio frequency voltages are amplified between 0.5 and five to 10 MHz. This is responsible for the highly unwanted sensitivity to conducted and radiated RF power.

In West Germany, limits of field strength and conducted RF transfer have been set. Knowledge of these facts and early warnings has improved shielding and filtering of Video Recorders during the past two years.

New limits for the radiation immunity of VCRs have come into force with this publication of *cq-DL* magazine. The VDE (Association of German Electrical Engineers) regulation DIN/VDE 0872, Part 4 aims finally at an immunity, in the critical case of reproduction, of 3.16 volts per metre (field strength 130 dB (uV/m), and unwanted signal unloaded voltage level 140 dB (uV) under section 3.3 for the radiation immunity.

This final aim is already being achieved by some especially well-designed VCRs. Until March 31, 1987, the above mentioned unwanted signal unloaded voltage was allowed to reach a level of 125 dB (uV). Within the frequency range, for us of special interest, 4.25 MHz to 6.25 MHz, 120 dB (uV) was set. These values were increased by 5 dB as from April 1, 1987, that means 130 dB (uV) within the amateur bands.

This relative success required hard discussions backed by much practically measured data during the meetings of the Committee 761.5 of the German Electrotechnical Commission. In attendance during the critical phase was the representative of the DARC, Doctor Gerhard Blechert DL9TJ, and during the determination of the limit values DL1BU (Honorary Technical Officer of the DARC). It required 30 meetings to deal with all aspects of the complex subject; whilst the limit values, which determine finally the radiation immunity, were mainly completed at three meetings.

The German Electrotechnical Commission referred in a letter to the complaint of the DARC (letter December 18, 1985). In the meantime they worked out standards, which consider our proposals, and expressed their appreciation of the DARC co-operation.

Another complaint had been lodged by a technical college, DL9AH/DL6BQ. This led to the adoption of the sentence in the explanations at the end of VDE-0872 Part 4. "The limit values listed in this Standard are minimal values, and they represent commercially acceptable application of the present technical standards. Locally, special cases may make it necessary to use additional means to improve further the radiation immunity."

Figure 2: Sharp VCR Type VC 387 GS. Radiation Immunity is better than required (by up to 20 dB). Metal case, Date 6/1985.

The meetings were attended by experts of the VCR manufacturers, DL9TJ and, at times, DL1BU for the DARC, experts of the FTZ (DOTC), the Consumer Association (product testing), Association of Consumers, RBT-Neirnberg, Association of the Electrotechnical Industry (ZVEI) and the VDE Testing Office.

The often heated debates are most likely forgotten today. The manufacturers also gain from a far-reaching peaceful development and a greatly reduced number of complaints by customers with radiation problem cases.

All transmitter operators, not only the radio amateurs, will be confronted by similar problems in future. The sale of mass-produced electronic entertainment cannot simply be stopped by referring to possible EMC collisions. We, ourselves suffer and gain from this turbulent development. It takes some time before performance standards and limits for these products can be established. The FTZ (DOC) is, in spite of this problem, continuously active with the VDE, the "Market Leader" in establishing standards, which such apparatus has to meet to avoid EMC problems. Many foreign administrations adopt these limit values and standards catalogue, but not always with the same stringent field strength values.

The Video Recorder problems were first mentioned in detail in *cq-DL* November 1984. The measuring method with the Test-Cell (Jacky) was shown in Figure 2 page 542. This publication was almost identical with the text in English and the drawings (by DL1BU) which DK2NH lectured about at the Symposium on EMC at Wraclaw (Poland) in 1984. The Council of the DARC has been fighting for years and still continues the administrative battle with the German Post Office and the FTZ, to obtain fair rules and laws for dealing with cases of unwanted radiation (insufficient immunity). The

Figure 1: BETA Video Recorder, of the year 1979/80, plastic lid, no shielding. Field strength within the test-cell. Solid line as per standard April 1, 1987. Radiation immunity is below standard April 1, 1987.

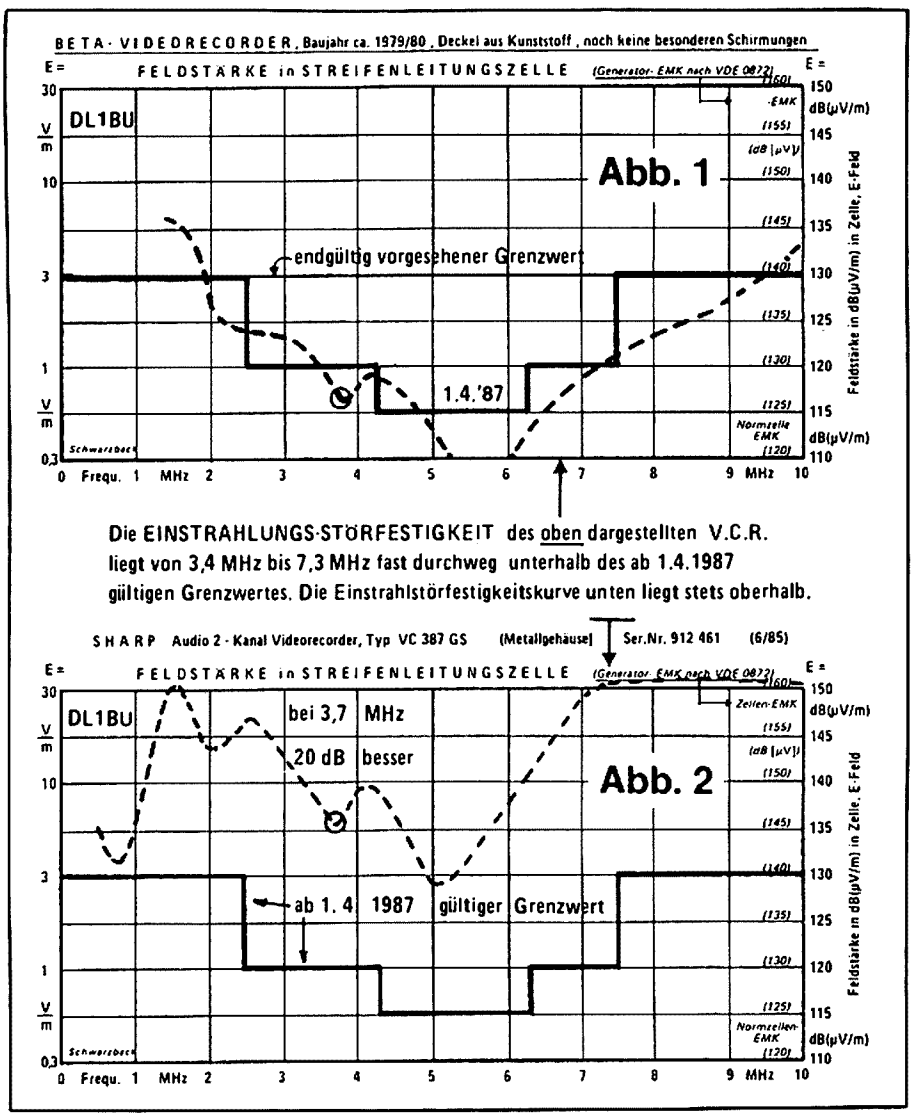


Figure 3: VCR Type VT-14E (Oberlander) Serial Number 30511297, Date 6/85. Very low immunity.

following measurements are in line with those by the FTZ. Warnings were issued some years ago before VCR performance standards had been issued, because large variations in immunity properties had been observed. The differences amounted to over 20 dB, that is a 1:100 power ratio. This situation shows that one could not speak of "VCRs being representative of the state of the technology" without detailed testing. Two years ago both Grundig and Sharp VCRs surpassed even the finally required immunity standard of 3V/m, eg 140 dB (uV) unloaded level as per DIN-0872 over the range of 1 to 10 MHz. On the other hand there have been VCRs with immunity 10 dB below the limit due to production tolerances. There is also still the question of what stage is a picture acceptably free of interference? The start of picture interference is, for example, clearly lower with a colour bar than with a test picture. The testing conditions have now been established with VDE-Norm 0872 Part 5 (January 1987). The radiation immunity tests of VCRs in 1981 were carried out with standard test pictures and originally with a SW workshop monitor. Changing over to colour bar tests showed particularly high sensitivity of VCRs to medium frequency not visible in black and white reception. Complaints were received by the manufacturers from customers who lived near high power medium-wave transmitters, indicating that screening and filtering is very important. Far East manufacturers learned from their European partners about the problem. Also, the pressure from the above mentioned expert groups and the FTZ, and also from the radio amateurs, was quickly conveyed to Japan. Substantial improvements have been observed during the last two years and more are expected.

THE PRACTICAL MEASURING RESULTS

Figures 1 and 2 represent two Japanese VCRs, which were imported at different times. Figure 1 is for an old VCR (construction year 1979/80) with a plastic lid and top loading. We are especially interested in the immunity value on the 80 metre band. As the graph shows (dotted line), interference at 3.7 MHz occurs for 0.6 V/m. The Sharp 387GS VCR from year 1985 can take 10 times this field strength at 3.7 MHz, before VCI is observed. This VCR withstands 6V/m, twice the finally specified standard level at 1.7 MHz, and can even suppress 30 V/m at 7 MHz.

The graphs showing the radiation immunity were obtained as described in *cq-DL* November 1984. The equipment under test stands in a wide Lecher line (test-cell, Jacky). This is a very much enlarged Lecher line, related to the twin wire feeder line. The line is correctly terminated at the end (low SWR) and is fed with a power signal generator (Figure 2, *cq-DL*, November 1984). The amplitude modulation technique has been determined since 1984. The unmodulated generator signal is measured and plotted on a graph. Only then is 1 kHz at 80 percent modulation added. The generator voltage is increased until the first effect is visible on the colour bars or the sound. The field strength is calculated from the applied RF voltage and the width of the test-cell opening. Correction factors have to be considered, depending on the height of the equipment under test. The test-cell used here was 40 centimetres high, therefore well-suited to VCRs. The standard cell according to VDE-0872 is 80 centimetres high. It is connected to the signal generator via a matching network. Graphs show usually the unloaded voltage of this set-up. The figure expressing voltage in dB is 10 dB larger than the figure of the electrical field strength stated in dB (uV/m). I had objected that the RFI-measuring service measures field strength and therefore the field strength in the test-cell should be specified. This was rejected, because the method had already been finalised years ago for the testing of radio and television receivers. One can live with this 10 dB difference, which is easily calculated.

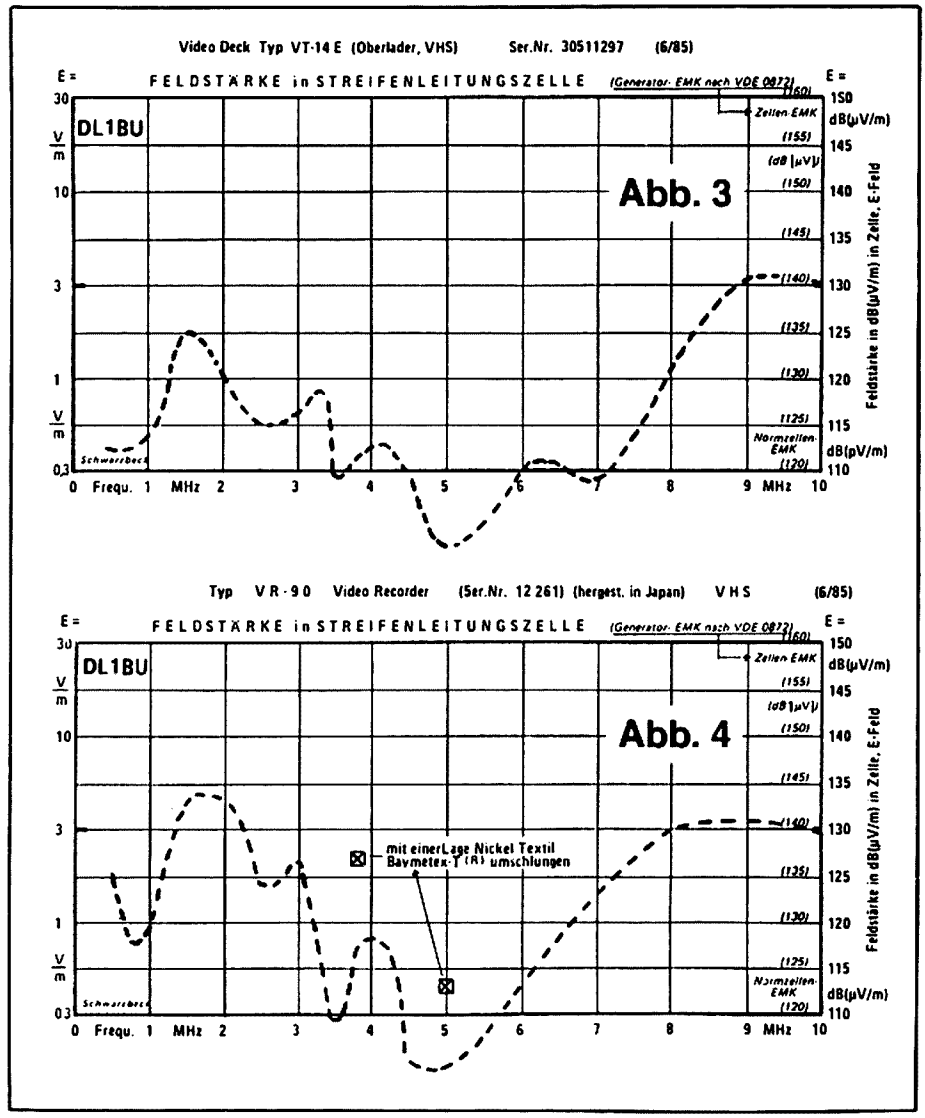


Figure 4: VCR Type VR-90 Serial Number 12 261, made in Japan, VHS, Date 6/85. Very low immunity, immunity is improved by wrapping shielding cloth around the VCR.

Figures 3 and 4 show the radiation susceptibility graphs of two Japanese VCRs, which had been developed in 1984. The industry then had already been warned that planned susceptibility limits by the German Post Office had been issued, but they were not enforced at that time. These VCRs show RFI already at 0.3 V/m on 3.7 MHz. The best VCRs constructed in 1985/86 showed an immunity of 6 V/m, which is an improvement of 26 dB. This is a power ration of 1:400. A practical example demonstrates the tragedy facing all involved. It does not matter whether a medium wave or shortwave radio transmitter (unlikely to reduce power) is responsible, an official shortwave station or a radio amateur transmitting the legal field strength. Whilst in the same position the VCR with 6 V/m immunity is not affected by 400 watts transmitter power, the VCR with only 0.3 V/m capability is already affected by a one watt signal. The radio amateur, who would be forced to close down his transmitter, when he lives near such a bad VCR, is likely to lose his faith in justice, because it is quite impossible to have communication these days with one watt on the 80 metre band. The operator cannot move to higher frequency bands during years of low sun activity because of the low MUF.

Figure 5 shows another very bad case, unless the manufacturer is prepared to save his good name and incorporate the necessary shielding. This VCR is a portable model, which is not bound to comply with the immunity standards. Only an agreement between the VCR owner and the transmitter operator (time sharing) would make co-existence possible.

Very much better is even the very old Grundig VCR 2x8 (1983/84). This VCR achieves nearly the same good values as mentioned in *cq-DL* November 1984, in Figure 6 page 543 for the Grundig VS-200 (VHS). At 3.7 MHz, this VCR too is better than the later introduced limit of 3 V/m.

The VHS model shown in Figure 7 only just complies with the limits of March 31, 1987. It was designed five years ago.

Figure 8 shows the effect of the outstanding screening and shielding of the Sharp Video Recorder having a metal case: Immunity at 3.7 MHz of 6 V/m and at 7 MHz of over 30 V/m.

Measurements by the FTZ (DOC), which were produced at the end of the commission meetings, demonstrated also "that it can be done". Nine VCRs were tested and three went beyond the graph range for VDE-0872 of 140 dB over the

Figure 5: Very low immunity of a portable VCR with separate power supply. VHS. Made in Asia, Date 3/85.

frequency range of 2.5 MHz to 4.25 MHz, this being 3.16 V/m. Four VCRs reached 135 dB (uV). Testing of identical models showed that one was acceptable whilst the other one was 16 dB worse. These results permit the statements:

1. The now-established immunity standards can be adhered to, because the know-how is available everywhere. Well-constructed VCRs had already achieved this three years ago.
2. VCRs, which were distributed by the trade prior to the determination of the present standards, do not deserve the claim "state of the art technology". Some models may well be good or excellent as far as immunity is concerned, whilst others can be 20 dB or even 30 dB worse. The radio amateur (who is being blamed for causing VCI) is not responsible for this. The VCR owner states that he paid good money for the equipment. Helpful co-operation is the only way to obtain a solution, by involving the RFI Measuring Service of the Post Office, who (as a neutral party) has to explain the facts to the owner of the badly designed VCR. A court of law is most likely the least able authority to understand the technical facts. VCRs were quickly exchanged

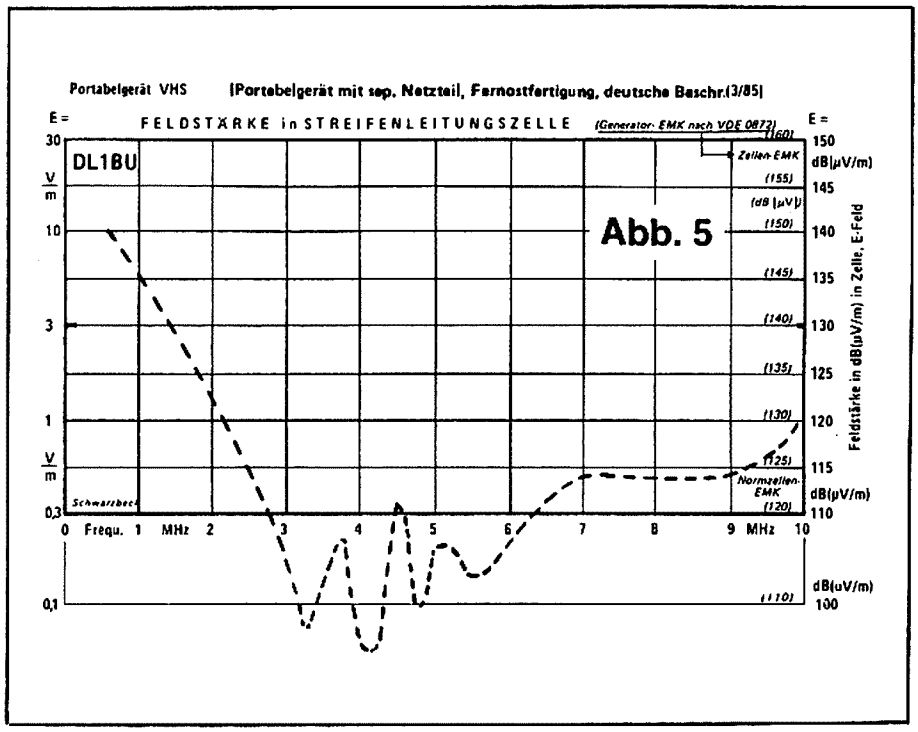
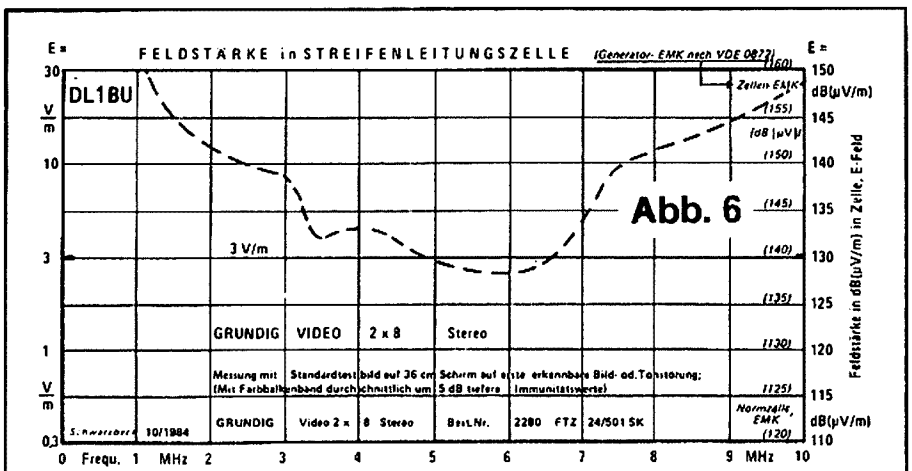
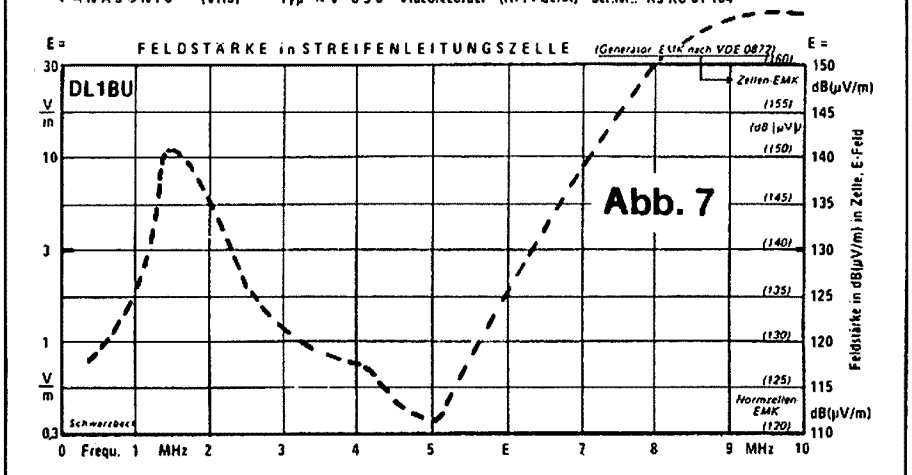


Figure 6: Field strength in test-cell, Grundig VCR 2x8 Stereo, No 2280, FTZ 24/501 SK immunity certificate, very high immunity. 5 dB lower with colour bar test.



PANASONIC (VHS) Typ NV-850 Videorecorder (Hi-Fi-Gerät) Ser.Nr.: K3 KC 01 104



for a different make and model if the VCI was caused by the nearby local radio transmitter, to obtain peace. The latter VCR worked without problems.

3. It is not possible to "harden" electronic entertainment equipment so far that it could handle all possible field strength levels. The radio amateur may have to investigate the possibility of some decoupling of his beam with regard to the position of the neighbour's television set and VCR as indicated by a field strength test.
4. The two involved parties may have to come to some agreement if no technical solution is in sight. A time-sharing agreement between both parties may be feasible. The owner of the VCR could often agree to a time table, because the problems involve usually only the play-back of VCR tapes.
5. A metal case, to obtain the necessary shielding, should not be too hard for a radio amateur to construct and provide. By placing the VCR in such a case and by filtering the input and output cables even the most difficult cases can be solved.

Literature: (In English) EMC Booklet, "EMC in the Amateur Radio Service" IARU Region 1 from page 44, 1984.

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See over page for Figure 8.

Figure 7: Field strength versus frequency showing low immunity of Panasonic VHS VCR Type NV-850, Serial Number K3KC 01 104.

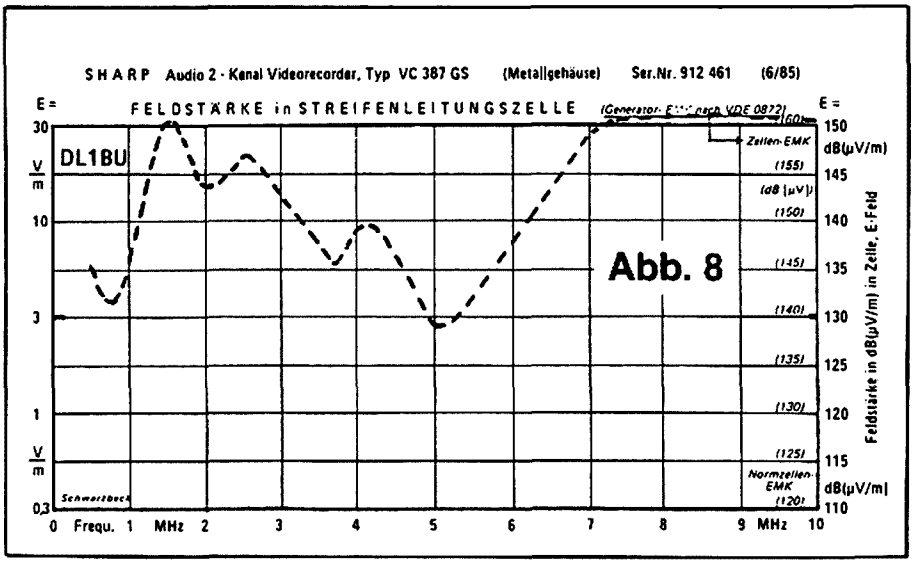

Figure 8: Sharp two-channel VCR Type VC 387 GS (metal case) Serial Number 912 461, Date 6/1985. Very good test immunity, above 3 V/m field strength within test-cell.

OPERATING SCHEDULE OF FO-12

This is the schedule for operation of FO-12. According to power conditions, operation may miss the schedule, but once its condition recovers operation should return as soon as possible. Necessary information will be posted on the BBS of FO-12 when it is available.

JA means mode of analogue. JD is for mode of digital. D for all systems off and DI for systems off except the CPU and memory.

July 7, from 1530 to 1732, and September 14, from 000 to 0204, acquisition of telemetry at every two seconds, when mailbox does not function. A card will be sent for report of telemetry data.

MODE	BEGINS AT MONTH DAY	TIME (UTC)
JD	June 4	0353
DI	5	0259
JD	7	0110
DI	8	0218
JD	11	0546
DI	12	0654
JD	14	0505
DI	15	0613
JD	18	0533
D	19	0439
JA	22	0156
D	23	0304
JA	25	0318
D	27	0131
JA	29	0143
D	30	0049
JA	July 2	0103
D	4	0116
JD*	7	1530
JD	7	1935
DI	8	0143
JD	9	0049
DI	9	2355
JA	13	1409
D	14	1315
JA	16	1328
D	17	1235
JD	20	1356
DI	21	1301
JD	23	1141
DI	24	1020
JD	26	1033
DI	27	1141
D	30	1100
DI	31	1006
JA	August 2	1020
D	3	1128
JA	6	0845
D	7	0751
JA	11	0617
D	12	0724
JA	13	0630
D	14	0536
JD	18	0603
DI	19	0712
JD	20	0415
DI	21	0523
JD	25	0348
DI	26	0457
JD	27	0606
D	28	0511
JA	30	0120
D	31	0228
JA	September 3	0758
D	5	0201
JA	7	0623
D	8	0529
JA	10	0543
D	12	0150
JD*	14	0000
JD	14	0610
DI	15	0516
JD	17	0124
DI	18	0435
JD	21	0355
DI	22	0301
JD	24	0314
DI	25	0220
JA	27	0234
D	28	0140
JA	October 1	0100
D	3	0113
JA	4	2325
D	6	0032
JA	8	1339
D	9	2258
JD	12	1406
DI	13	1312
JD	15	1325
DI	16	1231
JD	18	1245
DI	19	1151
JD	21	2016
D	22	1922
JA	26	0936
D	27	1043
JA	29	0855
D	31	0909

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RUSSIA HAS NO-CODE LICENCES

The Soviet Union has three amateur radio station licence grades which do not have CW examination as a prerequisite.

A Novice licence allows operators to use five watts on 160 metres. Another grade gives 10 watts on 1.8 MHz, 28 MHz and above with a power limit of 10 watts.

The third class allows 50 watts on all bands except 20 metres, where CW is permitted on the low end of the band.

Russia's fourth licence grade with a CW examination allow 200 watts on all bands. There were 300 000 radio amateurs in the Soviet Union.

—Contributed by Sam Voron VK2BVS from information supplied by RA0CDM

PUBLIC TELEVISION TESTS

Transport and Communications Minister, Senator Gareth Evans, says the government is considering whether it is possible and appropriate to dedicate a UHF frequency specifically for public television.

But, Senator Evans says UHF channels are in scarce supply in capital cities. He made the comment in announcing the Australian Broadcasting Tribunal decision to grant a test transmission permit to the public television aspirant group, Unlimited Television Incorporated.

Since the mid-1970s, there has been many proposals for public television services in Australia. They have come from community-based groups, independent film makers and education bodies.

Senator Evans said it must be clearly understood the government had made no commitment to the introduction of public television. But I would be happy to see interested groups have an opportunity to show their wares and test public reaction, he said.

Unlimited Television plans to transmit about six hours of programs from 6 pm each night during June 5 to 11.

The Minister's Office in Canberra, told *Amateur Radio* magazine the tests will be carried out on UHF Channel 47, in Melbourne.

That frequency had been chosen because it was unrelated to any existing wide area service and could readily be seen by viewers with sets to watch SBS television, a spokesman said.

Unlimited Television said it was negotiating with the DOTC on remaining technical matters including the type of transmitter, power output, and transmitter site.

—Contributed by Jim Linton VK3PC

1987 BHP SCIENCE PRIZE AWARDS

An amateur was one of 23 national finalists in this years awards. VK5ZWI had researched whether it was possible to predict when UHF amateur television could be broadcast away from the Adelaide area and had successful results.

The BHP Science Prize is Australia's award for excellence in scientific research by school students and is jointly organised by BHP, the CSIRO, and the Australian Science Teachers' Association, with support from Westinghouse Electric Australia. The 1987 prize attracted 150 entries from students aged between 13 and 18 years.

—Adapted from the *Canberra Times*, February 23, 1988 and contributed by Ron Henderson VK1RH

Club Corner

RADIO ENTHUSIASTS' CLUB OF THE BLIND/KOOYONG RADIO CLUB

At a Special General Meeting, held on February 17, 1988, the members of the Radio Enthusiasts' Club of the Blind adopted a revised constitution and a new name.

For some time now, these changes have been considered necessary so that the club can expand its membership and provide a standard radio club for radio amateurs in the inner eastern suburbs of Melbourne. Nonetheless, membership will not be restricted to just those in the locality.

As Full Membership of the club is no longer exclusively for visually handicapped enthusiasts, the name of the club has been changed to the Kooyong Radio Club. Now any Australian radio or electronics hobbyist, disabled or otherwise, is invited to apply for membership in writing to the club's committee. For further details, write to the Secretary or attend the next General Meeting, which will be held at 8 pm on Wednesday, June 15, at the H M Lightfoot Centre, 454 Glenferrie Road, Kooyong, Victoria.

In accordance with the new rules, all members can enjoy Full Membership rights and privileges and visually *impaired* members are encouraged to participate along with all other members. The club will still offer special facilities for those with eye sight impairment when pursuing their radio interests. Also, country and interstate members are welcome to communicate via the postal service or on air.

At present, all members are charged a small annual subscription. The Kooyong Radio Club meets regularly at 8 pm, on the third Wednesday each month at the Centre which is located opposite the Kooyong Tennis Courts. It is hoped that a suitable transmitting site can soon be established close to the meeting room for the club station, VK3DBN.

The club is a member club of the Victorian Division of the Wireless Institute of Australia. Please send all correspondence via the Club Secretary, John Machin VK3CCC, 21 Paget Street, Hughesdale, Vic. 3166, phone (03) 568 2649.

—Contributed by John Machin VK3CCC, Secretary, Kooyong Radio Club

DARLING DOWNS RADIO CLUB

Recently the Darling Downs Radio Club took part in the Hobby-n-Craft Spectacular conducted by the Rotary Club of Toowoomba South, which was held at the Toowoomba Showgrounds over the weekend from Friday night to Sunday, February 19, 20, 21.

Beginning at 0000 UTC, Friday, members erected a mast supporting a two metre two-by-five-eighth wave vertical and a HF windom antenna, using an ironbark tree and the Founders Pavilion roof, as end supports for the Windom. The steel building had to do duty as an earth because a stake could not be driven due to either foundation concrete or native rock.

Arranged inside, on a large table, were HF and two metre equipment, antenna matching units, a glass RTTY display using an inexpensive computer and an area of home-brew and ex-commercial equipment adapted for amateur radio use.

Informations sheets, call books, QSL cards, magazines (*Amateur Radio* included), some enlarged cartoons featuring amateur radio, filled out the display. Hessian was used to cover the steel walls in the corner where the radio display was housed, and this proved useful for supporting maps, notices and posters on amateur radio.

An on-air display of glass RTTY was arranged on 146.500 MHz with Graham VK4AGN and Roley VK4AOR, operating from the base and Tom VK4BTW, Ben VK4APT and Greg VK4ZDC providing outside contacts. (*There was one* embarrassed operator though when he arrived home to make a RTTY contact only to remember that the display being used at the base was using his monitor!).

The working display of early railway telegraph equipment, by Keith VK4NCM, proved popular with young and old alike. Historically, Keith was the last railway telegraph operator when Toowoomba ceased using the system in May 1974. (This accounts why Keith is such a "hot" CW operator).

The two metre rig on 146.500 MHz Simplex was the main communication channel. Ron VK4BRZ, Dougal VK4KUY and Eric VK4ADA took messages and provided QSPs with other stations who could not reach VK4WID direct. A first, and unusual, contact was with Ron VK4AGS Aeronautical Mobile. Ron was located at about 4000 feet above the area in a glider!

An opportunity occurred during the weekend to contact Scouting Association officials toward facilitating and improving liaison between Scout groups and radio amateurs for the running of Jamboree on the Air (JOTA), and other activities.

Club members at the stand were kept busy answering questions, greeting friends and visiting amateurs and encouraging would-be amateurs.

Members who donated time and equipment were:
Graham VK4BGA, Graham VK4AGN, Eric VK4ADA, Keith VK4NCM, Tom VK4BTW, Derek, Ray and Col (all studying for licences), Dougal VK4KUY, Ben VK4APT, Greg VK4ZDC, Roley VK4AOR, Theo VK4KHM, Kev VK4CCJ and Roy VK4RE.

Whilst dismantling the display on Sunday evening, the somewhat weary crew agreed that the effort was well worthwhile considering the interest created in the hobby — and some were even thinking up improvements for "next time"!

—Contributed by Steven MacQueen, Honorary Secretary, Darling Downs Radio Club

SUMMERLAND AMATEUR RADIO CLUB

Following is the club social calendar for the rest of 1988. The club has tried to obtain a good spread in the venues so as to make these days more attractive. With weekends away and the operation of portable stations, an increase in interest from members and non-members is envisaged. These weekends depend on you, let us make this year better than ever before.

Demonstrating amateur Radio at the Hobby-n-Craft Show are: from left — Keith VK4NCM, Kev VK4CCJ, Graham VK4AGN and Dougal VK4KUY.

The club, operating under the call sign VK4WID, joined in the Intruder Watch Net on 3.594 MHz on Friday night and Theo VK4KHM, under the call sign VK4WID, conducted the Saturday night Darling Down Radio Club 80 metre net from the display when 15 stations joined in. A one-contact award was promoted for the occasion of the Bicentennial Hobby-n-Craft Spectacular.

Some interesting HF contacts made over the weekend included:
Rafi 4X4FR in Tel Aviv; Paul IK8ETA, Salerno, Italy; Kasu VS6VZ, Hong Kong; Hiro JM1LAW, Tokyo; Joe N7JAA, Sultan, Washington State; Francis KA5RYJ, Louisiana; Peter ZS5XA, 200 kilometres north of Durban; Patty CE0GHO, Easter Island and Mark HL1AFD, Seoul, Korea.

A warm welcome is extended to any amateur, or SWL who is visiting the New South Wales north coast. Contact the Secretary of the club or check into the Club Net.

June 25	Sit-down Dinner — TBA
July 31	Mini Hamfest — Richmond Hill
August 28	Woody Head
September 24	Sit-down Dinner — TBA
October 29/30	Toonamba Dam (Kyogle)
November 27	Christmas Barbeque — Richmond Hill
December	Nil

DIRECTORY OF THE SUMMERLAND AMATEUR RADIO CLUB — Founded 1961
Club and Net call sign — VK2AGH

Repeaters	— VHF 146.800 MHz, VK2RIC, Lismore — UHF 438.675 MHz, VK2RSC, Lismore VHF Packet, VK2RPL, Mount Nardi
President	Duncan VK2DLR
Vice-President	Rob VK2BBR
Secretary	Peter VK2XHL
Treasurer	John VK2JWA
Publicity	Jim VK2ESI
Member	Ken VK2TQB Scott VK2XGM
WICEN	Peter VK2PF
Repeaters	
RIC/RSC	VK2AWH, VK2BCW, VK2ZFS
RBB	VK2YRL, VK2XGM, VK2XHL
Packet	VK2BEV, VK2AGE, Memb $10 pa

Meetings

Annual General — January or February

General, Formal — Called as required

Workshop — Thursday nights, First, Third and Fifth at Kadina High School. Second, Fourth and Holidays at the Club-room.

Nets

HF — 3.605 MHz, Monday to Friday at 2030 UTC. Sunday at 1000 UTC.

VHF — 146.800 MHz, Friday at 1000 UTC on the Lismore repeater. Sunday at 0100 UTC, the VK2 WIA News.

* Deduct one hour during Daylight Saving Time.

LAS BALSAS AWARD

Created to commemorate the 1973 Las Balsas raft expedition across the Pacific and the part played in it by amateur radio.

Awarded to amateurs and SWLs from Australia and New Zealand for 15 points, overseas require seven points.

Club Net Control Station is worth five points, any other club member, one point, on any mode, band or time.

Applications should include a log extract and $A2 and be posted to the Club Address, PO Box 524, Lismore, NSW. 2480.

—Contributed by Jim Cunningham VK2ESI, Publicity Officer, Summerland Amateur Radio Club

SOUTH EAST RADIO GROUP

The South East Radio Group will again be holding its very popular SERG Convention during the Queen;s Birthday weekend. in June.

As a special Bicentenary contribution to the hobby of amateur radio, the South East Radio Group is currently involved in a concentrated media campaign to publicise the Convention and the hobby. To this end, the general public will be invited to attend the Convention on the Sunday afternoon.

As well as those events generally associated with the Convention over the years, there will be other activities.

A display of vintage radio equipment (both commercial and amateurs) will be held and visitors are invited to bring their favourite piece of equipment for display. This may be anything from a vintage crystal radio receiver to that "you beaut" phasing transmitter you built in the 1950s. A prize will be awarded for the best single piece of equipment displayed.

This year, there will be many more Trade Displays involving state-of-the-art technology, including the latest in computers and, as a special treat, a demonstration of Satellite Television.

For the interest of the general public there will also be a working "Amateur Shack" displaying some of the modes available to amateurs. Of course, the Bicentenary call sign, VI88SA, will be used during the Convention and will provide another opportunity to work this "once in a lifetime" call sign.

So be in It and come alonly enjoy yourself and at the same time help promote amateur radio. Registration forms and convention programs are available from the South East Radio Group Inc, PO Box 1103, Mount Gambier, SA. 5290.

—Contributed by David Edwards, Secretary, South East Radio Group Inc

URUNGA RADIO CLUB

Although there was rain predicted for the Easter Weekend, 48 visitors attended the 40th WIA Urunga Radio Convention on April 2 and 3, 1988.

Saturday's Events and winners were as follows:

20 metre Talk-in 1st VK2EFM; 2nd VK2KZV

2 metre 2 Fox Pedestrian 1st VK2DGT; 2nd VK2BYY

2 metre 2 Fox Pedestrian 1st VK2KZV; 2nd VK2XDW

Sunday's Events and winners were as follows:

The Urunga all-band Scramble 1st VK2AMV; 2nd (a tie) VK2KZV and VK2EFM

40 metre Pedestrian Fun Hunt 1st VK2BYY; 2nd VK2ZVY

2 metre 3 Fox Mobile Hunt 1st VK2EFM; 2nd VK2XDW

2 metre Mobile Talk-in 1st VK2KZV; 2nd VK2EFM

Indoor Events and winners:

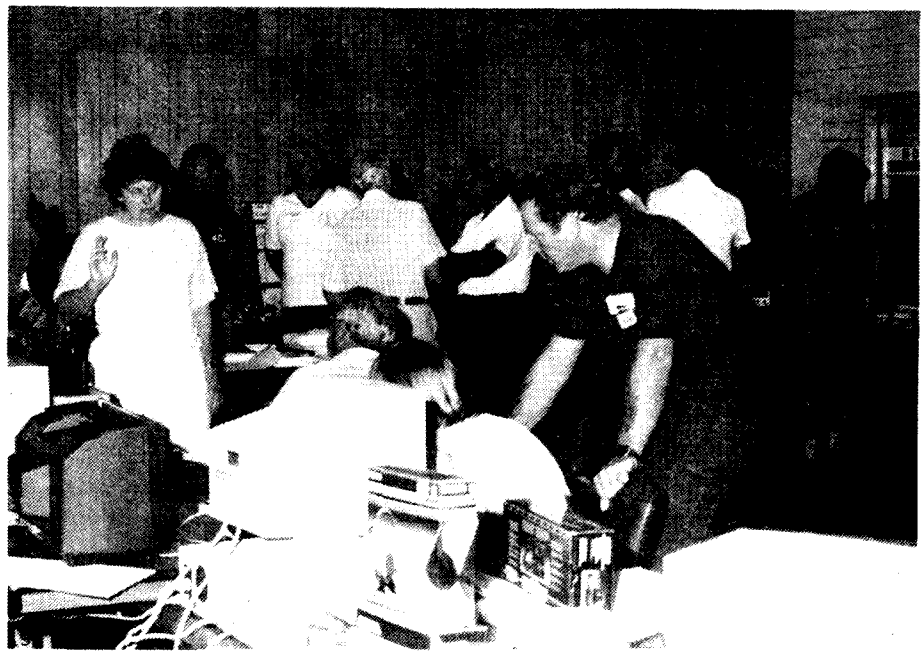
Technical Quiz	1st VK2BYY; 2nd VK2XU
Non-technical Quiz	Tie: VK2DCM & VK2YGQ
CW Sending	VK2MPK
Genius Capacitor Network Problem	VK2BYY
Expert Capacitor Network Problem	VK2YGQ
Guessing number of capacitors in bottle	VK2DLM
Old Circuits Competition	VK2XU
VFO Problem	VK2BYY

Ken VK2DGT, on the trail of the Fox.

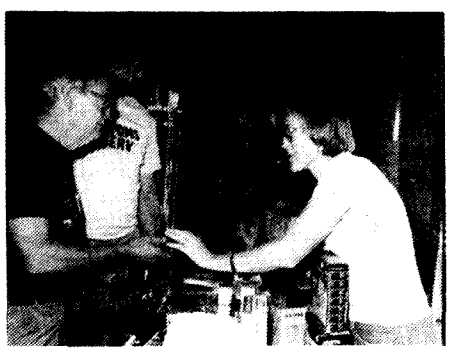
Chris and Judy Eddy, the local Coffs Harbour Dick Smith agents had a terrific display of radio, kits and computer equipment whilst Ian VK2XU, from DX Engineering displayed the latest in Kenwood technology for HF and VHF0 Disposals tables were very busy with plenty of equipment on offer. John VK2AMV, brought his home-brew 1950s vintage HF transmitter (used to win the scramble in 1951) and two metre AM mobile transceiver complete with rotary inverters and log book which made an extremely interesting display and brought back many memories to the old timers present.

John also screened some old 16 mm films on Saturday night which were filmed in Urunga about 1950. VK2EVB had a 30 metre packet station operating from the convention, but due to lack of contacts, he printed the RTTY broadcast on Sunday.

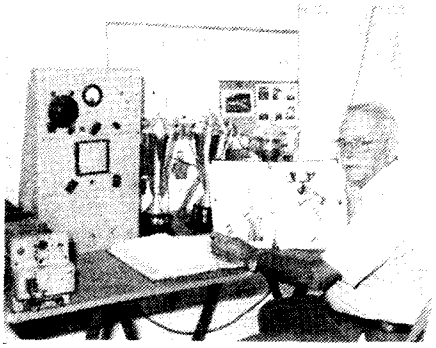
Allen VK2EFM, won the Jack Gerard Memorial Shield and will be the first name engraved on the trophy. He was also presented with a personal trophy for his radio shack.



Overview of the Convention.



From left: Ian VK2XU, Merv VK2DMS and Judy Eddy.



Peter VK2PA, reminisces about the Old Days as he views the display by John VK2AWV.

The Happy Foxhunter, alias Graham VK2KZV

The Jaycar Electronics digital capacitance meter (worth $220) was won by Mr C Edmondson, of Port Macquarie, who is no doubt very pleased with his prize.

The Convention Committee would like to express their grateful thanks to Jaycar Electronics, Dick Smith Electronics and Tandy Electronics for their generous assistance in the provision of pamphlets, catalogues and prizes.

A terrific weekend was enjoyed by all and a very tired group of amateurs left for home on Sunday evening.

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CORRECTIONS TO TOPICAL TECHNICALITIES — 3

$A_{amax} = G\lambda^2 / 4\pi$

λ/s dipole $A_a = 1.64\,\lambda^2 / 4\pi = 0.13\,\lambda^2$

Also, fourth paragraph, second line . . . ϕ watts per square metre. . .

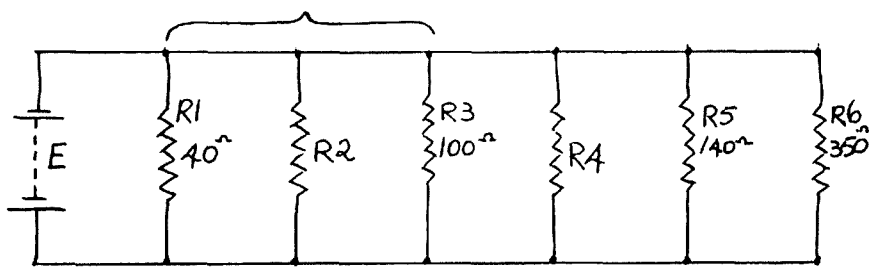
—Lindsay Lawless VK3ANJ

The intrepid Foxhunters.

TRICKY PROBLEM

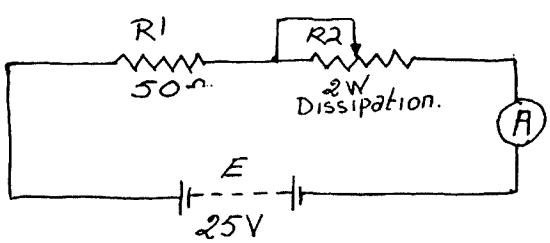
Any good amateur should be able to solve the first problem, but can anyone solve the second? It is a little harder than the first but it can be done.

Current through R1 + R2 + R3 = 5.5A



Current through R3 + R4 = 2A

PROBLEM No 1 — Find the total current in the circuit.



PROBLEM No 2.
Variable resistor R2 can be adjusted to two different values at which it will dissipate two watts. What are the two circuit currents?

See next month's AR for the solutions.

—Contributed by Frank Wright VK2BZ, 18 Second Street, Blackheath, NSW. 2785

WICEN News

Dennis Gibson VK1DG
39 Lyall Crescent, Kambah, ACT. 2902

"THREW A BEARING NEAR MOWLONG, REPAIRED AT DUBBO, ARRIVED AT WEST WYALONG OKAY."

—Photograph courtesy of *The Federal Capital Press of Australia*

A small portion of the display of cars at the Canberra showgrounds arena.

Such is the spirit of a motoring era long past. We were treated to a glimpse of the past with the running of the 1988 *Bicentennial Castrol World Rally* for veteran and vintage cars, in February and March this year.

With 10 years of planning, this Australia-wide event resulted in over 1000 veteran and vintage cars taking part in our bicentenary celebrations.

The rally Executive Director, Ian Irwin, contacted WICEN four years ago to establish a nation-wide communications network to co-ordinate the rally. The WIA Federal Executive endorsed this exercise as part of its official 1988 Bicentennial celebrations. This event is believed to have been the longest running nation-wide WICEN operation ever conducted in Australia.

Approximately 60 amateur operators in the field spent many hours keeping Rally Headquarters, in Canberra, informed of the rally progress. Another 30 amateurs maintained HF operations in the Australian Capital Territory before the rally converged on Canberra, whilst 20 operators provided local communications for the events in and around Canberra.

The rally commenced on schedule with a message, received on 20 metres, stating that 27 vehicles had left Darwin on February 21. They all arrived in Alice Springs, although four vehicles required assistance.

The West Australian contingent mobilised on February 28 with 22 vehicles heading towards the desert where they experienced 43 degree temperatures. A Perth command station co-ordinated communications with the mobile WICEN operator who escorted the rally to the South Australian border.

By the time the cars from Perth and Darwin had reached Adelaide, the Hobart cars were being loaded onto the *Able Tasman*. Under the watchful eye of the Tasmanian operator, the details of the cars were recorded on his own manifest for forwarding to Canberra.

At this time, 960 vehicles from Sydney, Brisbane, Adelaide and Melbourne were preparing for their start. With no delays, the vehicles began their nine day tour towards Canberra. The rally entrants were treated to enthusiastic crowds at their daily stop-overs, and the generally good weather ensured regular civic receptions, tea parties, and visits by large numbers of school children.

Considering the large number of vehicles and people involved, there were very few problems in the running of the rally. All of the runs arrived in Canberra on schedule, with only a few vehicles retiring from mechanical failure. There were a small number of minor collisions on the way, but no reports of injury. WICEN message handling was very good, with little clarification required although the following message raised a few eyebrows!

"Entrant B71 1911 Daimler in Goulburn with Ventilated Motor."

After the vehicles arrived in Canberra, the communications network reduced to cover the events organised throughout the region. The major function was co-ordinating a display of over 1000 vehicles, valued in excess of $80 million, and visited by 33 000 people at the Canberra showgrounds. WICEN operators also accompanied club runs out of town to minimise traffic congestion, and the final activity was the Grand Parade of vehicles through the city.

The operation was of immense value to the organisers of the rally, and to WICEN as a major training exercise. It would have been impossible without the co-operation of all the operators in the States and Territories, and the WICEN Regional Co-ordinators who spent many hours organising the stations. To you all — thank you.

—Dennis Gibson VK1DG
Richard Elliott VK1ZAH
ACT WICEN Co-ordinators
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AMATEUR RADIO IN FICTION

There is not a great deal of material to investigate when writing an article on amateur radio in fiction. I can remember a film which used a young amateur to save a ship at sea from a gang of villains, and a novel about the disappearance of a character in the frozen Yukon, in which amateur radio played a significant role.

Apart from those, my main recollection of radio as used by fiction writers has been frustration at their obvious technical ignorance of what it can and cannot do. So, when I decided to enter into the fiction writing field myself I was determined to include amateur radio and adhere to the facts.

Since my writing is aimed at young people, it seemed an excellent way of doing something about the problem repeatedly raised in this journal of how we can interest more youngsters in out hobby. There may be many reasons why modern youth finds other areas of electronics more attractive than amateur radio, but at least one of them is that they cannot become interested in something they have never heard about.

To expect them to start on literature with a title like *How to become a Radio Amateur* presupposes some knowledge of and interest in the subject in the first place. However, if they find a radio amateur using his hobby to good effect in a story, seeds might be sown towards further investigation, and *How to become a Radio Amateur* could become a significant book to them.

I have recently published the first of a series of short novels for the 10 to 12 age group featuring a once world famous magician who is also a radio amateur. Those who wonder at the connection between magic and radio may be interested to know that the magazine *Electronics Australia* was originally *Radio and Hobbies*, and early issues included a page on the hobby of Magic! I have maintained both hobbies since those days and they naturally find a place in what I write.

As I wanted to use call signs in the story, which is set in the south-east of South Australia, I received permission to use that of the South East Radio Group (SERG) radio club, along with my own, and acknowledge this in the front of the book. One cannot pull letters out of one's head because they either do or will belong to someone.

On a trip to the south-east to promote the publication, I did a number of radio and television interviews. It was surprising how often a question arose about SERG and amateur radio in general. Our hobby received a great deal of publicity by this means. I am hoping that the fact that the book is finding a place in school libraries will do some small thing towards enhancing the future of one of the world's most valuable hobbies.

Anyone interested in using the book as a gift to young family or friends can secure it from VK5VH, QTHR. The price is $4.95, post free anywhere in Australia. It is called *The magic of Mr Ree.*

Contributed by Ron Holmes VK5VH, 6 Keirana Avenue, Port Noarlunga, SA. 5167

ICOM IC-4GAT UHF HAND-HELD

When it comes to squeezing the maximum amount of circuitry and the greatest number of wanted features into the smallest possible package, Icom has led the field. From its small multiband units and tiny UHF mobiles, to an incredibly compact rage of micro-hand-helds, Icom transceivers keep getting smaller but the features list just keeps growing.

Icom's latest hand-held, the IC-4GAT, is a pocket-sized package, yet it boasts the highest power output of any UHF hand-held yet released and the most memory channels.

This tiny transceiver, with full six watts of output power from the optional IC-BP7 13.2 volt battery pack, plus 20 memory channels and a call channel memory, is designed around a series of smart, low-dissipation power saving circuits which reduce battery power consumption to just 25 percent of normal during standby receive operation, greatly extending the time between re-charging.

Frequency entry is simplified with a state-of-the-art version of the IC-2A thumb-wheels — digital touch-step switches mounted on the top panel with the feel of thumb-wheel switches.

Memory and VFO operation is enhanced with full duplex operation, sub-audible tone capability and two different scanning modes, plus the convenience of memory skip scanning to eliminate temporarily unwanted memories.

A unique audio squelch monitoring circuit lets you set the squelch threshold at a comfortable level, but still hear weak audio signals that would not break the squelch.

When sub-audible tone calling is used, a special 'pocket beep' function lets you know when the correct tone combination is received (requires optional UT-40 tone squelch unit).

A backlit LCD display ensures that the unit can be operated in very dark or zero-light situations, whilst a convenient timer circuit extinguishes the backlight after five seconds if no switch is pressed, saving battery power!

See the IC-4GAT UHF amateur band hand-held now at your nearest authorised Icom dealer. For details of your nearest dealer, contact Icom Australia, 7 Duke Street, Windsor, Vic. 3181, or telephone (008) 33 8915 (local call charge).

ICOM IC-781

When Icom released the IC-761 HF amateur radio transceiver late last year, it seemed that this was the peak in the evolution of the sophisticated 'super-base' line — a that would take many years to eclipse.

However, Icom has now scooped the pool with the release of a vastly more sophisticated HF "super-base" with features that will surprise even the most seasoned reviewers.

The central feature of the Icom IC-781 is a large multi-functional cathode ray tube (CRT) providing visual, menu-driven tracking of memory data storage, multiple filter configurations and VFO settings.

The CRT also doubles as a powerful spectra-scope, displaying up to 200 kHz of the spectrum in graphic detail for instant location of interfering signals, close analysis of received transmissions, wideband DX signal spotting and visual tuning of digital transmissions.

CRT spectra-scope bandwidth is selectable at 50, 100 or 200 kHz, and a highly accurate built-in log amplifier allows accurate measurement of received signals from 0 to 50 dBu.

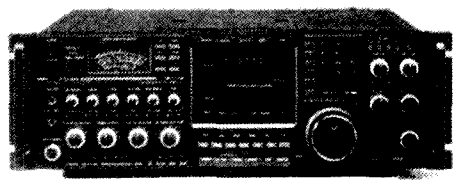
The IC-781 features a Dual Watch facility which allows simultaneous listening on two separate frequencies anywhere in the HF spectrum.

Two independent passband tuning (PBT) circuits, one on the 9 MHz second IF and the other on the 455 kHz third IF, electronically narrow the bandwidth of the IC-781 by using computer driven dual rotary encoders, combined with an IF shift facility, to eliminate adjacent signal interference.

An advanced array of high quality, high shape factor filters in the IC-781, the basis for the twin PBT control, also provide standard 500 Hz CW filtering (250 Hz filter optional), plus 9 MHz and 455 kHz filters at the touch of a button.

A delay-controlled trigger circuit provides the IC-781 noise blanker with the ability to blank repetitive pulsed noise up to a maximum of 15 milliseconds. Together with an MCF filter at the front of the noise amplifier, this allows the IC-781 to fully eliminate Over-the-Horizon-Radar (OTHR) (Woodpecker) signals, even on adjacent frequencies.

Icom's advanced direct digital synthesis (DDS) frequency locking system, a feature of all new Icom transceivers, provides the IC-781 with unmatched frequency stability and the fastest lock-up time of any transceiver yet released, making it ideal for high-speed switching applications like AMTOR and Packet Radio.



Designed with computer control in mind, the IC-781 contains Icom's remote control Local Area Network (LAN) system using the unique Icom Communication Interface-V (CI-V). a carrier sensing multiple-access computer interface using the CSMA/CD collision detection standard. Although sounding complicated, the CI-V system allows simple computer interfacing to all new Icom transceivers via any RS-232 serial port.

The IC-781 comes equipped with an electronic CW keyer (five to 60 WPM full break-in or up to 100 WPM non-QSK), front panel controlled VOX facilities, all mode operation without additional boards, audio passband and notch filtering, transmit and receive incremental tuning (XIT/RIT), crystal frequency marker, IF monitor, receive preamplifier and variable attenuation from 10-30 dB.

Listing every feature of the IC-781 would be a mammoth task, but the huge memory storage capability, multiple scanning facilities, separate mode selection for RTTY and data operation, or the optional rack-mounting handles cannot be overlooked.

The only way to get the full picture of the IC-781 is to visit your nearest Icom dealer and take a look for yourself.

For further details contact Icom Australia, 7 Duke Street, Windsor, Vic. 3181, or telephone (008) 33 8915 (local call charge).

Q R M from VK7

John Rogers VK7JK
VK7 BROADCAST OFFICER
1 Darville Court, Blackman's Bay, Hobart, Tas. 7052

Meetings of Branches in June will take place as follows:
Northern Branch — Launceston Maritime College on Friday, June 10, at 8 pm.
Northwestern Branch — Penguin High School on Tuesday, June 14, at 7.30 pm.
Southern Branch — Activity Centre, 105 Newtown Road, Hobart, on Wednesday, June 1, at 8.15 pm, preceded by an Executive Committee Meeting at 7.30 pm.

The address for the Southern Branch is 105 Newtown Road, Newtown, Hobart, Tas. 7008, not as published in April's AR.

Elsewhere in this magazine is an article by Dennis Gibson VK1DG, the WICEN Co-ordinator, about the 1988 Bicentennial Castrol World Rally. A letter was received by the northern WICEN on this subject, thanking them for their part in the event and pointing out that it had been the longest running nation-wide WICEN operation ever conducted in Australia.

The WICEN exercise "Callout" held in the south during April was intended to test procedures and give further practice in the use of pro-words. There were 19 amateurs who took part, and although some of the messages were humorous, the intent was quite serious.

The Southern Branch reports that they have had a change of President, as Stuart VK7NXA, has had to withdraw because of an increased work and study load.

VK7WI BROADCASTS

We are pleased to report an extra news collector in the north. He is Leon VK7NHG, and very welcome he is too. Do not forget that, for VK7s — and others, of course — who are on their way to warmer climes, there is a VK7WI relay by Arthur VK7SE, on 14.140 MHz every Sunday morning at 9.30. Keep in touch with home news, and also let everyone keep in touch with you. The 80 metre repeat on 3.590 MHz, Tuesday evenings at 7.30 pm, may be receivable in various mainland States. Contributions, by letter or tape, are most acceptable for these broadcasts. This also applies to home-bound or State-bound amateurs who have a point of view to put over on-air.

TARC 88

The venue is the Polish Club, just a short way up-the-road from the Activity Centre, the two centres having a combined function for the occasion. The date is the last weekend in October. Demonstrations and constructional activities are to be included in the program, as are talks on subjects of wide interest. We hope that many amateurs from all over VK7 will visit during that weekend. For TARC, the restoration of some early post WWII VHF and UHF home-brew is in progress, in conjunction with the Max Loveless Collection. To this end, we need several RL18 valves — the little double-ended peanut shaped triode valves (Mullard). These were considered excellent valves by post-war home-brewers. Contact Barry VK7RS, the Collection Co-ordinator, QTHR, or C/- GPO Box 215C, Hobart, Tas. The trustees of the collection also state they are producing a newsletter for circulation to interested parties, perhaps twice a year. Anyone who would like to receive same, which would contain items of historical interest, drop a line to the Co-ordinator at the address given above. It will be gratis.

By the time you read this, the southern two metre repeater on Mount Wellington should have been fitted with its new controller, which was on display for all to see at the April branch meeting. Such was its sensitivity to static that it was definitely a "hands-off" display, but VK7ZTA was there to explain its operation. Repeater linking was never like this before!
73, John VK7JK

AMATEUR AND NOVICE AMATEUR OPERATOR'S CERTIFICATE OF PROFICIENCY
February 16, 1988

STATE	SECTION "M" (Theory AOCP)			SECTION "O" (Theory NAOCP)			SECTION "K" (Regulations AOCP & NAOCP)		
	Candidates	App Rec/Sat/Pass		Candidates	App Rec/Sat/Pass		Candidates	App Rec/Sat/Pass	
New South Wales	73	65	22	30	27	15	51	43	29
ACT/Canberra	9	9	3	7	6	3	16	15	10
Victoria	73	60	22	24	18	9	42	33	23
Queensland	49	41	11	23	16	7	33	27	22
South Australia/Northern Territory	26	26	11	10	10	4	22	22	16
Western Australia	34	34	7	14	13	6	21	20	14
Tasmania	7	7	1	6	6	2	5	5	2
TOTAL	271	242	77	114	96	46	190	165	116

STATE	SECTION "LS" (Telegraphy-Sending AOCP)			SECTION "LR" (Telegraphy-Receiving AOCP)			SECTION "NS" (Telegraphy-Sending NAOCP)		
	Candidates	App Rec/Sat/Pass		Candidates	App Rec/Sat/Pass		Candidates	App Rec/Sat/Pass	
New South Wales	26	21	12	42	32	13	26	22	20
ACT/Canberra	4	3	2	4	4	1	6	3	1
Victoria	35	26	20	65	53	18	26	21	20
Queensland	26	19	16	39	31	5	17	11	10
South Australia/Northern Territory	8	6	6	17	13	3	9	8	7
Western Australia	19	16	11	32	26	6	15	10	9
Tasmania	5	5	3	13	13	5	3	3	3
TOTAL	123	96	70	262	172	51	102	78	70

STATE	SECTION "NR" (Telegraphy-Receiving NAOCP)		
	Candidates	App Rec/Sat/Pass	
New South Wales	34	26	16
ACT/Canberra	8	4	1
Victoria	37	31	21
Queensland	23	16	7
South Australia/Northern Territory	11	9	1
Western Australia	18	15	9
Tasmania	4	4	3
TOTAL	135	105	58

Will you be a SUCCESSFUL CANDIDATE in the next statistics? ? ?

Forward Bias

Norm Gomm VK1GN
GPO Box 600, Canberra, ACT. 2601

1988 BICENTENNIAL CASTROL WORLD RALLY

One of the major events for Canberra this year was the 1988 Bicentennial Castrol World Rally in February and March (see WICEN News, this issue). A large number of amateurs were involved with these operations as the cars approached Canberra.

VHF communications achieved prominence in its own right once the vintage and veteran cars started to arrive in the Australian Capital Territory. Prior to this, VHF had been used to provide local links between Rally Headquarters and HF net control stations.

Like the HF co-ordinator, the VHF co-ordinator came to the same conclusion; he had suddenly contracted some form of terrible affliction which no other amateur wanted to catch. Each time he came on air, all other operators instantly QSYed or, worse still, went QRT. Even the "Kachunkers" on the two metre repeaters went quiet. This, he was assured, was entirely coincidental and had nothing to do with his search for operators. This requirement was:

● 5 Tuesday	1000 to 1700
● 5 Wednesday	1000 to 1700
● 10 Friday	0900 to 1700
● 5 Friday	1700 to 2030
● 10 Saturday	0530 to 1830
● 7 Sunday	1000 to 1330

Thankfully, despite salt-mine and family commitments, the camaraderie of the amateur community won through and all places were filled.

Tuesday, Wednesday and Friday were very easy days. So much so that many operators were stood down without seeing any action. Friday night and the weekend promptly made up for it; and how, in style.

It is difficult to conceive the magnitude of an exercise of marshalling in excess of 1000 vintage cars into a display arena, ensuring overnight security, co-ordinating crowd control of 33 000 people and keeping convoys united.

On Saturday night and Sunday morning, some 700 vintage cars assembled into convoys. Each convoy, end to end, extended over five kilometres and, with the willing and able involvement of the ACT Police, proceeded smoothly without disruption, to its destination.

Saturday attested to the co-operation and professionalism of some 70 cars from the arena, across the major traffic route feeding the city in 35 minutes!

In closing, the success of the event was in no small part due to the willing and tireless assistance of each of the operators who deserve WICEN's sincere thanks. This has been endorsed by the Rally Director, who made a specific point of conveying his gratitude for the service provided by WICEN.

VK1 OFFICER BEARERS FOR 1988/89

President — Alan VK1WX (Intruder Watch Co-ordinator and Property Officer)
Senior Vice-President — Ray VK1ZJR (Committee Handbook and WICEN Liaison)
Vice-President — Rob VK1KRM (Repeater Liaison)
Secretary — Alex VK1ZDX
Treasurer — Ken VK1KEN (Broadcast Manager and Membership Secretary)
Committee Members —
Neil VK1KNP (JOTA Co-ordinator and Re-Broadcast Officer)
Hank VK1HZ (Meetings Manager)
Norm VK1GN (Field Day Co-ordinator and Forward Bias Editor)
Paul VK2CJ (Recruiting)
Awards Manager — Bob VK1DE
Federal Councillor — Kevin VK1OK
FTAC Representative — Dick VK1ZAH
Historian — Ron VK1RH
OSL Bureau —
John VK1CJ (Inwards)
Ted VK1AOP (Outwards)
WICEN Co-ordination —
Dick VK1ZAH
Dennis VK1DG
Ian VK1KID
Book Sales — Eric VK1EC
Education Officer — Ian VK1ZF

MONTHLY MEETINGS

Monthly meetings of the ACT Division are held on the fourth Monday of each month. Visitors are always welcome and should make themselves known to any of the office bearers listed above.

The next meeting on June 27, will be a presentation on micro-electronics and components by Dr David Gambling, from the Department of Defence's Electronic Research Laboratory, in Adelaide. Dr Gambling is an international authority in communications and radar and it should be an interesting night.

The July meeting will be a Trash and Treasure night to be run by a man in the wrong profession — VK1RH.

DIVISIONAL BROADCASTS

The VK1 Divisional Broadcasts goes to air each Sunday evening at 8 pm, using the Divisional Call Sign, VK1WI. Frequencies are:
3.570 MHz LSB; 28.455 MHz USB; 52.075 MHz USB; 146.950 MHz FM (VK1RGI); 438.375 MHz FM (VK1RIR).

Call-backs are taken on the above frequencies at the conclusion of the broadcast. DX call-backs are particularly welcome.

Broadcasts are re-transmitted on Monday evenings at 8 pm, on two metres only. On meeting nights, the re-broadcast is on the Tuesday evening.

CANBERRA AIR PAGEANT

The annual Canberra Festival included a special air show for 1988, called the Canberra Air Pageant. The pageant was held on Sunday, March 13, at the Canberra Fairbairn RAAF Air Base and provided in excess of 10 000 spectators with an exciting series of aerial aerobatics by both military and civilian aircraft. There was also a splendid display of planes from very small ultra-lights to large commercial planes.

The ACT Division of the WIA provided VHF communications between the Pageant administrator and volunteers controlling the parking, main gates, access to the static displays and liaison with the flying displays. In addition, amateur operators provided a UHF receiver to monitor the air-to-ground radio traffic linking it to the public address system for the enjoyment of spectators.

About 20 amateurs donated equipment and time to man the eight radio links for the full Sunday Pageant. In return for their time and effort, each volunteer was given free access to all Pageant activities.

Thanks to Phil VK1PJ, for co-ordinating the WIA's amateur contribution.

ACKNOWLEDGMENTS

Thanks to Rob VK1KRM, Dennis VK1DG and Dan VK1ST for their contributions.

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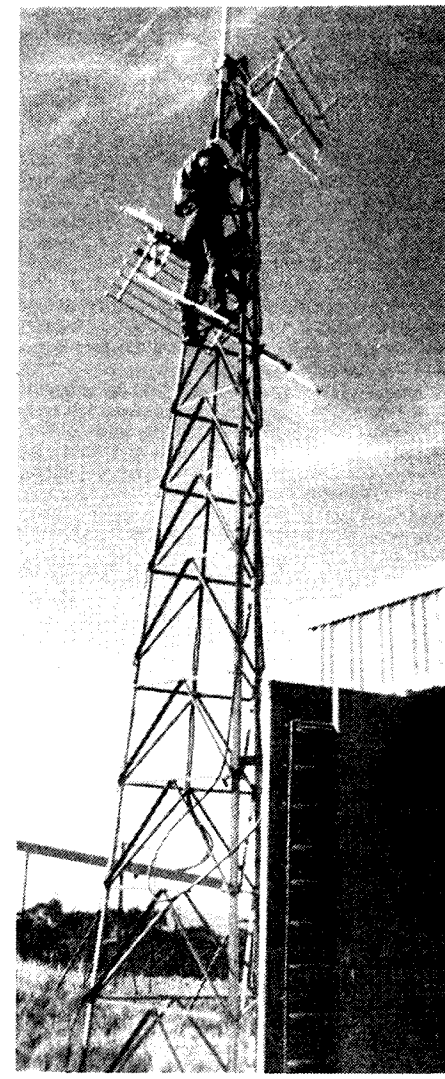

Rob VK1KRM, up the mast of the Mount Ginnini repeater, VK1RGI, attending to the antenna.

VK3 WIA Notes

WIA VICTORIAN DIVISION

412 Brunswick Street, Fitzroy, Vic. 3065

NEW MEMBERS

The Victorian Division of the WIA would like to extend a warm welcome to the following new members:
Ashley Bolton VK3NAB, Kimball Monger SWL 30121, Layton Moss VK3CLJ, Donald Stewart VK3TCH, and David Ranson VK3ECG.

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VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

SILENT KEY

It is with regret that we have to advise of the passing on Thursday, April 14, of Divisional Councillor, Mike Burns VK2AUE. Mike had been a Councillor for many years as well as being active with the Novice Group and many Divisional committees. He assisted in many ways at the Parramatta Office, as well as the Dural broadcast team. He had only recently retired from Telecom and was looking forward to a further year on Council.

ANNUAL GENERAL MEETING

This was held on Saturday, May 7. The list of Office Bearers will be in the July issue of these notes. The posting to members contained the meeting notice, four pages of reports and a membership card. If any pages were missing, please contact the office.

BULLETIN BOARD

The Divisional Bulletin Board, on Channel 4850, is in the process of relocating the transmission point to the Dural site which will improve coverage in the Sydney region.

REMEMBRANCE DAY (RD) CONTEST

In three months it will be time again for the RD. Are you ready to take part again this year? We need your score. While on the subject of contests, the next Postcode Contest will be held on Friday evening, June 24 from 9 to 11 pm. The weekly Divisional Broadcasts will remind you nearer the date.

OXLEY REGION

The Oxley Region Amateur Radio Club Field Day, will be held over the long weekend in June, Saturday 11 and Sunday 12. Contact the club at PO Box 712, Port Macquarie, NSW. 2444 for further details.

CONFERENCE OF CLUBS

The next Conference of Clubs will be hosted by the Illawarra Amateur Radio Society Inc. It will be held at Wollongong on Saturday, November 5.

WICEN

Forthcoming WICEN events include:
The Sun-Herald City to Surf on Sunday, August 14.
The Hawkesbury Canoes on the weekend, October 22 and 23.
Few thousand bike riders from VK3 in late November, early December.

VI88NSW

Activity continues with a club a week having a turn with this call sign. By early April, several hundred QSL cards had been received, both direct and via the bureau. These, in turn, are sent to the various clubs, together with blank QSL cards for replies. Where an envelope has been supplied, they are posted direct, otherwise they are returned via the bureau.

AWARDS

By early April, the first claims were notified for several of the awards available from the VK2 Division. A full set of rules s available from the VK2 Division, Awards Manager, PO Box 1066, Parramatta, NSW. 2150. Please enclose two 37 cent stamps to cover production and postage.

On September 22, there will be a special one-day award to commemorate the 70th anniversary of the working of the first direct wireless transmissions from one side of the world to the other by Fisk, in Australia, with Marconi, in England. Further details next month.

Also, mark the calendar for November — the Parramatta Bicentenary — work VI88NSW at 10 historic sites for an award.

Finally, need cards for all those contacts? Blank cards, suitable for overprinting, are available for $6 plus postage and packaging from the Divisional Office. Designing your own and wish to use the Bicentenary logo, etc. Send a draft of your design to the VK2 Division for approval by the Bicentenary Authority.

NEW MEMBERS

A warm welcome is extended to the following who were in the April intake.
D S Cohen VK2FUF, Greenwich
R W Comerford VK2EZE, Glen Innes
R W De-La-Torre VK2BDT, Saint Clair
B J Dooley VK2KFI, Yowie Bay
J M Emery VK2MEE, Seven Hills
J L Kavanagh VK2KAV, Ryde
J G Knight VK2JGK, Kooringal
J Plecko VK2MEG, Blacktown
J Rajca VK2JRA, Mount Kuring-gai
G Robertson Assoc, Babbara
A H Steffgen VK2VAH, Mount Warrigal
C J P Verhoeks VK2FVC, Condell Park

BROADCAST TIMES

A reminder for this year that the broadcast is preceded by a historic and technical tape. Commencement times are 1045 and 1915 hours local time from AX2WI and relay stations. Copies of the taped material is available from the Divisional Office, on a C90 cassette, six segments per tape. Segments 1 to 18 are now available.

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Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

VI88SA AT PORT ADELAIDE

One of the best Public Relations exercises that we have had for some time took place at Port Adelaide from April 1 to April 10. This was to coincide with the First Fleet re-enactment arrival in Adelaide. After dozens of telephone calls and weeks of frustration, Alan Mallabone VK5NNM, finally managed to get permission for us to have a display station on the wharf (actually the final place was in the offices attached to No 1 Shed, near the Birkenhead Bridge), very near to the ships of the First Fleet. As soon as Alan got permission, he contacted the Port Adelaide Radio Club, who agreed to help with the project. I don't think that either Alan or I should have been surprised if Port Adelaide had told us what to do with our display station. After all, they hadn't seen a WIA councillor for months (or longer) and when one did arrive he was asking for a favour! Also, they only received a fortnights notice in which to plan the event, and the original position that they were offered was only a thin partitioned wall from the rock-groups, which entertained the crowds every evening. But, like the great group of OMs that I found them to be on the three occasions that I was subsequently down there, they rallied to the occasion, got the station set up and on air, and provided more than 50 percent of the manpower (unfortunately, they do not have any YL members at present, but after the time Maria VK5BMT, put in down there, they will probably make her an 'Honorary Member'!). Hopefully, Alan or one of the other members of the Bicentennial Committee will write this up for AR, or perhaps one of the members of the Port Adelaide Club will. Suffice to say that the station attracted plenty of attention amongst the public, including many groups of school children. Hopefully, from this, the Club may have gained some new members and certainly some excellent PR in the area.

CORRECTION

Unfortunately, due to various circumstances beyond his control, John Hampel VK5SJ, will not be able to take over as Divisional Historian. Ray Bennett VK5RM, has agreed to carry on for the time being but would be pleased to hear from anyone who is interested in assisting. Ray has also suggested that several people might be interested in getting together to form a committee of historians — now, there is an interesting concept.

CLUBS' CONVENTION

Once again, a very successful convention took place two weeks prior to the Federal Convention. Unfortunately, we still have not worked out how we can get agenda items out to the clubs, when we only received some of them, both from Federal and from the clubs, only days before the event! One club actually put up an agenda item regarding this problem, but we only received it one week before hand! We were very fortunate to have Peter Gamble VK3YRP, with us on the Saturday, Not only was Peter our guest speaker on Saturday evening, but he was able to give us background information on many agenda items that arose, through his roles as FTAC Co-ordinator and as a member of Executive. I feel that many more individuals and clubs would benefit from hearing what Peter has to say, and we hope that it might be possible to have Peter at a normal monthly meeting later in the year, and perhaps video-tape it for the benefit of Country Clubs.

Clubs who were represented at the weekend were, Lower Murray, Port Adelaide, Elizabeth, Barossa, LEPARC, and we were pleased to welcome three new clubs who were attending for the first time, Moonta Scouts Radio Club, Mid North (based in Port Pirie) and the newly formed SAPUG (SA Packet Users Group).

After lunch on Saturday, Grant Troubridge VK5ZLY, gave us a brief talk on Packet Radio, its history, and how to get started. Those who wanted a practical demonstration on his mobile station (only used when stationary, needless to say!). My thanks once again to the ladies (mentioned last month) who gave us the usual high quality meals that we have almost come to expect, and also to the Council members who gave up their time and energy in various ways, to make it a success.

DIARY DATES

Don't forget the SERG Convention on the June long weekend (11-12). (See Club Corner for further information).
Tuesday, June 28. General Meeting. Speaker unknown at time of going to press. 8.45 pm.

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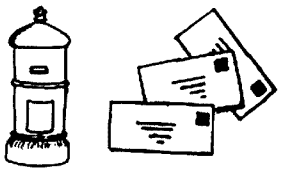
Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Over to You!



20 METRES VERSUS PACKET

I read the letter by Keith Scott VK3SS, re the Travellers' Net (AR, April 1988) with a certain amount of dismay and concern, mainly due to the hostility he expressed towards packet radio users on the lower end of the 20 metre band.

As a regular listener and sometimes participant of the Travellers' Net, and also an avid packet radio enthusiast, I am only too aware of the problem of interference between the two systems. I can understand Keith's frustration and anger to some extent, however, I cannot condone a hostile and ignorant attitude towards any special interest amateur radio group. This sort of hostile attitude does not help solve the problem, it only compounds it. I am sure Keith probably realises this now, and is feeling a little sheepish having seen his name in print, as we all do when we 'put our foot in it"!

Sure, there is a problem, for both types of users of this piece of the spectrum. I do not know the answer, but it does seem that one group should move frequency to avoid interfering with the other. Which group should move is the question.

I know Art VK6ART, and others have been there for a long time. Art does sterling work on the net, and I for one have been very grateful for his assistance in passing messages, keeping track on car travellers around Australia, and the odd yacht or two as well. It is a wonderful net, and as a safety factor it is invaluable to all travelling amateurs, their spouses, families and friends.

On the other hand, we have the relatively new phenomenon of packet radio, wanting to use the same frequencies. Why this is so is because apparently these frequencies were chosen by overseas amateur groups who had already established their packet radio networks. It seems Australian packeteers had to follow to keep in line with international demands. Frankly, I don;t think the choice of frequencies was good. I would rather see packet up at the top end of the bands. The 50 kHz section between 14.100 and 14.150 MHz is a valuable area for low powered stations, away from the Californian Kilowatts.

It would not be so hard for either group to QSY. A little cooperation and organisation is all that is required.

Keith stated, somewhat aggressively I feel, "I would like to know just what information of significance or importance these electronic noises (from the 'Robots') are conveying, also, how can the average amateur be sure they are not commercial intruders?"

Well Keith, many of the messages passed by packet are of just the same importance and significance as much of the traffic on the Travellers' Net. One of the most wonderful things about packet is that these messages can be passed very quickly and 100 percent error-free, something that is often difficult with phone in bad conditions.

Packet is a new and wonderful technology, with amateurs again at the forefront, just like the change from AM to SSB long before the commercial users, like the early experimentation by amateurs with the first hill-top VHF repeaters, like the first amateur experiments of sending picture by wireless, now called television by the commercials, who insult our efforts in technology by feeding us nightly doses of rubbish. Hostility towards packet! I remember the same irrational attitudes back In the AM days, when a few adventurous souls had the audacity to experiment with SSB!

As for commercial intruders, I am sure there is no problem there, as each packet station sends out an identifying code with each packet sent. Any intruder using packet would be easily identified, it would be like shouting abuse on two metres and signing your call sign! I also think it will be some time before commercial users of packet start to appear, especially on the amateur bands. Most commercial radio users cannot afford to keep up with modern technology, that is why you will still find AM HF used from time to time.

Well, it is not much use butting our heads together like male mountain goats over who gets what and who. Let us solve the problem in an educated and civilised way. There is room for all of us, suggestions please!

I am a little surprised that no one has yet mentioned the other stations who use the low end of the 20 metre phone (and packet!) band. I am referring particularly to the French amateur stations in the Pacific islands who talk to their mates on adjacent islands a few dozen kilometres away. From my basic understanding of the French language, I understand many of them find it necessary to run high power and large beams. A number of them are running kilowatt stations, as attested by my collection of burnt-out front end receiver cat's-whiskers. Could someone please explain to them, that the frequency is not necessarily clear just because no one is speaking French, and that another band with must reduced power would probably be much more suitable for their requirements.

Back to packet, a suggestion to Keith and others, have a look at it, give it a try. One of the most interesting things about amateur radio is our freedom to experiment, on different modes of communication. Surely that is what it is all about, whether it be phone, CW, packet, RTTY, AMTOR, SSTV, FSTV, or what you will. But, don;t let us knock any mode in a hostile way!

Pete Robinson VK4DFR
PO Box 874
Cairns, Qld. 4870

ar

* * *

GOOD TO KNOW!

It was good to get the information on the RAAF Signal Group from Peter Alexander in *Amateur Radio*, February 1988.

I sometimes hear them going for their lives on their keyboards at the CW end of the bands. However, like all of us getting older, the spacing is not what it used to be in the old days, or perhaps the Radar boys "looked a lot", but did not send a lot!

Peter's photograph of the Pigeon is probably the one which sorts out the sending anyway! Good luck.

Bruce Jackson VK2DZW
Fenton Road
Narrabri, NSW. 2390

ar

* * *

CORRESPOND WITH SOMEONE IN EDUCATION? ! ?

I am a maths teacher in a junior high school (ages 12 to 15) and am very interested in computers, education, working with youth groups and learning about Australia. I am looking for Australians who would be interested in exchanging a few letters.

I have a brother in California who is a amateur radio operator and he has told me that most of the members in his radio club are interested in computers. I have exchanged many programs and other correspondence with them. They have one of the largest Apple Computer Clubs in Orange County, California. I am hoping some radio people in Australia may also be interested in computers. (Since I work with computers in the schools, almost all of my experience is on the Apple. I currenlly own an Apple Iie and Iic and am considering upgrading).

Through an agricultural exchange program between our two countries, I have met some exchange students. Because of them, I have become very interested in Australia. I have plans to visit Australia one day, and would like to know some people that I could call when I go there.

I am married and have four children — daughters aged 24, 22 and 18 and a son who is 11. We live about 10 miles from town on a few acres where the children raise Hampshire sheep as a project for their youth group. The two youngest children still live at home. My daughter is also active in horse activities.

I have a bachelor's degree in mathematics and a master's degree in computers. I am interested in any area of computers — education, programming, games, etc. I would really like to find out what people in other parts of the world are doing with computers. I am also interested in comparing cultural similarities and differences. I would also love to correspond with someone in education.

Sincerely,
Marilyn Stafford
Box 217
Evansville, WY 82636, USA

ar

* * *

SPONSORSHIP

Recently, I have had time to spare for reading over the last six months of AR. Keep up the good quality; I am not fussed about colour covers.

The reason I am writing is to say many people are genuinely in hardship and cannot afford membership of the Institute. So I propose a sponsorship scheme.

I am financially capable of supporting another fellow amateur. So are a few more. How about some thoughts back from others? Get the ball rolling, or has this been proposed before my time?

Wanting to help keep AR alive!
Greville Knight VK2FEI/JGK
HMAS Orlon
Mllsons Point, NSW. 2061

It is an excellent suggestion, Greville, and one that I have not seen suggested before for the WIA. There could be a few administrative problems. What do others think? —Ed.

ar

* * *

COMMUNICATION BREAKDOWN

The writer became a member of the WIA on August 31, 1987, and holds Certificate No 17628. Since that time, the journal has been enjoyed for its great articles and technical coverage. But today, a great discovery was made and I must tell about it.

The WIA does have a Victorian branch and Ray Chambers told me this morning that gross newcomers like me are able to use the library, listen to Sunday broadcasts on club affairs and participate in radio courses of instruction.

The above news came as a complete shock to me as I have been reading the journal closely for six months to try and find out how I could prepare myself for the DOC examinations. Further, I found out that slow Morse code is being transmitted every evening!

I believe a summary of all services available to new members should be sent with the Membership Certificate. Secondly, if that is not possible, then some information should be published in the journal from time to time. As for me, six months has

been lost in learning Morse and getting some instruction on radio for the examinations.

If I have missed any published information on the above matters, please let me know and accept my apology. This letter is written in a constructive way to help other new members of the WIA.

Yours sincerely,
Milton Johnson
8 Ledbury Court
Toorak, Vic. 3142

ar

* * *

NEED FOR CW[1]

Gordon McDonald VK2ZAB, tells us in AR, March 1988, that A1 moders are nothing more than ". . .quaint (obsolete) old men 'playing' with Morse keys." He then follows this disrespectful reference to pioneers, alive and dead, with the comment "that the study of Morse is only a demeaning chore to be regarded as a joke" — and that it should be deleted unilaterally and immediately — no waiting for a possible WARC consensus in 1992.

VK2ZAB also informs us "that newcomers to AR ranks are falling off and we are out of touch with the latest technology".

If Gordon McDonald was code proficient, he would never have penned the above words. Deleting the Morse requirement would certainly add to our members (but not necessarily proportionally increase WIA membership above its present 45 percent). But everything has its price. History shows that cramming more stations into a limited space lowers the standard of operating — and the policing of our bands, which is abysmally poor even now, would become more difficult.

Moreover, a codeless full VK ticket is virtually useless when tendered for reciprocity overseas.

I can never understand why the 'clever' boys in AR find CW to be a 'fog in the head' when raw rookies in the Armed Services can manage 10 words per minute in as many weeks, or less.

One reason for the reduced interest in AR, referred to by VK2ZAB, is that much of the mystique has now gone from the hobby — and a leap ahead into the digital, packet, bulletin board, Satcom, mail drop technology is not likely to markedly stimulate it either. Human nature being what it is, the main body of amateurs prefer to socialize, which means a preference for voice or Morse OSO rather than the automated, depersonalised, machine-made contact.

The anti-CW lobby cannot sustain an argument for the deletion of the code requirement at this point of time. A1 happens to be on a popularity peak in many overseas countries — and the rising solar cycle will ensure that it stays that way. Instead of painting themselves as 'griping whimps', with mostly noise and bluster as a means to their ends, the lobby should get on to the right target and strive for a modified licensing structure — one that does not restrict code.

In reply to Gordon's ungracious tilt at OOTers, I would like to invite him to my shack to observe what this 'quaint (obsolete) OM can *do* with VK2ZAB's idea of a joke — Morse — and then have him switch to SSB for comparison.

Bi-lingual proficiency has proved to be my greatest asset in DXing.

Alan Shawsmith VK4SS
35 Whynot Street
West End, Qld. 4101

ar

* * *

NEED FOR CW[2]

The letter by Gordon McDonald expressing his view that the Morse code requirement "is seen to be an anachronism of no relevance to present day radio enthusiasts", seems to be just another example of the failure of amateurs to realise the broad picture of radio communications.

Our licence is to enable us to self-train in radio communications and to conduct technical investigations. The aim of such training must be to communicate with the highest efficiency. In order to do that we use the system which gives that efficiency, namely telegraphy. An inspection of the HF bands will reveal the extent of the use of CW by the services.

The amateur service has always been regarded by the authorities world-wide as consisting of competent radio operators, who, in time of need can be called on to augment other services.

Our frequency allocations are now under a greater threat than ever before and it is vital we present our service as having the highest status possible. If, however, we can only claim to be capable of operating telephony, the picture presented will be no more than operating a home radio telephone.

Sincerely,
Norman Richardson VK4BHJ (ex-G5HJ)
1069 South Pine Road
Everton Hills, Qld. 4053

ar

* * *

COST OF AWARDS — I PROTEST!

How many awards does one chase in the awards arena? I venture to say that the cost associated with obtaining them would be the limiting factor. Most of them are available to an amateur who does a reasonable amount of operating. But the cost; and it is here that I protest. Am I alone with these feelings?

Some time ago, reading AR for April 1987, the USSR Amateur Radio Awards caught my eye. Without any problems, I found that I qualify for five awards. Great, I will apply, so reading on to find the address and cost I suddenly lost interest. Each award cost 14 IRCs and I was seeking five, so at $0.80 (since increased to $1.35) each for IRCs I am to send $56. Highway robbery! What should an award cost? "Over to You!".

Neil Penfold VK6NE
2 Moss Court
Kingsley, WA. 6026

ar

* * *

ENJOY BEING MEMBERS

At the forthcoming Federal Convention, some of the Divisions will be trying to introduce changes which *they* believe the members should want. I hope they neglect to include the Institute journal, AR.

That publication, its member editors and member contributors is essential to the WIA. At present it is the best amateur periodical available in Australia; not because there is no competition; there is, some from overseas; but simply because it serves the WIA members very well and incidentally it also serves the rest of the amateur radio community. It does not compete on newsagent book stands or other public market places and that is how it should be.

Its prime purposes are to inform WIA members of WIA proceedings and events and to provide a vehicle for members learned discussion and the airing of opinions. It does that very well for a widely dispersed membership (even into Lakes Entrance) and without it the WIA would cease to exist as a truly national institute.

It is a non-profit publication. Its editors and contributors are unpaid dedicated amateurs who are members of the Institute. It does not need or want "trade journalists" pandering to advertisers' influence and it could and should, if the need arises, continue without revenue from advertising. It is an independent journal run by the members for the benefit of the members and, incidentally, a large proportion of non-members. Let us keep it that way and if necessary, bear the extra costs or be content with less gloss and any other necessary economies. Confine illogical 'political inputs' to the waste paper basket, suggestions such as 'amalgamation with a commercial magazine' 'sell off meeting rooms and other assets'. We can manage without those and similar measures.

An organisation, such as the WIA is, must be prepared to do what it can within the limits of its own resources and no more. It should not over commit any of its members. Above all, it should be dedicated to doing for itself the things which make it easy for the members to enjoy the pastime and *to enjoy being members.*

We hear from office bearers who admit to being over-committed and nothing from those who are, but do not complain. Are they all trying to make the WIA something it cannot be? Are they trying to provide facilities which the members do not really want or selfishly depriving members of opportunities to do interesting things for themselves? Relax chaps; I for one do not expect anyone to "burst-their-boiler" on my behalf! But if you can enjoy that, go right ahead, otherwise don't.

Yours sincerely,
Lindsay Lawless VK3ANJ
PO Box 112
Lakes Entrance. Vic. 3909

ar

* * *

WHAT AND WHAT CANNOT BE WRITTEN ON OSL CARDS

I would like to submit the following two statements and hope to draw some comment on there interpretation.

1. Under present postage regulations only five words of greeting may be written on cards sent by bulk-mail. Cards with more than five words may be returned to the sender at the outwards QSL manager's discretion.
(Extract from the official WIA (Old) Information Booklet)
2. The old story about no more than five words on a card is a myth, via the bureau anyway.
(The above as stated inter alia in an excellent article *Memo from the VK2 QSL Bureau,* AR, March 1985, page 34.

I request that this letter not be construed as knocking our QSL managers. I personally would like to congratulate the VK4 QSL staff for their effort and dedication in performing heir duties. However, I do feel that this controversial topic should be clarified particularly for our newer members.

In conclusion, may I suggest the following:
1. Publish the postal regulation applicable to QSL bulk mailing.
2. Reprint the excellent article *Memo from the VK2 QSL Bureau.*

May I wish the magazine the very best of luck in the future.

73,
Jim McPherson VK4CBU
10 Courageous Court
Scarborough, Qld. 4020

ar

* * *

INCREASED TECHNICAL ARTICLES

It is a delight to see an increase of articles of technical and theoretical interest in AR.

In particular, Lindsay Lawless' Technicalities are most welcome. Congratulations to VK3ANJ and to AR.

His TT 2 was of great interest, so much so that I obtained a copy of the *QST* article (to which he referred) to see if I could gain any more information. It did contain interesting details on the bandwidths of the network under different circumstances; but I do not criticise Lindsay for omitting this aspect. Unfortunately, Lindsay's analysis will have been merely glanced at and then put aside by so many of our fellow amateurs.

What I like about the two articles is that they analyse, simply, the tank circuit that so many of us used in our home-brew valve transmitters of old. Take Lindsay's Figure 1a, and turn it back-to-front. The X4, X3 and X2 comprise the tank circuit that

we used to use. The only difference was that X1, instead of being tapped directly onto the coil, was usually coupled by means of a smaller coil for feeding to the antenna. (I have seen circuits without the coupling coil in old handbooks).

So: what's new?

The answer to that question is the delightful analysis of the circuit.

73,

Bob Slutzkin VK3SK
8 Lynedoch Avenue
Balaclava, Vic. 3183

ar

* * *

1 + 1

Roy Hartkopf VK3AOH, made a valuable contribution to AR with his *One plus One equals Disaster* in the April issue. It is worth commenting that a *proper test* for earthing of the frame of the griller, not with a test lamp but with an ohmeter, which should have shown almost zero ohms between frame and earth pin and close to infinity between earth pin and either active or neutral, would have revealed the fault. However, one does not usually expect to find one end of the element connected to a terminal marked "E" which stands for "earth" not "element"!

Having made those rather obvious remarks, I would like to endorse Roy's belief that these situations are neither random now accidental. They are man-made and flourish through ignorance enforced by political and bureaucratic stupidity. In Britain, electrical work can be done by any competent person and checked by an expert inspector. That was also the situation in VK5 until about 20 years ago.

This State had a lower per capita rate of electrocutions than all other States which required work to be done only by licenced electricians. It was not just marginally lower, but about two-thirds of the figure for the other States.

Statistics prove that accident fatalities have dropped faster in countries like the USA and Britain, where seat belt wearing is encouraged, but not enforced, than in Australia. But bureaucrats have two sayings; "Don;t confuse me with the truth — I've made up my mind" and "Shut up and do as you're told". I found that out when I applied for an electrician's licence and was told that I did not require one!

Amateur radio must be unique in that it still has a large measure of self-regulation and self-discipline. We must take care that it stays like that — or one day we may find that we are required to have an electrician's licence before we can switch on our rigs!

Yours faithfully,

P D Thomas VK5ZPT
Thomas Hill Road
McLaren Flat, SA. 5171

ar

DEADLINE FOR AUGUST IS JUNE 20, 1988

REPEATERS & BEACONS

Tim Mills VK2ZTM
FTAC Beacon Co-ordinator
PO Box 300, Caulfield South, Vic. 3162

With the plans to change the 10 metre beacons from a continuous transmission on its own frequency to a time-shared frequency, there will be the need for a control system. It will need a clock referenced source to hold an accuracy so the transmission slot will commence precisely on its allotted minute for say the next 58 seconds. It may need a read-out and the ability to be set easily against a reference. It will need to repeat at, say, 10 minute intervals.

It may also need to be able to power step the transmitter, so this would be a signal control of say four instructions.

You may well ask, why the details? Well, a design for this type of controller is required. We may finally need six or eight controllers for this country, and perhaps a few more for the region. If you can help with either an existing design and can produce one, then please write to me at the above address. Thanks.

Whilst on the beacon subject, has your club or group considered establishing one in a remote or presently uncovered part of your State? Beacons provide a signal source for those interested in path investigation. The increasing sunspot cycle is helping the 10 metre beacons provide their role. Recent reports, particularly in *Break In* shows that 10 metres is again becoming useful. Have you looked for the Sydney 10 metre beacon on 28.262 MHz? Read its message, send a card, and you will receive one via the bureau.

ar

MORSEWORD 16

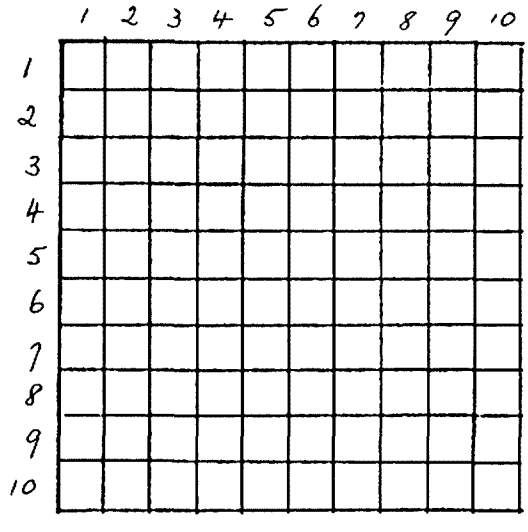
Audrey Ryan
30 Starling Street, Montmorency, Vic. 3094

ACROSS

1. Betray (colloq)
2. Rock
3. Anxiety
4. Animal like a rabbit
5. A good person
6. Fabric closure
7. Chilled
8. Young Arthur
9. Jabs
10. Balk

ACROSS

1. Fees
2. Basin
3. Repair
4. Donation
5. Strong wind
6. Letters
7. Santa's expression!
8. Steal
9. Cost of a trip
10. Spoken



Solution see page 62 . . .

Silent Keys

It is with deep regret we record the passing of:

MR ROBERT HUGHES BLACK VK2QZ
MR M R (MIKE) BURNS VK2AUE
MR JOHN H W CAHILL VK6AJC
MR EDWARD WILLIAM (TED) IRWIN VK3EX

Obituaries

CARL THIELE VK3BBL

It is sad to report the death of Carl on December 29, 1987, after a short illness.

Carl was born at Gerang Gerung, in the Western District. He always had an interest in radio and in the 1930s was a keen builder and repairer of radios in his home town and surrounding area.

He was a frequent visitor at the Yanac home of Herb VK3NN (SK), his brother-in-law, and from there developed an interest in amateur radio.

Carl became an associate member of the WIA in September 1978, and after much study and help from his friends, obtained his Novice licence in June 1979 (VK3VFG) and graduated to a full call in February 1982.

Much of his time on air was spent talking on VHF to his nephews, Max and Garry VK3NN, at Yanac, and also Colin VK3ARS in Bendigo.

Sincere sympathies are extended to Carl's wife, Lorna, and sons Eric and Ian.

Bob Seal VK3RS
ar

ARTHUR STANLEY HECKENBERG VK2AHL

It is with deep regret that we record the passing of Arthur on February 19, 1988, at the age of 63.

Arthur was born in Richmond, one of twins, in a family of 13 children. He grew up and was educated in Cabramatta. He was married in Richmond in the same church in which his farewell service was held.

Arthur attained his licence in 1965, and was a very enthusiastic home-brewer, keen DXer on 20 metres and a regular voice on 40 and 80 metres. A perfectionist with his antennas, and work as a carpenter, Arthur was well-known throughout Richmond and surrounding areas as always willing and eager to help others.

Having constructed many buildings for the locals, he later worked at the St Johns Hospital, Richmond.

Unfortunately, in 1978, Arthur suffered a stroke which affected his speech and amateur radio became difficult for him. Another stroke followed which confined him to a wheelchair and Arthur became a listener only.

Sincere condolences are extended to Arthur's wife, Lilian, and daughters Kayleen and Marcel and their families.

Josef Pietras VK2AJP
ar

HARRY ALDERSON VK2EP

It is with regret that I inform all amateurs that Harry VK2EP passed away suddenly on March 8, 1988 in Baringa Private Hospital, Coffs Harbour. He will be sadly missed by all radio amateurs, especially in CW circles.

Harry's passing is also an irreplaceable loss to the Coffs Harbour and District Amateur Radio Club. He worked tirelessly within his church, community, as Morse Training Officer in the club and was a friend to all members.

A kind, patient educator, operator, and one of nature's true gentlemen, he has left a gap in amateur radio that will not be easily filled.

Harry is survived by his wife, Elva, three children and seven grandchildren, and I am sure all amateurs feel their loss.

Peter McAdam
President, CHADARC
ar

LOREN G (WINDY) WINDOM W8GZ

It is with great regret that we note the end of an era with the passing of Major General Loren G Windom (Windy) W8GZ. Windy passed away on the evening of February 1, 1988, at the age of 82. Windy's lifetime of accomplishments would fill several volumes, so we will briefly try to present the highlights of a very active life.

Windy began his radio career In 1917, with a backyard telegraph. His first radio licence, 8GZ, was Issued in 1920. In 1926, at the age of 21, he established the world's "low power" record of 17 820 miles per watt, by communicating with Australian station 5BG, 10 000 miles away. The total input used by 8GZ was 0.567 watts which included the power to the filaments. An article was published in *QST* in 1929, on a single feeder Hertz antenna which has become known world-wide as the "Windom" antenna. Windy served two terms as ARRL Director in the 30s and 40s.

In 1957, W8GZ became the first amateur to contact 100 countries on SSB — his big love in amateur radio was DXing. Since 1970, W8GZ has been at the top of the DXCC Honour Roll on phone . . . the last two years by himself with the passing of Don Wallace W6AM. Windy's final country total stood at 366.

Amateur radio was not Windy's only interest. He was a practicing attorney, and served for 25 years as a United States attorney. He retired from military service as a Major General. During WWII, he received the Purple Heart with three Oak Leaf Clusters, the Distinguished Service Cross, the Silver Star and a Bronze Star. Windy also served one term as Adjutant General ot the state of Ohio. Surviving him are his wife, Dottie, his son David W8ZG, and daughter Diane.

Windy's life and amateur radio career exemplified the Amateur's Code.

(Unfortunately, the Windom home in Reynoldburg, Ohio, has been sold to a non-amateur. Windy's widow's health failed rapidly following her husband's death and she is now confined to a nursing home. Thus cards of sympathy or notes would be futile.)

Courtesy N1ACH, staff of *Ham Radio* magazine, John W3AEV and Ray VK3ATN
ar

Q & A

Why the variation in membership bscriptions for the different States. I have been asked and do not know.

— Rick VK5BEG

WIA membership is made up of two components — Federal and Divisional.

The Federal Component for 1988 is $30. This covers the costs of producing, printing and posting *Amateur Radio* magazine, membership of the International Amateur Radio Union and Federal Office salaries and overheads.

Each Division determines the amount of its own Divisional Component to cover the cost of running the Division and providing its own membership services.

Your Divisional Secretary or Treasurer will be able to inform you of what your Divisional Component comprises of.

— Helen Wageningen, Membership Secretary

WHERE DO WE GO FROM HERE?

The following is an extract from the President's Report *in the Summerland Amateur Radio Club newsletter of March 1988, written by Duncan VK2DLR.*

Much has already been written and spoken about the future of amateur radio. Many press for the preservation of the past where we all feel comfortable because of the familiarity of the surroundings.

However, the past is not the future and that's where we are headed. By tradition and indeed by regulation ours is an experimental hobby. Experimentation will continue to lead us towards the unknown.

Indeed it is this spirit of adventure and desire to learn that not only forms our past but is the basis of our future.

Packet radio gives our club the biggest recruitment opportunity since CB radio. We should strive to take advantage of this opportunity to tap into the great field of computer buffs.

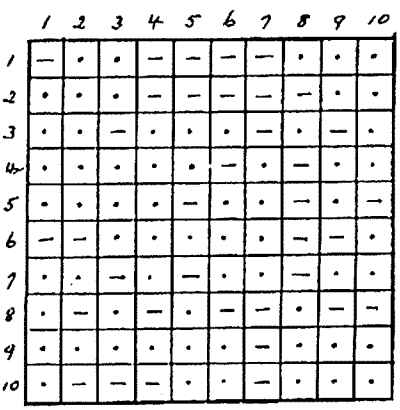
Not only can we appeal to their technical/experimental nature, but we can lure them with dreams of multiple connections and connection to bulletin boards and computers around the world. And all this free of Telecom charges.

Our own packet radio society SAPS and other groups are providing the infrastructure. What our club has to do is to start an educational and recruiting drive. We must attract them into the club, help them obtain their licences and get them started in our manifold hobby.

SOLUTION MORSEWORD 16

Across: 1 dob 2 stone 3 fear 4 hare 5 saint 6 zip 7 iced 8 Arty 9 hits 10 jib

Down: 1 dues 2 sink 3 fix 4 gift 5 gale 6 mail 7 oho 8 rob 9 fare 10 said



IONOSPHERIC REPORT

The IPS Radio and Space Services summary contains the following information. The monthly averages were:
10 cm flux — 108.9
Sunspot number — 59.6
A index — 10.3
I index — 63.4
Flares — 3

Solar activity was low in January with an exception of an X class flare on January 2, and two M class flares on January 14. The X class flare came from a region which had threatened energetic flares in late December, but did not produce anything until the January 2 flare.

The monthly averaged 10 cm flux value was the highest since May 1984, continuing the rapid rise of the new solar cycle. The daily flux value of 127 on January 16, was the highest single daily value since May 23, 1984.

The geomagnetic field was at major storm level on January 2 and 3. There was a sudden commencement in the field at 2012 UTC on January 4. Another disturbance started after 1500 UTC on January 6, and ended slowly on January 8. There were minor storm conditions from 0900 to 1300 UTC on January 12. There was sudden commencement at 2328 UTC on January 13. The field continued to storm to 1200 UTC on January 15. The second half of the month was remarkably quiet with the largest A index being only 10.

HF propagation for Sydney was generally good because of the strong solar flux values throughout the month. MUFs were affected by the geomagnetic disturbances in the first part of the month, especially the January 14 to 15 disturbance.

The sun's activity dictates the conditions in the sun-earth environment. This activity is responsible for the emission of the extreme ultra-violet and Xray radiation, the ejection of energetic particles and clouds of solar material which perturb the earth's ionosphere and magnetic field. Such perturbations subsequently disturb radio communications and the earth's environment.

The summary for February contains the following information. Monthly averages were:
10 cm Flux — 105
Sunspot number — 40.2
A Index — 11.2
Flares — 1

Solar activity for February was low with the exception of a single M class flare on February 20. There were a number of regions visible on the disc of the sun during the month. One of these was quite impressive in size from being the first visible on the eastern edge of the sun on February 12. It remained this size until it crossed the western edge of the solar disc on February 26, but did no look likely to produce energetic flares at any time. The fade out from the Class M flare occurred on February 20, with the fade out possible 0402 to 0445 UTC.

In respect to geomagnetic activity, the feature of the month was the intense magnetic storm centres on February 22. The A index for the day reached a value of 67 which was the highest daily value since the start of the solar cycle 22, indeed since the remarkable storm of February 8, 1986. There was a report of an aurora being sighted at around 1710 to 1750 UTC on February 22, from the Siding Springs Observatory, in the central-west of New South Wales. Geomagnetic disturbances occurred on February 5, 12-13, 15, 18, 21 and 23 when a major geomagnetic disturbance started around 0000 UTC, on February 22, and the field was at major storm levels throughout the day. The intensity of the storm then abated slowly on February 23.

Sydney MUFs were considerably higher than IPS predicted values during the middle part of February 5. They were then severely depressed from 210 on February 5, to 1000 UTC. They were again moderately depressed from 2100 on February 6, until 0600 UTC on February 7. MUFs in Sydney were severely depressed from around 2200 UTC to February 21 through the daytime hours of February 22 and 23, when conditions were likely to have been extremely poor due to the intense geomagnetic storm and on February 29 conditions were moderately depressed for most of the day. The two largest geomagnetic disturbances during the month both affected the ionosphere badly at times, February 22 being especially poor.

VK2QL's Radio Australia propagation report shows 20 flares occurring during March.

For those readers with general coverage receivers, Radio Australia gives a propagation report each four hours daily, except Sundays, commencing at 0425 UTC on the frequencies of 15.320 and 11.945 MHz and at 0825 UTC on 9.580 MHz.

—Contributed and compiled by Frank Hine VK2QL

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AMSAT Australia

SATELLITE ACTIVITY FOR THE MONTHS OF JANUARY/ FEBRUARY 1988

1 LAUNCHES

The following launching announcements have been received:

INTL NO 1988	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INC deg
004A	Cosmos 1915	Jan 26	USSR	90.3	402	207	r172.9
005A	Meteor 2-17	Jan 30	USSR	104.1	973	947	82.5
006A	USA 29	Feb 03	USA	101.5	832	824	98.8
007A	Cosmos 1916	Feb 03	USSR	89.9	384	179	64.9
008A	USA 30	Feb 08	USA	90.1	333	223	28.6
009A	Cosmos 1917	Feb 18	USSR				
	Cosmos 1918	Feb 18	USSR				
	Cosmos 1919	Feb 18	USSR				
	Failed to reach required orbit						
010A	Cosmos 1920	Feb 18	USSR	88.8	268	193	82.6
011A	Cosmos 1921	Feb 19	USSR	90.4	408	215	70.2
012A	CS-3A	Feb 19	Japan	650.0	36755	200	26.3

2 RETURNS

During the period 51 objects decayed including the following satellites:

1984-083A	Cosmos 1588	Feb 17
1988-059A	Cosmos 1769	Feb 18
1987-102A	Cosmos 1901	Feb 03
	Cosmos 1917	
1988-009A	Cosmos 1918	Feb 19
	Cosmos 1919	

—Contributed by Bob Arnold VK3ZBB

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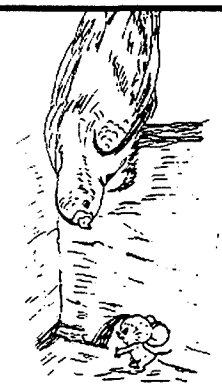


All copy for inclusion in the **August 1988** issue of *Amateur Radio*, including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162**, at the latest, by **9 am, June 20, 1988.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: RJ & US IMPORTS, Box 157, Mortdale, NSW. 2223. (No inquiries at office please . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT. (Please note that the R J and U S Imports Office will be closed during the month of June).

WANTED — ALL STATES

THE MAX LOVELESS COLLECTION: is most anxious to obtain a "Type A-Mk2" or similar WWII era clandestine operations radio set. Also: Bendix TA 12 HF transmitter. AT20 or WS 173 HF transmitter. WS 133 HF transmitter. These items are required for restoration & preservation by the Loveless Memorial. We are prepared to pay reasonable prices for such or similar gear, but we cannot afford "antique dealer" prices. If you can help with any of the above please contact Barry VK7RS, QTHR. Ph: (002) 28 6351 BH. Mail address: GPO Box 215C, Hobart, Tas. 7001.

WANTED — NSW

EARLY WIRELESS SET: Any condition, crystal set, early valves, 20s radio parts, Wireless Weekly magazines or similar, telephone bits & pieces. Bob VK2DWA. Ph: (02) 620 1635.

KENWOOD LINEAR AMP: TL922 or similar unit. Ph: (049) 59 6335 anytime.

WANTED — VIC

HANDBOOK OR CIRCUIT DIAGRAM: for Eddystone receiver type S870. Cost etc to John Weir VK3KMW, 196 Deakin Avenue, Mildura, Vic. 3500. Ph: (050) 23 7252.

OPERATING MANUAL: for "Galaxy V" transceiver. F Maher. Ph: (03) 354 9329.

WANTED — QLD

ANTENNA TUNER AT-130: Must be in VGC & 100 percent operational. Icom IC-22S/22A in VGC. Must be 100 percent operational. Hy-Gain 18AVT or similar trapped vertical HF antenna in VGC. Please phone Geoff VK4CET (077) 73 7179 & leave your phone number for contact.

HUSTLER 5BTV VERTICAL HF ANTENNA: Watt-meter. Also, mike/earphone headset. Details to John VK4SZ, QTHR. Ph: (070) 61 3286.

WANTED — SA

VALVES: Old valves 2A5, 2A6, 57 (2), 58, 6U7, in good order. Also, one 5 inch Electrodynamic Speaker, 1000 ohm coil. David VK5NCM/KDE, QTHR. Ph: (08) 389 2362.

WANTED — WA

ICOM IC-720A: Will pay top price for set in good cond. Call on reverse charge. Emanuel VK6NEB. Ph: (09) 276 2207 evenings.

SWAP

YAESU SPEAKER MIC: with scanning & frequency lock, type YM-49 — for a Kenwood speaker mic to suit Kenwood TR-2400 2-metre transceiver. VK3CXP, QTHR. Ph: (03) 366 5060.

FOR SALE — NSW

HY—GAIN MULTI-BAND VERTICAL ANTENNA: 10 to 80 metres. $95. Mosley Mustang 3 el beam, 10, 15 & 20 metres. $80. For linear amplifier builders, quantity of valves, type 813. Al VK2AXR. Ph: (02) 477 6275.

KENWOOD TR2600A 2M FM HAND-HELD: with speaker-mic, extra PB26 battery pack. Rubber flex antenna, AC charger, manual. $150. Allan VK2ELE, 9 Loquat Avenue, Leeton, NSW. 2705. Ph: (069) 53 3756.

METERS: 1 x Weston Model 301 0-25mA DC. 3" round-new. $30 ONO. 1 x 0-250mA DC 3" square. $25 ONO. 1 x 0-100V AC non-linear scale. 3" round. $15 ONO. 1 off CDE model AR22 rotator with control. Suit small HF beam.$175 ONO. 1 off Autronic (USA) Morse key — new. suit electronic keyer. $45 ONO. Art VK2AS, QTHR. Ph: (02) 467 1784.

ROBOT 400 RTTY/ASCII/MORSE & SSTV TERMINAL: complete with all documentation and in good working order. $250. Mactrotronics RM1000 radio modem, complete with interface card for IBM PC or compatible & software for RTTY/ASCII/Morse. Modem is software controllable for all common shifts & CW. Complete with all documentation & disc. $300. VK2HL. Ph: (02) 981 4762 for further details.

SIEMENS TELEPRINTER: with opto-coupler interface to Apple computer. Prints program listings, etc. $65. Unmodified Siemens good order, with free 'spare' machine $25. Roger VK2AIV, QTHR. Ph: (042) 34 1431.

VZ300 & DATASETTE: 16k expansion module, glass RTTY, expanded Basic, Tech manual, Morse keyboard program, 8 games, speech processor, pwr supplies, cables & plugs. $300. Allan VK2AGR, QTHR. Ph: (044) 71 1059.

YAESU FT-100: VGC $125. ACU Yaesu FC-700. $200. Carton of valves all kinds. Valve tester. Data of valves. Offers? FTDX-400 (Serial No 805452) GC. $150. FTDX-400 (Serial No 9062244) could be suitable for parts. RX Okay. TX no. Offers? Trio CS-1654 dual trace oscilloscope. Only used 3 times. GC $250. (Licenced amateurs only). VK2DJM QTHR. Ph: (075) 36 5868.

YAESU FT-101B: CW, xtal filter, & G3LLL clipper installed. Manual, mic, 240/12 volt leads, original PA tubes. (also a new spare set) plus outboard SX59 preselecter. No modifications. $400. VK2YN. Ph: (046) 77 1842.

FOR SALE — VIC

BEARCAT DX-1000 HF RECEIVER: 10 kHz to 30 MHz, AM/SSB/CW. Three selectivity filters (12-6-2.7 kHz). Dual clocks, memory, three event timer. Keyboard or dial tuning. Mains or battery power. Very good condition. $500 includes postage & packing. John Abrim, 11 Halpin Crescent, Shepparton, Vic. 3630. Ph: (058) 21 0846 after 5 pm.

COLLINS KWM2 HF TRANSCEIVER: with PM-2 power supply in original unmodified condition. $950. MFJ-525 RF speech processor. $80. David VK3BFB. Ph: (03) 587 1593.

DECEASED ESTATE: Yaesu FT290R all-mode 2m tcvr. $350. Yaesu FC-102 1.2 kW aerial tuning unit. $250. Assorted lengths of RG8 & RG59U coax cable. Some terminated at both ends. RG8 $1.50 per metre. RG59U $0.75 per metre. Slim Jim antenna for 2m. $10. Lowpass filter, Cabena $10. Morse key, Himound. $40. World clock, Seiko. $15. Dick Smith extension speaker in box. $7. National 8 ohm stereo headphones. $10. Peak multimeter $5. Prices as stated, but make offer for any or all if it. Contact Frank VK3EV. Ph: (03) 878 7157.

IC-551 ALL MODE 6M TRANSCEIVER: including IC-SM2 desk mic. Manuals & original packing $575. Roger VK3XRS. Ph: (051) 56 8291.

IC-701 TRANSCEIVER: with mic & remote control unit. $500. Fred VK3BQA. Ph: (03) 439 2545 AH.

KENWOOD STATION MONITOR: Model SM-220; Monitorscope + Oscilliscope with two-tone audio generator. As new. $485. Walter VK3DFO, QTHR Hawthorn. Ph: (03) 817 4149 AH or (03) 818 4976 BH.

MICROPROCESSOR DEVELOPMENT SYSTEM: 6801, 6809, running flex, 15 M-Byte hard disc, twin 5.25 floppys, Beehive ATL004 terminal, printer LA180 132 column, EPROM programmer. Software includes Fortran, various assemblers, Stylograph word processor, etc. Spare ribbons & circuit. Cards, manuals, cables, all working. Prefer to sell as is, but will separate. $2400. Graham VK3KOA, QTHR. (03) 561 7011 BH or (03) 45 1731 AH.

TOWER: 80 foot crank-up tower in excellent condition. $650. CE35DX 5 element triband beam 10/15/20 $230. Siewa SV230 13 channel 2M FM transceiver 30/5 watts $80. Model 15 teleprinter with power supply complete with full manuals & home-brew modem. $50. Erik VK3AKJ, QTHR. Ph: (03) 756 6958.

TRAPPED VERTICAL ANTENNA: Chirnside C-5B 80 to 10 metres. As new. $100. VK3CAY, QTHR. Ph: (03) 398 2714.

VHF FILTER UNIT: AEA 1P4-145, 144-174 MHz, 20 dB (min) attenuation at unwanted freq. 250 W (max) fitted with type 'N' sockets. Suitable for 2m repeaters. $125. UHF mobile, Philips FM747, 10 ch 15W FM, fitted with 5 rptr & 1 simplex. Remote handset, installation cradle & manual. $220. 2m SSB tcvr, solid state home-brew, digi dial, 12 VDC. 10-15W PEP output. 144-145 MHz. Professional appearance & performance. Top quality components. $220. Mobile mount bracket, Yaesu, hump or dash mounting FT101 etc. Brand new in box. $20. Mobile mount bracket, Kenwood MB100 for TS120/130. Brand new in box. $35. Digi clock, Copal Quartz, QG-870 24-hour, batt operated. 300 x 150 mm. $45. VK3ADM, QTHR. Ph: (03) 592 2168.

FOR SALE — QLD

6M & 2M HENRY 1 kW LINEAR: Model 6N2 240 volts AC pair of 8874 tubes. $1500. Robot Keyboard RTTY, ASCII, CW & SSTV character generation. $350. Write to VK4TL, QTHR or Ph: (070) 54 3677 AH.

BARGAINS: Quality test equipment must be sold. Marconi TF995A/5 1.5-220 MHz FM/AM/CW sig gen $250. Marconi TF144H/4 10k/72 MHz $100. Matrix 931H 50k/50 MHz $100. Ratcliffe 205 45/180 MHz $50. Airmec CT212 85k/32 MHz $40. Hewlett Packard 5245L 0/500 MHz freq counter $250. Takeda Riken Ditto $250. Gertsch 20/1000 MHz freq measuring meter $50. Marconi Picture Monitor $25. Valves, transformers, mags, etc. Will swap for tx/rx. Bob VK4OY, QTHR. Ph: (07) 396 0886.

IC-730 MATCHING POWER SUPPLY MOUNTING BRACKET: Good condition. $950 negotiable. Kevin VK4VKX, QTHR. Ph: (074) 22 3228.

OSCILLOSCOPE: True Double Beam, Telequipment D31. 2 vert amps, DC to 6 MHz, 9 ranges from 0.1V per cm. Timebase 18 ranges from 1 microsec per cm. Comprehensive triggering, 3 inch screen, illuminated graticule. Well maintained, with users/maintenance manual & 2 home-made x10 probes, $150 ONO + freight. Dennis VK4ADY, QTHR. Ph: (071) 86 4492.

RECEIVER: Valve, Drake R2B w/manual. Full coverage capability. 50 kC IF with steep-sided LC filter. (Excellent for CW). Sensitive. $180. John VK4SZ, QTHR. Ph: (070) 61 3286.

TAXAN RGB COLOUR MONITOR VISION I: Compatible with IBM-PC, NEC-PC, Apple II & III computers VGC. Apple interface card included. $250 ONO. Tower 33 foot triangular steel. 3 fool base. Strong. Thrust bearing included. Cheap & located in Brisbane area. Geoff VK4CET. Ph: (077) 73 7179 for details.

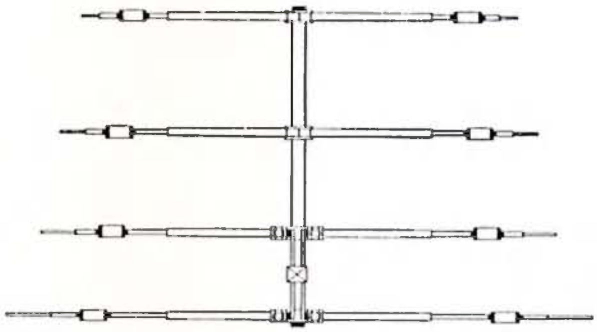
YAESU FL-2100Z LINEAR AMPLIFIER: in good condition. $950. Reply to Jim VK4FAL. Ph: (071) 21 4010.

Advertiser's Index

Made in Australia TET-EMTRON ANTENNAS

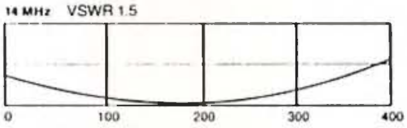
Dr MAC TANIGUCHI of TET Japan has now joined EMTRON INDUSTRIES and improved his already famous "phase-feed" matching system based on the "HB9CV" concept. This new matching system provides an increase in gain, roughly comparable to adding another element to the antenna, while significantly improving the front to back ratio. The performance exceeds even conventional YAGI-UDA design and these new TET-EMTRON multiband beams exhibit extremely flat VSWR over a wide frequency range.

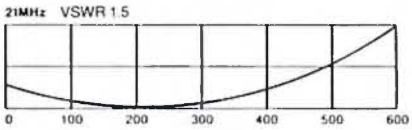
Our new antenna factory "TET-EMTRON" a division of EMONA ELECTRONICS is now producing a range of antennas aiming specially at the export markets of Japan, U.S.A. and Europe.

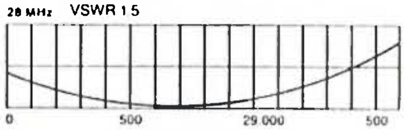


SPECIFICATIONS:

	HB33DX	HB43DX
Frequency	14/21/28 MHz	14/21/28
No of Elements	3/3/3	4/4/4
Gain (dBd)	8.5/8.7/8.3	9.4/9.5/9.8
F/B Ratio (dB)	22/24/21.5	24/24.7/22
VSWR	1.5 or better	1.5 or better
Power Rating	2 kW	2 kW
Impedance (ohm)	50	50
Element Length (metre)	8.25m	8.25m
Boom Length (metre)	4.0m	6.0m
Turning Radius (metre)	4.54m	5.1m
Wind Surface Area (m²)	0.58m²	0.74m²
Wind Load (EIA STD 80 MPH)	56.7 kg	72.7 kg
Weight (kg)	15 kg	19.2 kg
Price	$449	$549







NEW 1KW EMTRON TUNER
EAT-1000A Only $549

NEW 300W EMTRON TUNER
EAT-300A Only $349

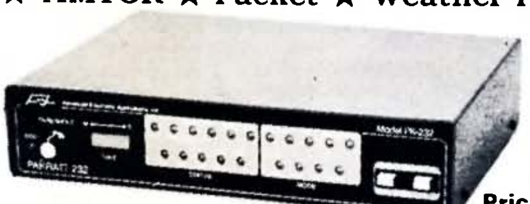
OVER 1000 FAMOUS EAT-300 SOLD

JOIN THE PACKET REVOLUTION!

New PK-232 Breakthrough

A new software enhancement makes the AEA PK-232 the only amateur data controller to offer six transmit/receive modes in a single unit.

★ Morse Code ★ Baudot (RTTY) ★ ASCII ★ AMTOR ★ Packet ★ Weather FAX



WITH FAX
Price $699

An incredible 2000 percent per year growth in the number of PACKET RADIO OPERATORS has been recorded in the USA. This packet revolution is fast coming to Australia and EMTRONICS is ready to serve you!
NEW PACKRATT PK-232 — Morse, Baudot, ASCII, AMTOR, and packet data controller in stock now! This six mode machine goes with any RS232 computer or terminal. Call for full specs.

PK-87™ PACKET CONTROLLER
$399

The PK 87 is not just another copy, it's much more. With all the packet program features of the Multi mode PK 232, the PK 87 is an economical new TNC designed to bring you enhanced, completely compatible packet software plus new hardware features for improved packet operation.

Software Enhancements

★ AEA's exclusive MBX Mailbox Monitor command lets you read and save received data without confusing headers, callsigns or repeats ★ New commands let you restrict the use of your station for connects and digipeater functions ★ Host mode for improved terminal program operation and development of specialized programs and applications ★ Compatible with existing W0RL1/WA7MBL PBBS/Mailbox/Gateway programs, with complete software command for remote selection of link rate, modem tone, etc ★ Autobaud routines for terminal data rates from 300 to 9600 baud (programmable down to 45 baud), and software control to set on all data rates from 45 to 9600 baud. While the PK 87 can be used for HF operation, AEA recommends the PM 1 packet modem as a high performance front end for best results in HF packet service. Only the new AEA PK 87 has all these features. Contact your local AEA dealer and join the packet revolution today by ordering the new PK 87.

Hardware Enhancements

★ Eight front panel status indicators show Converse, Transparent and Command modes, Multiple Connects, Data Carrier Detect, Push to Talk, Status, and Connect ★ High sensitivity (5 millivolts RMS) and dynamic range from 5 to 770 millivolts RMS ★ Rear panel AFSK output level adjustment from 5 to 100 millivolts RMS ★ One minute hardware watchdog timer provides system security in unattended VHF/UHF PBBS/Mailbox and digipeater operation ★ Modem disconnect circuits guarantee compatibility with future high speed modem applications and developments ★ Zilog 8530 SCC provides dependable hardware HDLC for higher speeds, and AMD 7910 for reliable modem performance without calibration.

CORRESPONDENCE:
BOX K21,
HAYMARKET, NSW
2000

EMTRONICS

MAIL ORDERS WELCOME

NSW & HEAD OFFICE:
92-94 Wentworth Ave, Sydney
NSW. 2000. TLX.AA73990
P.O. Box K21 Haymarket, NSW. 2000
Ph: (02) 211 0988
FAX: (02) 281 1508

VICTORIA:
288-294 Queen St, Melbourne
Vic. 3000.
Entrance from Lt. Lonsdale St
Ph: (03) 67 8551 or 670 0330
FAX: (03) 670 0671

QUEENSLAND:
416 Logan Road, Stones Corner
Qld. 4120.
Ph: (07) 394 2555
FAX: (07) 394 4316

THIS SCREEN CAN TELL YOU AS MUCH ABOUT THE IC-781 AS WE CAN.

The huge CRT display on this new HF transceiver will show at a glance all the functions we're about to describe here.

That's because it has a built in spectra scope for the first time, for programmable, multi-functional central monitoring.

Plus there's a VFO, A/B contents, memory contents, two menu screens, band scope, and 15 operational screens.

It also has a sub display, and its DDS system offers a lock-up time of just five milliseconds. So it's ideal for data communications systems like PACKET and AMTOR.

The dual watch function is a huge advantage on DX-peditions or when chasing DX-stations. And its computer-controlled twin PBT with high efficiency IF filter eliminates interference.

Maximum frequency stability is achieved at ±15Hz (0-50°C), which is more efficient than other transceivers on the market.

Also, the delay control noise blanker system is adjustable by up to 15 milliseconds.

There's a full and semi break-in function that can output up to 100 words per minute. And a p.a. unit that outputs 150W of power.

However, just because the IC-781 has so many state-of-the-art features, don't think ICOM haven't made it simple to use.

There is a built in 10-keyboard for easy operation. Or you can use the built in remote control communication interface-V system.

This lets you control your transceiver via a personal computer or other compatible equipment. Plus you have a 2 way sleep timer, and 5 separate automatic weekly timers.

For your nearest ICOM stockist, just call (008) 33 8915. And they'll tell you everything you need to know about the IC-781. Then once you've got one, the CRT display will tell you everything you need to know about what it's doing.

ICOM

The Ball Partnership ICO 0014

Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

VOL. 56, No 7, JULY 1988

OPENING OF PARLIAMENT HOUSE — CANBERRA

TWO METRES FOR THE NEWCOMER

EQUIPMENT REVIEWS

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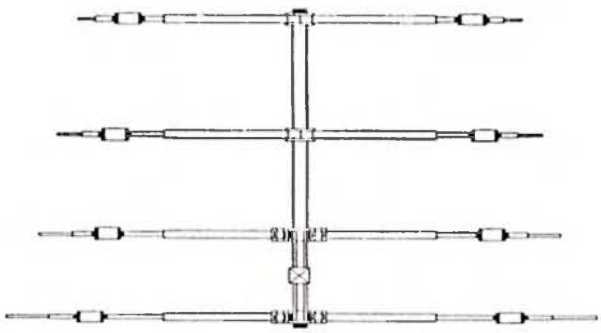

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Turning Radius (metre)	4.54m	5.1m
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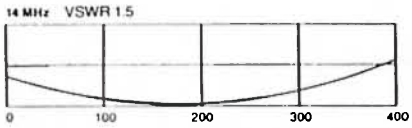
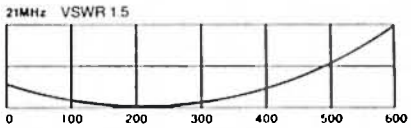
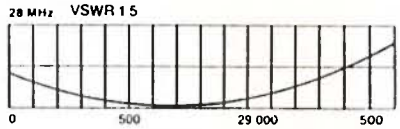
Price incl balun	$479	$579







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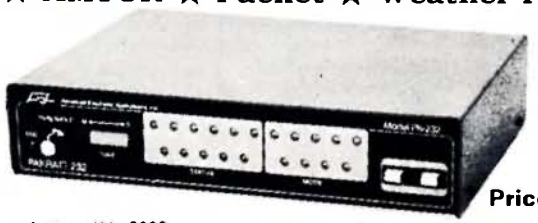
★ AMTOR ★ Packet ★ Weather FAX



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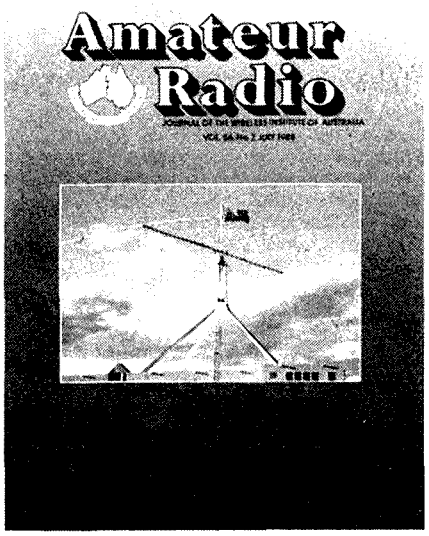
Radio Amateur



The VI88ACT Yagi Antenna. (Is it a five element 160 metre beam on top of the Parliament House Flag Mast?) Actually, VI88ACT was located about 100 metres to the south of the mast and it is an optical illusion that the Yagi appears to sit on top of the controversial 85 metre high flag mast!
—Photograph courtesy Dan Steiner VK1ST

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All copy for inclusion in the September 1988 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, July 18, 1988.

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Editor's Comment

NOVICES ON TWO

By the time you read this it will be almost a month since June 1, the day from which VK Novices are permitted to operate (FM voice only) between 146 and 148 MHz. Welcome to Two FM, all you Novices old and young!

Unfortunately, not everyone seems to be as happy about this as the Novices are. In fact, I understand that there are even some Novices who are not as jubilant as might be expected. And in both cases (Novice on one hand, Limited or Full on the other) the reason seems to be the same, an alleged loss of incentive. Rather than go into details at this stage, I would like to refer you to a letter in this issue in "Over to You!" from Clive Wallis VK2DQE. He claims (rightly, I'm sure) that it represents the feelings of many Full and Limited Call operators. This being the case, it seems to me that even after all the surveys and discussions of the last 12 months, perhaps many people still are not fully aware of the facts.

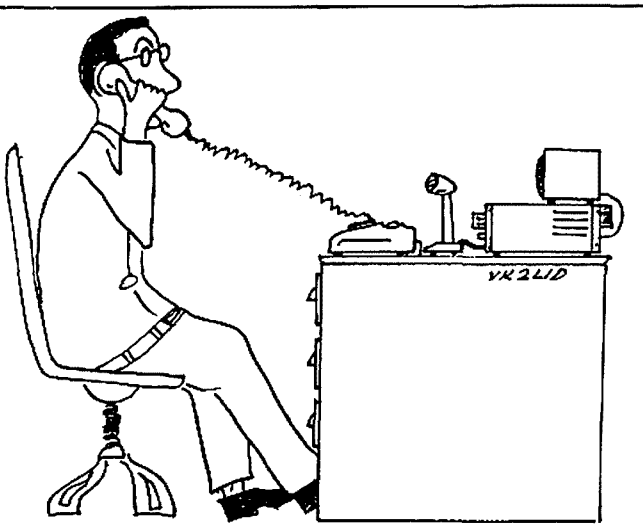
First and foremost, the purpose of getting Novices on to VHF is to enable them to talk to Limiteds. Years ago it was seen to be almost ridiculous that two sizable groups of the AR fraternity, many belonging to the same Institute, could not talk to each other on any amateur band. It has been WIA policy, almost as long as there has been a Novice class, that there should eventually be a common band available to all licence classes. The only question has been "what band will it be?". Obviously, it either had to put Novices on VHF or Limiteds on HF. The latter is contrary to ITU regulation (the dreaded Morse code), so it had to be Novices on VHF (or UHF).

In spite of what Clive says, DOTC did in fact have a large input into the choice of band, and much preferred two metres to 70 cm. From the viewpoint of "where's the action?" there is no doubt that it's on Two FM, and the equipment is cheaper (and easier to home-brew, for those Novice constructors whose only problem is the code). Ultimately, there really was little choice. As the DOTC spokesman said, whatever they did there would be some who would be unhappy about it!

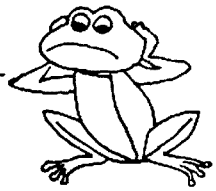
Not this suggestion of only giving Novices a 500 kHz bandwidth. The purpose is to be able to talk to many other amateurs, not to introduce a "Novice ghetto" in some lightly populated part of the band. So it must be FM and repeaters. All repeaters, not just those (say) in the top 500 kHz! This would discriminate against those whose local repeater was not in the selected segment.

Degrading the Full Call? No incentive to upgrade? The only thing the Novice now has that he/she didn't have before is the ability to talk to VHF/UHF enthusiasts and find out what they're still missing. They can't use RTTY, ATV or packet. They can't use SSTV or work through satellites. They still can't use the mainstream bands, 7 and 14 MHz, or the WARC bands. They're restricted to 30 watts PEP, and only 10 watts on two metres FM. They still have a great incentive to upgrade! And now they can talk to even more people who can help them to do it! I don't think my Full Call is thereby degraded. I only wish I had the time to have a go at all it permits me to do!

Bill Rice AX3ABP
Editor



"You're 5/9 OM — Now let's try it on the radio!" — VK2COP



Main QSP

At the recent Federal Convention, one of the working parties devoted some hours to discussions of ways to recruit new amateurs and to increase the number of members of the Institute.

Ways of attracting newcomers to amateur radio have been considered by a number of bodies and in a number of publications, and we all have our own ideas of the most productive methods and the group/s to which our efforts should be directed.

I think we all accept that continuation of our privileges, especially spectrum space, depends largely on the steady inflow of new operators to maintain or increase usage of the bands. We cannot continue to lay claim to hands which are unused or underused in the face of the increasing commercial pressure for frequency allocations.

It was interesting to hear the proposals for ways to increase Institute membership, and to hear other views on reasons for joining. For some, membership is seen as a duty or an obligation incurred when one becomes licensed, in similar vein to joining a trade union or professional body on completing a qualification.

Others saw their membership as a way of "paying for" their privileges and ensuring their continuation, or as some sort of "balance sheet" which squares off the membership fees against services provided by the Institute.

Several suggestions were made for active recruiting campaigns, especially through the numerous localised clubs. Club members are easily approached and if the club is genuinely backing the Institute, it should not be too difficult to have almost 100 percent WIA membership.

It is harder, however, to reach the operators who are not club or group members, who do not have regular contact with other amateurs. As in many other situations, the isolated amateur is at a disadvantage, and gains less benefit from the membership then the suburban amateur.

It may be that these amateurs are the ones who have most need for the Institute, for it to become their "local club".

Can the Divisions extend their services so that the distant ones feel that they are really part of what is happening?

One of the main arguments in favour of membership is that increased membership should allow better service to all. It may even slow down the rate of increase of fees.

Much of the Institute's budget is spent on services where the cost is not proportional to the number of members.

For example, the cost to send a delegate to the Region 3 IARU Conference later this year will be the same whether we have 30 percent membership or 80 percent. Similarly, the office and telephone rentals are fixed.

The cost of the magazine, however, does depend on the number of members, So with more members, a smaller fraction of each fee goes to the fixed costs.

It is very difficult to put any sort of monetary value on many of the services provided to members. For example, what is the value of the WARC bands, 10 MHz and 18 MHz, to the average amateur? (Is there an average amateur?) How do you value the availability of repeaters? I know I personally was very pleased to be able to call for help from the car one wet night when the windscreen wipers gave-out. I can repay the cost of the phone call, either in person or by helping someone else when the opportunity arises, but some of my membership fee went towards that repeater, and I am grateful that it was available.

The final argument is, of course, that the more members, the stronger the Institute's voice when protesting an injustice or lobbying for a change or increase in privileges. This is as true at the international level as within Australia.

There are always new issues arising where it is necessary for the Institute to take a stand on behalf of all amateurs.

It makes for a much firmer stand if all amateurs are working on behalf of the Institute.

Brenda Edmonds VK3KT
Federal Education Officer and
Federal Executive Member

VISITOR FROM JAPAN

A very pleasant evening was organised by Eric VK5EZ, on May 2, 1988, to welcome visiting amateur, Gus JH4UQC, from Japan.

Gus Okazaki is a medical doctor in Hiroshima, specialising in skin diseases. Eric has had regular weekly CW scheds with Gus since 1983.

During his brief visit to Australia, Gus stayed with VK4DXC of Nambour, and VK2OG in Sydney before his three-day visit to Eric.

—Contributed by Eric Hauber VK5EZ

Standing from left: Gus JH4UQC, Roy VK5PG, George VK5BGL and Doug VK5MN. Seated: Eric VK5EZ, Darcy VK5RJ and Harold VK5NJG.

OPENING OF PARLIAMENT HOUSE — CANBERRA

Amateurs around Australia and the world joined in celebrating the opening of Australia's magnificent new Parliament House in Canberra on May 9, 1988.

Dan Steiner VK1ST
PO Box 24, O'Connor, ACT. 2601

The new Parliament House, home to Australia's Federal Government, was opened by Her Majesty, Queen Elizabeth II.

The WIA, ACT Division, obtained permission from the Joint House Department, which manages Parliament House, to set up a temporary amateur radio station at the site to join in the Opening Day celebration.

Operating with the call sign VI88ACT, from one of the temporary site sheds, used during construction of Parliament House, the ACT Division set up two HF stations. One used an HF five element triband beam atop a portable 35 feet tower on the 20, 15 and 10 metre bands: the other used dipoles for 80 and 40 metres. The station operated continuously from 0900 UTC, May 8 to 1400 UTC, May 9, 1988 and made 440 contacts including 73 prefixes and 16 countries. SSB, CW, RTTY and AMTOR modes were used.

A special QSL card for the Parliament House Opening will be sent to all stations which made contact with VI88ACT that day.

A special feature was the re-broadcast (live) of the Queen's Opening Speech on the 80, 40, 20 and 15 metre bands. This was achieved by relay of the speech from Parliament House using a two metre FM transmission to the QTHs of several Canberra amateurs who then re-broadcast the Speech onto an HF band from their home station. Prior approval from DOTC and others involved was generously provided. Those receiving the broadcast relay by amateurs gratefully acknowledged the efforts of the numerous volunteers. Replies afterwards were received from around Australia, New Zealand and several DX stations.

An unexpected reply came from Rob VK1KRM, who was attending the Opening, along with about 30 000 other spectators outside Parliament House. Unable to hear the speech on the Public Address system because of the noise from a helicopter overhead, Rob listened to the two metre relay on his hand-held and even turned up the volume so others nearby could enjoy the auspicious occasion, too.

Those involved has an enjoyable day. The ACT Division gratefully acknowledges the following amateurs for the loan of equipment, and assisting with the set-up and operation of VI88ACT at the Parliament House Opening: VK1s: ST, PJ, GB, WX, EG, FM, DH, DO, VB, RH, KV, EP, LF, KCM, KEN, KED and KIN.

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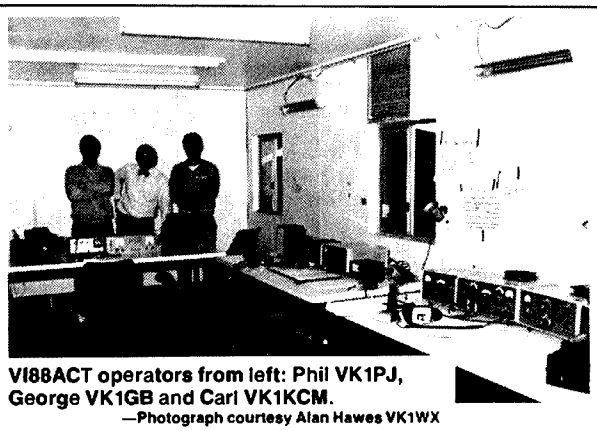


VI88ACT operators from left: Phil VK1PJ, George VK1GB and Carl VK1KCM.
—Photograph courtesy Alan Hawes VK1WX

Some of the VI88ACT set-up team: (from left) Alan VK1WX, Phil VK1PJ and Carl VK1KCM.
—Photograph courtesy George Brzostowski VK1GB

TWO METRES FOR THE NEWCOMER

With the introduction of two metres as the common band for all amateurs regardless of grade of licence, a short article to help the newcomer get started seems timely. The author had his first QSO on this band over 27 years ago and still considers it one of the most enjoyable bands to operate on.

Ron Cook VK3AFW
7 Dallas Avenue, Oakleigh, Vic. 3166

THE BAND

GROUNDWAVE.
The coverage obtained by the groundwave is normally the same during daylight or darkness. It is dependent on the power used at both ends of the path, the antenna system gain, the local topography, receiver sensitivity and bandwidth. The range that can be expected with 10 watts, simple antenna with a clear sight-line to the horizon and essentially flat open country between stations using a typical modern commercial FM transceiver can be estimated from Table 1. If both stations have masts five metres high and both are 45 metres above sea-level, then the table shows a line of sight of 25.3 kilometres for the antenna height of 50 metres. Thus both stations could be 50.6 kilometres apart for mutual line of sight. Because of normal refractive effects of the atmosphere, the radio horizon will be some 30 percent greater thus these two stations could be about 66 kilometres apart for line of sight conditions. This might be extended some 50 percent before the signal begins to get down to the noise level.

In other words, in open low lying country, two moderately elevated novice stations can expect a 100 kilometre range. This will be reduced to perhaps 30 kilometres for average suburban terrain and in the case of obstruction by large buildings, hills or a valley location, the range may be reduced even further. Antenna elevation is important, the distance covered is approximately proportional to the square root of the height of the antenna.

There will be no fading or static as occurs on 80 metres. Some variation in signal strength will be noticed in the vicinity ot airports due to the direct signal and reflections from aircraft combining and some ignition interference will be heard from nearby vehicles. Otherwise, signals are usually "crystal clear".

EXTENDED GROUNDWAVE. Certain weather conditions cause VHF signals to be bent at a radius close to that of the earth, hence causing the groundwave signal to propagate considerable distances. Distances of up to 400 kilometres are occasionally possible for 10 watt stations with modest installations. With beams and higher power 3000 kilometres has been spanned. When these openings occur they are usually associated with a strong, slowly moving high pressure region centred to one side of the direct path between the two stations. These openings are characterised by the band initially opening up in the early evening and building to a maximum late at night or early in the morning. Often the best signals occur next morning around local sunrise, so there is usually plenty of time for QSOs to be made. Slow fading with a period of several minutes often occurs, so if a station fades out keep trying as it will usually come back in. Some of the best openings last for days, with repeats about a week later as the next high pressure cell moves east. Signals are often very strong and appear to be close to the free space level.

IONOSPHERIC PROPAGATION.
Yes, the ionosphere works for two metres too. During the summer months, sporadic E openings occur on two metres. The openings can last from a few seconds to over an hour. Heavy and rapid fading can occur, especially when the band is opening or closing. Signals can be very strong and a 10 watt station can make contacts in the region of 1000 to 2000 kilometres with only a groundplane antenna. VK7 to VK4 contacts have been made using 2.5 watts FM to a groundplane on a car roof. Unfortunately, these openings are not common.

OTHER MODES. In Northern Australia, Trans-Equatorial Propagation (TEP) can provide many contacts into Japan on two metres, and again low power can make the grade when conditions are right. Other modes such as Aircraft Enhancement, Meteor Scatter, Moon Reflection (EME) require high power and/or high gain antennas and are usually only possible on SSB and CW.

REPEATERS. For mobile operation, distances of only five to 10 kilometres may be achieved in built-up areas. To overcome this, remote receivers and associated transmitters are set up on high points near major population centres. The mobile's signal is readily heard on the mountain top by the receiver which uses the recovered audio to modulate a transmitter 600 kHz higher or lower in frequency. Other mobile stations can readily hear this retransmitted (repeated) signal, hence mobile to mobile contacts over distances of 100 kilometres are easily attained. The range can vary according to local terrain, the repeater location, it's power, antenna gain, etc, but distances of 600 kilometres are achieved with enhanced propagation quite frequently and up to five times this on rare occasions. The power of the mobile station need be only sufficient to reach the repeater whose transmitter may span mountain ranges with

Table 1: Line-of-Sight Distances.
A pair of 10 watt VHF stations with simple vertical antennas will readily communicate over a path equal to twice the line-of-sight path provided there are no obstructions of size along the path. Signal strengths should be very solid over these paths but would fall steadily beyond them. The distances given in the table are calculated from exact formulae and assume that the earth is smooth and that no atmospheric bending of the radio wave occurs. In practice, the atmosphere normally extends the radio horizon by some 30 percent.

QTH ALTITUDE (metres)	DISTANCE TO RADIO HORIZON (kilometres)
5	8.0
10	11.3
15	13.8
20	16.0
25	17.9
30	19.6
35	21.1
40	22.6
45	24.0
50	25.3
60	27.7
70	29.9
80	31.9
90	33.9
100	35.7
200	50.5
300	61.9
400	71.4
500	79.9
600	87.5
700	94.5
800	101.0
900	107.1
1000	112.9
1200	123.7
1400	133.6
1600	142.8
1800	151.5
2000	159.7

ease. The location of the repeater at 300 or more metres above the surrounding terrain is the most significant factor in improving the system performance.

When stations work through the repeater, it should be remembered that it is the repeater that is doing the work and that the received carrier is that of the repeater and not of the remote signal. Thus, if you are near line of sight to the repeater, all signals will be "40 over 9" as far as the S-meter indication goes, even when they are barely readable. The signal to noise ratio is the only guide to signal strength. Weak signals sound noisy whilst strong ones have no noise and are said to be "fully quieting".

THE TRANSCEIVER

There are three common brands of commercial units — Icom, Kenwood and Yaesu. Whether you buy new or secondhand depends on your inclination and budget. It is preferable to get a set which is synthesised and has 5 kHz steps as otherwise you will not be able to use all the repeaters or simplex channels available. The repeaters are allocated channels in 25 kHz steps and, while there are designated calling channels (146.500, 146.550 MHz) you may use any frequency outside the repeater allocation for simplex operation (all stations on the one frequency, no repeater offset involved, similar to HF operation).

Buying secondhand equipment involves some risk so it is advisable to have some assistance from an experienced amateur if making a private purchase. Ask for a demonstration and permission to test the set at the seller's QTH before agreeing to buy it. Establish the set's history: has it been serviced or modified in any way. "Improvements" often aren't and can introduce their own problems. A missing or obliterated serial number suggests the unit may have been obtained by illegal means! Most WIA Divisions maintain a stolen equipment register to help trace stolen equipment — check with them if in doubt.

Badly scratched paint-work, rust or corrosion, a tangled microphone cord and missing screws are all signs of neglect or abuse. Take the covers off and check inside for modifications or badly executed repairs. A dirty, stained circuit board can spell trouble later. Facilities other than frequency selection, repeater/simplex operation switch, received audio level and squelch are bonuses but not essential. It is useful to have several memories (you will rarely have enough) as is the ability to check the repeater input frequency (called reverse) to see if the other station can be worked on a direct path. Some models have established a bad reputation for problems due to dry joints and aging of components in the Phase Locked Loop (PLL) leading to intermittent operation.

Some indication of received signal strength and output power is quite useful, the former is especially so for a hand-held unit to enable the most favourable position to be found when working a repeater or higher powered station.

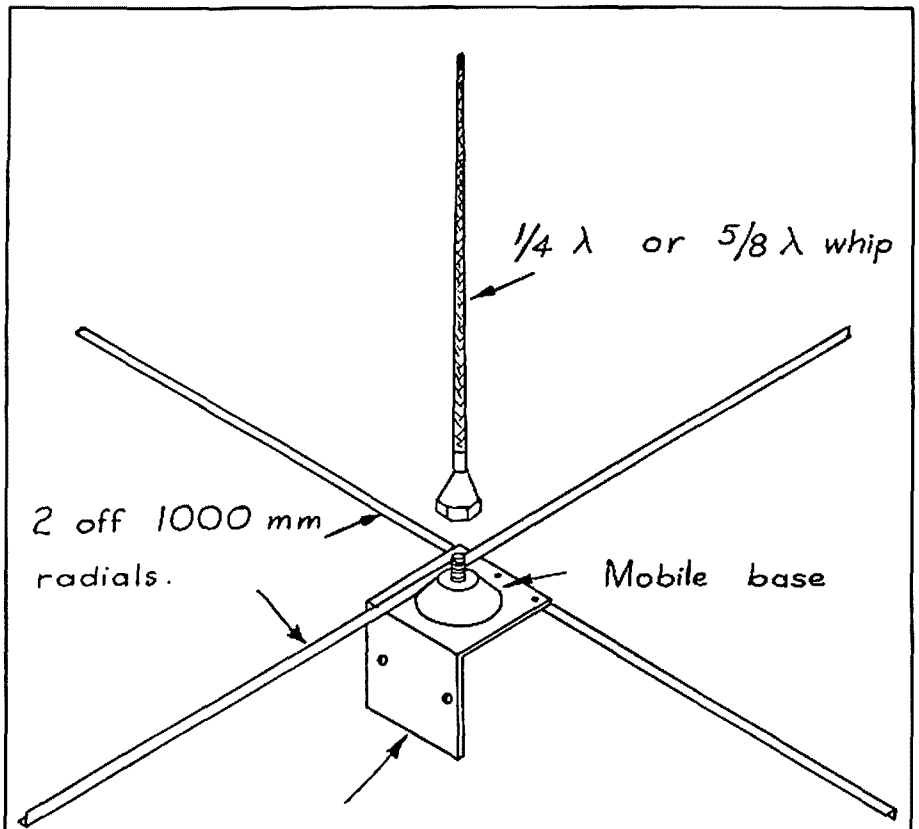


Figure 2: Home-Brew Vertical for Two Metres.
This antenna uses some commercially available parts and can be built in an hour. It features aluminium angle rivetted together to make a groundplane and a mobile whip and base combination. A length of water pipe or a television barge-board mounting mast is suggested for holding the antenna erect.

THE ANTENNA SYSTEM

Because the wavelength is so much shorter than any HF band, the adjustment of the antenna is much more critical. Element lengths must be cut to within three millimetres for best performance. Feedline losses are much greater. Any old piece of coaxial cable will not do. The antenna system is the heart of the station so it must not be neglected. A 10 watt station very quickly becomes equal to a one watt station if care is not taken. As feedline losses apply equally to both received and transmitted signal if you set is reduced to one watt output, then the other operator is, in effect, also reduced to one watt. It is a common error to think that losing, say, 10 dB of power only matters for high power operation. The effect is not power dependent. The only difference is that the feedline gets hotter with higher power.

A suitable antenna can be purchased from most equipment suppliers or one can be built using some purchased parts and a little ingenuity for a few dollars. Either a groundplane or a halfwave vertical is recommended. These are inexpensive, light and give acceptable performance. They have an omni-directional pattern so you will not miss out on hearing stations hidden in nulls as can occur with beams and no rotator is required. The antenna can be mounted on a standard television barge board mount, on a short television type mast on a chimney or on a standard seven metre long piece of 25 millimetre galvanised water pipe.

If you are interested in home-brew, the antenna shown in Figure 1 is easy to construct and install. It used a short length of 50 millimetres aluminium angle to which is fitted a standard mobile roof mounting VHF whip base. These are available from some of the AR advertisers and can be purchased with four metres of RG-58 CU cable complete with a connector. To extend the feedline, a lower loss cable is recommended. The groundplane is made up of two halfwave radials symmetrically fitted to the larger angle. Aluminium angle of up to 12 millimetres width is suitable and this can be bolted or pop-rivetted to the larger angle. If other material of different thickness is used, the length should be made five percent longer than a resonant length at 147 MHz.

The antenna whip can be purchased ready to cut down to resonance. The tuning process is dealt with later. Either a quarter-wave or five-eighth wave vertical can be used. The five-eighth is preferred as it has about 2 dB gain over the quarter wave.

The feedline should be RG-214 or equivalent. Beware of low cost "RG-8" as while this ought to

be much the same as RG-214, it often has a very open braid and mediocre dielectric resulting in quite a few dB loss in a typical two metre installation. RG-58 has similar identification problems and has a higher loss anyway. Unfortunately, it is legal to sell cable labelled as RG-8 or RG-58, but which has very much higher losses at VHF Often it is usable at 27 MHz, but is virtually useless at 146 MHz. Even the genuine RG-58 is definitely not recommended if the total run exceeds 10 metres. Indeed the small saving made in using thinner cable in a home station is very false economy. In a mobile situation, the length will not usually exceed four metres and the thinner more flexible RG-58 type cable is about all that can conveniently be fitted into most vehicles. In this case the compromise is acceptable.

Increasing the height of the antenna and using a beam will, both increase the station's performance, but until the newcomer has learned more about the band and settled on operating habits, "neither course are recommended". Masts higher than eight metres or antenna installations on building exceeding the common suburban television installation size usually require council permits.

OPERATING TECHNIQUES

Simplex operation is much the same as HF Select a clear channel outside the Repeater Allocation and call CQ. Better results are likely if you can use one of the standard calling frequencies and then move to another simplex frequency.

Because the FM signal has a deviation of, typically, 5 kHz the holder of an NAOCP licence definitely should not operate any closer than 5 kHz to the band edges, ie confine operation in the range 146.005 to 147.995 MHz.

Repeater operation is much different. Firstly, repeaters are intended for use primarily by mobiles. Whilst there is no embargo on fixed stations using repeaters, especially those outside the major metropolitan areas, they should be left clear for the mobile operators during those times when traffic is heavy. To prevent monopolisation of repeaters they are fitted with timers which will cut off transmission after about three minutes. This time varies from one repeater to another so keep your overs short. In general, no QSO via a repeater should exceed 10 minutes to allow as many operators as possible to use the device. That means three or four transmissions only!

A pause of several seconds between one station concluding transmission and the next one starting is most important. Firstly, it allows the timer to reset and secondly, it allows for breakers to call. Many breakdowns, accidents, trouble spots, etc are reported via repeaters and delays of even minutes can be vital.

Some repeaters provide a short tone beep to indicate that the timer has reset and that transmission can be recommenced after a short pause.

To access a repeater, set the receiver frequency to the repeater output frequency and set the 600 kHz offset low for repeaters with outputs in the range 146.625 to 147.000 MHz and set the offset high for other repeaters. If the frequency is not in use, press the transmit button and announce your call sign. If all is well you will hear the repeater carrier hold on for a few seconds and then stop. With luck, you will be called by another station. Do not call CQ on a repeater. Just give your call sign and state whether you are listening for a call or testing. Thus "VK3AFW testing", "VK3AFW listening for a call on repeater RWG", "VK3AFW listening" and VK3AFW calling VK1BG mobile" are all acceptable calls via a repeater.

Repeater calls must be brief and concise. A repeater is no place for the long-winded ragchewer. If you wish to check the operation of your equipment always give your call and state that you are testing: do not be a "kerchunka" or anonymous button pusher, you will not make yourself popular if you keep bringing the repeater on and breaking the mute of other sets without identifying.

TUNING THE ANTENNA

The antenna should be mounted temporarily at a height so that the top can be touched. It should be at least one metre above the ground and at least three metres from any metal work or wires. A broomstick and step ladder are very useful for this exercise. Connect a low power transmitter and VHF VSWR meter to the antenna as shown in Figure 2. If a mains operated power supply is used, ensure that it is properly grounded, otherwise you could become a silent key before your first QSO! A number of extension cords have been incorrectly wired and caused fatalities in the past, so be carefull or use a battery powered transceiver.

Set the set on a clear frequency near 147 MHz. Make a brief transmission and measure the VSWR. This will probably exceed 2:1. We aim to reduce this to less than 1.5:1. Using a pair of side-cutters or a hacksaw (depending on whether the whip has a fibreglass core or is a metal rod), cut off three millimetres from the top of the whip. Check the VSWR. It may not have changed much as the whip was probably intended to operates at frequencies below 144 MHz.

Keep chipping away until the VSWR begins to fall below 2:1. Check the VSWR near 146 and 148 MHz. The whip should be tuned until the minimum VSWR occurs at 147 MHz. The VSWR at 146 and 148 MHz will be higher and roughly equal. A VSWR of less than 1.7:1 should be easily attained across the band with less than 1.5:1 at mid-band. A small shift will occur when the antenna is raised to its final position but this should not be of any practical significance.

CONCLUSION

Two metres is a great band and the allocation of NAOCP holders to it will make it better. Next time you hear me on two metres why not give me a call and tell me about your experiences on the band. I am sure you will enjoy two metres!

ar

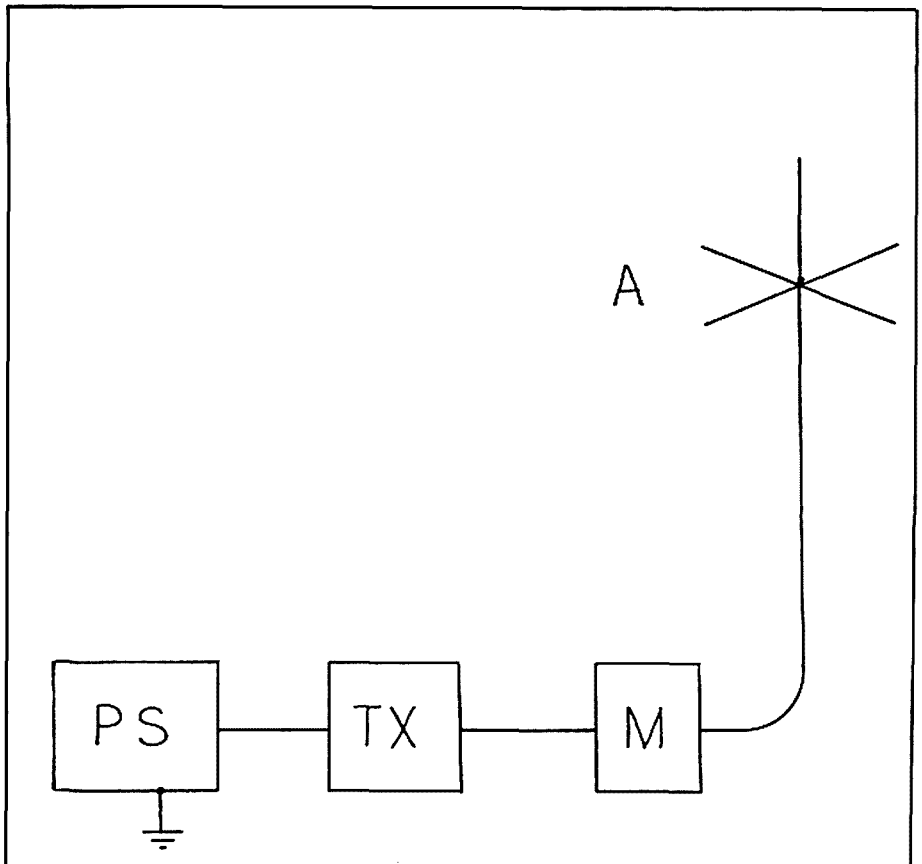
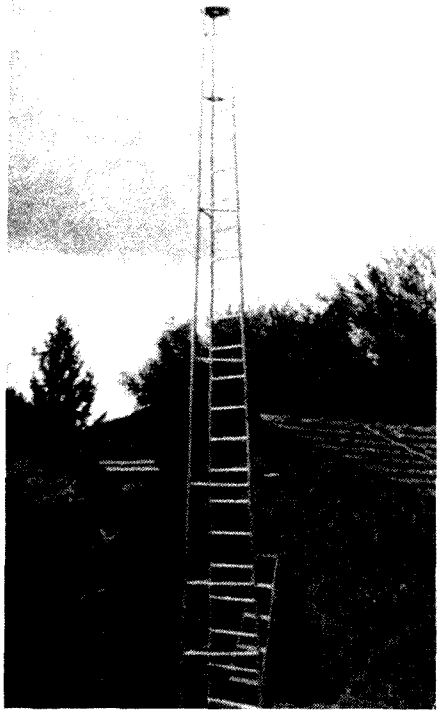


Figure 1: Set-up for tuning a vertical.
PS is a power supply solidly grounded for safety
TX is a low power transceiver to excite the VSWR meter M.
A is the antenna to be tuned.
As purchased the antenna is a little longer than needed and is pruned back to resonance. (See text for further details).

MAST FOR A RESTRICTED AREA

Leo Weller VK3YX
46 Pepperall Avenue, Syndal. Vic. 3150



The mast just after delivery.

The mast to be described in this article is different from most other amateur masts because of the need for accessibility with experimental work.

For many years, some 20 different antennas have been built and evaluated using a tree stem with extensions as a support. Steel pins made it easy to climb and over the years, numerous clamps, brackets, supports, etc, were made into a type of antenna meccano® box. At the top was a small platform sufficient to accommodate test equipment.

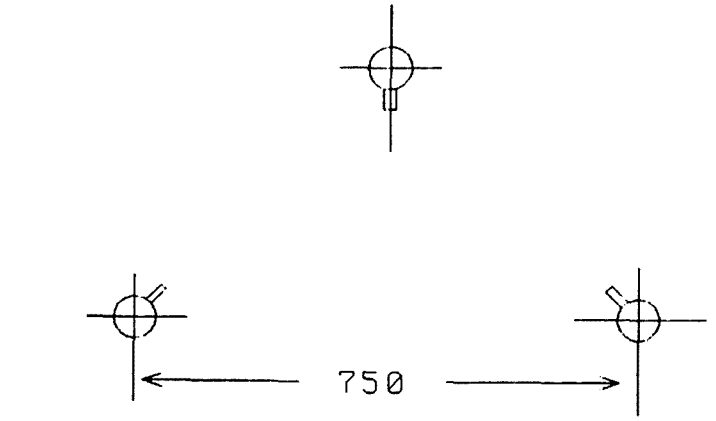
Unfortunately, the wood started rotting just on ground level and the tree stem had to be replaced.

After investigating factory-made towers and visiting local amateurs, it became clear that, with an "off the peg" mast, experimenting would be very difficult and probably cease.

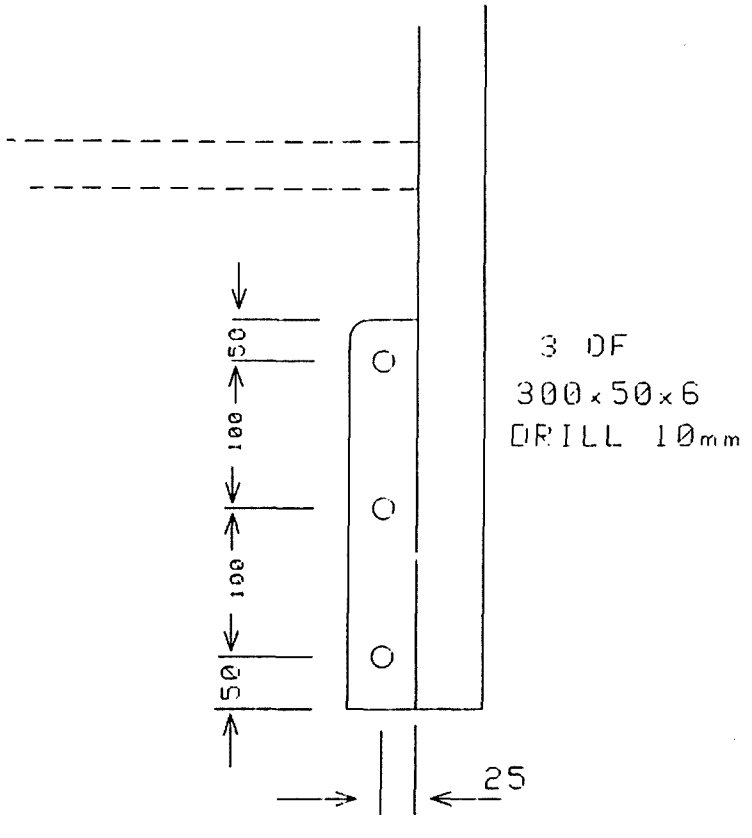
One evening, whilst watching a Navy film, I noticed the radar antenna was supported on a three-legged mast on the foredeck of one of the ships. This mast was shown many times which gave the opportunity to view it from many angles. My mind was made up — this was the mast I wanted!

THE MAST

A visit to the local council revealed a permit was not required from the town-planning authority for towers under eight metres high and less than 60 x 60 centimetres ground area. The confirmed the



Position of Fixtures.



Fixtures to Foundation.

main dimensions of the mast — seven metres high and 75 centimetres triangular base — well within the required regulations.

The mast consists of a ladder, a third leg, a top plate and a second plate. Both plates are drilled to fit a ball bearing. The stay bearings are type KS 0.50 and available from Emtronics. Computations are made for a loading of 40 kilograms and a surface area of 0.75 square-metres. This would be sufficient to accommodate any experimental antenna. With this construction, cross-bracing is not necessary, which give the mast a neat and inconspicuous appearance and keeps wind-loading on the mast itself to a minimum.

The material used is 33.7 OD x 2.6 CHS 25 mm nominal bore for the verticals and 26.9 OD x 2.3 CHS 20 mm nominal bore for the rungs, top plate being 330 mm OD x 10 mm.

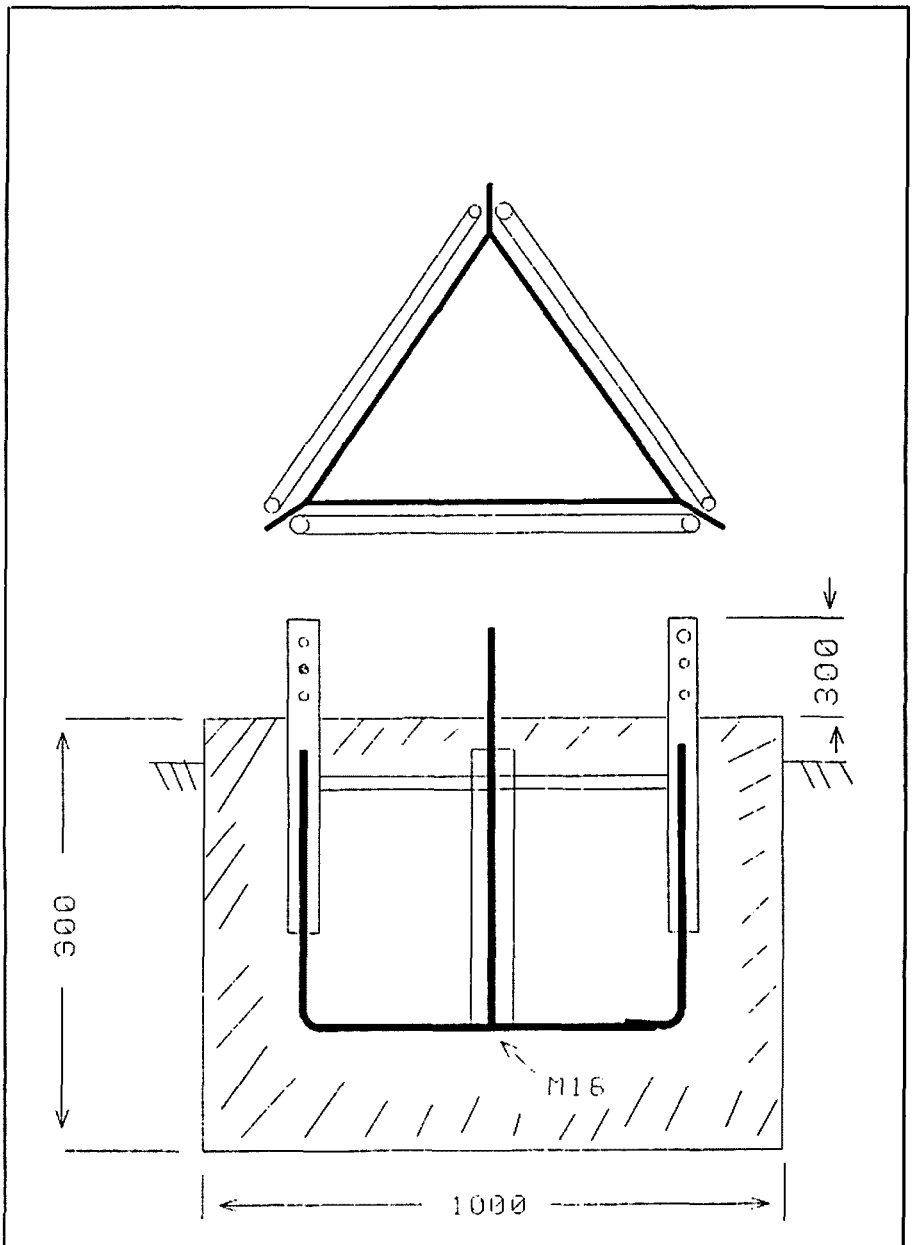
FOUNDATIONS

The foundation drawings show the foundation, frame and method of connecting the mast to the foundation.

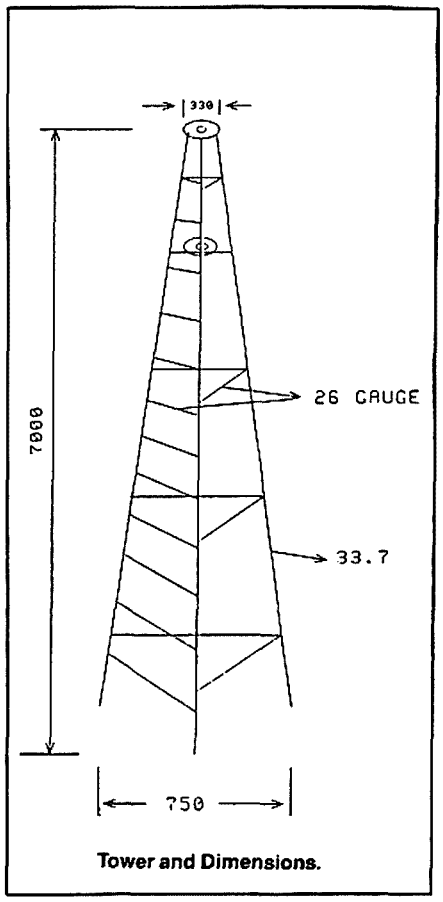
Most of the work digging the hole in the hard soil for the foundation was made easier by using a post-hole drill. Sixteen holes were drilled to a depth of one metre and the rest of the soil was removed with a shovel. The frame can be positioned horizontally and centrally while the concrete is still wet. The three holes for each leg in the foundation frame are drilled with the mast in an accurate vertical position. The bolts are 10 millimetres in diameter.

The mast proved to be extremely versatile and fully meets my expectations. Amateurs with a small backyard will find this type of tower, with two or three metres of tubing as an extension, and a small beam, a good solution. A rotator could be mounted halfway up the tower in such a way that the extension tubing can be lowered for antenna maintenance.

The structural computations were made by Gamble and Cosentino Pty Ltd and the construction, delivery and erection by Lukassen Engineering, 14 Florence Street, Burwood. The successful execution of this project depended mainly on their expertise and co-operation for which I am indebted.



Framework and Foundation.



Tower and Dimensions.

EXAMINATION DEVOLVEMENT IN CANADA?

The Canadian Department of Communications appears to be moving towards amateur examination devolvement.

It held a pilot project in Quebec which saw radio amateurs organise and supervise the running of examinations.

The exercise is being evaluated but no official announcement has yet been made.

—From *Westlakes Amateur Radio Club* Newsletter

MEDICAL EMERGENCY IN PAPUA NEW GUINEA

. . . and the doctor is more than a (kidney) stone's throw away!

Ally and Bob Lynch P29RL
C/- PO Box 49, Inmand Valley, SA. 5211

The languid peacefulness of the new day's awakening was now contrasted by a bustle of activity.

THE MORNING OF May 19, 1986, dawned gently in our snug anchorage as one island after another of the rarely visited Arawe group of West New Britain materialised through the gray mist of the dying morning showers and slowly changed to a lush tropical green. The freshness of the morning was matched by the crew of the 36 foot (11 metre) *Maxine*. They had swum and rested the previous afternoon following a magic night crossing of the Vitiaz Strait from Dregerhafen. Throughout that passage, *Maxine* magnificently beating along the fringes of long line squalls of the south-easterly monsoon, had sailed close enough to steal the 15-20 knot winds, yet far enough away to avoid the wrath of the centres and the clutches of the frustrating calms that follow.

The languid peacefulness of the new day's awakening was now contrasted by a bustle of activity aboard *Maxine* heightened no doubt by the six weeks delay in Lae renovating a recalcitrant engine, and by a further day's delay in Dregerhafen locating a doctor about recurring pains in my side and lower back. But these thoughts gave way to the pleasures of my morning coffee and the greater pleasure of watching Ally, my wife of eight months, dip the oar tips in the reflected sunlight as she steadily rowed herself, six-months pregnant, towards the mangroves in search of the oysters that had appeared earlier at low tide.

Paul, a long-standing friend who had joined us in Lae for a two week respite from his coffee shop, was busy about preparing for a trip ashore to a nearby village, the concerns expressed earlier about the coffee shop having obviously vanished with the morning mist.

My euphoria quickly turned to annoyance, however, when I felt a twinge of pain in my lower back. These sporadic pains had started two weeks earlier in Lae, and since they hurt little and not often, I had associated their occurrence with indigestion. The pain had increased somewhat during the sail to Dregerhafen and hence we had spent a day travelling to a doctor in nearby Finschhafen — only to receive a diagnosis of a "pulled muscle". I did obtain medicine for a kidney infection (*my* diagnosis), but was still concerned since I was experiencing no pain during urination.

An acute knife-like pain started in my port kidney an hour later, instantly triggering a memory of 10 years earlier when I suffered a kidney stone. This earlier stone had come without warning or fanfare, and had passed painfully but easily within a few hours. This time, after two ineffectual codeine tablets, I rested in the most comfortable position, on my knees with my head down, and with Paul's commiserations in the background, I awaited Ally's return.

ALLY TAKES UP THE STORY

When I climbed aboard I found Bob crouched on all fours, his face contorted into a terrible grimace. He was clearly in great pain. His first words to me, between gasps and moans, were, "I don't want you to worry, it's only pain." But I could see that "only" was a terrible understatement, and guessed he was down-playing the situation on account of my "delicate" condition.

Bob took a total of six codeine tablets in the space of a few hours, but had no relief. I was about to search for some stronger pain-killers when some villagers came with the news that there was a doctor at the nearby mission, so we sent for him immediately. However, my hopes for an authoritative figure with a little black bag in his hand rapidly faded as the doctor's canoe drew close. The "doctor" proved to be an extremely kind and concerned man, but as he climbed aboard clutching one shipped petrie dish containing his entire medical fit — penicillin, anti-malarials, and bandages — my heart sank. Medical orderlies in countries such as PNG serve a real need in outlying areas, but serious cases are referred to larger centres. Alas, "doctor" Japeth did not know what a kidney was, and there was an embarrassing moment when Bob had to insist quite forcefully that he wanted neither a penicillin shot nor a dose of anti-malarial. Eventually, face was saved and Japeth paddled away with a promise to drop by on the morrow.

Bob was growing more desperate. I found some ampoules of pain-killer and prepared an injection, explaining to him that I had had plenty of experience injecting lambs on the family farm in South Australia. He rolled his eyes and I could see him thinking ". . .like a lamb to the slaughter." Suddenly, as I dabbed his right buttock with alcohol, his pain vanished as suddenly as it had begun. The nightmare, we dared hope, was over.

BOB CONTINUES:

Next morning, before long, the acute pains had returned. By 8 am I was ready to trade my soul for a pain-killing shot, which Ally confidently administered. Slowly I began to feel relief.

An hour later, however, with the sharpness of the pain returning, it became obvious that the stone was not going to pass easily and that we needed outside assistance.

We quickly contacted Tony's Amateur Radio Net, which was in progress, and soon after were relieved to hear a doctor's voice confirming our diagnosis. He gave what advice he could and a further radio schedule was arranged for midday.

The midday sched included the doctor and Don Hopper VK4NN — the amateur radio link with Australian Sea Safety Operations — as well as other interested radio amateurs who stood by to provide relays as needed. After hearing that the pain had not abated since morning, the doctor recommended that we obtain proper medical treatment post-haste. Following the discussion of alternatives, we accepted the doctor's advice, and indeed I welcomed this decision since I could feel myself weakening steadily from the pain and was becoming more disorientated from the effects of the pain-killer.

We then discussed evacuation details — where to go, and how to get there. Kandrian, Kimbe, Rabaul, Lae and Port Moresby were considered but Lae was selected because of its proximity (150 miles to the west) and, since having worked there previously, I was familiar with the hospital and transport facilities. In addition, I had several friends there who could provide reliable assistance.

The more difficult decision was choosing the means for getting to Lae. Villagers said that the nearest airstrip was at Kandrian (30 miles to the east) but there was no road connection from

Rescue helicopter arrives and hovers near the boat, indicating the pilot's plan to lift the patient directly out of the dinghy.

The evacuee's tender is forced violently sideways by the rescue craft's propwash. Despite repeated attempts, this evacuation method proved unsuccessful.

Arawe. They also advised that the local coastal boat servicing this sector was out of service. The possibility of obtaining a local dugout canoe with outboard motor was finally dismissed because of sea conditions and the delays envisaged in organising such a trip.

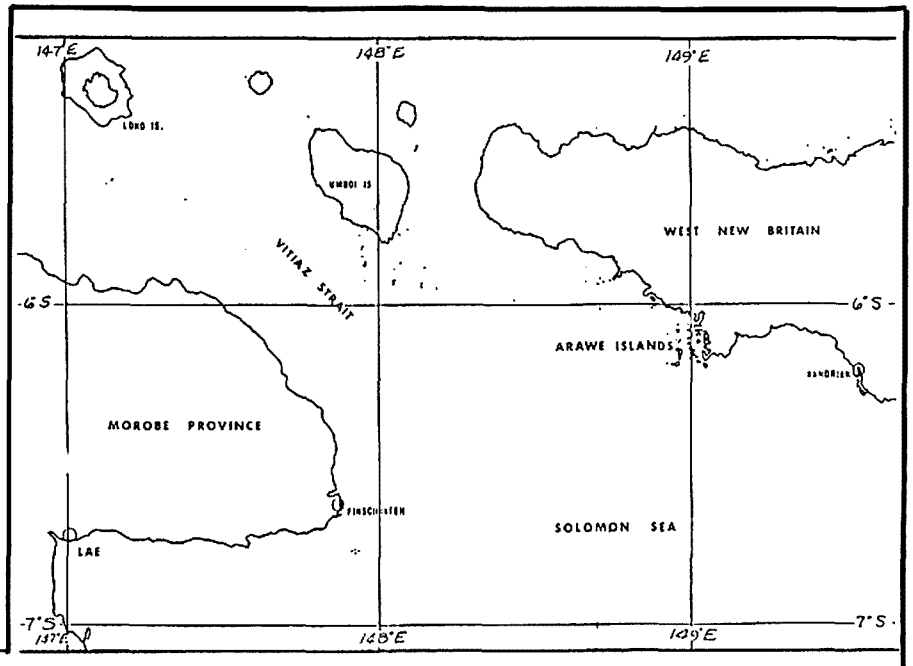
The choice was narrowed to sailing *Maxine* against the south-easterly to Kandrian the following day, *or calling for a helicopter to pick me up at* Arawe. We considered my weakening condition and the time and energy required to sail to Kandrian. A helicopter would have to do!

All decisions made, organisation of the helicopter rescue operation was left in Don's capable hands. He immediately contacted Sea Safety Operations in Canberra, who in turn contacted their equivalent organisation in Port Moresby, the Search and Rescue Section of the Department of Transport. Don then telephoned my Lae friends informing them of the situation, asking that transport from the airport be organised. Further, that the evacuation operation be monitored from Lae to minimise delays.

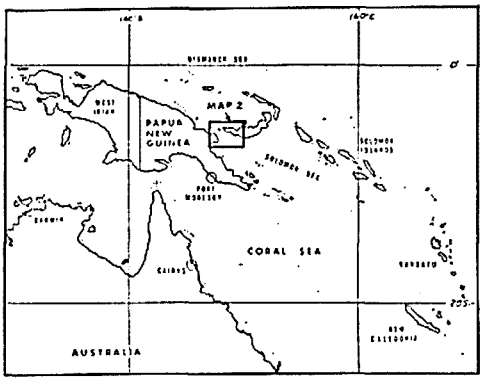
The hours preceding eventual evacuation at 5.30 pm were busy for all concerned. Don contacted the radio branch of the Department of Posts and Telecommunications in Port Moresby, obtaining authorisation for Ally to maintain a daily radio schedule with him at a set time and frequency. Don also maintained contact with my Lae friends to monitor the progress of the operation from there.

Things were hectic aboard *Maxine* during this period. Ally showed her true colours for calmness and organisation by simultaneously monitoring the radio, packing a bag for me, composing a detailed summary for my intended doctor regarding symptoms, medicine administered, etc, while interpreting and recording my sometimes incoherent tirades regarding switching battery banks, checking engine oil, watching for dragging anchors, establishing links with the local villages, etc.

The seemingly endless jobs were finally completed. Captain Ally gave me my last needle as a distant hum announced the helicopter's impending arrival.



Location of the remote Arawe Islands.



General location of Papua New Guinea.

ALLY:

By the time the helicopter appeared in the late afternoon sky, it had become obvious that it was neither an extravagance nor a soft solution as Bob's condition over the last few hours had deteriorated alarmingly. Continual pain, drug side-effects, and probably worry too, had eroded his earlier stoicism and made him increasingly irritable. Surprisingly, he was still thinking rationally and acting sensibly, but I could see that this could not continue for too much longer. Would I be able to cope after that? Fortunately, with the helicopter's arrival this merely became hypothetical.

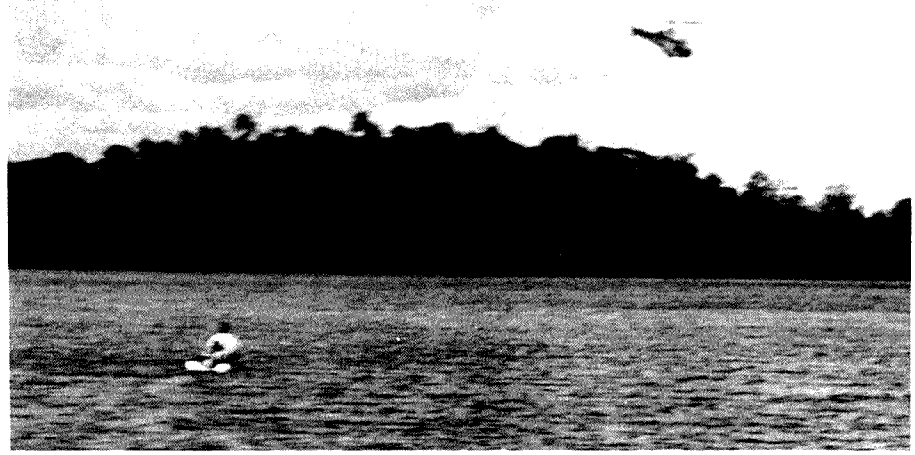
"Does it have floats?" Bob hollered from down below as the helicopter circled low over the boat. "No," I yelled in dismay, "No floats! What now?"

The helicopter hovered low over the water near us, from which we inferred that the pilot wanted to pluck Bob from the dinghy. I rowed the dinghy, with Bob and his bag, downwind well clear of *Maxine* and waited, wondering if a rope ladder would be lowered, or if the pilot meant us to grab the under-carriage. The helicopter descended slowly above our heads, the wind from the rotor blades beating the water around us to a frenzy. But as it came closer, seemingly inches from our grasp, our cockle shell was blown forcefully sideways out of range. Again and again we tried as my frustration mounted, for I figured that even if we anchored we had a very difficult act ahead of us. The pilot must have had misgivings too for he flew away, returning a few minutes later to signal us to follow him to a beach on the mainland. We hurried back to *Maxine* to mount the outboard and, after much trouble starting it, motored out of the anchorage into the choppy bay, heading for the mainland a mile away. Because of the heavy conditions, the trip was slow, wet and bumpy. Through the spray I looked alternatively at Bob wincing with each bounce, and the rapidly setting sun, and the seemingly ever-distance beach. We finally arrived amid a crowd of wildly excited children who pulled the dinghy through the shallows to the beach. I enthusiastically greeted the pilot Richard and co-pilot Heather, who were unloading a drum of kerosene as a gift for the villagers (a policy Pacific Helicopter has adopted when flying into remote areas).

We helped Bob into the helicopter and Richard started the engine. As the helicopter slowly lifted, Bob's raised hand at the window was like a trigger that released all the feelings I had kept under tight control for the last 36 hours. Enveloped in a circle of bewildered villagers, I wept.

BOB:

We set down on the tarmac in Lae just after dark. As the helicopter landed I could not help but reflect on the unselfish assistance that so many people had given to ensure my earliest possible arrival. The emergency rescue had been carried out in textbook style, swiftly and efficiently. Two weeks and two hospital internments later I returned to Arawe to be reunited with Ally and *Maxine*.



Rescue helicopter heads for touchdown on a beach a mile away, where the patient was successfully evacuated.

The following weeks provided many fruitful hours for reviewing the various aspects of the emergency. The major conclusions that we recognise as important are as follows:

1. Report all emergencies in the first instance to Sea Safety Operations, Department of Transport, Canberra, even if you are not sailing in Australian waters, as it is likely that Canberra will be easier to contact (rescue operations in many of the smaller island nations are run on an *ad hoc* basis). It is also likely that the local rescue organisation will respond more positively to an "official" request for assistance from Canberra than to a direct request from an individual. Reporting directly to Canberra may also reduce delays in those cases where the local organisation cannot provide the emergency services required.
2. Make use of emergency facilities available on radio to contact Canberra. At present, Australian legislation covers only those emergencies reported to coastal radio stations on marine band frequencies. These stations relay the emergency details to Canberra and/or contact the appropriate doctor standing-by for such emergencies. Equivalent organisations in PNG and New Zealand operate in a similar manner.

The majority of yachts cruising in the south-west Pacific, however, have opted for amateur radio communication. In these cases, emergency calls, when time permits, should be made to existing amateur radio nets (Tony's Net — 14.313 MHz at 2100 UTC, Seafarers' Net — 14.313 MHz at 0400 UTC, and the Pacific Maritime Mobile Net — 14.313 MHz at 0530 UTC). Operating daily, these nets are controlled by competent and interested individuals who can be relied upon to follow through with each emergency.

Contact with Canberra can be made either through these amateur radio nets or through Sea Safety Operations' amateur radio link VK4NN. In our case, Tony contacted Don VK4NN during his daily sched with Les Nutting ZL1BIN. Don (Australia) and Les (New Zealand) are well-known personalities around the band who are experienced in dealing with yachting emergencies reported on amateur radio.

3. Communication links should be maintained between involved parties throughout an emergency.
4. A state of preparedness should be maintained throughout the emergency. For example, having been informed incorrectly by radio that the rescue helicopter had floats, we had made no plans for the alternative. This caused about a 45 minute delay, which resulted in us landing in Lae just after dark. Fortunately, the pilot was able to obtain special permission to land — this airport being authorised for day operations only.
5. Never depart for isolated cruising grounds if you feel less than 100 percent fit.
6. Each crew member prone to a particular medical problem (be it kidney stones, heart trouble or heat rash) should become *au fait* with its causes, symptoms and treatment.
7. Ensure that the medical kit contains adequate up-to-date medicines that cater for both general treatment and specific crew problems.
8. Crew members should be trained *prior* to a voyage to assume responsibility. Pertinent details for each responsibility; eg battery charging could be clearly recorded to provide a handy reference.

A tele-photo lens belies the long, choppy mile to the rescue beach.

9. Choose the evacuation location with care. Selecting a place where you have friends or contacts has definite advantages, since customs and practices differ from country to country.
10. When an emergency results in a yacht and/or crew being left in a remote area for a period of time local officials/leaders should be contacted. In addition to being a matter of courtesy, these contacts could prove useful if assistance is required.

AFTER—THOUGHT

It is now two months later and *Maxine* is safely anchored in Gizo, Solomon Islands. I am again on my back! This time I have my right leg elevated to expediate the curing of a tropical ulcer that developed soon after my return from hospital.

I feel that this obstinate and potentially serious sore is, at least, partially due to our recent hectic sailing schedule. This leads to one final observation — following a medical emergency, allow sufficient time for your body to fully recover from the illness and medication. I dare say there are enough non-energetic tasks on the jobs-to-complete list to occupy the mind (and improve the boat) while the body mends.

FOOTNOTE

Bob a Civil Engineer, is an Australian citizen from the USA. He holds an amateur licence, P29RL, in Papua New Guinea, where he worked for over eight years prior to beginning his epic yatching voyage.
Ally is from South Australia. She lived and worked in Japan for several years as a Japanese translator.
Andrew Lee, the *new first mate*, was 16 months old in February.
In February 1988, the crew were still cruising on *Maxine* in the Philippines.
Sincere thanks is extended to all the amateurs who assisted in Bob's successful evacuation to Lae Hospital.

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LICENCE RESTRUCTURE

The Canadian Department of Communications has proposed restructuring of the Amateur Radio Service and supports a new structure based on four classes of certificates including a no-code VHF/UHF entry level.

The proposed entry level requirements will be the passing of a 100 question examination based on 40 hours study of basic electronics, amateur radio systems, antennas and propagation, interference and suppression, regulations and operating procedures.

Privileges for this class of certificate would be all modes on all bands above 30 MHz, maximum 250 watts input, and be able to use only "commercial" transmitting equipment.

The next grade would have the same examination paper syllabus as the entry level class, plus five words-per-minute code examination, and gained additional privileges of all modes 3.5 to 4.0 MHz, maximum 250 watts input, and be confined to commercial transmitting equipment.

Passing the 12 words-per-minute code examination would entitle holders of the entry level certificate to all modes and all amateur bands below 30 MHz, using commercial transmitting equipment.

Holders of the entry class certificate could, if they pass a 50 question advanced technical examination, and 12 words-per-minute code examination, be given full operating privileges, including maximum transmitting power and the right to home-build transmitting equipment.

The Canadian Radio Relay League, who made a submission to DOC on its thoughts about restructure nearly two years ago, is now negotiating with the Department on its proposals.

A VHF MODEM FOR RTTY, AMTOR AND PACKET

A simple VHF RTTY/AMTOR modem incorporating AX.25 Packet Radio!

Ron Mills VK5XW
13 Taylor Terrace, Rosslyn Park, SA. 5072

Whilst constructing a simple VHF modem for RTTY and AMTOR it seemed like a good idea to try and incorporate AX.25 Packet into the unit as most of the major components were common to this type of PLL modem as used by the three modes. As it happened, apart from the relay which was at hand, the extra cost was only around $15. It was constructed on Veroboard (Tandy 276-162).

All components, including the relay, fitted onto this board, however, for those unfamiliar with Veroboard construction, it may be prudent to use a larger board.

Component placement was not critical but it is better to give some thought to the layout of the components as that they are close to the relevant chip pins to keep the overall layout neat and easy to service. Use small 10-turn potentiometers for RV3 to RV8 and styroseal timing capacitors. It is relatively easy for home-brewers to achieve good results with Veroboard. As this is only a suggested solution for combining the three modes, no PC board or layout will be produced.

The main alterations needed to change from VHF RTTY/AMTOR to VHF Packet working were:

1. Change the Demodulator Baud rate from 45-110 (RTTY/AMTOR) to 1200 (Packet) and the centre lock frequency of the XR2211 from 2210 Hz to 1700 Hz.
2. Change the AFSK modulator frequencies from 2125/2295 Hz to 1200/2200 Hz and add the timing CCT. (This was borrowed from the Australian Amateur Packet Radio Association's (AAPRA) Packet Radio Modem circuit — Software for the Commodore C64 computer with interface instructions can be obtained from AAPRA).

Using a 12 volt, four-pole change-over relay made the above Baud rate and frequency changes possible and hence the project viable.

Having never been very impressed with the XR2211 as a demodulator (especially on HF), my introduction to RTTY many years ago was via this chip with an XR2206 as the AFSK generator. I learnt the hard way that even though the XR2211 is designed to handle an audio input level of between 2 mV and 3 volts RMS. it was not very difficult to accidentally exceed the 3 volt level from the audio available across the loudspeaker. The inbuilt preamplifier soon became very deaf! By limiting the input to XR2211 to around 0.7 volts by clamping its input to ground with back to back diodes such as IN914s (ensure that there is a capacitor between the clamping point and pin two of the XR2211), the inbuilt preamplifier was protected.

It was also discovered that better results could be obtained by feeding the input to the XR2211 from the audio source (usually from across the transceiver's speaker) via an 8/1000 ohm matching transformer (Tandy 273-1380). As well as giving a better match, it also prevented any distortion created by the clamping diodes clipping any excessive voltage due to audio overload from getting back into the speaker output. No problems have been encountered even using germanium diodes (0.3 volt) affecting the operation of the XR2211 if overloaded. A relatively cheap and reliable modem can be constructed for use on the VHF band using XR chips, so long as the above points are kept in mind. (The RTTY/AMTOR section actually works quite well on HF as long as the signal is not down in the noise).

Most of the circuitry is straight from the specification sheets for the XR chips with minor compromises to satisfy the large range of Baud rates. A LED was added to indicate just when the XR2211 was in lock. Although not really necessary for VHF apart from showing that you are receiving a signal and are on frequency, on HF RTTY/AMTOR it makes tuning much easier.

RLY1 changes from RTTY/AMTOR to AX.25 Packet with RL3 14/9/16 changing the Baud rates. RL1 5/12/7 and RL2 11/6/13 the AFSK tones and RL4 8/15/10 the PTT circuit change. The 555 receives plus five volts from the cassette port of the C64 to prevent keying of the transceiver should the computer be switched off first. Provision was made for the polarity of the TTL input and output to be reversed mainly for RTTY/AMTOR use. As this project was initially for use as a RTTY/AMTOR modem, the five volt TTL levels were obtained by using voltage divider networks using 18K and 10K resistors from the 12 volt rail. After the Packet facility was added and five volts became available, the original values were not changed.

As the modem was made for use with the Commodore C64 computer, two separate DIN

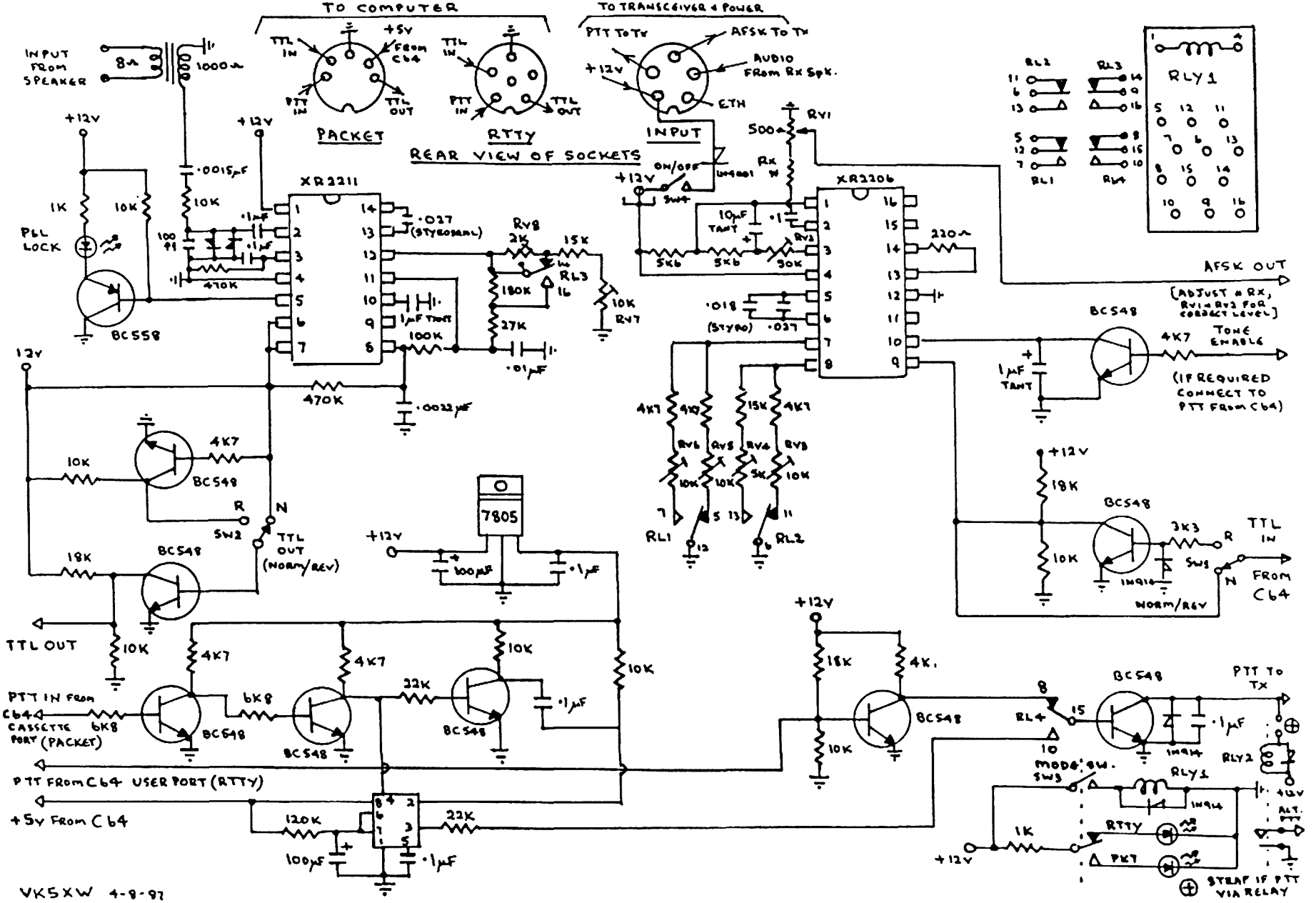

Figure 1 — RTTY/AMTOR/PACKET Modem.

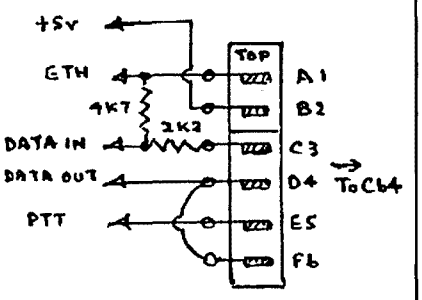

Figure 2 — Wiring to C64 Cassette Port for Digi Com 64.

sockets were fitted to give both RTTY/AMTOR and Packet access to the computer. Because different input points were necessary, eg the cassette port is used for Packet using the German Digi-Com 64 software, which seems to be the most popular program in South Australia, and the user port is used for RTTY/AMTOR, the DIN sockets were made different so that the interface cables could not be mixed up. (The software from AAPRA uses the Commodore User Port for Packet — wiring details are supplied with their kits). C64 software programs for RTTY/AMTOR/Packet are readily available by asking around the groups using these modes.

The frequencies were set using an Audio Frequency Generator/Counter. Set RV3 for 2125 Hz (0 volts (GND) on pin 9) of the XR2206 and RV5 for 2295 Hz (5V on pin 9). Operate mode switch SW3, adjust RV4 for 1200 Hz (0V on pin 9) and RV6 for 2200 Hz (5V on pin 9). Set the centre lock frequency of the XR2211 by connecting the frequency counter to pin 3 of the XR2211, strap together pins 2 and 10, apply power then adjust RV7 for 2210 Hz, operate the mode switch SW3 and adjust RV8 for 1700 Hz. Turn off the power and remove the short from pins 2 and 10 of the XR2211. (Most procedures recommend the removal of pin 3 of the XR2211 chip from the socket and measure the frequency on the now floating pin 3. This is risky in that the pin may break off in the process. I have found that leaving pin 3 plugged into the socket is almost as good. Sometimes it has only been necessary to just tweak RV7 (only once) to get proper lock on AMTOR.).

Provision has been made for setting of the AFSK level. Most two metre transceivers seem to require an audio input of around 7 to 10 mV for good sounding Packet tones. The values of RV2 and RX were adjusted so that there was about 10 mV across the 500 ohm trimpot, RV1, and then RV1 was adjusted on air until favourable reports were received on the quality of the tones.

Shielded cable was used between the modem, the computer and the transceiver. Regulated 12 volts DC came from the station power supply. The modem fits into a metal case 100 x 60 x 145 mm (WHD). This can be bought at most suppliers or it may be home-brewed. The front panel has two switches — Power On/Off, and Mode. Three LEDs, one (green) for PLL Lock and two (red) to indicate the mode in use, ie RTTY/AMTOR or Packet. They also serve as power on indicators. The rear panel has three sockets. Two are DIN for connection to the computer and a five pin (microphone connector type) for power (12 volts DC and ETH) plus transceiver connections (audio from the speaker, PTT and AFSK).

As only the computer software and interface connections would be different, this modem should be adaptable to any computer.

A much more detailed description of the operation and line up procedure of the Packet section can be found in an excellent article by VK2AAK in the July. August 1987 issues of *Australian Electronics Monthly* or from the AAPRA should you purchase their software package.

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AUDIO FREQUENCY GENERATOR COUNTER

Not a constructional article but a working circuit incorporating ideas!

Ron Mills VK5XW
13 Taylor Terrace, Rosslyn Park, SA. 5072

For a long time I have been an avid home-brewer of RTTY/AMTOR, and more recently, Packet modems. It did not take long before I realised that I needed a reliable means of checking the frequencies. Over the years I have built and modified many audio generators for this purpose. Some of the ideas are original and others have been borrowed from the many articles published on this subject.

This is not meant to be a constructional article on building such a unit, but the submission of a working circuit incorporating ideas that may be of use to other constructors who would like to experiment. Of course, anyone reasonably skilled in building such projects could replicate this design and expect it to work.

The frequency covered is from 10 Hz to 200 kHz in three ranges, with variable output of sine, triangular or square waves plus a fixed five volt p/p square wave output for TTL. The function generator's frequency is monitored by a crystal locked frequency counter which can also be used as a counter for external signals. This allows test frequencies to, and output frequencies from modems to be easily set. The most difficult part of the project is to get a fine enough control over the setting of the frequencies generated. The circuit is better than most of this standard, especially if a 20 kohm linear Bournes type 10 turn potentiometer is used for the fine frequency control (if you also use one of these for the coarse frequency control, so much the better). I only use ordinary 20k linear potentiometers with quite good results, although they are a little "fiddly" once set the frequency remains firm. The HZ and kHz LED indicators are auto-ranging. Although shown as separate LEDs in the schematic diagram (see Figure 1), they actually are wired to the decimal points of the Digital Display LEDs.

There are undoubtedly better and more sophisticated ways of tackling some of the circuit design, but this relatively simple one may be of interest to others. The frequency counter was built on one board and the function generator on another. The boards are "piggy-backed" to fit into a reasonably small case with the power supply.

Many articles have been published on setting up the XR2206 as a Function Generator so this is not covered in this article.

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See page 16 for Figure 1.

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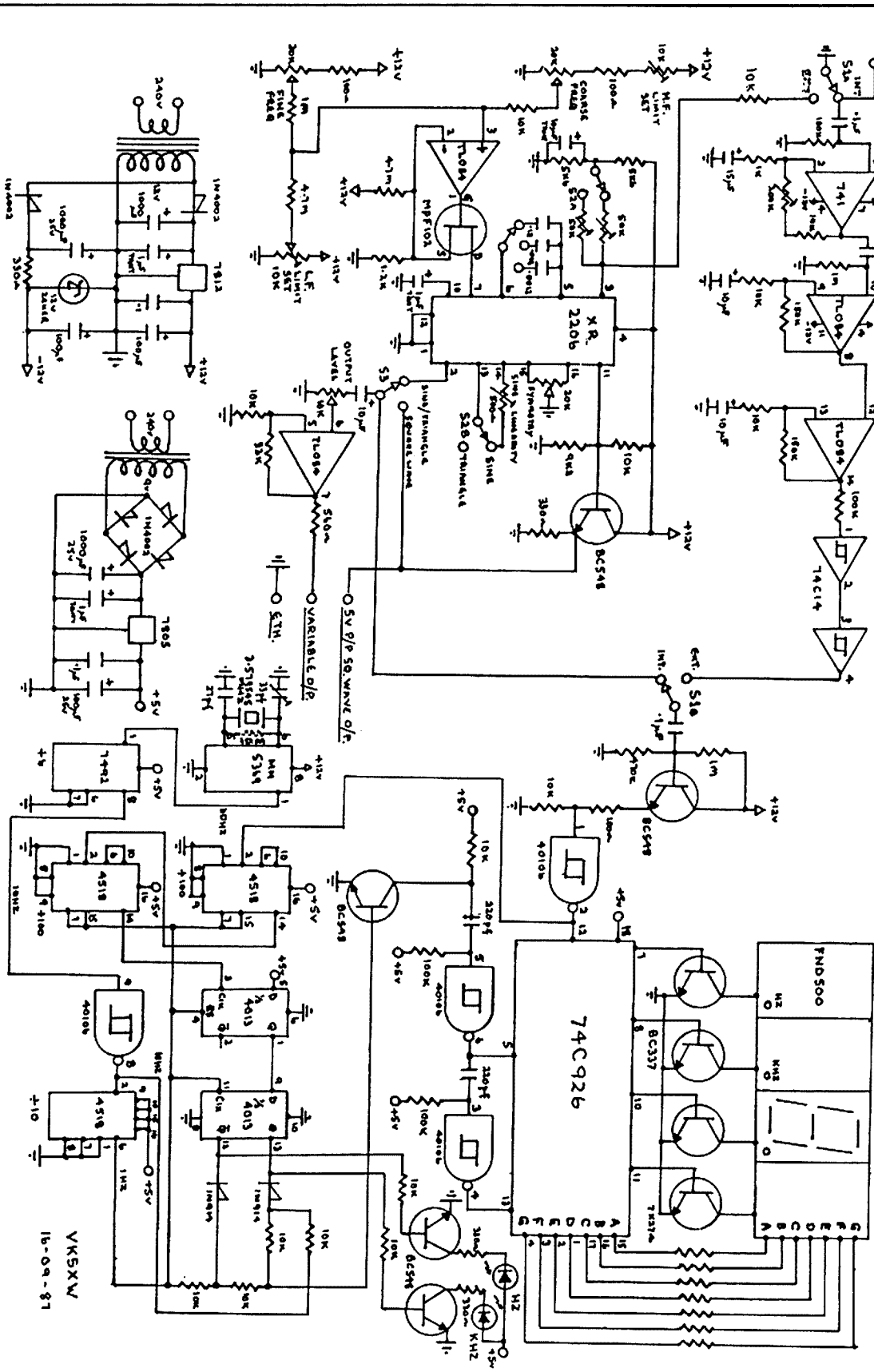

Figure 1 — Audio Frequency Generator Counter.

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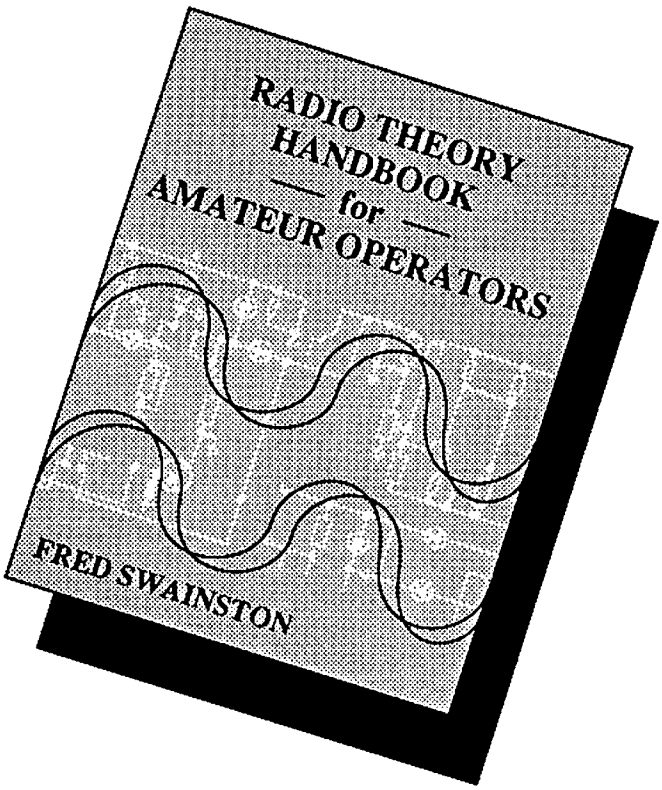

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THE MURRAY BRIDGE STORY

A History of Amateur Radio in one South Australian Town

Lloyd Butler VK5BR
18 Ottawa Avenue, Panorama, SA. 5041
(With support from others — see text)

Every town has its own amateur radio story — Murray Bridge is no exception!

THIS ARTICLE IS a historical review of amateur radio at Murray Bridge, commencing in the early experimental days of 1924 and passing through an era when radio amateurs built their own equipment. The article continues with some interesting details on the activities of the amateurs and the equipment they used.

INTRODUCTION

Every town has its own amateur radio story, some of it early history which has passed on with the silent keys of those who created it. This is the story of one particular town, Murray Bridge, told by some amateurs who have been active there.

We begin with an early experimenter, Frank Miller, long since a Silent Key, and progressively discuss the various radio amateur enthusiasts who followed on to build their own equipment and generate radio signals on the air. We finally review amateur radio in Murray Bridge as it has been in recent years.

We discuss modes of transmission and the type of equipment used in the pre-war and early post-war era and make particular reference to the problems we had in coping with the DC mains which Murray Bridge originally had.

Much of the story has been assembled from information supplied by some of its early participants, namely, Elizabeth Wallace, formerly Betty Geisel VK5YL, Bob Grundy VK5BG, Jack Trevor, formerly VK5AM and now VK2UP, Bill Rice, formerly VK5BP and now VK3ABP, and Lloyd Butler VK5BR, the writer. Information contained in reference 1 and 2 has also been utilised. More recent information, particularly that concerning the Lower Murray Amateur Radio Club, has been supplied by Colin Schick VK5JP.

THE EARLY YEARS

The pioneer amateur radio experimenter in Murray Bridge was Frank Miller, who had an early association with communications as a signaller in World War 1. He is accredited with having assisted in developing the teletype machine whilst working with the trenches with the Signal Corps[1].

Frank set up as an experimental broadcaster in Murray Bridge in 1924 using a grid modulated master oscillator with an input power of 4.4 watts. His call sign was 5BF, which eventually became VK5BF in later years with the development of amateur radio communications. (Considerable detail of Frank's early experimental broadcasting can be found in reference 1). Frank spent the rest of his life as an active radio amateur in addition to his many other activities associated with radio in Murray Bridge.

Figure 1: Frank Miller and his amateur radio equipment.

For some years Frank managed a radio and electrical business in the town, servicing radio receivers and actually building receivers for sale. In 1934, in conjunction with a business partner, Frank set up Broadcasting Station 5MU with a 50 watt transmitter which he had built himself, and with local help (much of it voluntary) he erected masts and an aerial system for the station.

In 1925, a Murray Bridge branch of the Railways Radio Club was formed and Frank had a close association with this club as joint secretary. The club operated from railway offices across the line from the Murray Bridge Railway Station and Frank carried out transmissions from that location using one of his old transmitters. He was also a member of the South Australian branch of the Wireless Institute as early as 1921, only two years after it was formed[2].

Over the years, Frank built numerous units of experimental radio equipment. Apart from his knowledge of radio, he was skilled in fitting and turning and meticulously applied these skills to the construction of his radio equipment.

A QSO recorded in 1937 shows that, at that time, Frank used a two stage transmitter consisting of a 6P6 valve oscillator driving a pair of 807 valves in parallel, with an input power of 25 watts. This had superseded an earlier transmitter using a Meissner master oscillator driving a power amplifier (details unknown). His receiver was an eight-valve superheterodyne, and on 80 metres he used a 134 feet single wire matched impedance antenna. A photograph of Frank, with his station around the 1940s, is shown in Figure 1. Frank also later obtained a National HRO receiver, a desk *mounted* version of the one shown in Figure 2. Early equipment was powered from the DC mains supply to be discussed later.

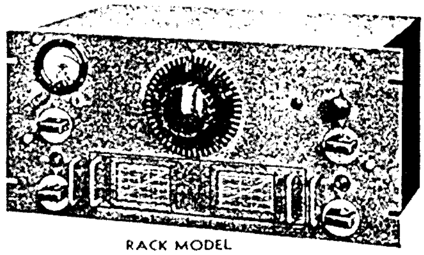


Figure 2: The National HRO Receiver.

Rotatable high gain beams, seen everywhere today where there are radio amateur stations, were not so common in those early years. Frank built a 20 metre rotatable Yagi which was mounted on a timber mast. To change direction, the whole mast section was rotated by a mechanism fitted at ground level. The mechanism was made up from an old milk separator gearbox, working in reverse,driven by a quarter horse power DC motor.

Frank's last transmitting system, then AC mains powered, included a rack containing 1000 volt power supplies using 866A rectifiers, a modulator using a pair of 838 valves and an RF unit on 20 metres using a pair of 834 valves as a final stage. The rack was probably redesigned from the one shown in Figure 1. An auxiliary rack contained RF units on 40 and 80 metres and one unfinished unit, probably meant for 10 metres. The auxiliary RF units worked in conjunction with the main power-modulator rack.

After Frank became a Silent Key, his transmitter and other equipment was purchased by Dave Goode, a one time resident of Murray Bridge and district. Dave also took up the call sign VK5BF and made many contacts from the town of Yankalilla, using Frank's old transmitter.

VK5YL

An early Murray Bridge amateur radio operator was Betty Geisel who, in 1936, was the first YL (young lady) in South Australia to obtain an amateur radio licence. Appropriately, her call sign was VK5YL. Betty also obtained her commercial operator's certificate and she has the distinction of having her certificates on display in the comprehensive radio section of the Adelaide Telecommunications Museum[3].

Betty operated in the CW mode mainly on the 40 and 80 metre bands, with an occasional contact on 20 metres. Betty built her own transmitter and receiver from limited resources. A QSL card, confirming a QSO in May 1937, shows that her transmitter then utilised a valve type 42 electron coupled oscillator, running an input power of 10 watts. Further cards show, that in 1938, her transmitter had been changed to a 38 Tri-tet crystal oscillator driving a pair of 42 final amplifier valves with an input power of 25 watts (refer to Figure 3). Her receiver was a two valve regenerative set, using a type 30 valve RF stage driving a type 19 valve audio stage. (Her final superheterodyne was constructed later after she moved to Adelaide). The receiver and transmitter were initially powered from batteries although later the town DC mains were utilised.

Betty assembled her own high tension batteries to operate her equipment. The series cells, which made up the battery, were constructed by extracting the positive carbon rod and depolariser package from old spent dry cells and fitting them in *Marmite*® jars. The negative electrode was made from a rectangle of zinc amalgamated with mercury. The electrodes were immersed in an electrolyte of sal-ammoniac or common salt solution. The sal-ammoniac was more satisfactory but Betty cannot remember which one she used.

Her aerial, a half wave dipole on 40 metres, was supported by a 40 foot oregon pole which Frank Miller and Bob Grundy helped her erect.

Betty operated at Murray Bridge until 1939 when she left to work at National Radio in Adelaide. Betty, now better known as Mrs Elizabeth Wallace and lives in the Adelaide suburb of Tranmere, went on to become a High School teacher, a profession from which she has now retired.

VK5BG

Another early Murray Bridge amateur radio operator and experimenter was Bob Grundy, who obtained his licence in late 1937 and began operation with the call sign VK5BG.

One of Bob's early activities was carrying out the job of radio operator at Oodnadatta for a 1938 expedition to the Simpson Desert. The expedition was organised as an attempt to find some trace of the Leichhardt party. (Following many previous epic journeys into the outback, early explorer Doctor Ludwig Leichhardt and his party disappeared in 1848 during an attempt to cross the Australian continent, starting from the Darling Downs and intending to finish in Perth).

During Bob's years at Murray Bridge he built a number of different versions of amateur radio equipment. His first transmitter (on CW) used a 42 crystal oscillator driving a 42 power amplifier. A 6A6 modulator was later added to the original unit for phone operation. A further transmitter used an 809 power amplifier modulated by a pair of 6A6 valves and just prior to World War II, the 809 was replaced by push pull 45 valves. A 1938 QSL card reveals that, at that time, his transmitter was a three stage crystal controlled unit using a 42, a 6V6GT and parallel 6P6 valves as a final amplifier with an input power of 20 watts. The final amplifier was Heising modulated by a pair of 42 valves in class AB push pull. At that stage, his receiver was a home-built superheterodyne. An RF power amplifier, built by Bob, utilising a pair of 45 valves, is shown in Figure 4.

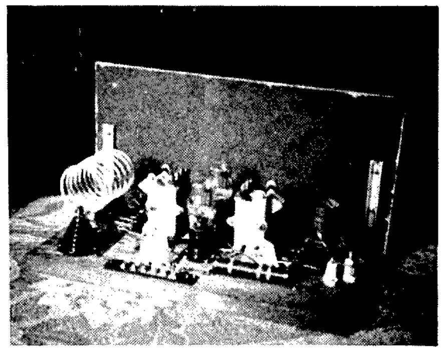


Figure 4: An RF Power Amplifier built by Bob Grundy VK5BG, using 45 type valves.

Bob's post war transmitter, used in 1946, consisted of a 6V6 crystal oscillator, 6V6 driver and push pull 807 final amplifier modulated by a pair of 6A6 modulators operating in class B. A photograph of his radio shack, taken in 1947, is shown in Figure 5. The receiver in the photograph is not too clear, but it can be seen, that at that time, he had upgraded his receiver to a National HRO, his first item of any commercially built transmitting or receiving equipment. After the war, for a short period, the first and only HF band released was 10 metres and Bob had a six element Sterba curtain antenna operating on that band. The schematic diagram of the Sterba array, a broadside antenna which consists of both collinear and parallel elements, is shown in Figure 6.

Figure 3: QSL card from Betty VK5YL — the first YL operator in South Australia.

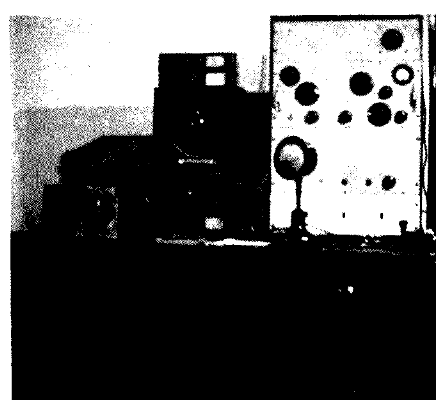


Figure 5: The equipment used by Bob VK5BG in 1947.

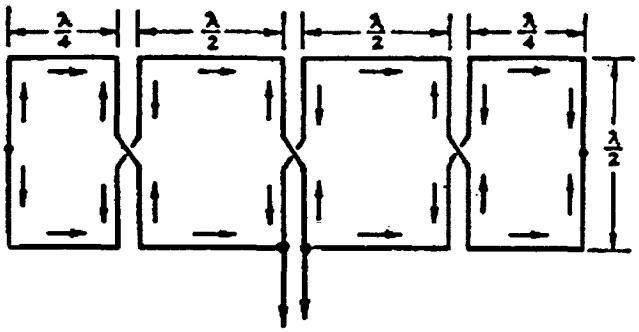


Figure 6: A Schematic Diagram of a six element Sterba Curtain Antenna.

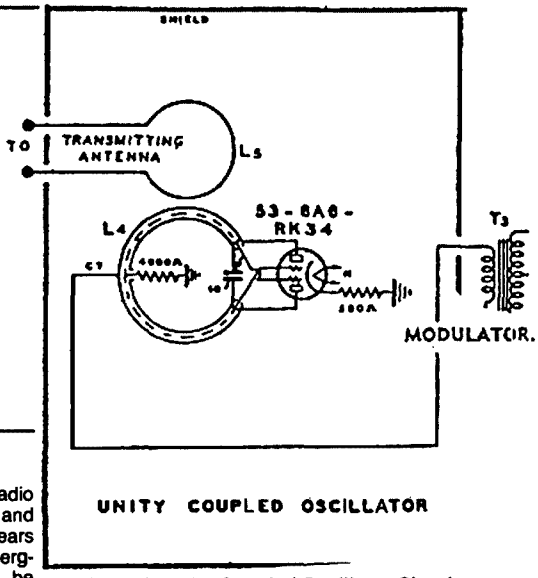


Figure 8: Unity Coupled Oscillator Circuit used on five metres.

Bob operated his station at Murray Bridge until 1952 when he moved to Crystal Brook to take up duties at Broadcast Station 5PI. Since then, Bob has spent many years as an active radio amateur at the Brook and is still there in his retirement. With 50 years as an active radio amateur, Bob is one of our real veterans in the VK5 region.

One early activity carried out by Frank and Bob was field operation on the old five metre band. Figure 7 is a photograph of Frank and a very young Bob operating fixed portable in the field. In this installation, the antenna used was a vertical collinear array supported by guy ropes. For five metre operation, their transmitters utilised a unity coupled oscillator, with 6A6 valves, in a circuit similar to that shown in Figure 8. The receivers were made up from the resistance coupled five metre superheterodyne circuit published in the early *Jones Handbook* (see Figure 9). Betty also recalls enjoying herself on a VHF field day at Palmer Hill and was so impressed that she went to work and built herself a VHF transmitter. She did not succeed in getting it to work very well but the attempt was made.

THE EARLY POST-WAR YEARS

At the outbreak of World War II, all amateur radio stations were closed down. However, Frank and Bob made use of their skills during the war years by setting up, for the district council, an emergency radio network, one of the first to be introduced for Emergency Fire Service (EFS) work. Licences were gradually restored early in 1946 when Frank and Bob renewed their amateur station activities. They were soon to be joined by other enthusiasts who had roots in Murray Bridge.

VK5BR

Lloyd Butler has qualified for a licence during the war years, in 1941 and first transmitted as a radio amateur with the call sign VK5BR in January 1946. Lloyd actually commenced operation in the Adelaide suburb of Blair Athol, but commuted at weekends to his home at David Terrace in Murray Bridge, where he operated fixed portable, using a low power 10 watt rig with a 25L6 as final RF amplifier.

Lloyd initially operated at Blair Athol with 35 watts of input power but soon upgraded to 100 watts after passing the first class amateur certificate, which was introduced for a short time permitting operation on the higher power. (The full 100 watts was eventually granted to all amateurs in September 1947). The transmitter used had an output stage of push pull 807 valves, running 750 volts on their plates and modulated by another pair of 807s, with 600 volts

Figure 7: Frank Miller VK5BF and a young Bob Grundy VK5BG, operating in the field on five metres.

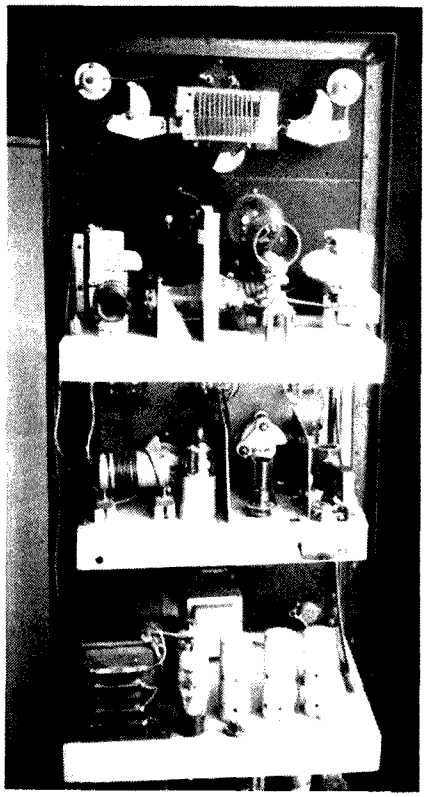
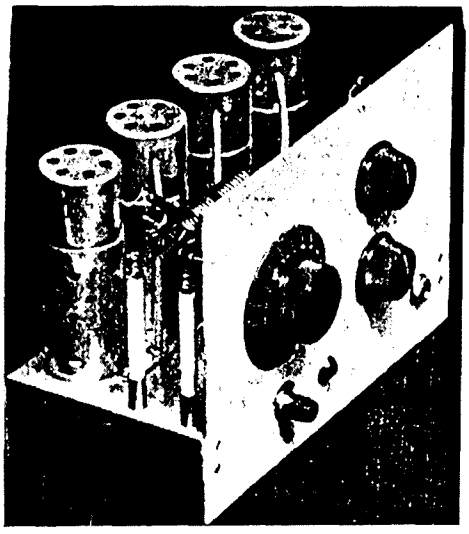


Figure 10: Modulator and RF units at VK5BR.



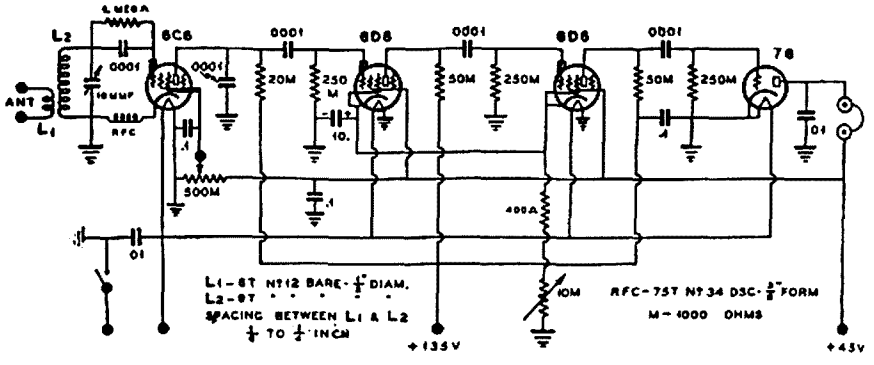


Figure 9: Jones Resistance-Coupled five metre Superheterodyne.

on their plates. The RF output stage was driven by a three stage exciter consisting of a 6F6 crystal oscillator and 6V6 — 807 buffer/multiplier stages. The exciter was, in fact, previously used as the 35 watt transmitter which was then modulated by the same modulator panel but with 6F6 type valves.

A photograph of the top section of Lloyd's rack showing the aerial tuner, RF stages and modulator is shown in Figure 10. All coils are on plug-in bases to allow change of frequency. Link coupling between RF power amplifier and aerial tuner is not shown in the photograph. The complete transmitter rack is shown in Figure 11. Power supplies are fitted at the base of the rack, the heavy transformers providing mechanical stability to the structure. Two separate supplies, each using a pair of 5Z3 rectifiers, provide the 600 and 750 high tension voltages. Additional separate lower voltage supplies are also fitted for powering the RF exciter, modulator and grid bias. Lloyd's receiver (Figure 12) was a 10 valve superheterodyne, home-built as was the transmitter.

Boarding-out and amateur radio did not quite go together and, in 1948, Lloyd moved all his equipment back to Murray Bridge, operating there with reduced power because of the DC power mains. (The problems of the DC power

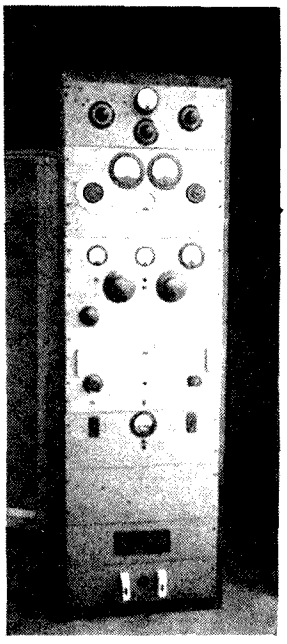
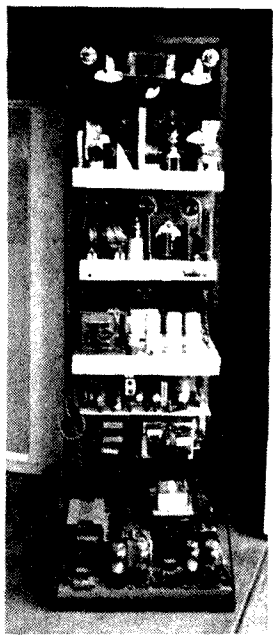


Figure 11: The original transmitter of Lloyd Butler VK5BR.



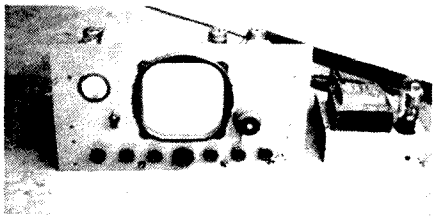


Figure 12: Lloyd's receiver.

will be discussed later). Lloyd operated intermittently from Murray Bridge until 1958. He then became an inactive licence holder until 1982 when he renewed operations from the Adelaide suburb of Panorama. Lloyd, close to retirement from the Defence Department, is still an active amateur and experimenter.

VK5AM

Jack Trevor was discharged from the Navy following war service, to take up residence in his home town of Murray Bridge. Jack was given the call sign VK5AM (Figure 13) after qualifying for a licence in late 1946.

Jack's first transmitter was built from a *China Mk 1* radio set which he brought home from the Persian Gulf. The transmitter consisted of a 6V6 crystal oscillator, 807 driver and push pull 807 final amplifier running 20 watts input from the 230 volt DC mains. Valve heaters were series operated from the mains via a radiator element. His first receiver was a Navy type B28. Antennas used were two half waves in phase on 40 metres and a Lazy H on 10 metres.

We raised the question of what was a *China Mk 1* set and Jack informed us that this was specially designed for use on small craft operating at the British Navy *China Station*. Up to about 1938, this station was based in Shanghai and the small craft were possibly gun boats operating in the Yangtze Kiang River.

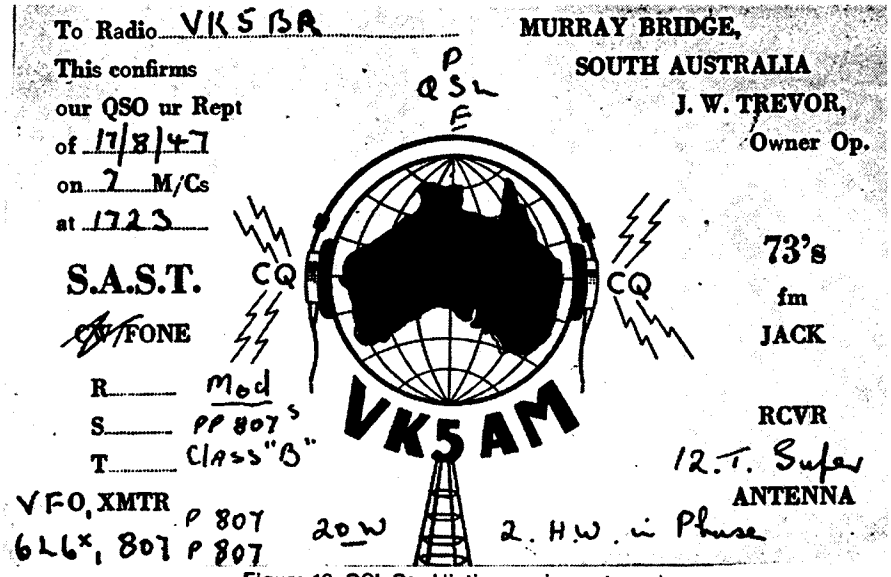


Figure 13: QSL Card listing equipment used by Jack VK5AM.

In the course of his business carrying out refrigeration service, Jack did a considerable amount of travelling in his utility vehicle within a 90 mile radius of Murray Bridge. He made use of this travelling to operate AM mobile radio using the call sign VK5WT, which was specially allocated for the mobile operation. His mobile transmitter RF unit consisted of a 5763 crystal oscillator driving a 5763 power amplifier. This was modulated by a further 5763 valve driven by OC71 transistor stages. (The OC71 was one of the first early germanium transistors to be produced). RF power from the transmitter was five watts operating into a tank whip antenna at the rear of the vehicle.

During the 1956 Murray River floods, Jack assisted in the emergency operations by supplying mobile communications. For an antenna, he used a 80 metre full wave vertical wire supported, ingeniously, by hydrogen filled balloons. At the time, he could not obtain weather balloons and used six toy balloons for the job. The idea worked well except in rain, when the water on the balloons added too much weight to maintain the balloons aloft. Jack later utilised the idea using real weather balloons from his home shack.

Jack operated in Murray Bridge until 1971 when he moved to Hope Valley and then, some 10 years later, ultimately retired to the Blue Mountains, where he is still an active radio amateur operating under the call sign VK2UR Jack informs us that he now has a fantastic location for amateur radio, 3000 feet above sea level, with no electrical noise and can access 19 repeaters on two metres with a Slim Jim antenna. The winds, however, are terrific and not kind to weak-hearted antenna systems.

VK5BP

Bill Rice commenced as a radio amateur at Murray Bridge in 1947 with the call sign VK5BP. Bill operated on 40 metres with a transmitter consisting of a Franklin VFO using 6AC7 valves, a 6L6 driver and push pull 807 final amplifier, modulated by a further push pull 807 pair. The VFO was later modified to a Clapp oscillator using a 6J5 valve.

In 1948, Bill moved his equipment to Adelaide where he was attending university. From the suburb of Prospect, Bill could be regularly heard on 40 metres talking technical topics with John Lamprey VK5JL, when he possibly should have been studying for those many examinations!

Following graduation, Bill moved to Melbourne where, since 1960, he has operated from his home in Altona with the call sign VK3ABP. Bill, of course, is now your editor of *Amateur Radio* and is known for those VK3ABP two metre converters. Unlike today, the amateur operators of those earlier years built almost all their own equipment and Bill was no exception. The different thing about Bill is that he still builds it and you are hard pressed to find any commercially built equipment in his shack.

Bill recently retired from the Defence Department with an aim to do some of those things he previously did not have time to do, including those amateur radio projects.

It is interesting to observe that, quite apart from VK5BF the other call signs, VK5AM, VK5BP, VK5BG, and VK5BR, all had earlier users in the 1920-1930 era. AM was previously allocated to P Kennedy of Unley, BG was previously used by Harry Kauper, one of the first early broadcasters, BP was previously allocated to R A Caldwell of Unley, and BR was previously used by the Blackwood Radio Club. (Some of the activities of these early experimenters can be found in references 1 and 2).

VK5MP

Len Porter came to Murray Bridge in 1952 to work at Broadcast Station 5MU following a period since 1934 with Broadcast Station 5PI at Crystal Brook. Len had previously been a wireless operator in the Royal Australian Navy during the spark transmitter era of the 1914-1918 war. During World War II he studied the Japanese signal code and, in 1943, was offered a position breaking codes with the intelligence service'. Len was an avid user of the CW mode of transmission and operated under the call sign of VK5MP which he appears to have first activated after World War II. He is believed to have been the first Australian amateur to contact all 48 states of the USA, as they existed at that time, on 28 MHz.

Len is no longer with us to tell any of his own story and we have been unable to find out any specific details of the equipment he used. During the period at 5MU, Len's permanent home was in Adelaide and he boarded at Murray Bridge. With this arrangement, it is not clear whether he actually operated from a Murray Bridge location.

Figure 14: Bob Parasiers VK5RF (left) and Ron Dube, inspecting a new two kilowatt transmitter for Broadcast Station 5MU.

VK5RF

Another amateur operator was Bob Parasiers who, around 1953, also came to Murray Bridge to take up duty at Broadcast Station 5MU (see Figure 14). Bob had operated pre-war from the Adelaide suburb of Glandore with the call sign VK5RP and post war with the call sign VK5RF Having settled in the town, Bob operated as a radio amateur in Murray Bridge for many years.

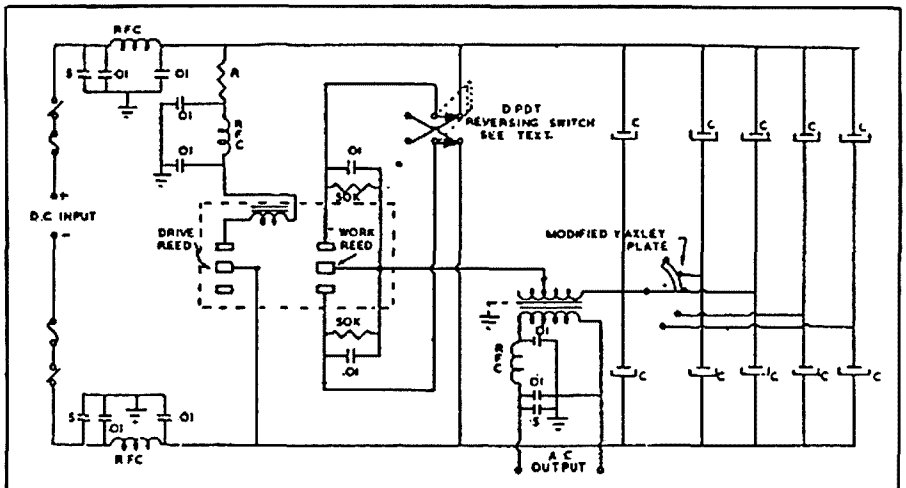
Like Len Porter, Bob is also now a Silent Key, and we have been unable to define what equipment he initially used at Murray Bridge. We do know that he commenced amateur radio operation in Adelaide around 1932. His early transmitter on the HF bands utilised push pull type 45 valves in a TNT circuit and his receiver was a three-stage TRF unit. On 200 metres, he used a three-stage crystal-controlled transmitter. The crystal control was probably necessary to satisfy stringent frequency stability requirements set down by the licensing authorities, at that time, for 200 metres. In those early years, amateur experimenters operated on that band. As broadcasting developed, stringent controls were progressively introduced, concerning the type of material transmitted, the operating hours and the standards of transmission. Ultimately, amateur operation on the broadcast band was prohibited.

Bob's final equipment at Murray Bridge, by then single sideband, included Swan 350 and 250 transceivers and an SSB transmitter, using 6146 final amplifiers, built by Gilbert Wilde VK5GX. Bob is thought to have joined the Silent Keys around 1969.

A further radio amateur, who worked at station 5MU for a short period around 1969/1970, was Ken Pledger VK5SV. Ken has been more recently listed in the call book at a Western Australian location as VK6SV, but we have been unable to contact him there to get details of his Murray Bridge amateur radio activities.

At this point, one could well have gained the impression that the local radio station 5MU had some affinity for amateur radio enthusiasts. In fact, the following holders of amateur radio licences have, at some stage, worked at 5MU: Frank Miller VK5BF Bob Grundy VK5BG, Staunton Macnamara VK5ZN and VK5ZH, Lloyd Butler VK5BR, Len Porter VK5MP, Bob Parasiers VK5RF, Ken Pledger VK5SV, Kevin May VK5AXT and Colin Davidson VK5IM. There may well have been several more we have missed.

A further licence holder, for whom we have few records, is Keith Kilsby VK5PR, who is listed in call books, around 1947 to 1954, as resident at Mingary and Wiltyerong, both via Murray Bridge. (The Kilsby property, on the river near Tailem Bend, is thought to have been named Wilterong). Keith is believed to have been a school teacher, possibly residing at various locations and using



C—Electrolytic capacitors to suit loading.
All 0.01 uF. capacitors are mica.
All 0.5 uF. capacitors are 600 volt paper.

F.C.1—Special chokes, see text.
F.C.2—2.5 mH. receiver choke.
—15 or 20 watt lamp, 220 v.

Figure 15: DC-AC Converter by Eric Cornelius which was used as a basis for a converter built by Bill VK5BP.

Murray Bridge as his postal base. He was apparently active prior to World War II as he is also listed in the 1937 call book at the town of Birdwood in the Adelaide hills.

There is another group who have been licenced amateur operators and have resided at Murray Bridge in the past, but were not active as radio amateurs at that time. This group included Tom Laidler VK5TL, Staunton Macnamara VK5ZN and VK5ZH, Jack Strachan VK5LH, John Millard VK5FC, Keith Angrave VK1RK and VK3BVK and Dave Goode VK5BF

THOSE DC MAINS

Prior to around 1953, when conversion to AC was completed, Murray Bridge was supplied with a three-wire DC power supply system consisting of 230 volts positive referred to neutral (and earth) and 230 volts negative referred to neutral (and earth). For the early radio amateur, it could be said that, if you hadn't experienced DC mains then you hadn't lived, because these mains presented a number of problems. Firstly, every second house was connected to the negative outer, that is, 230 volts negative on the active wire. Normal practice for valve equipment was to connect the negative high tension line to chassis, but if this were applied on a negative outer, then the chassis was at a dangerous potential. Either the negative line had to be isolated from chassis or the complete chassis had to be isolated from earth and human contact.

The second problem concerned supply for valve heaters. On AC mains, a stop down transformer was normally used, but on DC this option was not available. On receivers, heaters were generally operated in a constant current series heater chain (typically 0.3 amp). For transmitting valves, that was not always practical as valves were often directly heated and, in any case, often required many amps, so consuming much power when derived via a series chain from 230 volts.

The third problem was the limitation in plate voltage available. To transmit, using input powers approaching 100 watts, some 600 to 800 volts was normally required at the final amplifier plates and operation from only 230 volts amounted to a severe restriction in output power.

Various methods were applied to cope with some of these problems. Frank VK5BF had both mains outers wired to his house so that he was able to apply 460 volts to his final amplifier stage.

The house in which Bill VK5BP lived had a negative mains outer, This provided some incentive for him to build a DC to AC inverter[4] (Figure 15), a device somewhat difficult to get going satisfactorily because of the electrical interference created by the vibrator contacts which switched the high voltage DC. The inverter provided electrical isolation of mains from his negative high tension line (and chassis), as well as providing the AC source which could be transformed to the required voltage levels within the transmitter.

Lloyd VK5BR, rewound a genemotor to make a DC-AC rotary converter, which was sufficient to supply his valve heaters, but not large enough to power his high tension supplies, originally designed to operate from AC. The rotary converter operated from some time remotely located in his mother's pantry to isolate the noise, but one day the converter decided to destroy itself in a cloud of smoke and it must be said that this did not impress his mother in the least! By that time, Bill had moved to Adelaide where there was 'real' power and his vibrator inverter was pressed into service at VK5BR to replace the rotary machine.

Jack VK5AM, recalls problems he had with electric motor commutator noise on the DC mains and the low voltage experienced in the late afternoon when housewives turned on their electric cookers. The voltage often dropped so low that his oscillator stage ceased to function. (The problem with DC power is that high voltage distribution is not a practical option and power must be supplied all the distance from the power station at consumer potential, requiring very heavy main feeders to reduce the voltage loss). To reduce his mains noise level, Jack ultimately buried a converter in an old iron trunk in the garden and connected the converter via lead covered wires to his radio shack. There must be something magical about old iron trunks because Bill also used one to house his inverter!

MORE ON EARLY EQUIPMENT

The transmission mode up to the 1950 era was either CW or AM on the 3.5, 7, 14 and 28 MHz bands. VHF had not been widely used in Murray Bridge at that stage except for the early work on five metres. Also, Bob VK5BG, and Lloyd have a early record in their logs of having communicated on the six metre band in July 1947. Lloyd apparently was able to get his HF transmitter operational at 50 MHz and worked cross band to Bob who was on 7 MHz.

Transmitters and receivers were all home built although in later years, Frank and Bob eventually obtained the National HRO receivers and Jack had a B28. Audio power output valves, such as the 6F6, 6V6, 6L6, 2A3 and 45 were pressed into RF service particularly for RF driver stages. The 807 (Figure 16) was a very popular transmitting tube which was in plentiful supply from disposals following the war years. Power supplies were quite bulky to provide continuous power at high voltage to the RF amplifier for the AM mode of operation and for the high power audio amplifier needed with plate modulation. Because of the equipment bulk, larger transmitters were often panel mounted in a rack (refer Figures 1, 5 and 11).

807
Transmitting Beam Power Amplifier

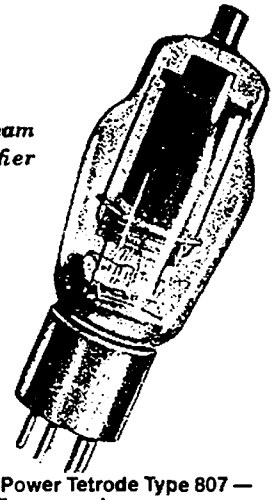


Figure 16: Beam Power Tetrode Type 807 — a very popular RF power valve.

Very early transmitters were self-oscillating or master oscillator — power amplifier units. However, by about 1940, with a requirement for better frequency stability, transmitters were essentially crystal controlled, the number of channels used being dependent on the number of crystals one possessed. The method of operation was to call CW on your own frequency and then listen around across the band for any reply from another station on his frequency. On contact, the QSO took place across two frequencies. A need for more versatility in choice of frequencies led to the development of more stable VFO units and Bill and Jack made use of these in their early transmitters.

Whilst superheterodyne receivers were generally band-switched, it was common practice to change bands on the transmitter by changing coils. Because each band change necessitated a retune of all RF stages, individual stage tuning and individual stage metering were provided as a front panel facility.

The early equipment built was, of course, all valve circuitry. The first small signal germanium transistors, extending into the high frequency spectrum, did not become available until about 1958 and power type transistors, for these frequencies, some years later. Integrated circuits had not been thought of and computing was in its infancy.

FURTHER DOWN THE TRACK

A more recent amateur operator is Kevin May, who was licenced in Murray Bridge around 1968, or a little earlier, with the call sign VK5ZKM. He later took up the call sign VK5AXT. Kevin is still resident in the town and controls operations at the local broadcast station.

A further more recent operator is Colin Schick VK5JP, who obtained his amateur radio licence in 1948, initially operating from the Adelaide suburb of Ovingham, but becoming inactive in the early 1950s. He took up residence in Murray Bridge in 1969 and recommenced amateur radio operations in the early 1970s when he purchased the Swan 350 transceiver, previously owned by the late Bob Parasiers.

Colin became involved with the Scout Jamboree on the Air (JOTA) and was active in the establishment of the Lower Murray Amateur Radio CLub based in Murray Bridge. Colin became the first president of the club and is still active in the club as its secretary. Information in the following paragraphs, concerning the background and activities of the club, has been presented by courtesy of Colin on behalf of his club.

THE LOWER MURRAY AMATEUR RADIO CLUB

The Lower Murray Amateur Radio Club was formed at a public meeting held at the Further Education Centre (FEC) in Murray Bridge on October 20, 1976. The meeting was well attended by people of many occupations in Murray Bridge and the neighbouring towns of Mannum, Tailem Bend, Jervois and other places. Colin Schick was elected president, Dean Jolly was elected vice-president, Richard Thiel was elected secretary and Kym Were was elected assistant secretary/treasurer. Other committee members elected were Barry Warnecke, David McNichol, Bruce Steven and David Edmunds.

Meetings of the club were held weekly in a classroom at the FEC and tuition was initially provided in radio theory by Richard Thiel, Dean Jolly VK5AKC and Colin Schick VK5JP. Colin also conducted Morse code practice. The club affiliated with the WIA and continued with lectures at the FEC for several years. A number of club members gained Novice, Limited and Full Call licences during their first year of membership. Barry Warnecke, from Jervois and now VK5ABW, gained his Novice and Full Call, then conducted classes at Tailem Bend to assist persons in that area with study for their licence.

Amateur radio displays were set up, in conjunction with other functions, at Mannum, Tailem Bend and Murray Bridge to publicise the hobby of amateur radio (refer Figure 17). The club has regularly provided stations for the Girl Guide and Scouting fraternity to take part in JOTA in the Lower Murray towns. Weekend camping trips at the Coorong and a weekend camp-in at Frahn's farm, at Monarto, have given members the opportunity to experiment with their equipment in more difficult conditions than experienced at their home QTH.

The incorporated club[5] now has permanent club rooms in the Murray Bridge Johnstone Park and operates with its club call sign VK5ALM. Station equipment is a TS520S transceiver with digital readout, a three element beam and a wire antenna. A club network is operated on Monday nights commencing at 1000 UTC on a frequency in the vicinity of 3.620 MHz. A regular controller of the network is Ray Turner VK5UY and operators on the network include club members from the surrounding district, as well as others, often from other Australian States and as far away as New Zealand.

Figure 17: Lower Murray Amateur Radio Club Display in conjunction with a Trade Fair at Murray Bridge. From left: Chas Swan VK5WG, Jeff Nottage VK5YU and Colin Schick VK5JP. (Unfortunately, Chas passed away in mid-December 1987).

The club offers the *Bunyip Award*[5] to interested operators and shortwave listeners who work or log the club station and members of the club. The Bunyip is a mythical animal which has been materialised in a model, built as a tourist attraction on the banks of the Murray River at Sturt Reserve, Murray Bridge.

The club is now in its 11th year of operation and approximately 25 amateur radio operators, in the Lower Murray area, have gained their operating licences through tuition from the club. Not all of them have been able to remain with the club, but the club's training program has certainly been a notable achievement.

PRESENT OPERATORS

Over the last decade, a number of amateur operators have held licences in Murray Bridge, some of them eventually moving on to other places. At the time of writing, the resident holders of amateur radio licences in Murray Bridge included Ray Turner VK5UY, Colin Schick VK5JP, Kevin May VK5AXT and previously VK5ZKM, Phil Stretton VK5YI and previously VK5NSO and VK5AKK, Colin Davidson VK5IM and previously VK5AJD, Richard Bowyer VK5NRB, Neil Peake VK5NTO and John Andrae VK5IH. Others who have recently moved on from the town, include Dean Jolly VK5AKC, Karl Saville VK5AHK, Sid Dalton VK5ASX previously VK5NSX, and Sid's wife VK5NUA. Other operators, in the neighbouring towns and district, also have connections with the Bridge through their membership of the Lower Murray Club.

THE END

Here our discussion ends. Within the limits of our fading memories and what records could be found, we have recalled an era of early experimentation when amateur radio operators built their own equipment, often to their own design. We have discussed, in chronological order, the various radio amateur enthusiasts who were active in Murray Bridge and discussed some of their activities and the equipment they used. We have started with an era around 1924 when radio experimenters operated on the broadcast band and we have concluded with some background of the radio club which is now based in the town. Some of us were born and brought up in the town but eventually left it and some of us came into the town from elsewhere and stayed there. Murray Bridge has been our town and we submit this document as its amateur radio story.

REFERENCES

1. JOHN F ROSS. *This History of Radio in South Australia 1897-1977.*
2. MARLENE AUSTIN VK5QO. *The First Sixty Years 1919-1980.* Amateur Radio *October 1985.*
3. THE ADELAIDE TELECOMMUNICATIONS MUSEUM, located near the GPO, has what is probably the most extensive collection of historic radio equipment in the Southern Hemisphere. For anyone interested in the history of radio, a visit to this museum is an enlightening experience.
4. VIBRATOR INVERTER. *Originally published in Proc. IRE (Aust) and rewritten for* Amateur Radio *February 1949 by Eric Cornelius VK6EC.*
5. Information on the activities of the Lower Murray Amateur Radio Club Inc, (including the Bunyip Award) can be obtained by writing to the club via PO Box 234, Murray Bridge, SA. 5253, or tuning in to the club network on Monday nights at 1000 UTC in the vicinity of 3.620 MHz.

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Unfortunately, Bob VK5BG, became a Silent Key shortly after this article was written.

TOPICAL TECHNICALITIES

Lindsay Lawless VK3ANJ
PO Box 112, Lakes Entrance, Vic. 3909

Topical Technicalities tries to provide readers with information which is not found in amateur text books and which is difficult to find in other text books.

Also, a different 'slant' on a familiar subject is presented where that could help understanding. The following professional standard notation for representing values of emf, current and power belongs to the 'hard to find' category. It is a very practical system recommended by Topical Texhnicalities to AR editorial staff and contributors.

The basic principals are:

a) Instantaneous values of quantities which vary with time are represented by lower case letters —
i for current, e or v for emf and p for power.

b) Fixed values such as maximum, average, effective and rms are represented with upper case letters —
I, E or V and P.

c) Constant value unidirectional (dc) and instantaneous total values are further identified by upper case subscripts.

d) Alternating values are further identified with lower case subscripts.

e) A single subscript is sufficient if there is no ambiguity, or use as required; eg v_{ce} for collector to emitter volts and i_c for the instantaneous value of the total (dc + ac) collector current.

f) Double subscripts are always used for supply volts and current; eg V_{cc} and I_{cc} for collector supply voltage and current.

If that notation is memorised and used by all there will be no need to append lengthy glossaries to each article or diagram. The following is an example:

$i_c = I_c + i_c \sin wt$

It is shorthand for 'the time varying collector current i_c comprises a constant value unidirectional (dc) component -value I_c plus a sine wave component (ac) with amplitude i_c. Figure 1 illustrates an application to transistor circuits.

More about standards — standards are a necessary part of intelligible communication. There have to be standard meanings for the words we use and a standard usage. Dictionaries try to do the task for us but unfortunately that effort is frustrated by those who choose their own meaning for the words they use. That habit is prevalent among technical people and radio amateurs are copying their professional counterparts by choosing their own set of meanings, and at the same time, claiming to be expert communicators.

The habit seems to be most prevalent among those who are using amateur machine telegraphy for computer intercommunication. Take, for example, the word 'data'. Which meaning will a novice choose from the following selection?

a) Oxford Dictionary — *data* the plural of datum.

b) Publication W — *data* digitally coded material (or information).

c) Publication X — *data* means numbers, facts, or anything already known that (sic) is needed to solve a problem.

d) Publication Y — (i) *data* are unorganised facts which appear as a collection of numeric and/or alphabetic and/or other characters in some representations.

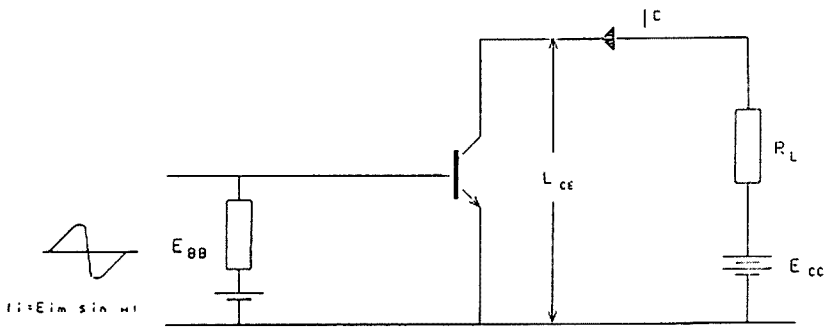
e) Publication Y — (ii) *data* are unorganised facts which are represented as a collection of characters, or which could be so represented.

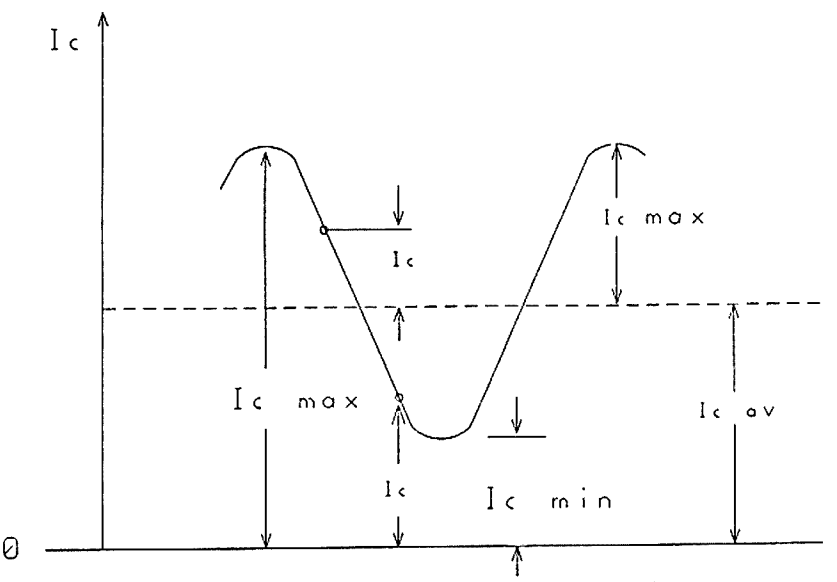
The authors W, X, Y seem to be attempting to share their confusion with their readers. At least they have attempted to tell us the meaning they have chosen, many others do not bother. What is wrong with the dictionary meaning? The fact that data is enciphered, encoded and translated to electrical impulses shouldn't change its meaning.

What is the meaning of 'data mode'? Is it an 'unorganised facts which are represented as a collection of characters, or which could be so represented' manner of communication; or maybe simply 'the many things known or granted' manner of communication?

Spare a thought for those people trying to acquire an understanding of the pastime. Mouthing hard words does not prove you understand hard things. Try some plain language, you will be surprised.

Figure 1.
i_c = instantaneous value of the total current.
i_c = the instantaneous value of the alternating component of I_c.
$I_{c\text{max}}$ = the maximum (peak) value of i_c.
$I_{c\text{max}}$ = the maximum of the alternating component of i_c.
$I_{c\text{min}}$ = the minimum of i_c.
$I_{c\text{rms}}$ = rms of i_c.
$I_{c\text{rms}}$ = rms of the alternating component of i_c.
E_{cc} = collector supply volts.
Apply the same logic to the base circuit currents and the circuit voltages.





THE FUTURE OF AMATEUR RADIO

by the Future of Amateur Radio Working Party

52nd FEDERAL CONVENTION

A report by the Future of Amateur Radio Working Party was considered at the 52nd Federal Convention, held in Melbourne on the last weekend of April. A presentation on the report was given by the Working Party, following which the report, and in particular its Conclusions and Resolutions, were debated for around four hours. Two recommendations were later modified to clarify their intent and the amended report adopted. The revised recommendations follow:

It is recommended the WIA adopt the following:

1 Note these Recommendations are based upon members opinions and comments as expressed directly or indirectly to the Working Party.

2 Agree the Amateur Radio Service must begin detailed planning soon, both nationally and internationally for WARC 92 and face the IARU Region 3 Conference in Seoul with definite proposals.

3 Note the Australian radio amateur is permitted a wide range of emission modes, specified on his licence as permitted occupied bandwidths. This approach permits considerable flexibility for the user, both now and in the future and agree this should be retained. Furthermore, note there is a direct relationship between the demonstrated theoretical knowledge level of an amateur licensee and the complexity of authorised emission modes.

4 Agree that the WIA initiate no change to the amateur Morse code proficiency requirements at this stage, pending further study of membership attitudes.

5 Endorse the WIA policy to press actively for an amateur licence currency in excess of one year with commensurately reduced fees. The longer term goal is an internationally accepted licence along the lines of the European CEPT scheme.

6 Agree the WIA position for frequency allocations for WARC 92 and convey that position to IARU members at the Region 3 Conference at Seoul 1988.

7 Agree the Japan/Australia reciprocal licence agreement be examined for possible bias against Australian amateurs, more specifically the amateur novices and if confirmed, redress be sought.

8 Agree the formation of WIA/DOTC joint committees be encouraged to facilitate communications with the Department and promote self-regulation of amateur radio.

9 Endorse the licence option for an additional entry point within the existing novice to unrestricted licence range and represent it to DOTC.

10 a) Endorse the preferred options for amateur licence restructuring as illustrated in the examination and licence models shown below and seek implementation at the earliest opportunity by DOTC.

b) Direct the Working Party to further develop proposals for suitable frequency allocations to be assigned to each licence grade.

11 Endorse the editorial policy of *Amateur Radio* magazine in publishing the current series of home construction and simple projects which are satisfying an expressed demand.

12 Agree the matter of WIA channels of communication needs examination and perhaps reorganisation if the current membership to Division and/or Division to Federal system is confirmed cumbersome and inefficient.

13 Note the Working Party has completed its duties as directed and task it with implementing these recommendations.

EXAMINATION MODEL.

THEORY	BASIC	FULL
NIL	VHF NOVICE	VHF INTERMEDIATE
MORSE SLOW	NOVICE	INTERMEDIATE
FAST		UNRESTRICTED
REGULATIONS	ONETEST	

LICENCE MODEL.

GRADE	TECHNICAL	BANDS
VHF Novice	CW/SSB/AM/FM Low Power	Novice VHF/UHF
Novice	CW/SSB/AM/FM Low Power	Novice HF/VHF/UHF
VHF Intermediate	All Modes High Power	All VHF/UHF
Intermediate	All Modes High Power	Novice HF All VHF/UHF
Unrestricted	All Modes High Power	All VHF/UHF All HF

NOTE: The licence model above indicates general principles adopted and requires further development by the Working Party under Recommendation 10 (b).

WHERE TO NOW?

As you will see from Recommendation 13, the Working Party continues in existence and is tasked with implementing these recommendations. This approach was taken with the activity being progressed as a project by the Working Party, separate from normal Executive actions, as the Executive found over the past few years they were able to carry out, at best, one project each year. Obviously this year Executive has a full workload with the IARU Region 3 Conference plus progressing the review of the corporate structure of the Institute.

As stated in an earlier AR paper by the Working Party, these recommendations are evolutionary rather than revolutionary. They tend to follow membership opinion rather than guide it, however a few items may generate more opinion from members.

WARC 92 AND IARU REGION 3

Recommendations two and six, concerning WARC 92 planning, have already commenced with the Convention adopting a set of guidelines for negotiations both within Australia and at the IARU Region 3 meeting in Seoul in October this year.

MORSE CODE

Despite some representation (principally from Queensland) to seek removal of Morse code from amateur examinations, a majority of members appear to favour maintaining the status quo. This is reflected in the amended Recommendation 4. Note that a number of overseas administrations accept our 10 WPM as equivalent to their 12 WPM for reciprocal and visitors licence purposes.

The Convention was advised the European CEPT licence proposals fall short of being a Euro-licence, for they apply only to temporary visits between subscribing countries and also apply only to two licence classes, equivalent to out limited and full licences. Nevertheless, we should strive for CEPT recognition as a first step and to assist Australian amateur visitors overseas. All that is needed initially is for DOTC to indicate the CEPT licence classes on the Australian licences and subscribe to the CEPT agreement.

SELF-REGULATION

Self-regulation, as distinct from de-regulation, has been the aim of both the Department and the WIA. It has brought in its wake an increase in poor on-air behaviour which, in the past, would have attracted the attention of now defunct advisory committees. To bridge this gap and maintain close relationships with DOTC, the formation of local joint WIA/DOTC committees is recommended. These committees need only be as formal as the participants desire, provided they permit regular contact between the two parties involved. Feedback of their observations to WIA Divisions and their broadcasts would assist in restoring our once proud operating standards.

EXAMINATIONS

Although examinations and licences are connected, concern about the former has all but disappeared as amateurs wait for the first of the devolved examination series. No doubt it will take several years for the new system to settle down and provide what it is intended to do, namely an affordable examination available at reasonable intervals and at the applicants convenience. The examination model does not introduce any more subjects, yet allows an extra licence grade to be introduced.

LICENCES

A recent move to widen the privileges for combined licence holders (K calls) appeared as a

separate Convention agenda item but was withdrawn, for the licence model of Recommendation 10 incorporates these views.

The Working Party was re-tasked by Recommendation 10 (b) to provide detailed proposals as to frequency bands to be ascribed to each of the licence classes of the licence model. Some of these are obvious, namely unrestricted and VHF intermediate, however this is a good opportunity to review the novice frequency allocations, both the HF band segments, which have existed now for 13 years and the recently granted 146-148 MHz FM segment. The Working Party's Paper 4 on licence restructuring made some suggestions as to increased HF allocations for novices, namely all of the 3.5 MHz band, an increase on 21 MHz and also an increase on 28 MHz to allow FM and consequently repeater operations.

These increases must be weighted against the need to maintain an incentive to upgrade, however the proposed intermediate licences can also be seen as a suitable objective for many, who will find their privileges adequate for their needs.

AMATEUR RADIO MAGAZINE

Our magazine satisfies an important need by providing amateurs with regular tangible evidence of their Institute membership as well as providing a vehicle for passage of information and a means of promoting the technical side of the hobby. With equipment costs continuously rising and a desire to recruit more younger members, the magazine has an important part to play in furthering the home construction of modest receivers, transmitters and accessories. Specialist kit sales by Divisions on a co-ordinated basis is another way the WIA can assist its members.

COMMUNICATIONS WITH MEMBERS

The Working Party discovered that members are generally not aware of the complicated ways in which the WIA is governed. Through its co-ordinated approaches of *Amateur Radio* magazine, Federal Tapes on Divisional Broadcasts, and Federal Councillors, the Federal Body has very good means at its disposal for the dissemination of information. In contrast, the return flow from members, due to the filtering actions of the Divisional structure, is limited to letters to the editor of AR and some direct correspondence that bypasses Divisions. This passage of information must be improved, both as to quantity and quality, for often the proposals of the vocal minority are purported to be the views of the silent majority.

Noticeable improvements have been observed in those Divisions which conduct "Conferences of Clubs" or like forums to solicit members views, however at times these endeavours are frustrated by lack of background knowledge by the general membership. This matter will be referred to those responsible for reviewing the corporate structure of the WIA.

NEXT ACTIONS

Once again we ask, *where to now?* The Future of Amateur Radio Working Party will continue as directed and prepare submissions and plans to seek the implementation of these recommendations. If you have any comments on them please write, via your Federal Councillor, as before. But one last plea, whatever is introduced must be simple to understand, administer and police for the amateur effort available is predominantly volunteer and our government is firmly committed to "user pays" for its services. Let us not request a monster and price ourselves off the air!

—Compiled by Ron Henderson VK1RH, Federal Executive Member

IMMUNITY —

the sword of Damocles

In his address to the recent WIA Federal Convention, the Assistant Secretary, Radiocommunications Branch, DOTC, Mr John McKendry stated that it was becoming more and more difficult for his Department to completely "defend" the amateur position in certain immunity problem situations, particularly where Ministerial complaints were involved.

He commented that sometimes the deciding factors in an EMC dispute could become social and even political, rather than technical, and that the Department, as the final arbiter, has already been forced to apply certain restrictions to amateur operating conditions in extreme and isolated situations. This had occurred despite the fact that the amateur in question might rightly claim that technically he was without fault.

This disturbing trend is world wide. In his annual report to the Convention, the Federal Standards Co-ordinator highlighted the problem in the following terms:

> "There have been disturbing developments in Canada, the UK and other parts of the world where limits have been imposed on amateur operations because of deficiencies in the immunity of domestic electronic equipment. This has come about because of the lack of appropriate EMC performance standards for (primarily) television receivers, video cassette recorders and AF amplifiers, although many other types of domestic electronic and electrical equipments can become involved at times. Secondly, as demonstrated in the Canadian Ravenscroft case, a lack of understanding of the logical apportionment of responsibilities for detection and clearance of the sources of the problem on the part of those involved in negotiations, can react most unfavourably on the Amateur Service."

What is being done to solve the problem? The answer is obviously complex. One of the most important needs, recognised many years ago, is the specification and application of appropriate immunity performance standards for domestic electrical and electronic appliances which are enforceable by regulation. This will counter the present justifiable response to complaints of defective immunity, namely that the apparatus is operating to current Australian and international standards.

In the early 1980s, the then Department of Communications was fired with enthusiasm — the Radiocommunications Act — the essential vehicle for application of the required standards, was proclaimed. The Australian Standards Association, eager to assist, formed special working committees to produce Australian immunity standards which could be applied at least until the International Electrotechnical Commission (IEC) and its associated Special Committee on Radio Interference (CISPR) were able to produce truly international standards.

The WIA has made its contribution, modest as befits a relatively small hobby organisation — providing a chairman/member of the Immunity WP of the SAA and by co-ordinating Government, instrumentalities and Industry participation of the WP activity.

Other countries such as the FRG, Canada and the USA have already produced and applied national standards on immunity — but Australian efforts have foundered. Support from Government and industry has waned and the DOTC, which was once in the forefront of the action, has failed to make any significant contribution over the last few years. Australia has now joined the vast majority of nations waiting on the sidelines for the IEC and CISPR to complete the job!

In the meantime the WIA, mainly through the co-ordinating processes available at the regular WIA/DOTC Joint Meetings, has been able to head-off EMC/immunity problems which might otherwise have become political issues. You may be assured that everything possible will continue to be done to counter the ominous trend discussed at the 1988 Convention. However, until the essential immunity standards are in place, the threat of restrictions on amateur operating conditions will remain. This will be a long and difficult period!

Will the Horsehair Hold!

NOTE: For those unversed in the classics, Damocles was a courtier whom King Dionysius of Syracuse treated to a splendid feast, but over whose head he caused a naked sword to be suspended by a horsehair, as a lesson that danger may overhang greatness and outward felicity.

—Contributed by Allan Foxcroft VK3AE, former Federal Standards Co-ordinator

THIRD PARTY TRAFFIC

This report has been prepared following the discussions on Third Party Traffic at the 1988 Federal Convention.

Last September, *Amateur Radio* magazine published a factual and explanatory article on Third Party Traffic (TPT). That article had been checked with the DOTC before publication and its contents agreed as substantially accurate by the Department. Since that time some Australian amateurs have made representations to DOTC concerning international temporary Third Party Traffic arrangements for health and welfare traffic during natural disaster situations and also pressed for a Third Party Traffic agreement with New Zealand.

The inquiries concerning New Zealand led to DOTC formally defining Third Party Traffic. Their definition adopts the dictionary representation. It is restrictive and has led to the editing of ZL messages from Australia Bulletin Board Services (BBS). Essentially, DOTC defined the sender and receiver as the first and second parties and any other incidental receiver, amateur or not, as a third party. Consequently, ZL traffic into an Australian BBS could not be on-forwarded to a third party.

Unfortunately, the New Zealand Radio Frequency Service (RFS) defines third party traffic much more liberally and the ZL actions described above are not in conflict with their regulations, only ours!

A DOTC official, in addressing the 52nd Federal Convention, stated he wished to get a collective response on TPT from the WIA, as distinct from those of small pressure groups. Indeed, he would prefer the individuals involved to work through the WIA.

Having stated the definition of "third party" above, he asked what do the Australian amateurs and the WIA want? If the Australian approach is out of line with other countries and the WIA has the opportunity to discuss this at the IARU Region 3 Conference in Seoul during October 1988, then the Department would examine their policy.

DOTC also invited comment from the WIA on the setting up of international TPT arrangements on a temporary basis for health and welfare messages arising from natural disasters.

At the Convention, the Federal Executive introduced an agenda item proposing "this Council agree a definitive policy on Third Party Traffic and represent it to DOTC". The motion was carried unanimously and generated two related motions which were also adopted unanimously.

Firstly "this Council supports IARU Administrative Council Resolution 85-7", which reads:

> The IARU Administrative Council invites the International Secretariat:
>
> 1. to review Article 32 of the International Radio Regulations, and to identify for the Administrative Council the modification that may be required to facilitate the development of the world-wide packet radio network, bearing in mind the concerns held by administrations regarding such communications;
>
> 2. to collect from member-societies information on how their domestic regulations limit to facilitate the development of packet radio, with the objective of determining what common problems may exist; and
>
> 3. to develop recommendations for Administrative Council consideration as to how these problems should be addressed, with a report to be rendered shortly prior to the next meeting of the Administrative Council.

Australia responded in 1986 to a request from the International Secretariat for national societies views.

The second Convention motion was "that this Council re-affirms minute 84.09.16". The minute, passed in 1984, states:

> The Executive should pursue strongly the matter of Third Party Traffic using the following criteria:
>
> 1. All countries with whom the USA has third party agreements,
> 2. All countries in which Australian Service Personnel are stationed,
> 3. The United Kingdom.

The Council agreed the first approach to setting up TPT agreements should be contact by the WIA with the other nation's national society representing its radio amateurs. A favourable response would lead to a request to DOTC to initiate or renew negotiations.

During discussions, the Council confirmed their wish that any amateur to amateur contacts should not be considered third party actions because of the open broadcast nature of amateur radio communications. The Council wished these views to be passed to DOTC and this has now been done.

On the subject of temporary international Third Party Traffic agreements for welfare and health purposes during natural disasters, the Federal Council was undecided and believed the matter needed further research. Was the need genuine or created in part by some zealous amateurs? Were the returns really worth the effort and did amateur radio have the extensive resources necessary to carry out an effective and efficient operation? The Federal WICEN Co-ordinator was of the opinion that the National Disaster Organisation and International Red Cross should be consulted as to their views. The Federal Executive will research this matter over the next few months.

SUMMARY

1. The WIA seeks to have any amateur to amateur communications to not be considered as Third Party Traffic.
2. The Executive will continue its endeavors to obtain TPT agreements with the nations defined in the 1984 Convention minute.
3. The WIA support the IARU International Secretariat's views that Third Party Traffic matters should be liberalised through bilateral agreements between nations and/or a less constraining definition of Third Party Traffic in domestic regulations.
4. The merits, constraints, advantages and disadvantages of temporary TPT agreements, together with the views of the international relief agencies involved will be examined by the Executive and a position put before Council.

—Prepared by Ron Henderson VK1RH, Member of the Federal Executive
May 17, 1988
ar

CEPT LICENCES

Talking to European radio amateurs or reading European amateur literature, one comes across that "mysterious" expression *CEPT Licencing.*

One would gather that it is some sort of European Common Amateur Radio Licence, and even most European amateurs have similar thoughts and hail the introduction of the CEPT licencing system as being equal to the much hoped for Euro licence.

The executive of Vereniging voor Experimenteel Radio Onderzoek (VERON), the Dutch national amateur organisation, recently published a history of CEPT licencing in their monthly journal *Electron.*

Besides the history, the VERON executive also explain the role the Dutch PTT has played, and is still playing, in making this licencing system more liberal, aiming to make it eventually a real Euro amateur radio licencing system.

CEPT stands for Committee Europienne des Postes et Telecommunications, a union of European Post and Telecommunication authorities. Twenty six European countries are members.

The CEPT accepts certain recommendations from members to facilitate some standardisation of technical, operational and administrative procedures. The member countries are obliged to accept particular recommendations in-toto if they wish to introduce it in their own country. Should a particular PTT have any objections to one or more clauses in a recommendation, the only way open to that particular administration is not to introduce it at that time and attempt to introduce amendments at a following CEPT conference.

Prior to the acceptance of CEPT licencing, many European countries already had reciprocal agreements. This required a visiting amateur to fill in numerous forms to apply for a visitor's licence, often at great cost. The "user pays" principle is rife and, especially during holiday periods, the licence fees were liable to be rather exorbitant, including long waiting times, to pay for all the overtime that a particular administration had to incur.

Neither the IARU Region I societies, or the administrations were very happy with this situation. Finally, in 1981, IARU Region I instituted a special committee, the Common Licence Group (CLG), to collect and summarise ideas from national amateur organisations in a proper format for presentation to the European administrations with the ultimate aim to institute a Common European Amateur Radio Licence.

The PTTs, united in CEPT, commenced an intense study to find a solution, acceptable to all CEPT members, regarding amateur radio licence qualifications.

The CEPT general meeting in June 1985, issued Document T/R 61-01 and the official text was distributed to all member PTTs in December 1985. it should be noted that this document does not attempt to make all European licences equal, that is very difficult anyway as licence qualifications vary from country to country. However, the first big step in the right direction was made.

Document T/R 61-01 will enable licenced radio amateurs to operate during their annual holidays, from a foreign country, either portable or mobile, without going through the traumatic experience of applying, and waiting, for a visitor's licence, probably only for a period of no more than four weeks. The visiting amateur is further allowed to operate the station of a licenced local amateur. However, this can only happen when that particular country has accepted Document T/R 61-01 (note, the Eastern Bloc countries are not members of CEPT). This CEPT regulation does not apply if one intends to stay in the country for a longer period than an average holiday period and it will definitely not apply to those amateurs who happen to have a holiday home in that particular country. It is quite common for Germans to have holiday homes in the Netherlands, or the Dutch to have second homes in Luxembourg. In those cases, one must apply for a genuine visitor's licence.

Document T/R 61-01 recognises two classes of amateurs:

CLASS 1 — This classification will only be issued to amateurs who have passed an examination, including a Morse test. Generally, Class 1 would be issued to those with the equivalent of the Australian AOCP It will entitle the holder to use all amateur frequencies as authorised in the country of destination.

CLASS 2 — This covers only the VHF UHF and higher amateur bands applicable in the country of destination. Is is usually issued to those with the equivalent of the Australian AOLCP

The PTT of a country which accepts the CEPT ruling has to establish the following:

a. Establish which national licences are acceptable to be issued with a Class 1 licence. The PTT must consider a clause in the CEPT document which says that a CEPT class can only be considered equal to the local licence rules if the rules applicable in the other country do not vary to a great extent from the local rules.

The Netherlands PTT ruled that CEPT Class 1 equals the A and B licences (VK AOCP), whilst CEPT Class 2 equals the C licence (VK AOLCP).

b. As an amateur with a CEPT licence can only operate from a foreign country within the technical qualifications applicable to his own national licence, a PTT must first establish the regulations to be followed.

The Dutch PTT decided that a Dutch CEPT Class 1 licencee may operate in another country according to the regulations applicable to the Dutch A licence, while a Dutch CEPT Class 2 amateur follows those applicable to the Dutch C licence.

It is further important to know that, regardless of the above, the visiting amateur must obey the local regulations as applicable to the local Amateur Radio Service.

c. The PTT must supply the amateur with a document which clearly states, in four languages, the CEPT class of operation and, preferably, also list of countries where a CEPT licence is valid.

(The Dutch PTT has all this information included in the annual renewal licence a Dutch amateur receives upon paying his annual licence fees).

Norway (May 1, 1986), Germany (May 26, 1986) and The Netherlands (July 10, 1986) were the first European countries to adopt Document T/R 61-01. In the meantime, 12 of the 26 countries have adopted this document, namely Austria, Denmark, France, Liechtenstein, Luxembourg, Monaco, Switzerland, Sweden and Belgium. Sweden only allows Class 2 operation for the time being. Portugal has indicated that it will introduce CEPT licencing in the near future.

THE DUTCH PTT AND CEPT

The Dutch PTT appears to be the most innovative of the CEPT members. In July 1987, they forwarded a letter to all CEPT members who had not as yet introduced the CEPT licencing, stating that all radio amateurs from those countries whose licences are equal to the CEPT Class 1 or 2 licences, will be allowed to operate from The Netherlands under T/R 61-01 conditions, provided their local licence papers clearly indicate the appropriate CEPT class. This is possible because many European countries have already, unofficially, notified CEPT of their intention to adopt T/R 61-01 but, due to the lengthy local procedures, are not yet in a position to introduce the document in their respective countries.

The Dutch PTT, in the same letter, asked of the administrations concerned to issue the Dutch amateurs with a free reciprocal visitor's licence. The reasoning behind this suggestion is, that "we give your amateurs the opportunity to operate from The Netherlands without extra paperwork and payment and, while we acknowledge that you still have legislative problems, we think it is appropriate that our Dutch amateurs should not pay for the delay".

THE DUTCH D-LICENCE

This licence is the novice licence in The Netherlands. They are only allowed to operate on 144-145 MHz and this leaves the Dutch novice out in the cold. This licence Is definitely not equal to CEPT Class 2. The Dutch PTT tried, in 1985, to introduce a few more CEPT classes, among them a Class 3 to cover the Dutch novices, but without success. VERON is still working to have this corrected and the Dutch PTT is more than willing to assist. But both VERON and the Dutch PTT agree that it would not be correct to equate a D licence with a C licence without the licence holder passing the appropriate examination.

The Dutch southern neighbours, Belgium, have found an interesting solution. In December 1987, a new act was promulgated from CEPT. It also introduced a separate Class 3 licence, 144-145 MHz, very similar to the Dutch D licence.

VERON immediately approached the Dutch PTT and, in February 1988, PTT advised that they were willing to issue the D licencees with a licence indicating that their certificate was equal to the Belgian Class 3 licence. Further, PTT is negotiating with Belgium to approve reciprocal licencing of Belgian novice amateurs. These exchanges will still "obey" CEPT regulations, namely a very short, temporary stay in the respective countries.

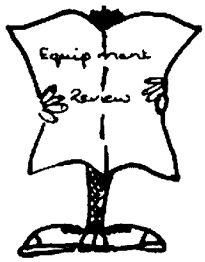
THE FUTURE OF AN EURO LICENCE

Although the present CEPT ruling is a step in the right direction, the ultimate aim is still a Common Licence for Europe, or even Region I. This will be a great, uphill battle, considering the great variations in local regulations and examinations. Neither VERON nor the IARU CLG expect short-term results.

The European amateur has a very active and sympathetic ally in the Dutch PTT/Radio Control Service. They are willing to consider well thought out proposals from IARU Region 1 CLG and bring those proposals to future CEPT conferences.

Step by step the evolution continues, first the possible introduction of a CEPT Class 3 licence to cover the novices, then the possibility whether or not non-CEPT countries may be able to join the scheme on a voluntary basis. And immediately two countries spring to mind — New Zealand and Australia. Many of our amateurs are going overseas to Europe and it would be great for them to have a licence acceptable to many European countries, come off the plane, take the hand-held and call CQ on the local repeater. What a thought, but, who knows, administrations are, after all, very innovative!

—Summarised from an article which appeared in *Electron* April 1988, written by PA0QC and PA0TO, members of the VERON/PTT Working Party, and contributed to AR by John Aarsee VK4QA



Equipment Review

KENWOOD

Kenwood TM-721A Dual Band FM Transceiver

Gil Sones VK3AUI
30 Moore Street, Box Hill South, Vic. 3128

The Kenwood TM-721A Dual Band FM Transceiver is a very accomplished radio. The case is no bigger than that of many single band FM transceivers of just 10 years ago. They could only manage 10 watts on one band. The TM-721A gives you 35 watts on 432 MHz and 45 watts on 144 MHz. Quite a step forward and with so many other features as well.

Power output was well up to the specification and was maintained over a reasonable range of standing wave ratio. This was observed by monitoring power output and SWR whilst using the radio with normal commercial aerials throughout both the 144 and 432 MHz bands. Power output was maintained throughout the band whilst the SWR varied.

One interesting accessory is a dual band aerial and duplexer which would be useful for mobile operation. The TM-721 has separate aerial inputs for each band which allows great flexibility.

Duplex operation is possible should this be desired as there are really two radios in the one box. Of course, the ability to monitor one band while operating on the other is a great convenience.

Both bands can be monitored and the audio from both can be mixed into the loudspeaker. The mix is continuously variable so you can always turn up or down either. Very useful for monitoring without upsetting the loudspeaker volume.

Naturally the full range of features we expect from a radio is provided with a few extra niceties. The beep tone which accompanies many of the push-buttons can be turned on or off. The tone of the beep is different for each push-button. Very handy when you are zooming along the highway.

The TM-721 is very well packaged and comes complete and ready to go on the air.

On air the deviation in the review model was on the low side. This could easily be corrected by adjusting the microphone gain control. This is a personal choice as it does depend on how loudly one speaks into the microphone. For mobile use, if you have it wound up too far, the road noise becomes obtrusive. So maybe the setting was a reasonable compromise.

I do have one small complaint and that is the use of series UHF RF connectors on both 144 MHz and 432 MHz. Surely in a radio of this quality Type N connectors could be used.

Internal construction of the transceiver is very clean. The use of Surface Mounting Components has contributed greatly in this regard together with the use of connectors on wiring looms. A big advance on the rats nest that used to be inside the lid.

On air the radio worked perfectly on both bands. I was pleased to have been able to make a contact through the repeater VK3RNE to VK2ACP at Wentworth Falls, New South Wales. Quite a reasonable distance from both stations to the repeater. The contact was of course aided by favourable tropospheric conditions. Other contacts on both 144 and 432 MHz bands were most satisfactory.

Well, that brings me to the bottom line . I can thoroughly recommend the TM-721 and it is now up to you and your bank manager whether you can drive one.

Thanks to Kenwood for supplying this review transceiver.

For further information about the Kenwood TM-721 contact Kenwood Electonics Australia Pty Ltd, 4E Woodcock Place, Lane Cove, NSW. 2066, phone (02) 428 1455 or your local Kenwood Dealer.

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Kenwood TM-421A 70 cm UHF FM Transceiver

For those who need a small 70 cm FM transceiver the Kenwood TM421A is an excellent choice. Full features together with a conservative 35 watt power output are packaged in a very neat and small package. A very impressive radio indeed from Kenwood.

Panel Layout is very clean and uncluttered. This is even more impressive in view of the features and performance of the transceiver. Controls are of a reasonable size allowing easy and unambiguous operation.

For such a small physical size the output power is claimed as a most impressive 35 watts. On test the TM421A was able to provide 40 watts or more into the antenna cable. This was with a wattmeter which is very reliable and not given to generous outbursts.

The receiver is unfussed by strong local transmissions and appeared to be of quite adequate sensitivity.

Internal layout is also clean and uncluttered. Surface mounted devices are extensively used and the RF is amplified in a Module. Send receive changeover is by a diode switching arrangement which avoids clattering relays.

On the rear of the case is a substantial heat sink. This needs to be kept clear so as to allow for clear circulation of air. The heat sink gets quite warm in use and should not be blocked - something to consider when mounting the transceiver in your car.

My one complaint is the use of a series UHF RF connector for the antenna connector. For such an excellent transceiver a Type N connector is appropriate. Seems a great pity to mar such an excellent radio by fitting such a connector.

The packaging is of the usual high standard. Individual items are covered in plastic and fitted into a foam insert inside the outer cardboard box.

The instruction book is clear and includes both block and circuit diagrams.

Definitely a transceiver which can be recommended.

Thanks to Kenwood for supplying this review transceiver.

For further information about the Kenwood TM-721 contact Kenwood Electonics Australia Pty Ltd, 4E Woodcock Place, Lane Cove, NSW. 2066, phone (02) 428 1455 or your local Kenwood Dealer.

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ABOUT THE REVIEWER

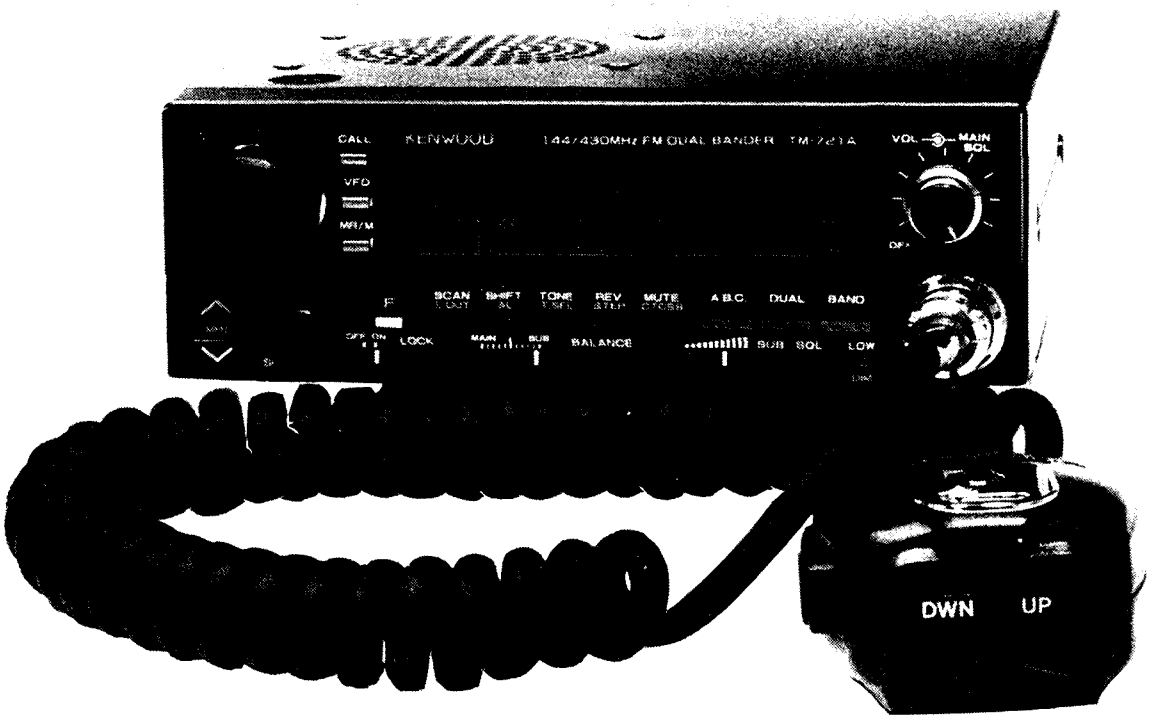
Gil Sones VK3AUI, was first licensed as VK3ZGS, in 1963, and upgraded to VK3AUI in 1969.

Gil is employed by the State Electricity Commission of Victoria as a an Engineer in the telecommunications field.

Amateur radio interests are principally in the VHF/UHF area and he is a keen 6 metre operator. Over past years Gil has been a driving force in the provision of a beacon keyer and equipment to activate Macquarie Island, Heard Island and Willis Island on 6 metres.

Gil has been involved in the production of *Amateur Radio* magazine for many years, a valued and hardworking member of the Publications Committee and a past Editor of the magazine.

Other interests are travel, cycling, bird watching, hot-air ballooning and generally enjoying life.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KENWOOD
144/430MHz FM DUAL BANDER TM-721A
VOL
MAIN
SQL
VFO
MR/M
SCAN
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DUAL
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LOCK
MAIN
SUB
BALANCE
SUB
SQL
LOW
DWN
UP


VFO/M
M.IN
MHz
KENWOOD
430MHz FM TRANSCEIVER TM-421A
VOL
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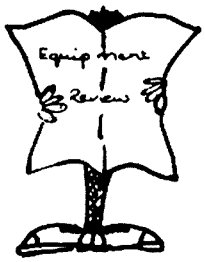

Equipment Review

ICOM IC-228H

Ron Cook VK3AFW

Another two metre unit?

Yes, this is another two metre FM unit but with some differences. It is compact, full of features, high powered and, going against the recent trend, has a simple front panel.

Weighing a mere 1.1 kilogram, it is 140 mm (W) x 50 mm (H) x 169 mm (D). This is smaller than most 10 watt units were a few years ago yet it delivers a husky 45 watts to punch through the noise.

The large amber coloured display takes up almost one third of the front panel yet the frequency tuning knob is still a sensible size as are the eight main push-button controls, this making it a unit suited for both mobile and fixed station installations.

FACILITIES

The transceiver is equipped with 20 memory channels and a call channel. Each memory can retain either a simplex frequency or a repeater frequency and it's offset. These memories can be scanned and one or more can be set to be skipped over during scanning if desired. Alternatively, a segment of the band can be scanned without altering the memories. When the priority watch function is evoked, the receiver checks the priority channel every five seconds. If a signal is detected on this channel then the function display flashes for 15 seconds at which time the receiver reverts to listening in the previous mode, checking the priority channel again every five seconds.

Each time a control is touched the set emits a beep. This tells the operator that a button has been activated, useful when mobile as you can keep your eyes on the road. This facility can of course be turned off.

The main tuning knob functions either as a VFO tuning control or as a memory channel selector, the function being selected by a push button placed above the knob. An additional feature is the provision of a call channel, separate from the priority channel, for your most often used frequency. This is selected by a button near the main tuning control. Separate LEDs are provided to indicate receive or transmit operation. Writing data to the memories is controlled by a push button as is the dial lock facility.

Rapid frequency changes can be achieved by selecting a 1 MHz step for the VFO. A low power (five watts) mode is available. This can be adjusted if the case is removed to give say 10 watts if desired.

The input frequency of a repeater can be checked by pressing the Monitor switch which is connected to the squelch level potentiometer. The microphone is fitted with buttons to allow the operator to change the VFO frequency or memory channel without touching the front panel. A 16 button keypad is available on the rear of the microphone for audio tone selection (DTMF) if the appropriate option is fitted. Programmed subaudible tones can also be used with the appropriate option. Frequency steps of 5, 10, 15, 20, 25 kHz may be selected.

INSTALLATION

A DC power supply capable of supplying 13.8 volts (± 15 percent) at up to 9.5 amps is required. On receive a maximum of 0.8 amps is used at full audio output and 0.45 amps on standby. Good ventilation is recommended. Both power and antenna connections are made to connectors on short leads protruding from the rear of the set. An external eight ohm speaker can be plugged in if required. An antenna with a low VSWR is necessary for good results.

ON AIR

The set was easy to use, no doubt a combination of a clearly set out easy-to-read manual and logical function design. The Function Display clearly showed the operating frequency with six big digits, duplex ± when selected and signal strength on a wedge shaped graphical 'S-meter' with seven divisions and markings of 1, 5 and 9. This same display also indicated output power level. When low power was selected this was also indicated on the display. Selection of the Priority Watch and 1 MHz step functions also brought up indications on the display. Operation of the memory mode was also indicated along with the memory channel selected and whether it was programmed as a skip channel. The memory channel number is replaced by the letter "C" when the call channel is selected. Repeater offset, beep status, dimmer level band scan edges, tuning steps and subaudible tone frequency (if installed) can all be viewed on the display.

Received audio from the inbuilt speaker was good but to get the full benefit of the 2.4 watts output and best audio quality an external speaker is necessary, as in all units of this type. All controls operated smoothly and positively.

Although no accurate measurements were made, the set appeared to deliver in excess of 45 watts right across the band and was quite sensitive. Selectivity seemed to be as good as claimed and no unwanted responses were detected. Excellent reports were received.

TECHNICAL DETAILS

The frequency, mode and memory operations are all controlled by a single chip microprocessor. The phase-locked-loop (PLL) is also essentially only one IC. The reference frequency is 12.8 MHz.

An integrated block IC power module is used to provide the final power amplification and feeds the antenna via a diode switch and a lowpass filter. Automatic power reduction circuitry provides protection against a less than perfect antenna match. (Any VSWR above 1.5:1 should be avoided and low power used if the VSWR is greater. A VSWR of 2:1 or more is excessive). Frequency stability is claimed to be ± 10 ppm for temperatures in the range minus 10 to plus 60 degrees Celsius. This should cover most shacks!

Frequency deviation is set at ± 5 KHz nominal.

The receiver uses a 3SK174 FET RF amplifier which is protected from out of band signals by a bandpass filter. It uses double conversion, the first IF being 17.2 MHz and the second 455 kHz. Sensitivity is stated as 0.18 μV for 12 dB SINAD. Selectivity is stated to be 15 kHz at minus 6 dB and 30 kHz at minus 60 dB.

SUMMARY

This is a snappy little unit with a big signal which should fit into even today's cars. It combines first class performance, Icom quality, ease of operation and almost every feature required in a modern mobile FM transceiver.

ACKNOWLEDGMENT

The Icom IC-228H was kindly made available by Icom Australia, 7 Duke Street, Windsor, Vic. 3181, to whom inquiries should be directed.

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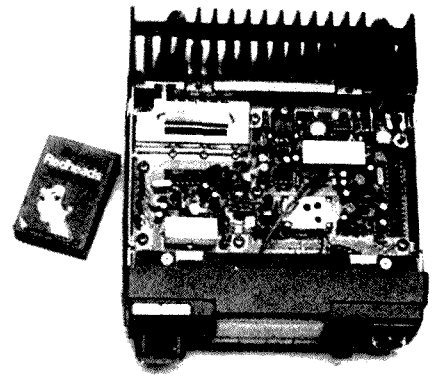


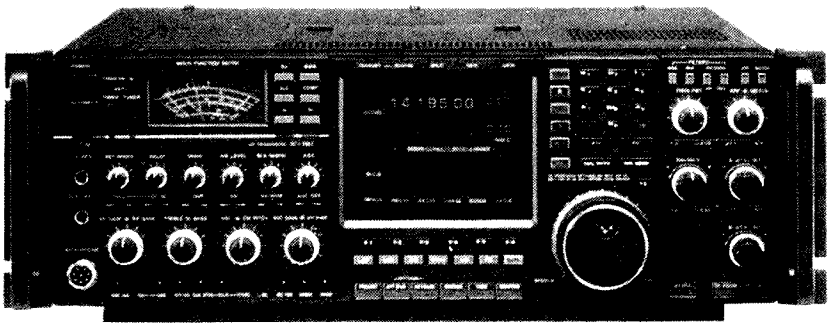
A top view of the IC-228H, with the cover removed, not only shows the compact size of the unit, but also indicates the relative size of the very adequate heatsink.

—Photograph courtesy Barrie Bunning

Equipment Review

ICOM IC-781

Ron Cook VK3AFW
and
Bill Roper VK3ARZ



This is not a cheap transceiver! It is Icom's pacesetter with many features others will want to copy. It seems to be the ultimate home station for the HF operator; it has everything in one box — AM, SSB, CW, RTTY, AMTOR and Packet (with external TU) for all amateur bands from 1.8 to 30 MHz and a general coverage receiver tuning 0.1 to 30 MHz.

You can see the signal in the band up to 100 kHz away from your operating frequency on the inbuilt spectrum display, and you can listen to two frequencies at once. When you change bands the inbuilt ATU almost instantly retunes to a preset frequency and antenna combination.

Add to this an output power of 150 watts, a dynamic range of 105 dB, a most extensive display capability, and many, many other features and the reason for Icom's excitement about this transceiver become apparent.

FACILITIES

The most obvious and unusual feature of this luxury transceiver is the 125 mm (5 inch) CRT Multi-function Display in the middle of the front panel. It displays the frequencies of the dual VFOs to 10 Hz, the status of many of the controls, the contents of the memory, two menu screens, 17 operational screens, and can show in sharp, amber display 94 symbols, including letters, numbers and punctuation marks. Because of the vast range of items displayed by the screen further comment is made later.

The bottom half of the screen can be used to display the RF spectrum 25, 50 or 100 kHz either side of the VFO frequency. The relative strength and individual spectrum of each signal present can be instantly viewed. The screen also acts as a terminal monitor when an external terminal unit for RTTY, Packet or AMTOR is used.

There are 99 memory channels, two scan edge frequencies, and the ability to attach notes up to 10 characters long to each channel are provided. Five daily timers can be set to turn the set on and off this allowing you to record (via the recorder remote plug) your favourite program whilst away from the shack.

Two clocks, useful for setting at local time and UTC, are provided.

As mentioned earlier, there is an inbuilt ATU which automatically tunes for a low SWR and goes to a preset tune condition when you change bands.

A new direct digital synthesis frequency generator allows very rapid shift from receive to transmit frequencies and is well suited to Packet, etc. Full or semi-break-in operation is provided.

Two PLL circuits are included to allow tuning of the band whilst monitoring that rare DX station on another frequency in the same band. This is known as the ***Dual Watch*** facility. A fine scan mode allows slow tuning without stopping which is useful for monitoring of CW and SSB signals.

Passband tuning is yet to appear on all rigs: this set has dual passband tuning for use in tandem on the second IF of 9 MHz and the third IF of 455 kHz. This should be a boon to the contester.

The output power is greater than any other solid-state transceiver on the market today — 150 watts. The power supply and heat-sinking are designed for 100 percent duty cycle operation. The 105 dB dynamic range is exceptional.

The noise blanking system allows control of blanking threshold and blanking interval to eliminate ignition and other sharp impulse noise or longer pulses from the woodpecker or even key clicks of nearby CW signals.

A nice feature is the band stacking register which gives the operator the ability to store a frequency, change bands and tune to check propagation and then return to the original operating frequency without using the second VFO.

A calculator-like keyboard allows entry of frequencies to 10 Hz, to select any amateur band directly, and to call up any of the 99 memories. A marker oscillator is provided and is most useful when used in conjunction with the spectrum display.

Nine filters are provided and can be cascaded to give superior selectivity for CW and RTTY. Wide and narrow filters can be independently selected for SSB. To eliminate annoying heterodynes an IF notch filter is available.

The CW audio pitch can be altered without altering the operating frequency. Separate receiver and transmitter incremental tuning is provided with the offsets being shown on the screen. An audio peak filter improves CW reception and an electronic iambic keyer operating up to 60 WPM is built-in for the keen CW operator.

A preamplifier can be switched in to increase sensitivity on quiet bands and up to 30 dB attenuation, in 10 dB steps, can be switched in. A continuously variable RF gain control is also provided.

In addition to the usual volume control, separate treble and bass tone controls are provided to tailor the audio response to your requirements.

A meter of sensible proportions monitors power output, SWR, ALC, compression level, Ic and Vc.

VOX operation is catered for, as is full or semi break-in CW. As befits a transceiver of this quality, provision is made to monitor the transmitted signal regardless of mode.

The dial knob allows tuning in either 10 Hz steps and 5 kHz per revolution, or 1 kHz steps and 500 kHz per rotation. In the 10 Hz per step mode rapidly turning the knob gives 10 kHz per revolution. An optional speech synthesiser is available to announce the selected frequency.

Of course, there is an RS232 port for communication with a computer if required.

TECHNICAL MATTERS

There are a number of different technical features in this transceiver. The first impression gained from looking at the circuit diagram is the vast amount of digital circuitry associated with the monitoring, display, frequency and general control functions. In fact, RF amplifiers, mixers, tuned circuits, etc, make up less than 50 percent of the circuit.

The signal to be received can be selected to pass from the antenna socket directly to the receiver or via the antenna tuning unit. A local oscillator rejection filter and switched attenuators come next, followed by one of the 11 bandpass filters. A 1.6 MHz highpass filter is added for all frequencies above 1.6 MHz.

New in amateur transceivers, is the use of PIN diodes as variable attenuators even though they have been in use for over 20 years in military and commercial equipment. In this unit, they are used to provide AGC control by adjusting the input signal after the filters and before the RF amplifier or mixer.

The RF amplifier uses two FETs in push-pull and can be switched in when the band is quiet and signals are weak.

Balanced mixers are used to obtain the 105 dB dynamic range quoted. There are two receive mixers, one for the main signal and the second for the Dual Watch frequency. The relative level of these signals is adjusted via PIN diodes on the output of the mixers. The first IF frequency is 46.5 MHz and there are two filters on this frequency in the receive mode.

Conversion is made to the second IF of 9 MHz without further amplification. For FM reception, the signal is amplified, limited and converted to 455 kHz for further filtering and demodulation. For the other modes there is some amplification first, followed by pre-filtering, the noise gate and

then a selection of any one of four filters, or a bypass position for wide band reception. Conversion to the third IF of 455 kHz then occurs and again one of four filters can be used. The signal is then converted to the fourth IF frequency of 10.7 MHz where the notch filter operates. After amplification, either a product detector or a diode detector is used for SSB/CW or AM demodulation respectively.

The noise blanker has the facility of providing a variable width blanking period thus increasing its effectiveness against the "woodpeckers".

There are two bandpass tuning controls which operate independently, one on 455 kHz and the other on 9 MHz. This facility, combined with the cascade filters, notch and audio peaking filter, gives unsurpassed QRM reducing ability.

The transmitted signal is generated initially at 455 kHz and is heterodyned to 9 MHz, then to 46.5 MHz, and finally to the signal frequency before amplification to the 150 watt level. Seven filters precede the SWR detector and the signal then passes through one of these directly to the antenna connector or via the automatic tuner.

The tuner can be preset to a favourite frequency in each band for the appropriate antenna so that, when you change bands, the antenna is matched virtually instantly without even putting a signal out.

The spectrum display takes the signal at 46.5 MHz immediately after the first mixer and converts it, firstly to 4.7 MHz, and then to 390 kHz where it is amplified, rectified by a logarithmic detector and converted to a digital signal by an analogue to digital converter. This is necessary as all video signals are controlled by a microprocessor system very much like the video generating systems used in some computers.

Such complexity would not be warranted for analogue signals alone, but the data terminal, message display and frequency display functions all demand a digital approach.

THE MULTI-FUNCTION DISPLAY

The range and quantity of information given on the display is incredible. Apart from the operating frequency mode, filter (wide/narrow), transmitter and receiver RIT offsets, selected memory channel frequency, mode, etc, in the top half of the screen, the bottom half shows either the spectrum display, memory information, scan data, or clocks and timer.

Each of these alternative screens have their own menus (in the computer program sense), enabling the operator to review the set parameters and to change them as described. For example, both UTC and local times can be set and the station's call sign can be displayed. Notes of up to 10 characters can be added to each memory for recall later when the memory list function is operated.

In addition, the bottom half of the screen can be used to monitor ASCII data from an external terminal. Checking and altering the data format is done using the screen and a menu.

Some 20 pages of the handbook are devoted to screen related operations and, as this relies heavily upon diagrams, no attempt will be made to give further details here. There is so much more that can be done with a 125 mm (5 inch) CRT screen as compared to even the best of the LCD panel displays that any attempt to describe it all would only fall short. It can only be a matter of time before the flagship transceivers of the rival manufacturers also boast a CRT multi-function display.

ON AIR

It should be stated at the outset that this is a most complex piece of electronics and, even though the handbook is extensive and well written, more then one afternoon is required to learn how to use all the facilities built into the transceiver.

In fact, it may take quite some time to become completely familiar with all of the facilities offered.

It is quite imposing to sit down in front of such a large transceiver with a total of 106 front panel controls. However, the controls are relatively large and easy to operate, and there does not seem to be overcrowding. The tuning knob is smooth to *operate* and *there* is an adjustable brake to set the feel to your own touch.

The VDU display is fascinating and, if you become addicted to all the facilities, you may not get to the stage of actually transmitting for quite some time. This happened to the reviewers!

The receive facilities far surpassed those of any other amateur equipment used, particularly in sorting out weak signals through heavy QRM. Even the bass and treble tone controls were found to be quite useful, and we wonder why other transceivers do not include this feature.

Reports on the quality of the transmitted audio, and the effectiveness of the speech processing, were well above average. The heavy duty power supply and 100 percent duty cycle final amplifier enabled high level processing to be used continuously.

After about a two minute warm-up, the VFO stability was well within the specifications of 15 Hz. The IF notch filter was very effective, without introducing any colouration of the received signal's audio, but seemed to drift slightly in the first two seconds after switch-on.

CONCLUSION

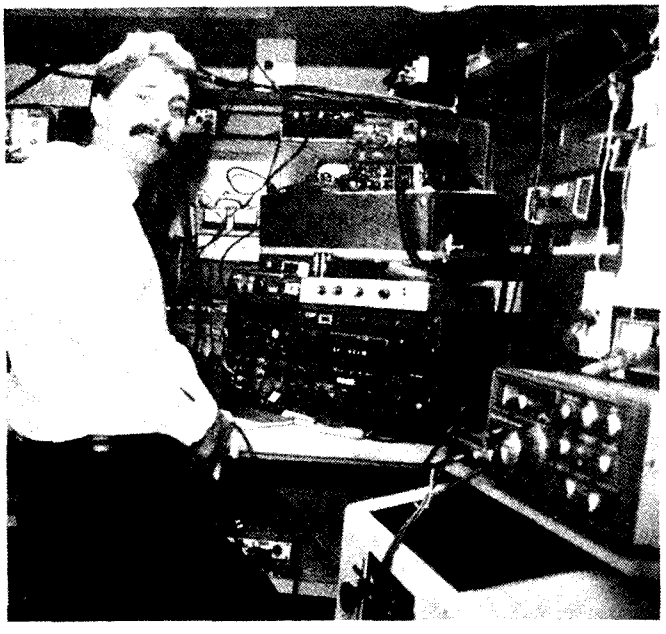
This must be, without any doubt, the most spectacular and sophisticated amateur transceiver manufactured to date. If money is no limit, and you want the best, then this is the transceiver for you. It will provide virtually any feature that you are likely to require in an amateur transceiver well into the foreseeable future, and may well be the standard against which other transceivers will be measured for a long time to come.

There were only two mildly disappointing aspects about the transceiver. Firstly, the engraved band markings on the keyboard keys were difficult to read. The alternative numeric functions were illuminated and easy to read. Infilling the engravings with bright white paint would help.

Secondly, although *the unit is* capable of displaying characters from a remote terminal, and has selectable shifts for RTTY, it requires an external terminal unit incorporating a mod/demod system. Considering the complexity of the system the company could have offered an option for RTTY (at least) requiring only a standard computer keyboard to be plugged in (the keyboard could be another option). One day these features will be available. What a pity we can't see them now!

The review transceiver was generously provided by the Australian importers, Icom Australia. They can be contacted at 7 Duke Street, Windsor, Vic.

ar



Andrew Chantler VK4TAA, in his Gold Coast shack tuning the higher bands for satellite signals and other mysterious transmissions.

MYSTERY SATELLITE OVER QUEENSLAND

A previously unknown satellite has been discovered by Andrew Chantler VK4TAA, who monitored it while transmitting aerial photographs of Queensland.

The Gold Coast Amateur Radio Club Vice-President said, listening to the satellite bands was an extension of his interest in amateur satellites. Andrew said checks have been unable to immediately identify the satellite monitored on about 136 MHz.

His discovery has attracted the interest of the Defence Department.

He said: "The satellite had taken high resolution pictures of Stradbroke Island and the Moreton Bay area."

Andrew told *Amateur Radio* magazine he was also monitoring transmissions in the GigaHertz part of the spectrum and feels other radio amateurs may be doing the same. He said he would like to share information about satellite listening with those also tuning into those transmissions.

OPERATION GUIDE OF FUJI-OSCAR 12

As at April 1988

Unfortunately, the following information was not received in time to accompany the information published on page 49, June AR.

Present transponder operation is as follows:

1. There are three modes of operation:

mode JA — for analog QSO (SSB phone, CW).

mode JD — for digital (packet) communication.

mode DI — digital system working except transmitter.

Generally, analog mode JA and digital mode JD work alternately every 10 days or two weeks.

2. In a JA week, except off days, beacon CW telemetry signals can be heard on the beacon channel, when communication is possible.

3. In a JD week it will open in as follows:

JTD-ON: At the beginning of JD period, station JJ1ZUT (satellite control station) uploads the necessary programs for satellite operation, and JD starts to work at the conclusion of program uploading, when JTD, the transmitter of JD system, becomes possible to transmit downlink signal. During this period, if FO-12 receives any valid uplink signal, JTD will continue to work for mailbox, and it will be turned off three minutes after the last access. If there is no accessing uplink and JTD does not work, downlink PSK stream will be transmitted for five seconds every minute, showing JD to be available. JTD-ON continues for two hours.

JTD-OFF: This follows after JTD-ON and no downlink signal is received for two hours. JTD-ON/OFF repeats cyclically every two hours.

DI: CPU and memory of the digital system work but JTD does not operate. This is to charge the battery during JD period, not to lose posted messages by turning off the whole system.

* Time counting of two hours begins at the conclusion of the program uploading, but this does not generally coincide precisely. Because the satellite has no permanent clock, it is necessary to set the time for CPU every uploading. Therefore the satellite time should be calibrated by comparing it with the correct one at a receiving site. The finishing time of uploading will be shown in the beacon of FO-12.

The operating schedule of FO-12 was shown on page 49, last month.

Mailbox Version 1.11

1. Setting of the TNC

* The TNC should be for the AX-25 Version 2. Version 1 does not connect to JAS-1 (8J1JAS).
* FRACK, waiting timer for ACK (acknowledging signal from the satellite), should be over six. Other setting of time constants are similar to packet link on the ground. Because the mailbox responds to multiple access, processing time may increase, therefore, it may become necessary to increase FRACK more than six.
* MAXFRAMES, the number of packets that can be sent at one time is up to seven. It is better for MAXFRAMES to set to less than three.
* PACLEN, the number of bytes of data in one packet, should be less than 200 bytes.

FO-12 transmits with PACLEN = 128 and MAXFRAMES = 1.

2. Digipeating

The mailbox has no digipeating function, and does not accept any frames as a digipeater.

3. Users commands available

B	displays all file names of the bulletin addressed to all, back from the latest one.
F	displays the latest 15 files.
F*	displays the latest 50 files.
F<d>	displays files pasted in the day <d>.
H	explains available commands and functions.
F<#>	kills mail defined as <#>, a file number, only by writer or addressee. It is not executed while someone is reading.
M	displays all files addressed to the user.
R<#>	displays contents of message defined as <#>.
U	displays call sign and SSID of all stations that have been accessing to FO-12/8J1JAS.
W	writes message to FO-12, responding to the sent prompt. For termination of the text, use <RET>.<RET> or <RET>^<RET>.

* Letters of both upper and lower case are available. Letter code for packet is ASCII.
* Disconnect by command through the TNC.

Further information may be obtained by writing to: Technical Laboratory, JARL, 1-14-2 Sugamo, Toshima-ku, Tokyo, 170, Japan.

VHF UHF — an expanding world

Eric Jamieson VK5LP
8 West Terrace, Meningie, SA. 5264

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.005	H44HIR	*Honiara*
50.005	ZS2SIX	*South Africa*
50.011	JA2IGY	*Mie*
50.020	JE6ZIH	*Japan* [1]
50.075	VS6SIX	*Hong Kong*
50.080	KH6JJK	*Hawaii* [2]
51.020	ZL1UHF	*Auckland*
52.013	P29BPL	*Port Moresby*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.432	VK0MA	*Mawson*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.445	VK4RIK	*Cairns*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
52.510	ZL2MHF	*Mount Climie*
144.022	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2HSY	*Sydney*
144.430	VK3RTG	*Glen Waverley* [3]
144.445	VK4RIK	*Cairns*
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
144.950	VK3RCW	*Melbourne*
145.000	VK6RPH	*Perth*
432.066	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK1RBC	*Canberra*
432.420	VK2RSY	*Sydney*
432.440	VK4RSD	*Brisbane* [4]
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*Macleod*
432.540	VK4RAR	*Rockhampton*
1296.198	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.440	VK4RSD	*Brisbane* [5]
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
2304.445	VK4RIK	*Cairns* [6]
2306.440	VK4RSD	*Brisbane* [7]
10445.000	VK4RIK	*Cairns*

1 Phillip FK1TS advises the JE6ZIH beacon is operating consistently on 50.020 MHz, so, for the time being, it has been included in the beacon list.

2 I am informed this beacon is operational with five watts to a three element Yagi pointing on VK at the moment. (Thanks VK5ACY for this).

3 Charlie VK3BRZ, has written in response to my plea in the May issue, to confirm VK3RTG is operational, but it appears to have a vertically polarised antenna. Charlie wonders why this should be, in view of the large loss when received on horizontal antennas and that it may be changed with relative ease. Yes — why?

4 The call sign has been changed from VK4RBB to VK4RSD.

5}

6} These are three beacons which, for the first time, have been advised as operating. John Aarsse VK4QA, sent me a very comprehensive list of all the beacons, repeaters and packet radios in Queensland and this has allowed an up date to be made.

7}

Wally VK5VU, telephoned recently to say the WA beacon, VK6RVF on 10.300 GHz is no longer operating and has been off the air for four or five years! This seems to indicate no one, in WA, at least, ever looks at the end of the beacon list. This particular beacon was originally constructed by Colin VK6CM, of the WA VHF Group. Thanks for the message Wally. At least the present status is known.

After struggling for months to obtain the information, the present beacon list is almost complete. The only beacons about which I lack information are VK6RTU at Kalgoorlie on 52.350 and VK6RPB at Port Hedland on 144.565 MHz. Even lacking definite information on these two beacons, the present list should now be the most accurate list available and should be included in the 1988/89 Call Book and noted by FTAC.

SIX METRES

From the Japanese *Ham Radio* magazine for April (courtesy Graham VK6RO), it is noted that, during February 1988, a number of contacts were being made, mostly on 50.110 MHz or thereabouts, to northern VK4 stations (VK4s FXX, FNQ, KAL, JH, ALM, FXZ, FUF, GB) and to VK8s ZLX, ZMA and VK6KOJ. The JA stations were also working KG6DX in Guam, VS6XRC Hong Kong and P29PL, in New Guinea.

A most interesting observation from the considerable list presented was the number of times ZL television, Channel 1, was observed, almost on a daily basis throughout February. Channel 0 from Queensland, and New South Wales, were also regulars with sound and vision carriers at times.

The fact that all these observations are being reported points to a dedicated band of enthusiasts, at least in Japan, always ready for contacts. There are so many Japanese six metre stations that relatively few can work VK or other stations when the band opens, so there are always stations hungry for contacts. This can only mean more contacts throughout the Pacific area as more stations become alerted to the possibilities of six metre contacts at any time of the year and period of the Cycle. The latest predictions for Cycle 22, which are mentioned later in these columns look very encouraging.

NOUMEA

Phillip FK1TS, has written again and refers to hearing FM stations with American accents on 50.100 MHz, between 20/3 and 7/4. They were using call signs consisting of either one letter and two figures or two letters and one figure, eg BI2 or C36, a typical exchange being: "C22 this is BI2 in the plane" or "D36 this is C22 do you copy?". Phillip believes these stations are probably US military but from where is not know. Due to FM being used and the strength of the signals, whenever they operated on 50.100, they obliterated 50.110 as well which Phillip found most annoying.

Reports received here at Meningie suggest there are other areas in the Pacific where six metres is used for military purposes/police purposes. Noumea happens to be one!

Phillip FK1TS, in his letter, also mentions the local radio club has a IC-202 and considers it might be used to advantage to provide a two metre beacon from there. The 1550 kilometre path from Brisbane to Noumea should not be too difficult given some enhancement to propagation conditions. I am sure Gordon VK2ZAB, would never consider the 2000 kilometre path too difficult to conquer, being about the same as Adelaide to Albany, but without the benefit of coastal ducting.

Phillip will keep me informed on the progress being made and whether it will be possible for future plans leading to a 70 centimetre beacon being installed, becoming a reality.

Finally, Phillip mentioned a news item in *Television* for February 1988, that confirms an original statement that, from April 1988, Dutch amateurs will be able to use the 50 to 54 MHz band running CW at up to 30 watts output. The Ascension Islands has also been given this allocation, with powers up to 50 watts.

NORWAY-AUSTRALIA 50 MHZ OPENING?

Jim Linton VK3PC, brought to my attention a report of hearing of the Perth six metre beacon by a station in Norway contained in *Radio Communication* for April 1988. Before making any comment I will quote the relevant information:

"At about 0900 GMT on February 21, 1988, LA6QBA and LA4LN both heard the Perth beacon, VK6RTV, on 52.300 MHz. Signals were apparently quite strong and lasted for a considerable time. Before this, Frans LA6QBA, had heard the Cyprus beacon 5B4CI for about an hour. To our knowledge this is the first time that anyone's reported an opening like this, and we asked propagation wizard Charlie Newton G2FXZ, for his thoughts about it and whether it could possibly have been connected with the aurora which took place the following day.

"G2FKZ says: The time was correct for an opening to Perth and the normal predictions show this for 28 MHz, so we only needed a bit more F2 ionisation to get the 50 MHz signals through. The most ionospheric concentration would be around the Magnetic Equator where the ring current would be the greatest. The path from LA to VK6 crosses the magnetic equator near Colombo/Southern India where the time was 1500 and we would expect quite high F2 levels anyway at that time. So if we can squeeze the ionosphere a bit, and the effects are not local but would be spread well either side of Colombo, we could well have had a dense ionised patch at the critical part of the path. If the 50 MHz signal from Perth could have got into that patch, then it could have been deflected to virtually a grazing angle incidence at the F2 layer, which was at or very nearly at its best for the time along the path. So it could, under these conditions carry the signal.

"Of course, we had an ionosphere that was very rapidly climbing to high F2 levels at the time in question; this together with the fact that the path from LA was rapidly going into areas of much higher ionospheric intensity, ie higher F2 critical frequencies. Then running into the denser Dst patch, to my mind, its all possible.

"To add to the story, between 0905 and 1000 on February 21, I understand that G3JVL heard 28 MHz, beacons in Z21ANB, ZS5VHF ZS6PY, VK6RG, 5B4CY and numerous UA4, UA6, UM8

stations and the rarely heard 5Z4ERR. Also, top band was wide open to the States from 0100 until 1000 before the aurora on 22/2. I am not sure of the time but the Greenland beacon, OX3VHF was heard by GW3LDH after the main aurora was over, and by Scottish stations when the aurora was on. That is the real interesting one — how does it happen?

"In terms of the aurora, it was a classic example of auroral HF band enhancement, it is just that this time it went to 50 MHz and a bit further than usual."

Okay. So much for all that! But there are a few things which do not tie in. Firstly, the last time I reported VK6RTV as operating from Perth on 52.300 MHz was in October 1984 AR. In November 1984 issue, I reported Bruce VK6CX, has advised the VK6RPH beacon frequency had been changed to 52.460 MHz where it has operated since. No beacon in Australia operates on 52.300 MHz and certainly not from VK6!

Unless this happens to be another one of those reports of reception of "long-delayed signals" which surface from time to time, I can only say the operators in question were sadly confused and/or need to improve their CW reading capability. The report said "the signals were apparently quite strong and lasted for a considerable time." If this was so, then correct identification should have been no problem. If there was any doubt, why were the signals not taped for others to hear?

Without being too unkind I can only say the operators probably heard a signal on 52.300 MHz. which they could not identify adequately and, by consulting a list of beacons, found VK6RTV in Perth on 52.300 MHz, and assumed this was the station. Unfortunately for them, they are about three years too late to make that claim accurate! I note also that the 1984/1985 Australian Call Book lists VK6RTV as being on 52.300, in the 1985/1986 issue, the listing is VK6RPH on 52.300 and the same in 1986/1987. Both wrong!

Before writing this, I telephoned the President of the West Australian VHF Group, Phil VK6AD, to receive confirmation that VK6RPH was operational and on 52.460 MHz. Sorry folks, I might be an old "skeptic" but I have not been around for most than 30 years without learning a thing or two, and I also have a fairly good memory when it comes to beacons — particularly as they are one of my pet hobby-horses! So — all concerned, more information please — or do we put it down to another hoax? May thanks to Jim VK3PC, for bringing such a matter to my attention.

SOUTH AFRICA

Hal Lund ZS6WB, has sent two further issues of *VHF News* one of which is a 50 MHz DX Special, in which he reports of an excellent six metre opening on 9/3 resulting in the Malta 9H1SIX and Cyprus 5B4CY beacons being heard by ZS6XJ and ZS6XL, at 1500 UTC following which there was a gathering of the clan on 50.110 MHz. By 1630, 5B4YC on 50.498 was S9 + in Pretoria. A report was received on 28.885 MHz from F5GZ, in Cannes, that the South Africans were being heard there as S7. Around 1730 UTC, contact was made between ZS6WB, ZS6XJ and ZS6XL to 9H1BT on SSB before the band closed a short time after.

On 12/3, during the afternoon, 5B4CY appeared again and, after making calls on 50.110, Costas SZ2DH, in Athens, Greece, appeared and worked ZS6WB, ZS6BMS and ZS6ADH, although the contacts were made difficult due to a large amount of traffic on the frequency. ZS6CE moved up a few kHz and received a report that he was being heard in France.

On 14/3, 9H1SIX and CT0WW beacons were heard around 1800 with good signals. 9H1BT was heard on CW and called but did not return. The same beacons were heard again on March 21 and 24.

Mike ZD8MB has applied for permission to operate six and 10 metre beacons on Saint Helena, as well as Ascension Island. The Saint Helena beacons would be looked after by ZD7CW, whilst the ZD8VHF Ascension Island beacon is ready for operation on 50.0325 MHz, but has so far not been installed. Permission is also being sought to run a beacon on Gough Island and talks are proceeding with Andy ZD9BV.

Although I have nothing definite on frequencies other than to say they are between 50.000 and 50.100 MHz, but the South African VHF News does report beacons have been heard signing FY7THF, HC2FG, PY2AA and with ZD8MB also working HC1BI, PY8TH, FM3BY and FM5CS, but missing out on PY0VO and HC2FG. It is quite possible we in Australia do not pay enough attention to the big continent to our west and the islands between us! Stations in VK6 should be monitoring 50 MHz with their beams west, particularly around the equinoxial periods and certainly as we approach the peak of Cycle 22. At the same time perhaps the South African stations should also look east instead of always to the north, again around the same periods!

A LINK WITH THE PAST

I received a very interesting letter from Maurie Phillips VK5ZU, which reads:

"Enclosed is a copy of a letter I received 50 years ago which may be of interest. At the time, 10 metres was alive with DX and there was quite a lot of local activity on five metres.

"On Sunday, March 13, 1938, Bob Manuel VK5RT, phoned and told me that ZL3JA had heard signals from USA on 56 MHz, so I went on 56.460 MHz CW sending "56 Mc Test CQ ZL DX" but heard nothing.

"My transmitter consisted of a 6A6 crystal oscillator on 7 MHz doubling to 14 MHz, 6LG6 doubling to 28 MHz and 807 doubling into the antenna with about 25 watts DC input. The receiver was the so-called resistance coupled superhet described by VK3VH in *Amateur Radio* for July 1936."

The letter subsequently received by Maurie was on NZART letterhead from W R Hamilton ZL4DQ and reads:

"I heard your five metre signals here this evening March 13, 1938, at 6.03 pm NZ time. They were RST 458 at best but QSB was very bad and they disappeared at short intervals. You called CQ Test 56 Mc ZL and DX. I gave you a call but did not hear you again.

"The receiver here is a seven tube S S Super, link coupled to a tuned antenna which is also used for transmission. The transmitter is a C C 100TH and boy! was that plate hot while I was calling you. I was calling on five metres most of the day as 10 metres was really good and I thought you chaps would be on the job. Yesterday I worked 24 Ws on 10 metres in two hours between 2 and 4 pm and a J at 5.15 pm so conditions must be good for the high frequencies. By the way, your frequency would be approx 56500 kc I should say.

"If this agrees with your log I would be pleased to get your verification OM. W R Hamilton ZL4DQ."

Thank you Maurie — I expect you sent the QSL! The period would have been around the peak or soon after for Cycle 17, so I am not surprised band conditions were good.

THE LOCAL SCENE

The bands have become rather quiet after the great flurry of activity during February and March — even April — where six metres was concerned. Roger VK5NY, reports the occasional contact to Melbourne and Mount Gambier on 144 and 432 MHz, and my own brief observations from Meningie confirm the lull in activity.

Roley VK3KXW, has not been letting the grass grow under his feet since sharing the 1296 MHz contacts to Albany earlier. He found another good set of conditions on 19/4 when he worked VK7DC at 0130 on 1296 MHz with 5 x 9 signals using FM. Similar very strong signals were available on 144 and 432 MHz. He also worked VK3KZZ on 1296 with the latter running one watt to a 28 element loop Yagi at 90 feet. This system requires the use of 101 feet of coaxial cable so the power out would not be large! Mark is located at Horsham.

On another occasion, with the band open to VK7DC, signals at 0100 on 144, 432 and 1296 were 5 x 9, 52 MHz 5 x 2, 28 MHz and 21 MHz 5 x 1. On 11/5, another 1296 contact was made with Mark VK3KZZ at Horsham, this time at 1500 with 5 x 2 signals and much QSB.

The end result of this type of activity is an upsurge in interest on 1296 and now there are quite a number of stations with that capability in both VK3 and VK5. Even the dust has been removed from the 1296 equipment at VK5LP, but the first step will be to get the antenna in the air — and that is being given consideration!

LATE NEWS

I am indebted to Hal Lund ZS6WB, for another batch of *VHF News* from South Africa. I hope that, by taking information *from* this newsletter I can alert VK operators to look for signals from Africa and South Africa, in particular. It is an area which has not figured prominently in contacts on VHF in this country and, although I have already given some prominence to South Africa earlier this month, I feel the following needs to be mentioned before it becomes stale news.

One very encouraging report is the mention of a Special Report in *The DX Bulletin* published by VP2ML. In this it is reported Cycle 22 may be one of the best ever. Only one year after hitting the minimum of 12, the smoothed sunspot number has increased to 40. This means that Cycle 22 is increasing at least 50 percent faster than any recent cycle and is comparable only to Cycle 19, which peaked with an SSN of 200. If the current trend continues, we could have another 200 plus peak in mid-1989. Earlier predictions based on statistics were for this to be a poor cycle, but updated ones are based on current numbers and should be more reliable. The advice is: Get your station and antennas ready now!

Information of the French six metre permits are said to be "precarious, personal and can be revoked." No permits are allowed within 150 kilometres of Television Station Channel 2, three watts ERP for 150 to 200 kilometres from station, 10 watts ERP if 200 plus kilometres away, and only fixed stations.

What is of considerable interest, to VK5LP at any rate, is the relatively high degree of activity of those stations permitted to operate on six metres, particularly in the European region. Looking at a map of South Africa we find Cape Town is about the same latitude as Adelaide and Pretoria the same as Maryborough, Queensland. Cape Town to Greece is similar in situation to Adelaide to Japan. Pretoria and Cyprus are about the same line, hence the 5B4CY beacon is regularly heard. There is a very large land mass to the north of South Africa with no six metre operation permitted. If it was permitted, the South Africans would have a ball and be much better off than VK. However, due to the above, South Africa and Australia are on a somewhat similar footing, as we have relatively few intervening places to our north with high levels of six metre activity.

I will save the remainder of the South African news for next month, but in the meantime, I feel that operators on both sides of the Indian Ocean should be doing more to establish six metre contacts, and with the possibility of a much better Cycle 22 than originally thought, 1989 to 1991 might just be the time to make those contacts!

CLOSURE

By the time you read this we will be into the winter Es period, maybe some of you will be rewarded with some choice contacts. Good luck.

Closing with two thoughts for the month: "Only man, among living things, says prayers. Or needs to." and "Death and taxes may always be with us, but death at least does not get any worse."

73. The Voice by the Lake.

ar

How's DX?

REEFTON ELECTRICAL CENTENARY

To celebrate the centenary of the first generation of commercial electricity in the Southern Hemisphere, particularly at Reefton, New Zealand, the Reefton-Buller Branch of the NZART are activating amateur radio station, ZL6REC, at the town of Reefton (near Westport) from August 1-6, 1968.

It is the Branch's intention to QSL all logged contacts with a special QSL card through the bureau. However, they request **no return QSL cards, please.**

It is anticipated this operation will be conducted on a 24-hour basis using frequencies in the 80, 40 and 20 metre bands. Tests will commence on July 31.

—Contributed by ZL3MF via William Stevens VK4YN

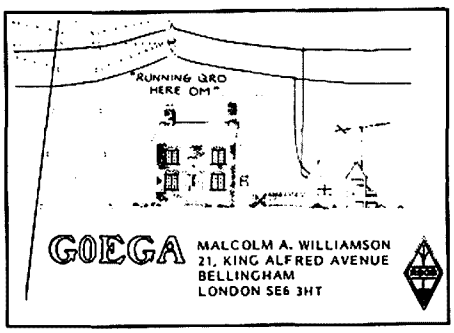
ROYAL NATIONAL LIFEBOATS

July 28-31, 1988, will see the operation of GB2RNL, an amateur station being conducted for the Royal National Lifeboats Institute at their headquarters in Poole, Dorset, UK. The station operation will coincide with the RNLI Open Days on July 30 and 31. A QSL card will be produced for the event.

GB2RNL will only operate on the HF bands around the frequencies of: 3.750, 7.050, 14.250, 21.250 and 28.500 MHz on Phone and 3.550, 7.025, 14.075, 21.075 and 28.075 MHz CW. Of course these frequencies are plus/minus QRM.

As the RNLI is totally funded by private donations to maintain it's entire operation, QSL cards will only be available via an SASE or a minimum number of IRCs for return postage. QSL to Malcolm Williamson G0EGA, 21 King Alfred Avenue, Bellingham, London, SE6 3HT, England. Please mark envelopes "GB2RNL".

—Contributed by Malcolm Williamson G0EGA



TRAVEL AROUND THE WORLD WITH AMATEUR RADIO

Amateur radio means different things to different people. There are VHF experts, AMTOR and RTTY enthusiasts, Packet Manipulators, those who work with the assistance of satellites — there are active and passive amateurs, doers and talkers — and, of course, there are the DX-chasers.

DX-chasers are peculiar people — they have an irregular sleep pattern and tired red eyes which only gleam when a rare and obscure station at the other end of the world gets on the air. Then the hunt is on! Hundreds of other chasers all over the globe want to talk to this very rare human specimen who sits in front of a microphone, or fiddles with a Morse key, and attempts to sort-out the "dog-pile". The chaser on this end is part of the pile, valiantly battling with 100 watts against the kilowatts, dipole against a 16 element *log* periodic antenna on a 20 metre boom, 50 metres up in the air.

Finally, as if by **magic, contact** is made, reports are exchanged, and sometimes, with luck, the name of the operator and the locality of each station is conveyed from one end of the globe to the other. The QSL manager's call sign is obtained and a careful entry is made in the log book, and onto the tally card — country number 257.

Those who *are* active on the bands do not have to be told that we are on the upswing of a new solar cycle and propagation on the HF bands is improving day by day.

So, dust off the HF equipment, familiarise yourself again with UTC time (the old GMT time is dead, very dead, and local time on QSL cards is very confusing), look around on the band and find the pattern: DX window, local traffic, SSB section, CW activity and read up on propagation. Which way is the long-path and where is the short-route? Above all, be patient and courteous towards your fellow radio enthusiast — *and have a great time*. . .

SHORT DX

QSOs sometimes develop into long, interesting chats. It was in early November, last year, 0817 UTC on 14.030 MHz. John PZ1DC, was on the other end in Surinam, a small country on the north-eastern coast of South America. We had a very long and interesting contact which lasted almost an hour. The entire contact was conducted in CW. John asked for details on Australian awards. I promised him that I would send all the details after receiving his QSL card. Not only did his QSL card duly arrive, but also a brief and interesting description of the country, of which many of us in Australia know very little. Following is his description of Surinam which I would like to share with you.

Surinam, in the official Dutch language, is spelled Suriname. It is situated between two and six degrees of northern latitude, and between 54 to 58 degrees western latitude. Mountainous rain forests cover about 80 percent of the country and most of the people live on the flat coastal area. The land covers 16 3265 square-kilometres (6 3037 square miles). The estimated population is 484 000, of which 31 percent are Creole — a mixture of white and black Africans, whose ancestors were taken there as slaves by the early British and Dutch colonialists. Hindustanis (Indian, Pakistan) makes up 37 percent of the population, 15 percent are Indonesian, three percent Chinese, (others are Europeans, Lebanese, Syrians, Americans, French), 11 percent are Bush Negroes and one percent Anirindians — the latter two live in the interior jungle. Paramaribo, with 15 0000 inhabitants, is the capital city. The Official language of Surinam is Dutch, but the native language is "Srana Tongo", a lingua franca which is widely used among the multi-racial population. English is widely spoken.

According to John, whose ancestry goes back to the Chinese and Dutch, Surinam is not Latin-American, neither is it Caribbean. It is different and a photographers paradise because of its topography and the mixture of its races.

It is also interesting to note the following historical information:

The land was sighted first by Christopher Columbus in 1498. The Spaniards and Portuguese explored the area in the 1500s. In 1651, British explorers built the first settlement there. They established cotton and sugar cane plantations and brought slaves from Africa to work the land. After the Dutch and British wars, at the peace of Breda in 1667 (16 years after the first British settlement) the Dutch took complete control of the settlement, and in exchange for the Surinam territory, gave the British the Island of Manhattan, in North America, the site of the present New York City.

Surinam became a self-governing Dutch territory in 1954 and gained full independence in November 1975 with the official call sign of ? ? .

All this information, and the exchange of many letters, began with a feeble CQ call on the 20 metre band one November evening. . .

Surinam has 73 licensed amateurs and is situated in the DX Zone 9, ITU Zone 12. QSL address is VRAS QSL Manager, Box 566, Paramaribo, Surinam, South America.

TO THE NORTH

Let's us now look at the polar regions to the north — the ice covered Svalbard Islands.

Ken McLachlan VK3AH, in the May 1988 issue of *Amateur Radio* described this lands features in detail. showing a photograph of polar bears.

It was on March 13, this year, nearing midnight in Sydney (1317 UTC), on the 14 MHz SSB band — a very clear voice was calling CQ VK. I listened expecting a rush of replies. No one answered. The band was clear, no QRM — an ideal situation. I replied and the answer was a very enjoyable QSO which continued for almost an hour. The operator was Geir, the station JW1CY. Geir is a meteorologist on a Norwegian meteorological station on Hopen Island, one of the many islands of the Svalbard group.

Geir's QTH was 25 degrees east longitude and 76 degrees 30 minutes north latitude. The temperature outside at the time of our QSO was minus-30 degrees Celsius. The island has a surface of 47 square-kilometres and at the time of the QSO, had only four inhabitants, three men and a woman, the staff of the meteorological station. The group were housed in small huts.

However, there is other life abundant on the island: polar bears. I can still hear Geir's voice as he described how "just the other day" several polar bears in search of food, broke down the door and through the walls of one hut. Fortunately, it was not the hut in which he station was situated.

There are now four coal mines on the islands, most of them operated by Russians and one by the Norwegians. There are 1300 Norwegians and 300 Russians on the islands. At the time of the QSO, there was also a Polish Arctic expedition on 12 men on the island group. (A few days earlier I had a contact with this expedition. The operator was Jacek using the call sign JW0B (QSL via SP5EVN).

It is possibly not widely known, but the months of March and September are the limes when propagation is best between JW and VK.

The 1988 International Call Book lists 45 JW stations, most of them Norwegian amateurs with a JW call sign. Svalbard Islands are in the DX Zone 40, ITU Zone 18. The Norwegian QSL Bureau handles their cards (NRRL, Box 21, Refstad, N0513, Oslo 5, Norway).

—Contributed by Steve Pall VK2PS

NATAL DX GROUP — TRINDADE ISLAND PY0T

During the month of June, the Natal DX Group, in Brazil, conducted a DXpedition to Trindade Island using the call signs:

ZY0s — TO, TK, TR, TF, and TW.

All QSLs are direct-only and must be accompanied by a SASE or green stamps. (Any donations to help defray the costs of mounting this DXpedition would be greatly appreciated). QSL manager is Karl Mesquita Leite, Caixa Postal 385, 59001, Natal, RN, Brasil, South America.

—Contributed by Karl Mesquita Leite PS7KM, ZW7KM, ZY0FKL, ZY0TK on behalf of the Natal DX Group, via Jim VK2BQS and Gary ZL2AKI

DX STATIONS WORKED DURING FEBRUARY, MARCH AND APRIL 1988 in Woodbine, NSW

14 MHz

FEBRUARY : GW4NZ; IK1ATT; JA2PGU; ZK1XO (QSL via I5JHW); UY5EG; VI88WA; RB5JZ; ZL0AFZ/ZL9; YU1ABA; PA3DPP; T32BC (QSL via ZL2QW); YV5VN; VU2RSK; VU2AU; KH2D; OH9RJ; OH5OJ; AX0NE (QSL via VK9NS); UP1BYC; PA3DOB; I3KVW; OE3HAU; F6BMZ; HL9CU (QSL via AA6BB); CE1LGD; J28DN (QSL via G4UCB); ON7BP; G4VPC; VK9LM; I7ZPB; TI2SAH; YU3BQ.

MARCH: HA6KNB; NR5M; HG1S; LZ2EV; OD5KV; I0FYP; IV3SUS; VI88WA; NP4A (QSL via W3NHK); HK1LDG; VK4APJ/ Tractor Mobile

APRIL 1: LZ1AI and CT1AYN
APRIL 2: VK6ALS
APRIL 3: SP9KJT; DF2PY; TI2SAH; HL0O; 3D2DW (QSL direct to PO Box 12775, Suva, Fiji)
APRIL 6: JY5HH (heard) and 4X6KA.
APRIL 8: 4X6TT/KH8 (QSL direct to 4X6TT)
APRIL 9: YB0SY
APRIL 17: OE6PY and OK3KII
APRIL 24: AX5DI; HB9FR and HB9CXZ
APRIL 25: G3ASM
APRIL 29: RB4MF

28 MHz

APRIL 6: HL0AF
APRIL 25: UA0JFL and AX2PWI (running about two watts)

—Contributed by Bob Demkiw VK2ENU

QSL INFORMATION AND DX WORKED DURING MARCH AND APRIL in Leitchville, Vic (All SSB)

10 METRES: George VK9NKG, Cocos-Keeling (QSL via VK6NKG)
Also on the island — VK9YT (QSL via W7SW)

15 METRES: Walter CP8CB (QSL via Box 1, Riberalt, Republic of Bolivia)

20 METRES: JW6WDA, Svalbard (QSL via LA5NM)
Harry ZK1XG, South Cook (home call sign G3MCN)
YI10BGD, on 222 Net, celebrating 10 years of operation in Iraq
Larry UI8LF and Mike UJ8JCM, (QSL both via bureau)
Raj 8R1RPN, Earl 9Y4EB/8R, Tom Y24PM, Rudi HA5HS and Lar Y24UK

40 METRES: 4X6TT/FW0; T25TT; 5W1TT; 4X6TT/KH8; 4X6TT/KH6 (All of these calls are Amir 4X6TT, during his DX trek across the Pacific. QSL to Amir Bazak, Box 1446, Ramat Hasharon, Israel)
N01Z/KH1, Howland Island DXpedition (QSL to Jim VK9NS)
Rick KM1G, aboard the US Coast Guard Tall Ship *Eagle* (QSL via N1BPV)
Frank WB3KBZ/VP9 (QSL via KG8U) and Jim KH2D (QSL via KA3T)
Dave KX6DS, Kwajalein Island (QSL via the North Alabama DX Group)
Chet PJ9EE, on Triple H Net (QSL for Chet's net-only contacts via WB8SSR) Warren N200EHD, celebrating the bicentenary of the US Constitution. (QSL via N3EHD or W3 bureau)
Don J37AH (QSL via W2GHK); Jeff KG4JO (QSL via Guantanamo Bay ARC)
Roger LW1DLF (QSL via LU1DQN); Raf CX1TE (QSL via Box 17, Montevideo, Uraguay)
Ben V31DZ (QSL Box 99, Belize City, Belize); Sojo ZL5BA, on Ross Island, Antarctica
K9AJ/KH5, Kingman Reef DXpedition (QSL via WA2MOE)
Felix HJ4OIG (QSL via Box 80333, Medellin, Colombia); Guy FK8FF; Jim C21RK; John CO7KR (QSL via Box 5343, Camaguey 3, Cuba); Javir XE2TCQ; Mike C6ANX; Phil 3D2PK.

There were also about 50 US and Canadian stations.

The Triple H Net begins at 0730 UTC on 7.235 MHz. John KD0JL runs an informal and friendly DX Net most days between 0630 and 0800 on 7.162 MHz.

—Contributed by Steve Jenkinson VK3YH

WORKED FROM DURAL FROM March 11 to May 9, 1988

3.5 MHz: Franz using T22VU, (home call sign) working on Tuvalu, at 1150 UTC, in CW. QSL to home call.

7 MHz: Jack VE1ZZ, Nova Scotia on CW

10 MHz: G3EER; JAs; Ws; ZLs and VEs

14MHz: Don YB8ASX, a ZL Missionary on Halmahera Island in the North Moluccan Group, located at 1 deg 16 min north, 128 deg, 42 min East
Duncan 9Q5DA operating in Zaire on SSB (QSL via KC4NC)
Jacques 5T5CJ, Mauritania, SSB (QSL via W4BAA — fast direct return guaranteed)
Arvid JW8WDA, Svalbard, SSB (QSL via LA5NM)
Emir T25TT, Tuvalu, SSB (QSL direct to 4X6TT)
Frank TP0CE, special station of the Council of Europe. Frank is striving to have TP recognised as a separate country for DXCC. (QSL via F6FQK)
Raul CX5DY, Uruguay, near Montevideo on SSB. (QSL direct to PO Box 37, Montevideo, Uruguay)
C31LHK, Andorra (QSL to PO Box 150, Andorra)
Mulay S0RASD, Rio de Oro region of West Sahara (QSL via his manager, EA2JG)
CQ0CIR, Azores and FM5CL, Martinique, were worked in the CQ WPX Contest (QSL FM5CL to W3DJZ)
Zedan JY3ZH, Jordan (QSL via bureau)
Rick KM1G/MM Region 2 on his return voyage to the USA after taking part in the Australian Bicentenary Celebrations on the tall ship *Eagle*
Camilo HP1AC, Panama (QSL via Box 600583, El Dorado, Panama quick return on a direct card)
Hugo HB0LL, Liechtenstein (QSL via bureau)
Hasan 5N8ZHN, Nigeria (QSL via Box 293, Kano, Nigeria)
Jaime EA6WV, Mallorca Island (QSL direct to Box 1386, 07080, Palma, Mallorca, Spain)
Barry 4K0DX, an American who is part of a Russian Research Station situated on a floating ice floe near the North Pole
Hani OD5KV, Lebanon (QSL via PO Box 70567, Lebanon)
Mike 5B4TI, Cyprus (QSL via PO Box 7121, Nicosia, Republic of Cyprus)
K9AJ/KH5, Kingman Reef DXpedition (QSL via WA2MOE). The DXpedition on Palmyra Island was conducted under the call sign of W0RLX/Portable KH5P. The same QSL route applies for this station.
CI8C, the Canadian Polar Expedition with its headquarters at Resolute Bay, North West Territory, Canada. Resolute Bay is near the Magnetic North Pole. (QSL via VE3HBF)
Roland TR8CR, Gabon
Clayton J73CB, Dominica Republic (QSL via Call Book address)

21 MHz
Walter CP8CB, Riberalta, Bolivia, PO Box 1, Riberalta, Beni, Bolivia
KL7LF/KH3, Johnston Island (QSL via KL7VZ)
Don A92BE, Bahrain (QSL via Box 26803, Manama, Bahrain)
George VK9NKG, Cocos-Keeling (QSL via VK6NKG)

24 MHz
Al W7EXR, Seattle — first QSO on this band

28 MHz
NO1Z/KH1, Howland Island DXpedition (QSL via VK9NS)
Edwardo TI4JHQ, Costa Rica, (QSL via bureau)
Curtis KB5ENR/KH3, Johnston Island (QSL via N5DAS)
Scott VK9YT worked on CW, April 22. Home call sign W7SW
Marcial YV5AE, Venezuela, CW (QSL via bureau)

—Contributed by Steve Pall VK2PS

International News

The International Telecommunications Union gained its 164th Member country in March, this year.

The Republic of Vanuatu (formerly known as the New Hebrides) achieved independence on July 30, 1980. The granting of independence saw the end of the Anglo-French Condominium of three quarters of a century.

The new Republic comprises an archipelago of in excess of 80 islands covering a land area exceeding 12 000 square kilometres which is situated 300 kilometres west of Fiji and a mere 150 kilometres north west of New Caledonia. The islands have rugged mountainous interiors surrounded by narrow coastal strips, where most of the estimated 135 000 inhabitants live.

It is estimated that 46 percent of the population is gainfully employed, the majority (76 percent) in agriculture, and the remaining labour force in services, manufacturing and retriculation of electricity and other necessities.

The domestic telephone and telegram network comprises some 3 500 telephones which have access to approximately 1600 exchange lines. Automatic exchanges are installed in the capital Port Vila (a population in the vicinity of 15 000) and at Luganville. All rural areas are serviced by a network of radio stations. The national radio station, Radio New Hebrides operates a service each day of the week in French, English and Pidgin. Aviation and marine facilities are provided from Port Vila and Luganville.

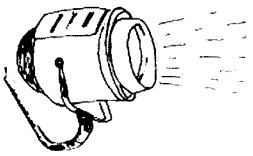
A satellite earth station is located in Port Vila, which provides international telephone, telegram and telex services. There are direct circuits to Noumea, Sydney, Hong Kong, Auckland, Suva and Paris of high quality communications on an around-the-clock basis, so in no way can Vanuatu be termed isolated from the major countries of the world, even from its idealistic quiet location in the Pacific.

THE INTERNATIONAL TELECOMMUNICATIONS UNION

The International Telecommunications Union (ITU) was founded in 1865 and as such is the oldest inter-governmental organisation. In 1947, it became a specialised agency of the United Nations. The ITU is the international organisation responsible for the planning of telecommunications worldwide, for the establishment of equipment and systems operating standards, for the co-ordination and dissemination of information required for the planning and operation of telecommunication services and, within the United Nations system, for the promotion of and contribution to the development of telecommunications and the related infrastructures.

The amateur fraternity in most member countries use special prefixes and call signs on May 17, each year, to commemorate the inauguration of the ITU and recognise the work it has done to further telecommunication techniques and particularly its assistance to the hobby we are privileged to enjoy.

—Summarised from ITU Press Releases 88-6 and 88-8, by Ken McLachlan VK3AH



Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

There was an interesting program on the BBC World Service recently, where the Director-General of the BBC External Services participated in a phone-in session that was simulcast with BBC television. Most queries mainly concerned programming, although two very interesting questions were raised on the technical level. One was from an American listener about the future of the BBC Hong Kong Relay Base after 1997, when the Crown Colony reverts to Chinese sovereignty. Mr Teucer was unable to give a firm assurance that it could continue, although the question has been raised at high levels in Beijing. The Hong Kong relay is providing very good signals into northern China and "English by Radio" is widely listened to.

The second question that was interesting to me was from Arthur Cushen. Arthur has been a monitor for over 45 years for the BBC and other international broadcasting organisations. There has been recent press speculation that the BBC and Radio New Zealand are interested in establishing a new transmitting site to serve the South Pacific. Both organisations are aware of inadequacies of audibility of their signals, particularly in the wake of the Fijian coups last year. Radio New Zealand is still utilising 40 year old, 7.5 kW senders which are obsolete and there is a need to upgrade. Hence, the reason for recent discussions between the two.

Mr Teucer stated it did depend on the British Foreign Office who funds the BBC External Service, whether it went ahead. The Foreign Office had other priorities, mainly the huge audiences in India, Pakistan and Central Africa. The Fijian crisis highlighted the need for an upgraded service and he acknowledged the co-operation of Radio Australia in being able to make transmitters available in the short term, to get signals into the South Pacific during the critical phase of the crisis.

One interesting fact that is emerging with the dramatic rise in the Solar Flux, is the increasing appearance of harmonic radiation from some senders. There is a Chinese broadcast on 10.150 MHz sometimes, yet it is weak, but it is the second harmonic of 5.075 MHz, which is the Central Network station in Beijing. Radio Moscow, in Spanish, is heard on 7.300 MHz at 0430 UTC, as well as its second harmonic on 14.6000 MHz. Recent reports on DX programs have stated that Radio Nepal is heard better on its sixth harmonic at 1115 UTC, in English, that at its fundamental frequency of 5.005 MHz. 30.030 MHz has been heard across the Indian sub-continent and the mid-east.

There is one Australian station that I still hear quite well in the evening hours on its fifth harmonic. The station is located at Sydenham, Victoria, and is on 774 kHz. Another ABC station in Gippsland is occasionally heard on the second harmonic on 1.656 MHz. A few years ago, in the Intruder Watch, we had a report of an ABC station on 3.564 MHz causing a constant heterodyne. At the time, we did not know whether it was the sixth harmonic of 3WV Horsham, or the fourth harmonic of 5AN, in Adelaide. In the end, it turned out to be both.

Some months ago I was hoping to review both the *World Radio and TV Handbook*, and the *International Broadcasting Handbook*. Unfortunately, I have not been able to do that, but I should be able to see a copy of the WRTH '88 soon. However, the *International Broadcasting Handbook* never made it to the printers. I was one of the hundreds who got caught with the pre-publication offer. It was compiled by Bernd Friedewald, who has compiled the *International Listening Guide* in the past. However, according to Radio Netherlands Media Network, the production of the ILG and handbook became too much for one individual. Not surprisingly, there have been many complaints about the book's non-appearance. The Media Network report also stated that publication of the ILG has also been delayed until November, with the publication only coming out every six months instead of quarterly.

The future of the ILG is therefore questionable. This is the second time I have got my fingers burnt ordering an overseas publication related to shortwave listening. The first occasion was *Voices* — a Finnish publication devoted primarily to programming. It went bankrupt. So I would strongly advise readers to check everything out very well before you part with any cash, if the publication is available from a local source, instead of ordering from overseas.

Radio Moscow World Service has sent out a questionnaire, according to Gerry McCulloch VK2BMZ, asking for listeners comments about their programming. It looks as if there has been "perestroika" (re-structuring) taking place within the World service. I was honestly shocked to actually hear a rock program on RM World Service. It is on fortnightly and called "Listeners' Request Club", being hosted by a Vasily Stroganoff.

The next scheduled broadcast from the Red Cross Broadcasting Service, in Geneva, Switzerland, was to be June 30, between 0740 and 0757 UTC, frequencies of 9.560, 13.685, 17.830 and 21.695 MHz. You could also try 1040 and 1057 UTC on 11.935, 13.685, 15.570 or 17.830 MHz. Other broadcasts are scheduled on August 1 and 4, at the same times and frequencies.

Well, that is all for this month. Remember that I am always interested to hear from you. My QTH is at the head of this column! Until next time, the very best of listening and 73. Robin VK7RH.

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INTRODUCE A FRIEND TO AMATEUR RADIO!

Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7251

CONTEST CALENDAR

JULY 1988
— 1 Canada Day Contest
— 2 Adelaide Hills ARS National Sprint (CW Section)
— 9 Adelaide Hills ARS National Sprint (Phone Section)
9 — 10 IARU HF World Championship
— 10 ARCI QRP CW Sprint
16 — 17 CQ magazine WW WPX VHF Contest (Rules June issue)

AUGUST 1988
— 6 YLRL YL/OM SSB Sprint
13 — 14 WIA Remembrance Day Contest (Rules this issue)
13 — 14 European DX Contest CW Section (Rules this issue)
27 — 26 All Asian CW Contest (Rules June issue)

SEPTEMBER 1988
10 — 11 European DX Contest SSB Section (Rules this issue)
24 — 25 CQ WW RTTY Contest

OCTOBER 1988
1 — 2 VK-ZL-Oceania DX Contest SSB Section
8 — 9 VK-ZL-Oceania DX Contest CW Section

NOVEMBER 1988
12 — 13 European DX Contest RTTY Section

The rules for the Australian National Amateur Radio Teleprinter Society RTTY Contest, that was held on the weekend of June 4-6, and published in this column in June, were sent to me by the contest editor of CQ magazine, W1WY. Contest information frequently takes many weeks to reach me from Caulfield South, and with the time it has taken to arrive from overseas, more often than not, is far too late to meet the publication deadlines.

The Remembrance Day Contest for 1988 will include the "open" section again. This step was taken in response to many requests received with the entries for last year's contest.

The other rule change is the requirement to pass a signal report. With the increased level of activity we are now experiencing on the higher bands, this year's RD activity should be spread around much more and will provide some really high scores.

John Litton ZL1AAS, who is the NZART VK/ZL/Oceania Manager, has written to me to advise of the promotion of the VK/ZL/Oceania Contest for 1988. The SSB section will be held over the weekend of October 1-2, and the CW section will be held over the weekend of October 8-9. The rules are basically the same as last year. The complete rules will be published when I have them to hand.

John tells us that, for over 40 years, Jock White ZL2GX, has been contest and awards manager for the NZART. During this time he has been (and still is) truly "Mr DX of New Zealand". However, he is now deservedly taking life a little easier, and, although he is still looking after awards, the position of contest manager has been divided.

I would think that being contest and awards manager for 40 years must be a world record, and with such a wealth of experience, Jock should write a book, that is if he has time now that he can spend more time on the air. FCM.

I have read various comments and suggestions for VHF contests run by the Institute, some have been quite complex in many ways, with methods of scoring that would appeal to many with degrees in higher mathematics or have access to computers with megabytes by the tonne. Many comments have been made by operators of what I would call "well set up and well placed VHF stations" most of these comments have suggested that the rules for the last Ross Hull Memorial Contest left much to be desired and have reduced the contest to little more than a DX chase. Let us see what the DX chase was about, firstly a contestant had to exchange a signal report and locator square number, to increase the number of locator squares, a station would be always on the lookout for stations within different locator squares and the really distant station are still valuable contacts for our super-stations.

These contests are not just a means for a few super-stations to demonstrate that, with a super site and super gear, they can, if conditions are right, drop a signal into a receiver 3000 kilometres away, we all know you can, and these VHF contests have received less and less support as the years have passed by. What I have attempted to do is provide some rules that are not complicated in any way, and give all stations the incentive to get out into the field and activate an unused Maidenhead Locator Square for the pleasure of other contestants.

These Locator Square contacts could provide the basis for some activity promoting awards that are sadly lacking in this country of ours.

The amateurs who sent me logs for the last Ross Hull Contest appeared to have enjoyed themselves, that is the impression that I received from the various comments.

If those amateurs who would like to have a separate contest for each of the VHF bands, based on distance transmitted/received, and who would be prepared to support such a contest actively, could indicate to me the approximate number of stations that would participate, I would accommodate them with separate contests.

The degree of Maidenhead Locator Square depth used in the Ross Hull Contest was deliberately chosen to reduce the number of squares workable in the metropolitan areas and, at the same time, not to have too many available for any future Australia-wide awards that may become available.

REMEMBRANCE DAY CONTEST 1988

As in previous years I will list the names of those amateurs who lost their lives whilst on active service during the Second World War, and who are commemorated with their names being engraved on our Remembrance Day Contest Trophy.
It is these names that you will hear read out as part of the Opening Ceremony prior to the commencement of the Contest.

VK2BQ	F W S Easton	Royal Australian Air Force
VK2JV	C D Roberts	Australian Military Forces
VK2VJ	V J E Jarvis	Royal Australian Air Force
VK2YK	W Abbott	Royal Australian Air Force
VK2AJB	G C Curie	Royal Australian Air Force
VK3DQ	J D Morris	Australian Military Forces
VK3GO	T Stephens	Royal Australian Air Force
VK3HN	J McCandlish	Australian Military Forces
VK3IE	J E Mann	Royal Australian Navy
VK3NG	N E Gunter	Australian Merchant Marine
VK3OR	M D Orr	Royal Australian Air Force
VK3PL	J F Colthorp	Royal Australian Air Force
VK3PV	R P Veall	Australian Military Forces
VK3SF	S W Jones	Australian Military Forces
VK3UW	J A Burrage	Royal Australian Air Force
VK3VE	J E Snadden	Royal Australian Air Force
VK4DR	D A Laws	Australian Military Forces
VK4FS	F J Starr	Royal Australian Air Force
VK4PR	R Allen	Royal Australian Air Force
VK5AF	C A Ives	Royal Australian Air Force
VK5BL	B James	Royal Australian Air Force
VK5BW	G J Phillips	Australian Military Forces
VK6GR	A H G Rippin	Royal Australian Navy
VK6JG	J E Goddard	Royal Australian Air Force
VK6KS	K S Anderson	Australian Military Forces
VK6PP	P P Paterson	Royal Australian Air Force

1988 REMEMBRANCE DAY CONTEST — RULES

Objectives

Amateurs in each VK call area will endeavour to contact other amateurs:

In other VK call areas, P2 and ZL in the bands 1.8 to 30 MHz, with the exception of the WARC bands 10, 18 and 24 MHz.

In any VK call area, including their own, P2 and ZL on bands above 52 MHz, and as indicated in Rule 5.

Contest Period

Between 0800 UTC August 13, and 0759 UTC August 14, 1988.

**** All Australian amateur stations are requested, as a mark of respect, to observe 15 minutes silence prior to the commencement of the contest.*** During this period the Opening Ceremony Broadcast, will take place.

Rules

1. There will be two contest categories.
   (a) High Frequency (HF) — for the bands below 52 MHz.
   (b) Very High Frequency (VHF) — for the 52 MHz band and above.
2. In each category there will be four sections.
   (a) Transmitting Phone
   (b) Transmitting CW
   (c) Transmitting Open
   (d) Receiving.

Modes applicable to each section are as follows:
   (a) AM; FM; SSB; TV
   (b) CW; RTTY
   (c) AM, FM, SSB, TV, CW, RTTY
   (d) Any of the above listed modes

3. Eligibility:
   All Australian amateurs (VK call sign) ZL and P2 stations may enter the contest, whether their stations are fixed, portable, or mobile. Members and non-members of the Wireless Institute of Australia are eligible for awards.
4. Cross Mode Operation is permitted. Cross Band Operation is **not** permitted excepting via a satellite repeater.

5. Scoring
(a) Phone contacts score one point.
(b) CW and RTTY contacts score two points.
(c) On all bands a station in another call area may be contacted once on each band using each mode; ie, you may work the same station on each band in Phone, CW, RTTY and TV.
(d) On the VHF bands the same station in ***any*** call area may be worked using any of the modes listed at intervals of not less than two hours since the same band/mode contact. However, the same station may be contacted repeatedly via satellite not more than once by each mode on each orbit.
(e) Acceptable logs for all entries must show a minimum of at least 10 valid contacts, and in the open section, a reasonable mixture will be required; ie, a log with 500 phone and 10 CW contacts would be judged as a phone entry.
6. Multi-Operator Stations Are *Not Permitted* (except as in Rule 7), although log keepers are allowed. Only the licensed operator is allowed to make a contact under his/her own call sign. Should two or more operators wish to operate any particular station each will be considered as a contestant and must submit a log under the individual call sign which applies to that operator. Multi-Station operators are not allowed.
7. Club Stations may be operated by more than one operator, but only one operator may operate at any time; ie no multi-transmission. All operators at a club station must sign the declaration.
8. Contest Exchanges
For a contact to be valid a signal report and serial number must be exchanged. This will consist of a RS/T plus serial number. The serial number will commence with 001 and increase by one for each contact. Should the serial number of 999 be reached, the serial number will again revert to 001.
9. Terrestrial Repeaters
Contacts via terrestrial repeaters are not permitted for scoring purposes. Contacts may be arranged through a repeater and if successful on another frequency will count for scoring purposes. The practice of operating on repeater frequencies in simplex mode is not permitted.
10. Portable Operation
Log scores of operators located outside their allocated call areas will be credited to that call area in which the portable operation took place.
11. Entries
A log of all contacts must be submitted. This should be in the format as shown in the examples and must be on one side of the paper only.
Entries must be on a standard size sheet such as Foolscap or A4, etc. Larger computer printout sheets are acceptable. Pieces of scrap paper and narrow rolls will not be accepted.
A Front Sheet must also be included showing the following information in this order:
Category (HF or VHF). Section (Phone, CW, Open, Receiving). Call Sign, Name, Address, Total Score, Page Tally.
Declaration: "I hereby certify that I have operated in accordance with the rules and spirit of the contest."
Signed:..... ***Date:***.....
Logs are to be forwarded to the Federal Contest Manager, C F Beech VK7BC, 37 Nobelius Drive, Legana, Tas. 7277.
Envelopes are to be endorsed REMEMBRANCE DAY CONTEST on the FRONT. Entries must be forwarded in time to reach the Federal Contest Manager by September 30, 1988.
12. Disqualification — see the general disqualification rules as printed in the Contest Section of June 1988 *Amateur Radio*.
Contestants should also note the General Contest Basic Rules in the same issue.
Any station observed during the contest as constantly departing from the generally accepted codes of operating ethics may also be disqualified.
Late entries will be used as Check Logs only.

Receiving Section
1. This section is open to all shortwave listeners in Australia, Papua New Guinea and New Zealand. No active transmitting station may enter this section.
2. Contest Times and logging of stations on each band are as for transmitting.
3. Logs should be set out as per the example. It is not permitted to log stations calling CQ. The details shown in the sample must be recorded.
4. Scoring will be as per Rule 5 for transmitting with the other aspects of that same rule also applying.
5. Club Stations may enter this section. All operators must sign the declaration.
6. Awards
Certificates will be awarded to the highest scorer in each call area. Further certificates may be issued at the discretion of the FCM.

Determination of the Winning Division
Scores of stations in VK0 are added to VK7.
Scores by VK9 stations are added to the mainland call area which is geographically nearest.
Scores claimed by P2 and ZL stations are not included in the scores of any VK call area.
The formula used to determine the winning WIA Division is applied on a Divisional basis using a combination of three factors, namely, involvement, activity and weighting factor.

Guidelines for Certificate Issue, Remembrance Day Contest
Certificates will be issued on the following basis:
1. Top scorer in each section (see also 4 below).
2. Top novice station in each section, but as per proviso 3 below. (N/K calls compete on an equal basis when operating in HF (novice) band segments. Therefore, there is no justification for separate certificates for each different type of call sign).
3. Where an entry other than the top scorer is concerned (as per 2 above), a certificate will only be issued to a station if that station's score is equal to, or greater than, the average score in the applicable section for that State/Division.
4. Where only one entry exists in any section, a certificate will only be issued when the score for that entry is equal to, or greater than, the average national score for that category/section of the contest.
5. On VHF the top scorer in each section will be awarded a certificate. There is no justification for separate awards for holders of Full, Z or K call signs as each competes on an equal basis on VHF
6. The above rules apply with the understanding, as already determined policy, that the Federal Contest Manager has the power of discretion in such matters and may either award additional certificates where he considers it warranted or not issue a certificate if he considers one unwarranted.

EXAMPLE FRONT SHEET
Remembrance Day Contest 1988
Category: HF **Section:** (a) Transmitting Phone
Call Sign: VK8ZZZ **Name:** Tom Brown
Address: 807 Iceberg Road, Darwin, NT. 8100
Total Score: 2536 points

Page Tally	14 Sheets	2536 points
	Page	Score
	1	46
	2	38
	.	.
	.	.
	.	.
Total	14 Pages	2536 points

Declaration: I hereby certify that I have operated in accordance with the rules and spirit of the contest.
Signed: T Brown **Date:** 3.9.88

EXAMPLE TRANSMITTING LOG
Remembrance Day Contest 1988
Call Sign: VK8ZZZ **Category:** HF
Section: (a) Transmitting Open

DATE TIME (UTC)	BAND (MHz)	MODE	CALL SIGN	NO SENT	NO RCD	PTS
13.8.88						
0801	14	SSB	VK6NE	57001	56001	1
0802	14	SSB	VK4TI	59002	58001	1
0804	14	SSB	VK78J	59003	59003	1
0806	7	CW	VK0AA	559004	479003	2
0809	7	SSB	VK78C	55005	58001	1
0809	7	SSB	VK78C	55005	58001	1

Page 1 of 13 Page Total 62

EXAMPLE RECEIVING LOG
Remembrance Day Contest 1888
NAME/SWL NO: L81234. CATEGORY: HF
SECTION: (d) Receiving Phone

Date Time (UTC)	Band (MHz)	Mode	Stn Calling	Stn Called	No Sent	No Rcd	Pts
13.6.88							
0800	21	SSB	VK1XXX	VK6LLL	001	002	1
0815	7	SSB	VK7YY	VK8QW	014	009	1
0815	7	SSB	VK7YY	VK8QW	014	009	1

Page 1 of 8 Page Total 42 points

EUROPEAN DX CONTEST 1988

Contest Periods
CW August 13-14, 1988
SSB September 10-11, 1988
RTTY November 12-13, 1988
1200 UTC Saturday to 2359 UTC Sunday.
Bands — 3.5; 7; 14; 21; 28 MHz.
The minimum time of operation on a band after a band change is 15 minutes — except *for* working a new multiplier. According to Region 1 IARU regulations contest operation is not allowed on the following band sections:
CW: 3.550-3.800; 14.075-14.350; 21.100-21.450; 28.100-29.700 MHz
SSB: 3.650-3.750; 14.300-14.350; 21.400-21.450; 28.700-29.700 MHz.
Classifications
(a) Single operator, all bands
No assistance in log keeping and multiplier searching allowed.
(b) Single Operator — high bands
As above, but operation on 14, 21, 28 MHz only.
(c) SWL. See special regulations (Rule 12).
4. Rest Periods
Of the 36 hour contest period only 30 hours of operation are permitted for single operator stations. The six hours of non-operation may be taken in one, but not more than three periods at any time during the contest. They must be clearly marked in the log.
5. Exchange
A contest QSO can only be established between a non-European and a European station (except in RTTY). Exchange the usual five or six digit RS/T plus a progressive QSO number starting with 001. A station may only be worked once per band.
6. Multipliers
The multiplier for non-European stations is determined by the number of European countries worked on each band (see WAE countries list). European stations use the *current* DXCC countries list. Each non-European country counts one multiplier unit per band.
Multiplier Bonus
The multiplier on 3.5 MHz may be multiplied by four
The multiplier on 7 MHz may be multiplied by three
The multiplier on 14/21/28 MHz may be multiplied by two
7. QTC Traffic
Additional point credit can be achieved by reporting a QTC, ie, data of a QSO between a non-European and a European station earlier in the contest, back to a European station. After working a number of European stations these QTCs can be reported back during a QSO with another European station. A QTC can only be sent from a non-European to a European (for RTTY see Rule 13).

(a) A QTC contains the time, call sign and OSO number of the station being reported QTC; ie 1307/DA1AA/431, means you worked DA1AA at 1307 UTC and received his serial number 431.

(b) A QSO may be reported only once and not back to the originating station.

(c) A maximum of 10 QTCs can be sent to the same station, which can be worked several times to complete this quota. Only the original contact, however, has QSO point value.

(d) Keep a uniform list of QTCs sent. QTC 3/7 indicates that this is the third series and that seven QSOs are now being sent.

(e) European stations may record the QTCs received on a separate sheet with a clear indication of their sender.

(f) If more than 100 QTCs are claimed, a QTC check list must show that the maximum quota of 10 QTCs per station is not exceeded.

8. Scoring

The final score is computed by multiplying the sum of the total number of QSOs and QTCs by the sum of multipliers from all bands. (cf Rule 6).

9. Contest Awards

Certificates will be awarded to the highest scorer in each of the different classification in each country, a reasonable score provided. Continental leaders will receive a plaque. Each participant with at least half the score of the continental leader will receive a certificate.

10. Disqualification

Violation of the rules of this contest, or unsportsmanship conduct, or taking credit for excessive duplicate contacts will be deemed cause for disqualification. Each duplicate QSO or excessive QTC will result in a penalty of three QSO/QTC points.

11. Logs

To ease checking participants are expected to arrange their logs according to the official WAEDC log form. All band changes have to be clearly indicated. The log must be accompanied by a summary sheet and dupe check sheets for all bands with more than 200 contacts. Sample log and summary forms are available from the address below. Please send an SSAE or sufficient postage (IRCs).

12. Special Regulations for SWLs

SWL log stations working in the WAEDC . Participation is only possible in the single operator/all band class. SWL logs from members of a team in the transmitting category cannot be accepted. The same call sign European or non-European may only be logged once per band. The log must contain both call signs and at least one of the control numbers. Each contest QSO logged counts two points, each complete QTC (maximum 10 per station) one point. Multipliers are determined by the DXCC country and WAE country lists (Rule 6).

13. Special Regulations for RTTY

In the RTTY section of the WAEDC there are no continental limitations. QTC traffic, however, is not allowed within one's own continent. Each station may send and receive QTCs. The sum of QTCs sent and received must not exceed 10.

14. Deadline for Entries

CW: September 15, 1988; Phone: October 15, 1988; RTTY: December 15, 1988.

15. Mailing Address

WAEDC Contest Committee, PO Box 1328, D-8950 Kaufbeuren, Federal Republic of Germany.

16. WAE Countries List

C31, CT1, CU, EA, EA6, EI, F, G, GD, GI, GJ, GM, GM Shetland, GU, GW, HA, HB, HB0, HV, I, IS, IT, JW Bear, JW Spitsbergen, JX, LA, LZ, OE, OH, OH0, OJ0, OK, ON, OY, OZ, PA, SM, SP, SV, SV5 Rhodes, SV9 Crete, SV Athos, T7, TA1, TF, TK, UA 1346, UA2/UZ2F, UA1 Franz Josef Land, UB, UC, UN/UA1N/UZ1N, UO, UP, UQ, UR, Y2, YO, YU, ZA, ZB2, 1A0, 3A, 4U1 Geneva, 4U1 Vienna, 9H1.

Criteria for the Awarding of Certificates and Trophies in the WAEDC

1. Minimal requirements for a certificate or a trophy are 100 QSOs or 10 000 points. In addition, at least one of the following conditions must be fulfilled.

2. Certificates

(a) Top score in a country.

(b) In countries or districts with a high participation, an additional certificate will be given for each full block of 10 participants.

(c) Members of the top 10 or top six (multi-operator) lists.

(d) Continental winners.

(e) Stations with at least half the score of their continental winner.

(f) Participants with at least 10 000 points.

3. Trophies

(a) Continental winners in the single operator category are awarded a plaque.

(b) Continental winners in the multi-operator category will be awarded a plaque if they have at least 100 000 points or at least the score of the winner in the single operator category in their continent.

(c) A station may receive a plaque in the same category only once within a three year period.

(d) Special plaques will be presented to all members of the top 10/six if they have been in this list for at least five times.

(e) The WAEDC committee reserves the right to honour outstanding achievements in the contest by additional plaques.

THE SUNSHINE STATE JACK FILES MEMORIAL CONTEST 1988

All licenced amateur radio operators throughout the world are invited to participate in the Sunshine State Jack Files Memorial Contest for 1988.

1. Object

The Aim of this contest is:

Firstly, to perpetuate the memory of the late Jack Files who was a long-time Council member of the Queensland Division of the WIA; and

secondly, to enable amateur radio operators to work Queensland stations for the *Worked All Queensland Award*, and other awards issued by amateur radio clubs in Queensland.

2. Period

The contest will be run in two timer periods:

First period — Saturday, July 16, 1988, from 0830-1230 UTC

Second period — Saturday/Sunday, July 16-17,1988, from 2330-0130 UTC.

3. Divisions and Sections

1. Stations within VK4:
   (a) Transmit all bands.
   (b) Transmit HF only.
   (c) Transmit CW only.
   (d) Club stations only.
2. Stations outside VK4:
   (a) Transmit all bands.
   (b) Transmit CW only.

4. Centre Frequencies

PHONE	CW
1.830 MHz	1.810 MHz
3.580 MHz	3.530 MHz
7.110 MHz	7.015 MHz
14.190 MHz	14.050 MHz
21.190 MHz	21.135 MHz
28.500 MHz	28.100 MHz

5. Operation

Phone and CW operation:

Each station may be counted as twice on each band for credit; once on phone and once on CW.

All contacts must be made in accordance with operator and station licence requirements. No net or cross-mode contacts will be valid for scoring purposes.

Station may be worked again after an elapsed time of one hour.

6. Calling Procedure

Phone: call CQ Jack Files Contest.

CW: call CQ Test Jack Files.

7. Exchanges

The usual RS/T together with serial number commencing at 001.

8. Scoring

For scoring on HF, Queensland is divided into two zones, the dividing line being the Tropic of Capricorn. On all bands, a bonus of 10 points may be claimed for the first contact to a Queensland City or Shire on each band during both, not each session. Also, a bonus of 10 points may be scored for each contact with a VK4 club station.

(a) Stations in VK4:

HF contacts within the same zone — three points.

HF contacts with stations in opposite zone — five points.

CW contacts: double points but not double bonus points.

Contacts with stations outside VK4 — two points.

(b) Stations outside VK4:

HF, VHF and UHF contacts with VK4 stations — two points. Bonus points apply. No points for contacts with stations outside VK4.

9. Logs

Logs must show full name, call sign, and address of the operator, the section entered, the points claimed for each contact and the total number of points being claimed.

Logs must be legible and signed by the contestant with a declaration that the legal operational requirements were adhered to.

The decision of the Contest Manager will be final.

Logs to be sent to: VK4 Contest Manager, T Mulholland VK4AEM, PO Box 35, Caloundra City, Qld. 4551, by August 12, 1988.

10. Awards

Trophies will be awarded to the highest scorer in each section. However, should a contestant receive an award in one section he/she will not be eligible for an award in any other section.

KEYMEN'S CLUB OF JAPAN SINGLE OPERATOR CW CONTEST
(Rules for non-Japanese Stations)

Period:

Saturday August 20 1988, 1200 UTC to Sunday, August 21, 1988, 1159 UTC.

Categories:

Single operator, Multi-bands, CW only.

Contest Exchange:

JAs — RST plus Prefecture/District Code.

Others — RST plus Continent Code.

Invalid Contact:

a. Contact with a multi-operator station.

b. Cross-mode or non-CW.

c. Cross-band, via repeater or satellite.

d. Contact between non-JA stations.

Scoring:

a. Points — For the complete contact with a station in Japan confirmed by the log submitted by all entrants — two points. For an incomplete one — one point. For an unconfirmed contact — 0 points.

b. Multipliers — 47 Japanese prefectures and 14 districts in Hokkaido in each band.

c. Final Score — Multiply points by the sum of multipliers.

Log Instructions:

a. Log should indicate Time in UTC, Call Sign and Exchange.

b. Multipliers should be clearly marked in the log only for the first time when it is worked in each band.

c. Use a separate sheet for each band.

d. Be sure to attach a summary sheet.

Awards:

a. The top through to the third scorer.

b. The top scorer In each continent who is ranked in the highest of the entire entrants.

Disqualification:

An entry with more than two percent duplications and/or invalid contacts left in the log will be disqualified. Violation of the amateur radio regulations and/or the rues of the contest will cause disqualification.

The decision of the KCJ Contest Committee is official and final.

Submission of Logs:

All entries must be postmarked *no* later than the last day of September and mailed to the Contest Commissioner of KCJ: Yasuo Taneda JA1DD, Gyoda Cho 3-9-2-102, Funabashi City, Chiba, 273, Japan.

Sponsor:

Keymen's Club of Japan (KCJ since 1976).

President — JA1DCL.

REFERENCE:

Codes of the Continents:

Asia — AS; North America — NA; South America — SA; Europe — EU; Africa — AF; Oceania — OC.

Codes of the Japanese Prefectures:

AC — Aichi; AM — Aomori; AT — Akita; CB — Chiba; EH — Ehime; FI — Fukui; FO — Fukuoka; FS — Fukushima; GF — Gifu; GM — Gumma; HG — Hyogo; HK — Hokkaido*; HS — Hiroshima; IB — Ibaraki; IK — Ishikawa; IT — Iwate; KA — Kagawa; KC — Kochi; KG — Kagoshima; KM — Kumamoto; KN — Kanagawa; KT — Kyoto; ME — Mie; MG — Miyagi; MZ — Miyazaki; NI — Niigata; NN — Nagano; NR — Nara; NS — Nagasaki; ON — Okinawa; OS — Osaka; OT — Oita; OY — Okayama; SI — Shiga; SG — Saga; SN — Shimane; SO — Shizuoka; ST — Saitama; TG — Tochigi; TK — Tokyo; TS — Tokushima; TT — Tottori; TY — Toyama; WK — Wakayama; YG — Yamaguchi; YM — Yamagata; YN — Yamanashi.

* Not used in this contest. See below.

Codes of the Districts of Hokkaido

AB — Abashiri; HD — Hidaka; HY — Hiyama; IR — Iburi; IS — Ishikari; KK — Kamikawa; KR — Kushiro; NM — Nemuro; OM — Oshima; RM — Rumoi; SB — Shiribeshi; SC — Sorachi; SY — Soya; TC — Tokachi.

Japanese multi-operator stations can be identified by their call signs.

Prefix 8J1 through to 8J0 (Ex-8J1ITU).

Suffixes RL (Ex-JA1RL).

Suffixes of three letters originating with Y or Z (Ex-JA1YWX, JA1ZLO).

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DEADLINE FOR SEPTEMBER IS JULY 18, 1988

Book Review

BEAM ANTENNA HANDBOOK

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

The authors draw on their experiences and those of others over the past 50 years. William Orr W6SAI and Stuart Cowan W2LX, first built two element 20 metre beams in the mid-1930s.

This updated book contains practical design, construction, installation and operating information for HF and VHF Yagi beams. It also covers Log Periodics, Quads and Vertical beams.

Beams for the 10, 18 and 24 MHz WARC bands are included.

Chapter 1 "Radiation and Propagation" looks at how antennas work, and the effects of antenna height. It reviews the relationship of the ionosphere and sunspots to DX communication.

Chapter 2 "The Yagi Beam Antenna" covers the theory of this type of antenna including gain, directivity, feedpoint resistance, front-to-back ratio and polarisation.

These basic chapters are well written and concisely give the necessary antenna theory concepts.

The following chapters over multi-band beams, transmission lines, antenna matching, construction and installation, test instruments, six questions about beam performance, and a brief chapter on compact Yagis for different locations, wire beams and log periodics. Dimensions are both in imperial and metric.

The book is well illustrated and aimed at those wanting to build Yagis with the minimum of fuss.

Beam Antenna Handbook by William Orr W6SAI and Stuart Cowan W2LX, is available from your Divisional Bookshop now.

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Please note: As the printed brochure DOC 71 was not available for study on June 1, 1988, the August Regulations Examination will be based on the existing Handbook.

AMATEUR EXAMINATION SYLLABUS

The following syllabus breakdowns became effective from June 1, 1988.

NAOCP — SECTION O (Theory)

SYLLABUS SECTION	TOPIC	NUMBER OF QUESTIONS
1	Electrical laws and circuits	8
2	Circuit symbols	
3	Mathematics	
	Note — questions on topics 2 and 3 are included in the various subject headings	
4	Semiconductors	6
5	Vacuum tubes	1
6	Power supplies	3
7	Oscillator and amplifier principles	2
8	Transmitters	5
9	Receivers	6
10	Propagation	4
11	Antennas and transmission lines	4
12	Test equipment and measurements	3
13	Interference	6
14	Safety	2
	Total	50

AOCP AND AOLCP — SECTION M (Theory)

SYLLABUS SECTION	TOPIC	NUMBER OF QUESTIONS
1	Electrical laws and circuits	8
2	Circuit symbols	
3	Mathematics	
	Note — questions on topics 2 and 3 are included in the various subject headings	
4	Power Supplies	3
5	Semiconductors	6
6	Vacuum tubes	1
7	Oscillator and amplifier principles	2
8	Transmitters	5
9	Receivers	5
10	Antennas and transmission lines	4
11	Propagation	4
12	Test equipment and measurements	3
13	Interference	5
14	Advanced modes of transmission and reception	2
15	Safety	2
	Total	50

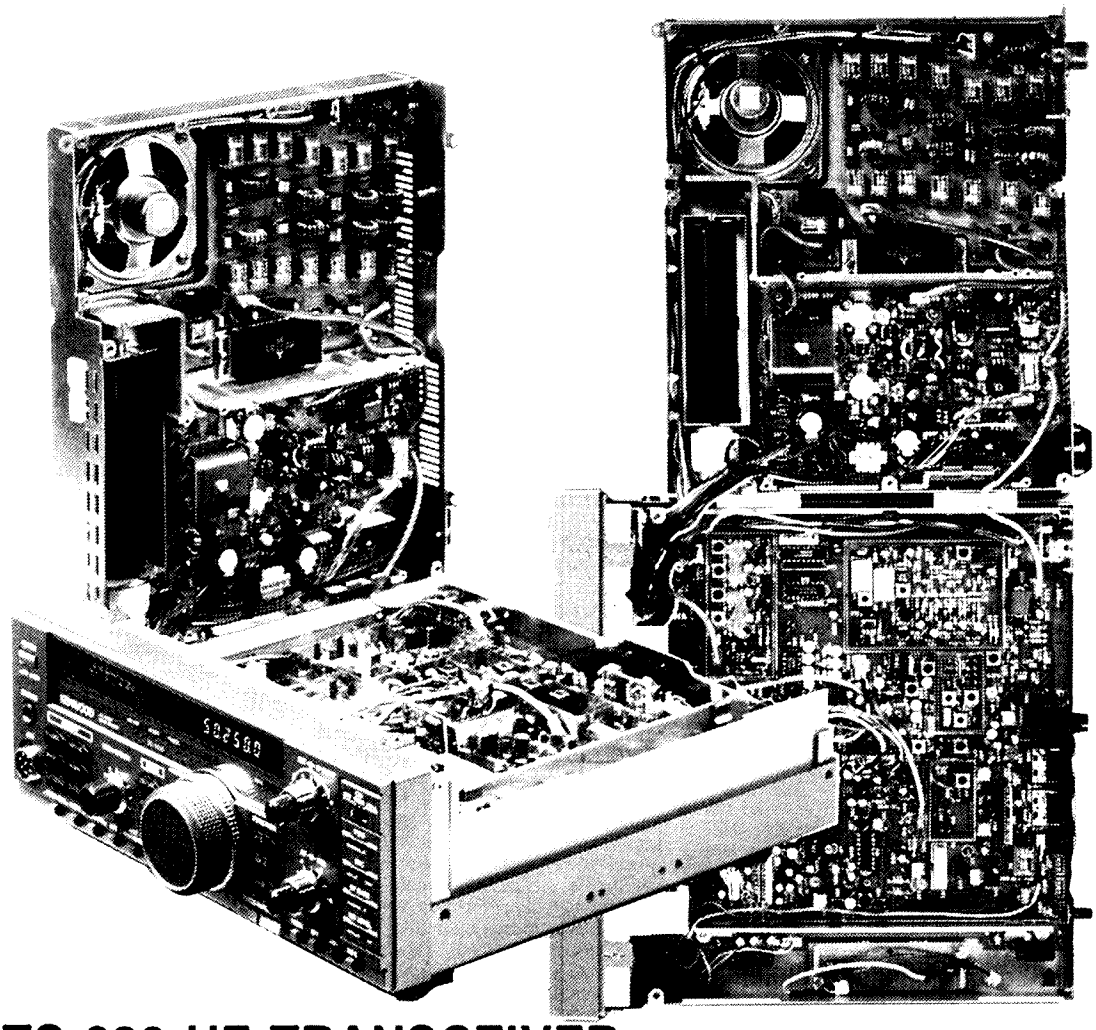
The above changes give effect to the desire to take more account of modern technology.

The syllabus sections covering 'Semiconductors' have been increased by one question and the sections covering 'Vacuum tubes' have been decreased by one question in the Novice, Limited and Amateur theory examinations.

In the theory Sections of the AOCP and AOLCP examinations, the syllabus section on 'Interference' has been reduced by one question with a corresponding increase of one question in the 'Advanced modes of transmission and reception' section.

—Signed: A Jordon, Radiocommunications Operations Branch, Communications Operations Division, April 19, 1988

KENWOOD



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100 WATTS OUTPUT ON 160 to 10 METRES
10 WATTS OUTPUT ON 6 METRES

The TS-680 is a high-performance HF transceiver designed for SSB, CW, AM and FM modes of operation on all Amateur bands. Covers Amateur bands 160 metres to 6 metres, combining the ultimate in compact size with advanced technology.

Compact and lightweight. CW Full Break-In, Semi Break-In and VOX Circuit. Superior receiver dynamic range. The receive front end has been specifically designed to provide superior dynamic range. The intermodulation dynamic range is 102dB, with an overall intercept point of + 12dBm, noise floor level of — 138 dBm. (when the optional 500 Hz CW filter YK-455C-1 installed). 31 Memory channels with split memory channels and memory scroll. Built-in dual-mode noise blanker ("Pulse" or "Woodpecker".) IF shift circuit. Adjustable VFO tuning torque. Switchable AGC circuit (FAST/SLOW) and built in speech processor, RF output power control and "F.LOCK" switch. Non-volatile operating system. Fluorescent tube digital display and squelch cicruit (for FM mode).

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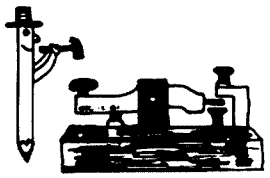

Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

Did you notice the mistake in last month's column? If you did, I hope you wrote to tell me about it.

If you want a letter answered, please enclose a self-addressed envelope, a I always answer those first. If I fail to answer immediately it usually means that I am waiting for information in order to pass it along.

Continuing from last month's episode I hope you are not more confused than you were before, because there is more to come.

FULL BREAK-IN

Essentially, full break-in is the ability to hear incoming signals between your own dots and dashes. This takes a little getting used to at first, especially if you neglect setting the equipment up beforehand. Careful control of the AGC speed, the receiver volume, as well as the volume of your own sidetone, and background noise are essentials. Practice working a strong "friendly" station with the RF gain turned right down so that the volume of the other signal is about the same as your sidetone. It should also be the same pitch. There should be little evidence of background noise when receiving until you are familiar with the operating practices anyway. If you cannot find anyone to practice with, give me a phone call some evening, but not too late please.

Much time can be saved as transmissions are concluded with a simple "BK" or "K" to let the other operator have his turn. It is amazing how much you can say in the 10 minutes or so between identifications. It can be quite exciting when there are three or more stations operating together, you can tell who is talking by their "fist" alone. Other stations have to be quick and lively if they want to sneak a comment in, which makes it much more fun!

A simple way of implementing a full break-in system is to use a separate antenna for the transmitter and (separate) receiver. A single antenna may be switched by a timed relay, but it may be preferable to leave the transmitter connected to the antenna permanently and use the relay to disconnect the receiver whilst transmitting. It is then easy to use the other relay contact to earth the receiver input. If you do not earth the receiver input, you will need to put two diodes "back-to-back" across its input, otherwise something is sure to cook. I found this out the hard way — complete with smoke!

Last week I had a letter from Lindsay VK3ANJ, who says:

"Last month I was trying to establish contact with VK7ZO on SSB. Conditions were difficult and Graham changed to CW. I replied also on CW and suggested he nominate a frequency at the CW end. His response was interferred with by a strong local sending at a laboured five words-per-minute "QSY CW end". I asked for his identification at his sending speed with the intention of enlightening him on some aspects of the legitimate use of CW. A long pause, then "QSY CW end dill. . .". "

Now, aside from the fact that if Lindsay were a true Morsiac he would have been on CW in the first place, he really did not have to QSY at all to be 'in the right' as it were.

I suspect we have all had the same sort of confrontations on air ourselves. I know I have, particularly in contests, but ours stem basically from SSBers in the Morse band sections. Anyway, Lindsay's letter prompted me into a little research on the regulations.

If you look in the current call book, page 105, you will see, interestingly, that in all the bands under 30 MHz, CW has its own segment at the bottom of the band. But it also extends across the *whole* band.

The *Amateur Operators' Handbook* revised 1978 edition, (which is the only edition I have been able to obtain since before I passed my exams) may be slightly out of date, but the regulations cannot have changed that much, states that "Transmissions without identification or with false identification are prohibited" (page 26, 6.34).

The same book also states in Appendix 2 "Wireless Telegraphy Regulations" that '50 The examination for an Amateur Operator's Certificate of Proficiency shall be such as to show that a successful candidate possesses the knowledge and qualifications specified in the Regulation, namely . . . (c) ability to send correctly, and to receive correctly by ear, in Morse code, a message in plain language at a speed of 10 words per minute.'

It also states, '50, (1) The Minister may at any time, by notice in writing, require the holder of a certificate issued under this Part to satisfy him, by examination or otherwise, within a time specified in the notice, that he possesses the knowledge and qualifications referred to in the certificate. (2) If the holder fails to so satisfy the Minister the Minister may, by notice published in the Gazette, cancel the certificate.'

I am not advocating informing on all the amateurs you know who have forgotten their Morse, they are probably in the majority anyway. But when one is harassed on air by basic ignorance, I think a call to the authorities is more than warranted. I would send a tape recording, as well!

The tried and true method of dealing with QRM is to ignore it. If you are concerned by bad operators, procedures or harassment, tape it, obtain an identification, and call the radio inspector for some action. Before you do though, I suggest a chat with the culprit first, if possible, as you can probably explain his error in a friendly manner. Isn't that what amateur radio is all about?

The most annoying thing about the amateurs who forget their Morse as soon as they get their licence, is that they do not realise what they are missing. I feel sorry or them, and who wants "contest throat" anyway?

Did I work you in the Novice Contest? Do not forget to send in your log!

73 for another month.

Gil.

ar

". . .Chap says we've got a chirpy note. . ."

ODE TO A TOWER

An Old Timer's Lament

Young amateur displayed some sense,
A ton of iron for eighteen pence!
With this he built a tower so bold,
It was amazing to behold.

Then off he went to Royal Arcade,
Where proudly once was all displayed,
At Number Five, a disposals store
Containing radio goods galore.

And here he bargained hard and fast,
Because the good bits didn't last.
He finished up with lots of loot,
And crammed it in his Chevvy's boot.

Off home once more, and in his shack
He wired it all into the rack.
With 813s in push-pull parallel,
When they were on you sure could tell!

Three thousand volts were on the plates,
In those days, mate, they weren't cheap-skates!
With all eight finals glowing bright
He gave a CQ late one night.

Three kilowatts the rig put out,
Four hundred, only, up the spout!
"CQ", he called, twas late at night,
It gave the ether quite a fright!
Yet some still think the pressure sprayer
Caused the hole in the Ozone Layer!

Slow time marched on, the years passed by,
And "Tempus fugit" is no lie.

His tower was now no longer bold
Like him, it too was growing old.
His Yagi drooped, no longer best,
A tangle like a wild bird's nest!

The tower was old, and rusty too,
And yes, it had a nasty slew!
The Council long ago has sense,
Ignored antennas at the fence.

New neighbours came, and nasty too,
They soon turned on a frightful blue!
They asked the Council round one day,
Our amateur wished they'd blow away.

The Council man just looked, and said,
"This blank old thing will hit your head!"

So now his tower's on the ground
A heap of junk, just lying round.

From iron to rust, a fact that's real,
Old amateurs last much longer than steel!

Stanley A Brunette VK3IS
Unit 44, Berwick Brae
870 Princes Highway
Berwick, Vic. 3806

(The author, whose previous call sign was VK2BRU, was at one time the proprietor of the disposals store *Reco Radio* at No 5 Royal Arcade, Sydney).

QUARTERLY AMATEUR STATISTICS as at March 1988

	1	2	3	4	5	6
VK1	2	66	30	62	228	3
VK2	12	978	377	902	3039	58
VK3	4	1097	361	738	2771	69
VK4	6	407	275	602	1643	43
VK5	2	280	138	299	1090	15
VK8	2	33	18	49	98	5
VK6	12	240	121	215	998	20
VK7	3	103	43	102	340	16
Terr	0	1	0	3	43	0
Total	43	3205	1363	2972	10250	229

The above is a breakdown of radio amateur station licences issued by the DOTC as at March 1988.

1. Beacons
2. Limited Licences
3. Limited/Novice Licences
4. Novice Licences
5. Unrestricted Licences
6. Repeaters

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

MEMBERSHIP LIST as at March 31, 1988

Charlene VK1NEJ
Kathleen VK2ACP
Betty VK2AMU
Ree VK2CAK
Dorothy VK2DDB
Norma VK2DJO
Beryl VK2DVL
Joy VK2EBX
Heather VK2HD
Joyce VK2MI
Maree VK2NKN
Nancy VK2NPG
Margaret VK2PNG
Bobbie VK2PXS
Freda VK2SU
Wendy VK2YQK
Jean Darling
Chris VK4ABN
Sandra VK4ACJ
Anne VK4ANN
Margaret VK4AOE
Jill VK4ASK
Connie VK4ATK
Dulcie VK4BDH
Betsy VK4BET
Wendy VK4BSQ
Jeanelte VK4BZL
Phyl VK4CPL
Anne VK4FAB
Christine VK4KCA
Noela VK4KCU
Hazel VK4MAZ
Dorothy VK4NAM
Candy VK4NES
Valarie VK4NNJ
Mary VK4PZ
Cecily VK4QW
Josie VK4VG
Val VK4VR
Bonnie Pounsett

Lorrie VK3AGO
Rae VK3AYL
Mavis VK3BIR
Joan VK3BJB
Mona VK3BRE
Janet VK3BTU
Barbara VK3BYK
Margaret VK3CWA
Kim VK3CYL
Margaret VK3DML
Marilyn VK3DMS
Valda VK3DVT
Bron VK3DYF
Gwen VK3DYL
Jan VK3HD
Marjorie VK3HQ
Marlene VK3JAW
Liz VK3JQ
Mavis VK3KS
Joan VK3NLO
Bonnie VK3PBL
Patricia VK3PRV
Phyl VK3PYL
Clarice VK3UE
Jessie VK3VAN
Joyce VK3VBK
Kathy VK3XBA
Austine VK3YL
Jean Truebridge
Raedie Fowler
Muriel May
Jean Shaw
Margaret Hamilton
Kay Bennetts

Jenny VK5ANW
Meg VK5AOV
Sue VK5AYL
Joyanne VK5BJH
Maria VK5BMT
Vicki VK5FK
Lorraine VK5LM
Carol VK5PWA
Marlene VK5QO
Joy VK5YJ
Denise VK5YL
Christine VK5ZCQ
Pauline Koen
Gill Wardrop
Bev Tamblyn

Bev VK6DE
Helene VK6HI
Joan VK6JMP
Peggy VK6NKU
Debra VK6OJ
Inge VK6OV
Trish VK6QL
Margaret VK6QM
Jan VK6PYL
Poppy VK6YF
Gillian VK6YL
Christine VK6ZLZ
Olive Couch
Daphne Hugo
June Greenaway
Lynda Francis

Helene VK7HD
Grace VK7TN
Kirsti VK9NL
Rae VK9NXL

OVERSEAS MEMBERS

Barbara CP5LE — Aimee FK8FA

Christel DF1LV — Heidi DF3LX
Christa DJ1TE — Margot DK5TT
Anny DF2SL — Gaby DL2BCH

Sheila G3HCQ — Joy G4OUZ
Ann G4EYL — Sylvia G4VBT
Diana G4EZI — Dee G4VFC
Jasmine G4KFP — Angelika G0CCI
Cilla G4KVR — Jeanette Arter

Shirely GM4LUS — Anne GM4UXX
Kay GM6KAY — Jean GW0ARP

Santina IT9KXI

Fumi JA1AEQ — Mizuyo JE6JQC
Akiyo JH1GMZ — Etsuko JA6KYP
Nanako JI1VLV

Jean K1IJV — Mary KB6CLL
Karla WA1UVJ — Maxine N6GGR
Cathi KA1OKF — Claudia N6GZW
Phyllis W2GLB/7 — Joanne N6LFZ
Christine WB2YBA — Jessie WA6OET
Jeanne KA3CEO — Martha KA7CRO
Liz W3CDQ — Jean KA7SWH
Mary Ann WA3HUP — Daurel KC7TE
Ruthanna WB3CQN — Gerry KD7RA
Lois WB3EFQ — Alice KD7SH
Edith WA4SRD — Joan KD7YB
Betty KA5ONE — Shirlee KQ7Y
Mary KE5UO — Marion WA7TLL
Carol KK5L — Lee KB8RT
Darleen WD5FQX — June KM8E
Karen KA5WXE — Shirley WD8HEV
Jerrie K6INK — Ann K9RXK
Joanie KA6V — Kay WA0WOF
Elizabeth KA6NZK

Eeva OH3ST — Zdena OK2BBI
Marie-Jeanne ON4AYL

Agnes PA3ADR — Paula PA3DST
Inge PY2JY — Rozita SM5HYL

Hallie VE6AUP — Rae VE7CIX
Elizabeth VE7YL — Margaret VE7DKC
Bobby VE7CBK — Muriel VE7LQH

Betty VR6YL — Junia YJ8NJW

Aola ZL1ALE — Alma ZL2AWP
Celia ZL1ALK — Biny ZL2AZY
Win ZL1BBN — Jos ZL2BAO
Heather ZL1BBT — Marilyn ZL2BOA
Clarrie ZL1BDZ — Jeanne ZL2BOD
Elva ZL1BIZ — Anne ZL2BOV
Ethel ZL1BWQ — Lynn ZL2PQ
Christine ZL1BQW — Pauline ZL2QW
Gail ZL1FV — Pearl ZL2QY
Vicki ZL1OC — Gail ZL2TZG
Cathy ZL2ADK — Carol ZL2VQ
Dawn ZL2AGX — Val ZL3GW

Lee ZS1YL — Mimi ZS5YO
Diana ZS6GH — Pat ZS6VC

Mary 5W1FMI

VK3 BARBEQUE

VK3 members held a barbeque at the home of Liz VK3JQ, a lovely setting with ample space, on April 17, 1988. The weather was glorious and the company excellent.

Those attending were Marjorie VK3HQ, Mavis AX3KS, Raedie Fowler, Gwen VK3DYL, Barbara VK3BYK, new member Phyl VK3PYL, Bron VK3DYF and Liz. Also in attendance were five OMs, including Liz's youngest son.

VK3HQ expressed her surprised and pleasure with the "trophy" (a little silver vase) ALARA recently presented to her to mark her 56 years "on air".

(Bron VK3DYF)

ALARA CONTEST

As part of our bicentennial celebrations this year, special contest certificates will be awarded.

To qualify:

VK operators require 200 points, and work 10 ALARA members.

DX operators require 88 points, and work five ALARA members.

BIRTHDAY ACTIVITY DAY

This year the ALARA Birthday YL Activity Day will be held on Saturday, July 23, 0400 to 1200 UTC. The normal Activity Day frequencies.

BITS AND PIECES

Sympathy is extended to Bet VK4BET, whose OM Berney VK4FOS passed away recently.

We were saddened to learn that Daphne Hugo, a VK6 member, passed away on April 23. Our sympathy to her family and VK6 friends.

Beryl, formerly VK2DVL is now VK2BBM.

Congratulations to Christine VK6ZLZ, now VK6 WIA Divisional President.

The YLRL Convention will be held in Hawaii in June 1989. Good location for those who can make it.

Bev VK6DE, came on the 222 Net on May 9, using the special call sign AX6YG. The occasion was the Travelling Australian Bicentennial Exhibition, in Geraldton.

Jenny VK5ANW, recently retired as VK5 Divisional President. On her last night in that position, a photograph, taken too commemorate the first lady president, was displayed, and Alan VK5NNM, spoke in appreciation of Jenny's contribution to the South Australian Division. The photograph of Jenny will be hung permanently at the Divisional Headquarters.

Jenny VK5ANW, at her last VK5 meeting as President.

KYOPELIVNON — 88 AWARD

It would appear that our OH counterparts are doing their bit to keep the amateur radio flag flying! In addition to YL meetings in different parts of the country, July is the month they hold their Radio Amateur League Summer Camp. They intend to work the bands with special call signs, OH2YLS and OG2YLS.

This information was supplied by Eeva OH3ST, who also gave some details of a new YL-88 Award.

Unfortunately the English is not very clear, but the rules seem to be that OH stations are required to work 88 YL stations, any band or mode, all other stations require 33 YL stations, any band or mode, during 1988. Cost is three IRCs. Log data (call sign, name, date, band) to: Eeva Kolvula OH3ST, Suksitie 16, 15880 Hollola, Finland.

Hopefully more precise details will be available in time for next month's AR.

YL Summer Meeting, Kuopio 1987. From left: OH2DL, OH5MX, OH7YL, OH2IO, OH7XX, OH3ST, OH2BYL/7LP.

The translation of Kyopelivnon, according to Eeva, is *The place where people say that witches get together to celebrate.*

I don't know whether it loses something in the translation, but it does seem a rather strange name for a YL award! I assume the OH ladies considered it appropriate, and don't intend to call for comments from our VK OMs!

NEW MEMBERS

Welcome to VK members: Cathy VK4CEK and Sally Ingram (VK4). Also DX members: Santina IT9KXI, Hiromi JJ1CAS, Phillipa ZL2CAV and Anne ZL3VR.

73/33 until next time,
Joy VK2EBX

ar

QSLs FROM THE WIA COLLECTION

Ken Matchett VK3TL
PO Box 1, Seville, Vic. 3139

The QSLs, GB3CJC and GB2SM, are those of what are called "Special Event Stations". In general, the call letters of the stations stand for the event itself.

In the case of these two stations, Captain James Cook (CJC) and Science Museum (SM). Such special calls are issued by the Radio Society of Great Britain (RSGB) and as their name suggests, celebrate or advertise usually some important event such as a hobby exhibition, an anniversary, a sporting event or a scout jamboree. In these cases, the licence is granted on the condition that the station is open to the public, is of general interest to amateurs or serves to publicise an important event. Special event call signs are normally issued to individuals for s specified time, it being required to operate such a station under the terms of the type (or grade) of license held by that person who is responsible for the station's operation. Several hundred special event call signs employing a variety of prefixes have been issued such as:

GB2NAH (North Area Hobbies Exhibition)
GB2RPF (Runicorn People's Festival)
GB3FB (Festival of Britain 1951)
GB4CFB (Cheshire Fire Brigade)
GB9DB (900th Anniversary of the Doomsday Book)

The uncommon GB0 prefix has also been used on a few occasions; eg GB0BRN (Silver Jubilee celebration by the Royal Naval Amateur Radio Society). A special event call sign has even been used to celebrate a private firm's anniversary; eg GB2IBM (IBM UK Laboratories). They have also celebrated royal occasions such as the investiture of HRH the Prince of Wales in 1969 (GB2HRH) and the Silver Jubilee of HM Queen Elizabeth II.

Some of the special event stations have what is called "Permanent (Special) call signs". The call GB2SM is one of oldest in this category. The 1965 edition of the RSGB Call Book lists only eight special (GB) calls amongst them GB2SM, all but one of the remaining seven being calls of the Radio Society of Great Britain or related stations. Station GB2SM is situated in the Science Museum at Kensington, London. It is a demonstration station at which licensed amateurs may take part in its operation. This reflects the philosophy of the museum itself which is to encourage viewers' participation in the operation of the many varied exhibits.

It seems fitting in this Bicentenary year to comment on the QSL GB3CJC. The station is a far more modern one than GB2SM, and attempts to trace the discovery voyages of James Cook over the air waves rather than by sea, to contact stations in those countries which he once visited.

Captain James Cook RN FRS, was born in Marton, Middlebrough, England in 1728 and died tragically in Hawaii during his third voyage in 1779, but his direct involvement with Australia was confined to an earlier voyage along Australia's east coast in the barque *Endeavour* in 1770. The station GB3CJC is operated by members of the Middlebrough Post Office Amateur Radio Club and is based in the Captain Cook Birthplace Museum situated only a few metres from the site of Cook's birth. The station was first operated on October 27, 1978, marking the 250th anniversary of Cook's birth and the opening of the new museum.

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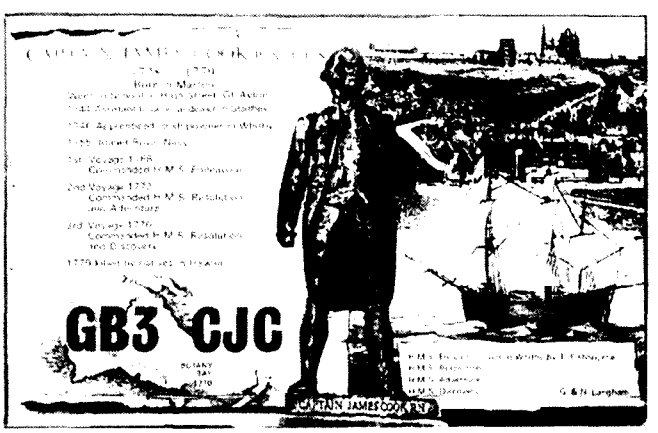

TECHNICAL MAILBOX

After reading the write-up on the TS-440S in the Equipment Review section of the July 1986 issue of Amateur Radio, I decided to go ahead and purchase the transceiver. Its performance lives up to all the expectations mentioned in the review and I am entirely satisfied.

However, since the day I purchased it in February 1988, I have noticed a rather annoying click in the loudspeaker every so often (every 20 seconds or so) and the pointer of the S-meter kicks up-scale at the same time, on all bands, particularly on the 80 metre band, even with the Noise Blanker in circuit. Sometimes the click would blanket a weak signal and the S-meter would kick up-scale almost to half-scale. Even with a short piece of wire as an antenna, I still get these clicks and kicks. Turning a light switch on and off does not seem to be the cause.

I pointed out this problem to the agent from whom I purchased the transceiver and he advised me to have it checked by the authorised Warranty Service Agent, which I did, but they "found no fault". However, the problem still remains.

I wonder if any other readers who own a TS-440S have experienced a similar problem. I would appreciate any comments.

—K E C Gillon VK6ZA

The above letter has been included in the *Technical Mailbox* with the view that someone else may have experienced the same problem with their TS-440S and may be able to help.

When I first read the letter, and noting that the Warranty Service Agent found no fault, I immediately believed that the effect was caused by an external (to the transceiver) noise source.

The first step would naturally be to define if the noise is external or internal to the transceiver. Totally removing the antenna should be a good guide although such interference could well enter the transceiver via the mains. Probably the acid test, and most simplistic at that, would be to substitute your transceiver with one of your local amateur friends.

If the noise is still evident with another transceiver then start looking for a device that is cycling on and off at about a 20 second rate! A portable radio, preferably with shortwave, will aid in localising the area. If it is not in your backyard, then call for help from DOTC. It will be of considerable help to that Department if you can arrive at an approximate location of the noise source.

Conversely, should you conclusively prove the noise to be in the transceiver, then take the rig back to the Service Agent and make the appropriate noises! Should the warranty have expired (as has most likely happened) then you have a debate on your hands! If you are willing to attempt to fix the problem (or even isolate it to an area for the Service Agent to fix), then consult the handbook!

I have had a browse over the circuit, and not wishing to take up too much space here, it should be a fairly easy task to isolate the respective stages backwards from the S-meter circuit. From the layout, it appears many points are available to achieve this without even unsoldering wires. It is possible, of course, that the problem may well be in the power supply or AF stages (a capacitor breaking down). It is up to you how far you wish to go! At least the problem is consistent and you should be able to tackle it with a degree of confidence. The intermittent ones are a different story!

Let us know the outcome.

ar

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED IN APRIL 1988

DXCC CW
132 Casey W Schreuder VK2CWS

WAVKCA
1576 Sampurno YC0BYW
1577 Olaf Sundin SM4BOI
1578 David L Levy KI4GV
1579 Shigeru Okazaki JH2ORJ
1580 Rumen Stefanov LZ2RS
1581 Radio Club "Jan Hus" YU2CCY
1582 Gene A Leis WR6P
1583 Harry Burhans W3FM
1584 Alan J Penney VE6LQ
1585 Thomas Freimann Y24PM
1586 Jarda Semotan OK1RD
1587 Yoshio Obuchi JE6MGR
1588 Minoru Nagata JA5EYW

WAS (VHF)
175 Lionel K Curling VK3NM 144 MHz

DXCC UPDATES
VK7YP 124 phone
VK4LC 310/345 phone

VK2 AWARDS — 1988
From the beginning of 1988, the New South Wales Division introduced a range of awards. It is some time since the Division had an awards program. The major award for 1988 is the Bicentenary of Australia — 1788-1988. It is valid from January 1, 1988 and concludes at midnight on December 31, 1988. Claims must be lodged by June 30, 1989. The object is to work and log 200 different VK2 contacts.

Other awards are *The Worked All New South Wales* by way of contacts in the various cities, municipalities and shires of New South Wales. The NSW National Parks Award, includes National Parks, State Recreation Areas and Historic Sites. For those who may not be able to work the full number required in the major awards, they may apply for the 25s Award. This is a one time, non-endorsement award.

There is still some work to be done on the VK2 Awards booklet, but basic rules, forms etc, are available from the VK2 Divisional Office. Please include two 37 cent stamps to offset postage and production costs. Later in the year the final version of the awards booklet will be available.

The Awards Manager is Col Stevenson VK2CS, WIA NSW Division, PO Box 1066, Parramatta, NSW. 2150.

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Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

Thought for the month: with 20 watts of RTTY into a dipole, one must be patient!

Many reports were received for March last, with contributions made by: VK2s ADL, CS, DEJ, EYI; VK3s AMD, DID, OJ, XB; VK4s ADY, AKX, BG, NHJ, BTW, IS, KHZ, YG; VK5s GZ, TL; VK7RH; VK8s ATK, HA, JF Thank you one and all for your efforts.

There were 475 intruders using AM mode reported, with the bulk of these being Asian stations on our 10 metre band. Of these, 146 intruders were heard using CW; 338 using RTTY; 144 were using other modes (R7B, B9W, N0N, P0N, etc). And, 34 intruder stations had the cheek to send their call signs. Reports are now coming in on 15 metres, which have been absent for quite a while. Seems 21 MHz is coming good. (At least for the intruders!).

The United States Federal Communications Commission (FCC), acting on input from the United States Intruder Watch (Amateur Interference Reporting System — AIRS) has sent telexes to the Soviet Minister of Post and Telecommunications and to the International Frequency Registration Board (IFRB) seeking assistance in eliminating harmful interference to the Amateur Radio Service. The Russian interference was on 7.025 and 7.070 MHz, and the subject of the telex to the IFRB was Radio Tirana, Albania, operating on 7.065 MHz. During March, the AIRS filed the results of 372 reports on non-amateur-to-amateur interference with the FCC Treaty Branch, in Washington, DC. Included in these reports were five-character coded groups which plague the amateur radio frequencies world-wide.

Let us continue to support the Ws and other Intruder Watch services around the world in their efforts to clean up our bands.

See you next month, and I hope you are getting more DX than I am!

73 de VK2COP

Acknowledgments: VK3PC, The ARRL Letter

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"OK — I've got one QSL card left — Who wants it? ! ?"

—VK2COP

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berville Road, Beverly Hills, NSW 2209

A LAW IS ONLY AS GOOD AS ITS POLICING IS EFFECTIVE!

The West German government has attempted to protect the unsuspecting customer who wished to buy electronic entertainment equipment, from obtaining equipment which did not meet the susceptibility standards considered necessary and fair by all parties concerned.

The customer finds, on unpacking the apparatus, a letter from the German Post Office (FTZ in DL is the same as the DOTC in VK) document 478/1981, 69/1981, which states to the effect:

"Dear radio listener/television viewer!

1. This equipment has been permitted to be purchased and used for the reception of radio and television signals.
2. The equipment must only be used to receive broadcast sound and television signals within West Germany. It is illegal to listen to police, sea-radio and mobile land radio stations.
3. Marking with the FTZ Test Number offers you the guarantee that this equipment does not interfere with other telecommunication services including radio services. Marking with the letters "S" or "SK" beside the FTZ Test Number indicates that this equipment is largely immune against disturbance by other radio services (eg amateur radio and CB radio). Please contact the local Radio Disturbance Measuring Office if, in special circumstances, disturbance occurs."

COMMENT:

Disturbance is caused by lack of immunity of a piece of equipment from licenced transmissions affecting it.

Interference is caused by illegal transmissions. (See also *Amateur Radio* April 1983, page 60).

SO FAR THE LAW, BUT WHAT ABOUT POLICING ITS EFFECTIVENESS?

The following is translated from cq-DL *September 1987, pages 549 to 550.*

Electronic entertainment equipment does not comply with the S or SK standardl One was anxious to learn about further tests by the consumer goods testing organisation (Stiftung Warentest) after the initial devastating results of the July test of Hi Fi equipment. Were the devices tested rare substandard examples or did they represent a generally bad standard of this type of electronic equipment?

Unfortunately, no better results could be reported. The testing authority stated that the nine tested Hi Fi combinations (tuner, amplifier, turntable, tape-deck, etc) offered generally good Hi Fi quality, but the immunity standards laid down by the FTZ were only met by a few examples. We will not go into detail here, but the tests showed clearly which equipment would be on the preferred list of any radio amateur shopping for equipment. There appear to be some manufacturers who have their immunity efforts under control, if one compares the two test reports. Products with bad susceptibility, on the other hand, come from the same manufacturer if both test results are compared.

cq-DL asked for comment from all manufacturers concerned. No replies have so far been received (September 1987). Also, the FTZ has also been silent, which seems to be typical for our problem. (There are only a few thousand radio amateurs involved!).

The fact that other radio services are also affected, to an ever increasing degree, is apparently overlooked. One reply was very quickly received at the DARS Headquarters (Baunatal, near Kassel). The Association of Consumer Organisations reacted promptly and placed the blame correctly.

THE INCOMPLETE FTZ REGULATIONS

The consumer pays! Very few areas of the consumer field have been covered with so many laws and regulations and technical specifications, as those for electronic equipment. The unsuspecting customer thinks that everything is covered such as radio frequencies on which listening is permitted, the requirement of reporting home computers, operating permission for antenna preamplifiers and the sale prohibition of certain transmitters. But the confidence of radio listeners and television viewers in the laws and regulations is lost, as son as the television picture starts to flicker during an important soccer game, or the expensive Hi Fi amplifier brings the greetings of the radio amateur next door.

Unfortunately, these disturbances are not rare, and they are not as funny as it may seem for the affected persons — the transmitter operator and the unwilling receiver owner! It is also not unusual that these cases are finally decided in a court of law. The surprise and anger of the affected radio listener are especially great, when he discovers, too late, that the dealer was permitted to sell the receiver, the use of which was, on the other hand, not permitted due to some regulation. For several years, the Consumer Organisation has claimed this is an impossible situation. The law maker has, in the meantime, closed this gap for transmitters.

There is nothing to stop the trade from selling unauthorised equipment, The law maker still places the entire responsibility on the layman, a condition which is severely criticised by the Consumer Organisation. It is difficult for the owner of a Hi Fi set, or television receiver, etc, to understand that his equipment is not sufficiently immune to legal transmissions, despite the testing sign and the "S" classification. The recent consumer product test of the Consumer Association (Warentest) again showed that one cannot rely on testing marks, which had been sought as a customer assistance. This unsatisfactory condition, criticised for years, is a direct result of the never ending arguments of industry and trade on one side, and the resistance of the radio amateurs and the consumer organisations on the other. One is afraid that this situation is likely to worsen in the near future when the Commission of the European Common Market countries adopts susceptibility limits and testing methods for radio receivers and other connected equipment (EN55020), which are less effective than the DIN VDE standards. One can then expect an increase of disturbance reports, and the FTZ will then see that the consumer in Germany and the other EG countries were not assisted by unsuitable regulations. It is clear that consumers especially will suffer as well as the radio amateur, until standards are *adopted and policed*, which are in line with the actual technical conditions. The industry and the FTZ is to be blamed for this. *cq-DL* will report on the answers to these questions as soon as they arrive from the FTZ and the equipment manufacturers.

(end of translation)

In recent years, we had the following situation:

If a neighbour complained to DOTC that his reception was affected by a nearby radio amateur, the radio amateur was likely to be blamed if the receiver of the neighbour carried the immunity test letters "S" or "SK". It was assumed that equipment carrying these letters did actually comply with the susceptibility standard. The tests published by the Consumer Association showed that this may not be so, and injustice was done to the radio amateur. This is why the DARC (equivalent to the WIA) fought a long battle with the FTZ recently, to ensure that the radio inspector ignores the "S" classification and instead uses a television set or radio receiver which is known to be so designed and tested that the immunity standards are met. This receiver could be placed alongside that of the complaining customer, and the radio amateur would only be blamed if this correct FTZ receiver was also affected!

Such a demonstration is the most effective way to show a complainant that the design of his equipment is at fault. Both the manufacturer and inadequate policing of the law are responsible, allowing the unsuspecting customer to buy equipment which does not comply with the wrongly indicated standard of immunity. In this case the radio amateur should not be blamed, nor his operation restricted.

Tests by DL1BU showed that the old and simple TRF receivers of the 1933 and 1938 period "VE-301 w" and "DKE" showed more immunity than most modern electronic entertainment equipment. Hi Fi combinations of the following manufacturers were tested last year by the Association of Consumer Organisations:

ITT, Graetz, Fisher, Kenwood, Sanyo, Sony, Sharp, JVC, Denon, Grundig, Dual, Sansui, Yamaha, Saba, Onkyo, Marantz, Telefunken, Luxman, Pioneer, Philips.

Some equipment radiated RFI by itself, causing active interference, whilst others had far too little immunity. Some equipment was already affected by local radio stations (non-amateur).

Concern was also voiced by a member of the Federal German Parliament, Gerhard O Pfefferman (CDU), when he addressed the visitors at *Ham Radio 1987*, which was held at Friedrichshafen (there were about 15 000 visitors from various countries). Mr Pfefferman stated that the customers, as well as the radio amateurs, are not sufficiently protected from buying equipment of low quality or performance. The FTZ tests only one prototype, which is not necessarily a representative sample compared with the mass-produced equipment of this type. The Consumer Association also tested one set per maker and found that, in seven cases out of 12, the immunity standards, which should have been met to earn the "S" or "SK" certifications were not met.

We can learn from this situation in West Germany. Laws and regulations which are not effectively policed are worse than no laws at all. They are misused by those who attempt to be "smarter" than the authorities, to the detriment of the public.

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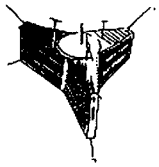
CANCER LINK

The American Radio Relay League has responded to recent news media reports of a possible relationship between amateur radio and health hazards.

The ARRL board adopted a resolution emphasising its continued support of legitimate investigations in this field, while at the same time deploring inaccurate and capricious assessments of scholarly work that have appeared in the media.

The ARRL said the reports had caused "unfounded anxiety and concern" among radio amateurs.

The reports said research had found a significantly higher than normal incidence of several kinds of cancer in radio amateurs due to prolonged exposure to electro-magnetic radiation.



AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR

Graham Ratcliff VK5AGR

INFORMATIONS NETS

AMSAT AUSTRALIA

Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC Sunday
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements, from the AMSAT Australia net. This information is also included in some WIA Divisional Broadcasts.

AMSAT-AUSTRALIA NEWSLETTER

This fine monthly publication is published on behalf of AMSAT-Australia by Graham VK5AGR, and now has 300-plus subscribers. Should you also wish to subscribe, send a cheque for $20, made payable to AMSAT-Australia, and post it to: AMSAT-Australia, C/- PO Box 2141, GPO, Adelaide, SA. 5001.

The newsletter provides the latest news items on all satellite activities and is a must for all those seriously interested in amateur satellite activities.

PHASE-3C (OSCAR-13) TO BE LAUNCHED JUNE 8

Historically, this item will be very old news by the lime this column reaches readers. All being well, OSCAR-13 will now be in orbit and about to be placed into general operations. However, this plan of operations will, no doubt, be subject to change depending on a host of post-launch criteria.

Notwithstanding, the following Specification Sheet, prepared by AMSAT-NA, is presented for information.

PHASE-3C LAUNCH CAMPAIGN INFORMATION KIT SPECIFICATIONS Rev 2.0 April 2, 1988 WA2LQQ

In three parts:
Part 1: Phase 3 Spacecraft Specifications
Part 2: User Station Requirements
Part 3: Ariane 4 Launcher Characteristics and Launch Site Information

The following preliminary specifications represent the latest known values for Phase-3C. However, it is understood and assumed some values will change as better values are obtained or as system changes are made either by intent or by natural processes inherent in component aging, temperature changes, etc.

PART 1: PHASE-3 SPACECRAFT SPECIFICATIONS

1.0 Power system

1.1 Solar arrays 50 watts at start of life rolling off to about 35 watts after three years, depending on various factors.

1.2 Batteries: Primary rated at 10 Ah: auxiliary rated at 6 Ah.

1.3 Regulation by a Battery Charge Regulator (BCR).

2.0 Attitude Control and Stabilisation

2.1 Type: Spacecraft is a spinner; spins on Z-axis at 10-60 rpm.

2.2 Control: Attitude and spin rate adjusted magnetically by generation of torque through interaction of on-board pulsed electro-magnets (magnetorquers) and geo-magnetic field.

2.3 Attitude determination and spin rate detection by two sun sensors (cross slits) and earth sensor inputs to computer.

3.0 Integrated Housekeeping Unit (IHU)

3.1 Operating System: Multi-tasking computer running IPS system.

3.2 CPU: 1802 COSMAC.

3.3 Memory:Harris HS-6564RH radiation hardened memory totalling 32 kBytes of error correcting memory (48 kBytes total).

4.0 Propulsion

4.1 On-board perigee kick motor (PKM) comprising a liquid fuelled, bi-propellant rocket engine.

4.2 Thrust: 400 N.

4.3 Specific Impulse: 293 seconds.

4.4 Delta V anticipated with 142 kilograms spacecraft: 1480 m/s.

4.5 Fuel: Aerozine 50: a 50 percent blend of unsymmetrical dimethyl hydrazine (UDMH) and hydrazine.

4.6 Oxidizer: Nitrogen tetroxide (N202).

4.7 Ignition system: none: hypergolic (self-igniting) fuel employed.

4.8 Pressurisation: Helium: 400 Bars high side: 14 Bars low side.

5.0 Transponders

5.1 Mode B: 150 kHz wide inverting linear transponder.

5.1.1 Frequencies.

5.1.1.1 Uplink: 435.420-435.570 MHz.

5.1.1.2 Downlink: 145.975-145.825 MHz

5.1.1.3 Beacons: General 145.812 MHz: Engineering 145.985 MHz.

5.1.2 Receive system characteristics.

5.1.2.1 Effective system noise temperature: ? ? ? K (NF = ? ? ? dB).

5.1.2.2 Figure of merit: ? ? ? dB/K (with antenna gain of 9.5 dBic).

5.1.3 Transmitter characteristics.

5.1.3.1 Power output: 17 dBW (50 W) PEP: 11 dBW (12.5 W) average.

5.1.3.2 Intermodulation ratio (NPR method): -23 dBr.

5.1.3.3 Downlink EIRP: 23 dBW (200 W) PEP: 17 dBW (50 W) average (with 6 dBic gain).

5.1.3.4 Downlink 3 dB beamwidth: Approximately 100 degrees.

5.2 Mode JL: 290 kHz wide inverting linear transponder.

5.2.1 Frequencies.

5.2.1.1 Uplinks
:1) Mode L: 1269.620-1269.330 MHz.
:2) Mode J: 144.425-144.475 MHz.
:3) RUDAK: 1269.710 MHz.

5.2.1.2 Downlinks
:1) Mode L: 435.715-436.005 MHz.
:2) Mode J: 435.990-435.940 MHz.
:3) RUDAK: 435.677 MHz.

5.2.1.3 Beacon: General 435.651 MHz.

5.2.2 Receive system characteristics.

5.2.2.1 Effective system noise temperature: 260 K (NF = 2.8 dB).

5.2.2.2 Figure of merit: -12 dB/K (with antenna gain of 12.2 dBic)

5.2.3 Transmitter Characteristics.

5.2.3.1 Power output: 17 dBW (50 W) PEP: 11 dBW (12.5 W) average.

5.2.3.2 Intermodulation ratio (NPR method): -23 dBr.

5.2.3.3 Downlink EIRP: 26.5 dBW (446 W) PEP: 20.5 dBW (111 W) average (with 9.5 dBic).

5.2.3.4 Downlink 3 dB beamwidth: 67 degrees.

5.3 Mode S: 36 kHz wide hard limiting transponder.

5.3.1 Frequencies.

5.3.1.1 Uplink: 435.601-435.637 MHz.

5.3.1.2 Downlink: 2400.711-2400.747 MHz.

5.3.1.3 Beacon: 2400.325 MHz.

5.3.2 Receive system characteristics.

5.3.2.1 Effective system noise temperature: (?) (Same as Mode B 70 cm receiver).

5.3.2.2 Figure of merit: ? ? ? dB/K (with 9.5 dBic antenna gain).

5.3.3 Transmitter characteristics.

5.3.3.1 Power output: 0.97 dBw (1.25) watts continuous.

5.3.3.2 Downlink EIRP: 14 dBw (25 W) with 13 dBic antenna gain.

5.3.3.3 Downlink 3 dB beamwidth: 45 degrees.

5.4 RUDAK.

5.4.1 Frequencies.

5.4.1.1 Uplink: 1269.710 MHz.

5.4.1.2 Downlink: 435.677 MHz.

5.4.2 Receive system characteristics.

5.4.2.1 Effective system noise temperature: 260 K (NF = 2.8 dB).

5.4.2.2 Figure of merit: -12 dB/K.

5.4.3 Digital rates.

5.4.3.1 Uplink: 2400 bps bi-phase PSK (BPSK) with 7.5 kHz RF capture range.

5.4.3.2 Downlink: 400 bps BPSK or 1200 bps NRZI.

5.4.3.3 Protocol: AX.25 version 2.

6.0 Antenna Systems

6.1 Two metre antennas.

6.1.1 Two metre high gain array.

6.1.1.1 Type: ZL special: three phased two-element beams.

6.1.1.2 Gain: 6.0 dBic.

6.1.1.3 3 dB beamwidth: 100 degrees.

6.1.1.4 Polarisation:RHC.

6.1.2 Two metre omni: monopole.

6.1.2.1 Type: Monopole.

6.1.2.2 Gain: -2.0 dBi.

6.1.2.4 Polarisation:Linear.

6.2 70 centimetre antennas.

6.2.1 70 centimetre high gain array.

6.2.1.1 Type: Three phased dipoles over ground.

6.2.1.2 Gain: 9.5 dBic.

6.2.1.3 3 dB beamwidth: 67 degrees.

6.2.1.4 Polarisation: RHC.

6.2.2 70 centimetres omni.

6.2.2.1 Type: Monopole.

6.2.2.2 Gain: -2.0 dBi.

6.2.2.3 Beam Pattern: Toroidal concentric with Z-axis.

6.2.3.4 Polarisation: Linear.

6.3 24 centimetre antenna
6.3.1 Type: Five turn helix.
6.3.2 Gain: 12.2 dBic.
6.3.3 3 dB beamwidth: 49 degrees.
6.3.4 Polarisation: RHC.

6.4 13 centimetre antenna.
6.4.1 Type: Six turn helix.
6.4.2 Gain: 13.0 dBic.
6.4.3 3 dB beamwidth: 45 degrees.
6.4.4 Polarisation: RHC.

7.0 Orbital Characteristics (at separation from launcher)

7.1 Geosynchronous Transfer Orbit (GTO).
7.1.1 Perigee Altitude: 222.504 kilometres.
7.1.2 Apogee Altitude: 36 076.636 kilometres.
7.1.3 Inclination: 9.997 degrees.
7.1.4 Argument of Perigee: 178.148 degrees.
7.1.5 Ascending Node Longitude: -135.541 degrees/lift-off.
7.1.6 True Anomaly: 127.554 degrees.
7.1.7 Epoch: Instant of Separation (L +4797.1 seconds).
7.1.8 Spin rate at deployment: 29.47 degrees per second.
7.1.9 Separation velocity: 0.590 metres per second.

7.2 Objective Phase 3C Orbit (Final orbit after two or three burns).
7.2.1 Apogee: 36 000 kilometres.
7.2.2 Perigee: 1 500 kilometres.

7.3 Inclination: Approximately 57 degrees.
7.4 Argument of perigee: 178 degrees (determined by launcher).
7.5 Anomalistic period: Approximately 662.4 minutes.
7.6 Longitude increment: Approximately 184.5 degrees east per orbit.

8.0 Physical Characteristics

8.1 Size.
8.1.1 Diameter (including antennas) 2.00 metres.
8.1.2 Height: (including antennas) 1.35 metres.
8.2 Mass: 142 kilograms fully fueled.
8.3 Mass: (After kick motor firing) 92 kilograms.

9.0 Major Subsystems.

9.1 Integrated Housekeeping Unit (IHU).
9.2 Battery Charge Regulator (BCR).
9.3 Liquid Ignition Unit (LIU).
9.4 Propellant FLow Assembly (PFA).
9.5 Mode JL (L) Transponder.
9.6 Mode B (U) Transponder.
9.7 Mode S Transponder.
9.8 RUDAK Transponder.
9.9 Sensor Electronics Unit (SEU).
9.10 Sun Sensor.
9.11 Earth Sensors.
9.12 Solar Arrays.
9.13 Perigee Kick Motor (PKM).
9.14 Propellant Tank System.
9.15 Helium Bottle.
9.16 Antenna System.
9.17 Magnetorguers.
9.18 Batteries.
9.19 Safe/Arm System.
9.20 Solar Energy Research Institute (SERI) Experiment.

PART 2: USER STATION REQUIREMENTS

1.0 Mode B

1.1 Uplink requirements.
1.1.1 Frequency: 435.420-435.570 MHz.
1.1.2 EIRP: 21.5 dBW for 20 dB peak and 10 dB average SNR on downlink.
1.1.3 Polarisation: RHC.

1.2 Downlink Requirements.
1.2.1 Frequency: 145.975-145.825 MHz plus GB at 145.812 plus EB at 145.985 MHz.
1.2.2 Polarisation: RHC.
1.2.3 Minimum recommended antenna gain: 10 dBic.
1.2.4 Maximum receive system effective noise temperature: 625K (NF = 5.0 dB)
1.2.5 Minimum figure of merit: -18 dB/K.

2.0 Mode JL

2.1 Uplink requirements.
2.1.1 Frequency:
Mode L: 1269.620-1269.330 MHz.
Mode J: 144.425-144.475 MHz.
2.1.2 EIRP:
Mode L: 25 dBW for 20 dB peak and 10 dB average SNR on downlink.
Mode J: 25 dBW for 20 dB peak and 10 dB average SNR on downlink.
2.1.3 Polarisation: RHC.
2.1.4 Suitable uplink components:
Mode L: 10 watts to 15 dBic gain antenna.
Mode J: 20 watts to 12 dBic gain antenna.

2.2 Downlink requirements.
2.2.1 Frequency: 435.715-436.005 MHz plus GB at 435.651 MHz.
2.2.2 Polarisation: RHC.
2.2.3 Minimum recommended antenna gain: 13 dBic.
2.2.4 Maximum receive system effective noise temperature: 290K (NF = 3.0 dB).
2.2.5 Minimum figure of merit: -12 dB/K.

3.0 Mode S

3.1 Uplink requirements.
3.1.1 Frequency: 435.601-435.637 MHz.
3.1.2 EIRP: Approximately 27 dBW under average Mode B AGC conditions.
3.1.3 Polarisation: RHC.
3.1.4 Suitable uplink components: 25 watts to 13 dBic antenna.
3.2 Downlink requirements.
3.2.1 Frequency: 2400.711-2400.747 MHz plus beacon at 2400.325 MHz.
3.2.2 Polarisation: RHC.
3.2.3 Minimum recommended antenna gain: 28 dBic.
3.2.4 Typical antenna: 1.4 metre dish assuming 50 percent efficiency.
3.2.5 Maximum receive system effective noise temperature: 290K (NF = 3.0 dB).
3.2.6 Minimum figure of merit: +3 dB/K.

4.0 RUDAK

4.1 Uplink requirements.
4.1.2 EIRP: 26 dBW (400 watts EIRP).
4.1.3 Typical suitable uplink: eight watts to 17 dBic antenna.
4.1.4 Polarisation: RHC.

4.2 Downlink requirements.
4.2.1 Frequency: 435.677 MHz.
4.2.2 Typical receive antenna gain: 10 dBic for 12 dB Eb/No ratio.
4.2.3 Polarisation: RHC.

PART 3: ARIANE 4 LAUNCHER CHARACTERISTICS AND LAUNCH SITE INFORMATION

1.0 Launcher, General

1.1 Model Ariane 4.
1.2 Flight V-23: first demonstration flight of the Ariane 4 launcher.

2.0 Ariane 4 Capabilities.

2.1 To GTO: 4200 kilograms.
2.2 To heliosynchronous (800 kilometres): 4500 kilograms.
2.3 To LEO (200 kilometres): 8000 kilograms theoretical: limited by structural design.
2.4 Escape orbit: 2600 kilograms.
3.0 General Specifications: Ariane 4, Configuration 44LP.

3.1 Configuration 44LP: Two liquid strap-ons: Two solid strap-ons.
3.2 Mass to GTO: 3700 kilograms.
3.3 Height: 58.4 metres.
3.4 Approximate lift-off mass: 471 metric-tons.
3.5 First stage: L220: height 23.22 metres: diameter 3.8 metres: Delta V = ~3100 m/s.
3.5.1 Four Viking V engines.
3.5.1.1 Thrust (each engine): 668 kN : 750 kN in vacuum.
3.5.1.2 Specific Impulse: 248 seconds: 278 seconds (vacuum).
3.5.1.3 Burn time: 206 seconds.
3.5.1.4 Chamber pressure: 58.5 bars (abs).
3.5.1.5 Propellant system: 226 *metric* tons of N204 plus UH25.
3.5.2 First Stage Liquid Strap-Ons.
3.5.2.1 Two Viking VI Engines.
3.5.2.2 Thrust (each engine): 661 kN: 750 kN in vacuum.
3.5.2.3 Specific Impulse: 248 seconds: 278 seconds (vacuum).
3.5.2.4 Burn Time: 143 seconds.
3.5.2.5 Propellant System: 39 metric tons of N202 plus UH25.
3.5.2.6 Dimensions: Height 19 metres: diameter 2.22 metres.

RECENT INFORMATION OF FO-12 AND OPERATING SCHEDULE

More than a year and half have passed since the amateur satellite JAS-1/FO-12 was launched. Radio amateurs world-wide welcomed the satellite and it has now been well used. Initially, period, only the linear translator worked as mode JA, but since June 1987, mailbox, Version 0.0 has become available as mode JD.

The mailbox has been improved up to the current Version 1.11. Because of the tight power conditions of FO-12, parallel running of both JA and JD is impossible, so they are operating alternately for the time being.

FO-12 is characterised by a function of store and forward system of messages in the packet. How many stations are active on the space packet? According to the users lists obtained, about 300 stations have been counted.

It is impossible to estimate the exact number of packeteers throughout the world, but it may, at least, amount to 30 000 referring to the number of TNCs sold so far. This means that only one percent of these are space packeteers on the whole, but hopefully this will increase.

There have been many interesting messages in the mailbox. There are many personal greetings across the world, information of AO-10, discussions on packet, Christmas messages, etc. One can send messages to anywhere in the world via FO-12, although not in real-time.

Generally, FO-12 is in good working condition, although there is a slight deterioration in the storage battery. In attempt to lengthen the life of the satellite, operation of transponders has been limited.

OPERATION GUIDE OF FUJI-OSCAR 12

Present transponder operation is as follows:

1. There are three modes of operation:
mode JA — for analog QSO (SSB phone, CW).
mode JD — for digital (packet) communication.
mode DI — digital system working except transmitter.

Generally, analog mode JA and digital mode JD work alternately every 10 days or two weeks.

2. In a JA week, except off days, beacon CW telemetry signals can be heard on the beacon channel, when communication is possible.

3. In a JD week it will open in as follows:
JTD-ON: At the beginning of JD period, station JJ1ZUT (satellite control station) uploads the necessary programs for satellite operation, and JD starts to work at the conclusion of program uploading, when JTD, the transmitter of JD system, becomes possible to transmit downlink signal. During this period, if FO-12 receives any valid uplink signal, JTD will continue to work for mailbox, and it will be turned off three minutes after the last access. If there is no accessing uplink and JTD does not work, downlink PSK stream will be transmitted for five seconds every minute, showing JD to be available. JTD-ON continues for two hours.
JTD-OFF: This follows after JTD-ON and no downlink signal is received for two hours. JTD-ON/OFF repeats cyclically every two hours.
DI: CPU and memory of the digital system work but JTD does not operate. This is to charge the battery during JD period, not to lose posted messages by turning off the whole system.
* Time counting of two hours begins at the conclusion of the program uploading, but this does not generally coincide precisely. Because the satellite has no permanent clock, it is necessary to set the time for CPU every uploading. Therefore the satellite time should be calibrated by comparing it with the correct one at a receiving site. The finishing time of uploading will be shown in the beacon of FO-12.

—The above information is supplied by the Technical Laboratory of JARL

FO-12 Mailbox Version 1.11

1. Setting of the TNC

* TNC should be for the AX-25 Version 2. Version 1 does not connect to JAS-1 (8J1JAS).
* FRACK, waiting timer for ACK (acknowledging signal from the satellite), should be over six. Other setting of time constants are similar to packet link on the ground. Because the mailbox responds to multiple access, processing time may increase, therefore, it may become necessary to increase FRACK more than six.
* MAXFRAMES, the number of packets that can be sent at one time is up to seven. It is better for MAXFRAMES to set less than three.
* PACLEN, the number of bytes of data in one packet, should be less than 200 bytes.

FO-12 transmits with PACLEN = 128 and MAXFRAMES = 1.

Digipeating

Mailbox has no digipeating function, and does not accept any frames as a digipeater.

3. Users commands available

B	displays all file names of the bulletin addressed to all, back from the latest one.
F	displays the latest 15 files.
F*	displays the latest 50 files.
F<d>	displays files pasted in the day <d>.
H	explains available commands and functions.
F<#>	kills mail defined as <#>, a file number, only by writer or addressee. It is not executed while someone is reading.
M	displays all files addressed to the user.
R<#>	displays contents of message defined as <#>.
U	displays call sign and SSID of all stations that have been accessing to FO-12/8J1JAS.
W	writes message to FO-12, responding to the sent prompt. For termination of the text, use <RET>.<RET> or <RET>^<RET>.

* Letters of both upper and lower case are available. Letter code for packet is ASCII.
* Disconnect by command through the TNC.

The above information is supplied by Technical Laboratory of JARL.

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SATELLITE ACTIVITY FOR THE MONTHS OF FEBRUARY/ MARCH 1988

1. LAUNCHES

The following launching announcements have been received:

INT'L NO 1988	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INC deg
013A	Cosmos 1922	Feb 26	USSR	11hr49m	39344	612	62.8
014A	PRC 22	Mar 07	China	1455.5	36613	36613	0.6
015A	Cosmos 1923	Mar 10	USSR	89.5	332	205	72.8
016A to 016H	Cosmos 1924 Cosmos 1931	Mar 11	USSR	115	1508	1445	74.0
017A	Molniya 1-71	Mar 11	USSR	11hr39m	38967	491	62.5
018A	Spacenet 3-R	Mar 11	USA	1429.7	35775	35548	0.1
018B	Telecom-1C	Mar 11	France	1418.4	35799	35883	0.4
019A	Cosmos 1932	Mar 14	USSR	89.7	279	256	65.0
020A	Cosmos 1933	Mar 15	USSR	97.7	675	650	82.5
021A	IRSJ1A	Mar 17	India	102.7	917	863	99.0
022A	Molniya 1-72	Mar 17	USSR	12hr15m	40584	655	62.9
023A	Cosmos 1934	Mar 22	USSR	104.7	1021	967	83.0
024A	Progress 35	Mar 23	USSR	88.9	281	190	51.6
025A	Cosmos 1935	Mar 25	USSR	89.5	356	179	67.0
026A	San Marco-D	Mar 25		93.4	615	263	3.0

2. RETURNS

During the period 70 objects decayed including the following satellites:

1986-080A	Cosmos 1786	Mar 06
1987-108A	Cosmos 1906	Mar 13
1988-003A	Progress 34	Mar 04
1988-007A	USA 30	Mar 01
1988-010A	Cosmos 1920	Mar 09
1988-011A	Cosmos 1921	Mar 04
1986-015A	Cosmos 1923	Mar 22

3. NOTES

a Satellites 1988-016A to 1988-016H were placed in orbit by a single carrier rocket. They are to be used for continuing space research.
b 1988-018A Spacenet 3-R and 1988-018B Telecom-1C were launched on an Ariane 3 launch vehicle from Kourou, French Guiana.
c 1988-021A IRS-1A was launched for India by the USSR.
d 1988-026A San Marco-D was launched from the San Marco platform at Ungwana Bay, Ngomeni, Indian Ocean by a Scout G-1 launch vehicle.

—Contributed by Bob Arnold VK3ZBB

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MORSEWORD 17

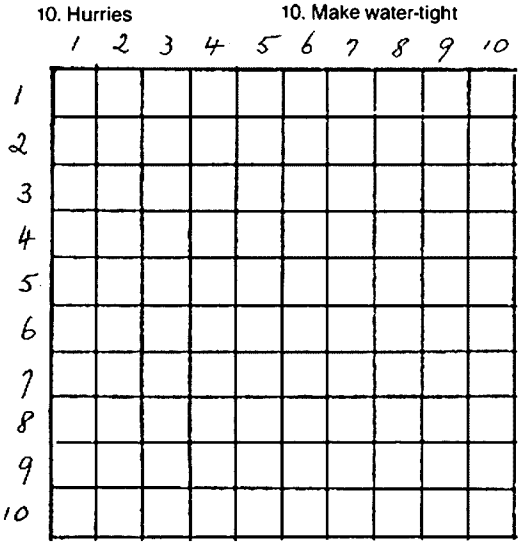
Audrey Ryan
30 Starling Street, Montmorency, Vic. 3094

ACROSS

1. Adam's son
2. Corrects
3. Part of face
4. Competed
5. Chanted
6. Property
7. . . . . & threes
8. Gilding
9. Finished
10. Hurries

ACROSS

1. Bubble
2. Fly
3. Regulates food intake
4. Strict
5. Discount
6. Valley
7. Mature
8. Keen
9. Weeds
10. Make water-tight



Club Corner

SUMMERLAND AMATEUR RADIO CLUB

The Summerland Club will hold a mini-Hamfest on Sunday, July 31, at the Richmond Hill Clubrooms. The many items of interest include — packet demonstrations, code speed contest, bring and buy, raffles, sausage sizzle, and much more. So, why not a Sunday out at lovely Lismore on the New South Wales north coast. Listen on frequency 6800 for check-ins and directions.

New services offered by the club include — an on-air Amateur Address Directory and the previously announced Life Membership option. The first Life Member of the Club is John Edwards, of Penhurst. Congratulations John.

It is sad to report the passing of fellow club member, Bernie Foster VK4FOS. Bernie (with Betty VK4BET), joined the Summerland Amateur Radio Club in 1978 when they first moved into the area. Supporting the club as a past committee member and as an ordinary member, Bernie is perhaps best remembered as the founder of the club's early morning net, the "Dawn Patrol". An ardent believer in the use of trapped verticals as a HF antenna in cyclone prone areas, Bernie often demonstrated that a well constructed and installed trapped vertical was both effective and sensible in areas where low wind loading and speed of securing are of *extreme* importance. Failing health limited Bernie's ability to keep up with the latest technological changes. However, he enthusiastically embraced amateur radio as a way of keeping actively involved with technology. A relationship that continued from his involvement in the design of heavy transport in World War II and other automotive fields since.

Deepest sympathy is extended to his widow Betty and their son Carl.

—Contributed by Jim Cunningham VK2ESI, Publicity Officer, SARC

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EASTERN ZONE

The Eastern Zone of the Victorian Division recently celebrated its 50th anniversary. A very successful convention was held at Moondarra, in Gippsland. About 75 people attended and joined in the activities.

Keith VK3SS, entertained the gathering in his inimitable style after dinner on Saturday, when he recounted early days of amateur radio in Gippsland. He reminded all that amateurs have always played an important communication role during emergencies.

A past WIA Federal President, Peter VK3KAU, also spoke about the history of amateur radio and played numerous interesting tape recordings of early days of amateur radio in Victoria.

Many people joined in the fox hunts, which were ably organised by Mike VK3ZQV. The small transmitter was found in some interesting locations; eg about eight metres up a tree, under a pile of briquettes, and in the coat pocket of someone walking around! Overall winner was Peter VK3FLC, who won a rechargable battery courtesy of Mike. Other winners were VK3s YTT, KAI, XBG, DY and KME.

The CW contest, organised by Jeff VK3DZZ and Peter VK3FLC, was not quite as popular as some of the other activities but was entered by some keen brass pounders. The outright winner was octagenarian, Arnold VK3BHI, who also won the same event at a previous convention. Arnold collected the I V Mitchell Memorial Trophy for this effort. Incidentally, the trophy was kindly donated by John VK3AXE, in memory of his mother, and is intended to be passed around the State as various CW contests are held.

The Zone would like to thank all amateurs and their families and friends who attended and helped make Moondarra a successful convention. A special mention should be made of VK4HK, who travelled all the way from Hervey Bay, Queensland, for the convention. Thanks also to trade displays and dealers who provided an eye catching display of equipment for all to buy. Their support is greatly appreciated.

Zone members look forward to seeing all at the next convention in a few years time.

—Contributed by C Morley VK3KME, President, Eastern Zone

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CENTRAL HIGHLANDS AMATEUR RADIO CLUB

The Central Highlands Amateur Radio CLub was formed in December 1986, to fill the need of widely separated amateurs within the region, which extends from Rubyvale (325 kilometres west of Rockhampton), north to Clermont, Moranbah and Glendon, south to Middlemount and Blackwater and further south to Springsure. This area includes Dysart, Capella, Emerald and Gindie — approximately 28 425 square-kilometres.

At the end of April 1988, the Club had 11 financial members. Meetings are held on air because of the distances involved. Monthly meetings are held on the third Sunday of each month at 0900 UTC on 3.620 MHz ±QRM. The group has established a two metre repeater on Mount Blue, 3 500 feet and situated 33 kilometres south-west of Sarina. The repeater call sign is VK4RRR which is situated on 146.975/146.375 MHz. The club is endeavouring to locate another repeater system on Hodgkins Peak (about 2 500 feet) in the Peak Range, west of Dysart. This would be a UHF link and repeater, 70 centimetres, VK4RHR. Transmit frequency is 438.500 MHz and receive 433.500 MHz. All transceivers at present are converted Philips 828 units. Link transmit is one watt, aerial 2 dBi, VK4RRR transmit 25 watts, aerial 9 dBi and VK4RHR transmit is 25 watts, aerial also 9 dBi and time out for all is four minutes.

Coverage from the trial site is very good. The Club Technical Officer, Richie, using 150 milli-watts was able to access about 50 percent of the area. Richie was instrumental in the modification of equipment.

The Blair Athol Coal Project generously assisted the club with a grant to install repeaters throughout the region for members and the committees within the Central Highlands.

Any amateur within the Central Highlands wishing to join the club is invited to break in on the Net, or write to the Secretary, Gordon Loveday VK4KAL, "Aviemore", Rubyvale, Qld. 4702. Alternatively, telephone him on (079) 85 4168.

—Contributed by Gordon Loveday VK4KAL, Secretary, CHARC

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RADIO CLUB CONFERENCE

An amateur radio operators' conference was held at the Cooee Bay Recreational Council camp during April.

About 50 members of the WIA Queensland Division attended, including 26 voting delegates.

Members attended from Brisbane, Dalby, Cairns, Mount Isa. Conference chairman was Rob Moodie VK4TKA, president of the Central Queensland branch of the Wireless Institute.

Speakers included the Queensland Divisional president, David Jones and the official guest was Terry Carrell, President of the New Zealand Association of Radio Transmitters (NZART).

Conference chairman, Rod, said members were continually upgrading the operation of amateur radio operators and the conference would work towards formalising the band usage for the whole radio spectrum.

Rob has held office on the council of the VK4 Division for the past 10 years. He was elected president this year.

Local amateurs attending the conference were: Noel VK4ZAR, Ted VK4QI (both Delegates), Lyle VK4ALD, Vic VK4MPZ, David VK4MQC, Ken VK4JPE, Doug VK4ZDK, Errol VK4ZHL, Rob VK4TKA, Tom VK4BTN, and Trevor VK4ZTV.

Catering in Rockhampton after the conference was conducted by Frank Sleep VK4CAU, and his wife Hazel.

—Adapted from the Rockhampton *Morning Bulletin* April 13, 1988 and contributed by the CQ Branch

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Delegates at the conference from left: Anne VK4ANN, Will Scott and Jim Smart.

—Photograph courtesy Rockhampton *Morning Bulletin*

SOFTWARE PACKET RADIO PROGRAM FOR TANDY COLOUR COMPUTER

A breakthrough in packet radio for Coco owners, from Grosvenor Software (G4BMK), gives full AX25 (Level 2 Versions 1 and 2) operation using a simple modem only — no TNC required. The software allows up to six simultaneous connections plus digipeater operation and beacon, whilst monitoring other traffic on the channel. The display can be scrolled whilst in QSO and any one of the concurrent OSOs or the monitor can be individually selected for display.

The program also permits HF and VHF (300/1200 baud) operation, has full printer support, your call sign built in, and many other features.

Grosvenor Software, already well-known among amateurs, and colour computer owners, for RTTY, CW, AMTOR and SSTV software, is now represented in Australia by Dave Ralph VK4ASB, 23 Darwin Street, Aspley, Qld. 4034. Telephone (07) 263 3872.

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NEW CATALOGUE

Stewart Electronics, of Melbourne, now have Update No 3 to their catalogue available.

This update covers the complete range of Amidon ferromagnetic materials and J W Miller inductors for power and EMI suppression applications, as well as types for RF and IF uses.

Copies of Update No 3 are available on request from Stewart Electronics, PO Box 281, Oakleigh, Vic. 3166. FAX: (03) 543 7238.

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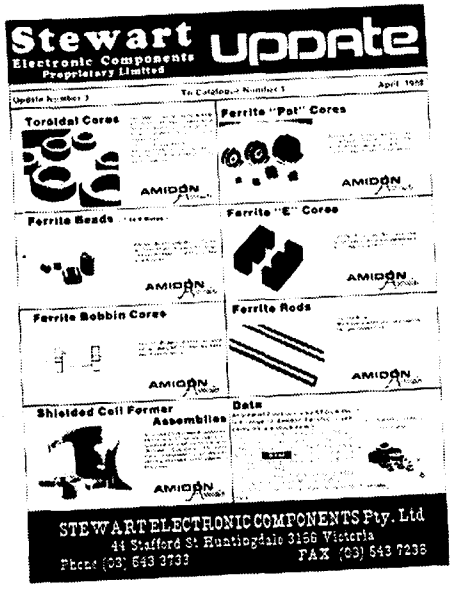
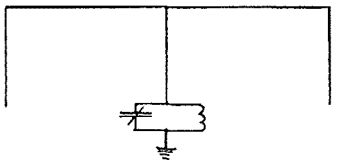


LOW BAND ANTENNA



PRACTICAL BOBTAIL LAYOUTS

FOR SUCCESSFULL DX:NG

BY

SM 4 CAN

KENT SVENSSON

SWEDEN

PRACTICAL BOBTAIL LAYOUTS

Due to an interest in low band DXing over a number of years, Kent SM4CAN experimented with many different low band antenna configurations and found the Bobtail Curtain best for his application.

In 1987, Kent published a small booklet, titled "Practical Bobtail Layouts".

After much correspondence and comments, Kent has now published a more detailed booklet of the antenna. This booklet of 27 pages, contains selected information based on practical work, experiences and observations as well as theoretical parts of the antenna's principles, antenna dimensions, feeding methods, construction, installation, grounding, lightening protection, and much more.

The booklet is priced at $US5 or 12 IRCs which includes air mail postage world-wide. For further information write to: Kent Svensson SM4CAN, Bruksgatan 18 B, S-695 02 LAXA, Sweden.

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SOLUTION MORSEWORD 17

Across: 1 Cain 2 edits 3 lip 4 vied 5 sang 6 asset 7 twos 8 gilt 9 ended 10 hies

Down: 1 bead 2 wing 3 diets 4 stern 5 sale 6 dale 7 ripe 8 eager 9 tares 10 seal

	1	2	3	4	5	6	7	8	9	10
1	—	•	—	•	•	—	•	•	—	•
2	•	—	•	•	•	•	—	•	•	•
3	•	—	•	•	•	•	•	—	—	•
4	•	•	•	—	•	•	•	—	•	•
5	•	•	•	•	—	—	•	—	—	•
6	•	—	•	•	•	•	•	•	•	—
7	—	•	—	—	—	—	—	•	•	•
8	—	—	•	•	•	•	—	•	•	—
9	•	—	•	—	•	•	•	—	•	•
10	•	•	•	•	•	•	•	•	•	•

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

Discussing the lack of activity on the bands during the portable operation of VI88SA, at Port Adelaide to mark the arrival of the First Fleet Re-enactment Vessels. From Left: Christine Taylor VK5ZCQ, Harry Hillard VK5AHH, John Mullins VK5PTT and Geoff Taylor VK5TY. Seated: Les Harris VK5KLH.

WHAT, STILL HERE?

Yes, I am still here. I'd like to be able to tell you that overwhelming public demand forced me to stay, but that was not the case (although I have had a few kind persons say that they would be sorry to see Five-Eighth Wave go). And, I suppose that is why I am still here. The fact that I would also be sorry to see it sink without trace and not be replaced by something else, and also the fact that volunteers to take over have been singularly 'overwhelming'! (actually singular is the operative word, and even he declined in the end). Anyway, I am back, at least for the time being.

On Monday, May 9, I attended one of the saddest funerals I have ever attended, even the weather matched the mood. Geoff Taylor VK5TY, his wife Christine VK5ZCQ, and their daughter Greta, also John Allan VK5UL and myself were amongst the eight people who gathered to farewell Rob Wilson VK5WA. Perhaps Rob was not one of the most active amateurs on the bands (in fact, at 87 it had been a couple of years since he had been active) and perhaps he was not the most well-known, although most of us, as amateurs in this Division, have cause to be grateful to him. Why? Well, in a 'nut-shell', Rob Wilson was the man mainly responsible for obtaining the Burley Griffin Building for our Divisional Headquarters. Admittedly, he headed a team whose object was to find us such a building, but I understand that he did most of the negotiating. There will be an obituary in this or a future edition of AR, but I felt I had to mention the passing of one of our Life Members, and one who had done something to earn our lasting thanks.

As those who attended the AGM will know, Council's parting gift to me as the first lady President, was a photographic sitting, the result of which will soon be displayed at the BGB (and I will also get a copy to keep). I was deeply moved by this gesture and also by the very nice things that were said by Don VK5ADD and Alan VK5NNM, on that night. However, this started me thinking how nice it would be is we had other photographs of Past-Presidents around the walls (it's going to be pretty lonely with just me and Marconi up there!), so I would like to start a campaign. Are you a past president (or a friend or relative) and if so do you have a photograph that we could have for the BGB. If it showed you as you were around the time of your presidency, so much the better, but if not, do you have a more recent one that you would be willing to donate. I will look forward to hearing from you.

YOUR 1988/89 DIVISIONAL COUNCIL

Don McDonald VK5ADD — President and Alternate Federal Councillor
Hans Van Der Zalm VK5KHZ — Secretary
Bill Wardrop VK5AWM — Treasurer
Alan Mallabone VK5NNM — Membership Secretary and Education Officer
Rowland Bruce VK5OU — Vice-President and Federal Councillor
Bob Allan VK5BJA — Vice-President, Public Relations Officer, DOTC Liaison SATAC Co-ordinator
Peter Madden VK5PRM — Minutes Secretary
Ken Westerman VK5AGW — Clubs' and Country Members Representative
Graham Iles VK5AT — WICEN Director
Jenny Warrington VK5ANW — Immediate Past-President

LOST DOTC?

In case you have been trying to find DOTC, they have moved. The Radio Branch are now located in the 'Commonwealth Centre', 55 Currie Street, Adelaide, phone 237 6333.

And, in case you have been looking for our QSL Bureau Manager, John Gough VK5QD, has also recently moved. He is now at 51 Mildred Street, Kapunda. His telephone numbers is (085) 66 2335.

DIARY DATES

Tuesday July 26 — Speaker possibly Peter Gamble VK3YRP, our new Federal President (unconfirmed at time of going to press). 7.45 pm.

ADVANCED NOTICE
Christmas Meeting, December 6 — Woodville Community Hall, speaker Dr Mike Tyler, Reader in Zoology at Adelaide University (an excellent and very funny speaker, so mark it in your diary).
Clubs Convention 1989 — April 7-9, at Aldinga.

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QRM from VK7

John Rogers VK7JK
VK7 BROADCAST OFFICER
1 Darville Court, Blackman's Bay, Hobart, Tas. 7052

The monthly meetings will be held as follows:
Northern Branch — Launceston Maritime College, July 8.
Northwestern Branch — Penguin High School, July 12.
Southern Branch — Activity Centre, 105 Newtown Road, Hobart, July 6, at 8.15 pm.

The Southern Branch President is now Ron VK7RM, who took over from Stuart VK7NXA. Stuart's work and study committments changed and he had to withdraw from the President's position.

The VI88 call sign began to be used in Tasmania when Bob VK7NBF used it during the Devil Net on Tuesday, May 10. Since then, written applications have been accepted or its use by other operators. The address to write to is: PO Box 1010, Launceston, Tas. 7250.

After a long period of tenure, John VK7KDR, has had to relinquish his post as News Co-Ordinator for the north-west of the island. New work commitments have meant he is no longer in a position to continue this task. We hope that he will soon be able to get on air once more.

WICEN in the south has made some changes following an exercise, "Call Out" in April. Extreme problems with QRM at the base station has meant a transfer out of town, and, after some searching, a new site has been found, where reception conditions are very much improved. Regular WICEN exercises in the south and the north/north-west have resulted in good report from SES and other participating bodies. Recently, in the south, a radio telephone voice procedure pamphlet has been circulated to assist with training for more efficient message handling.

The "long haul" 20 metre Sunday VK7WI Broadcast has been resumed at 0930 hours local time on 14.140 MHz, for the benefit of VK7s, and others who journey north to find warmer climes. This relay is carried out by Arthur VK7SE.

—John VK7JK

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Forward Bias

Norm Gomm VK1GN
GPO Box 600, Canberra, ACT. 2601

COMMITTEE APPOINTMENTS

Kevin VK1OK, has been appointed Vice-President of the VK1 Division following the elevation of Ray VK1ZJR, to the Federal Executive. Good luck to both on their new positions.

ITU DAY

The ACT Division ran a field station, AX1ITU, for ITU Day at Dickson College in Canberra. Terry Bevan VK1NAV, a science teacher at the College, has established a radio club, VK1NAT, in the science laboratory and amateur radio is an informal part of the science curriculum.

The station included the club's TS-520, running a mixture of voice and digital modes and an FT-707 running phone. Antennas were a trapped vertical and a "school-made" G5RV.

Full call operators were rostered on duty to supervise AX1ITU, but for most of the time, the station was manned by students from the College. There was considerable interest shown by the students in amateur radio and during school hours, the laboratory was bursting-at-the-seams with students, and others. In view of the current debate about attracting "new blood" to the hobby, it was worth noting that the digital mode operation attracted much of the unsolicited attention from the computer buffs.

Propagation was good in the afternoon and evening, and contacts were made with European, Pacific, North American and, of course, Japanese stations. The total number of contacts was not high (about 60) largely due to the inexperience of many of the operators, but, given the mutual pleasure enjoyed by supervisors and operators alike, it was a satisfying day. After all, it is the quality that counts, not the quantity.

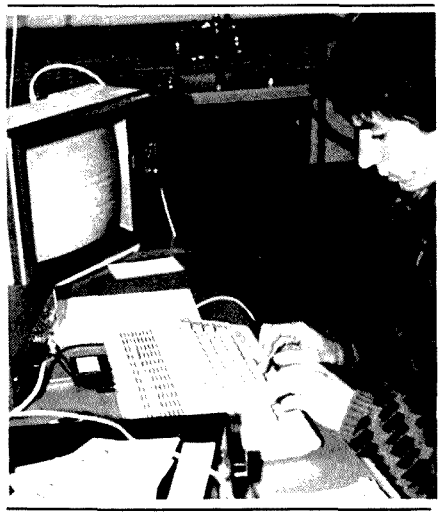
On the point of quality, I would like to pay tribute to the many stations calling AX1ITU who were both patient and helpful to the newcomers on the microphone and keyboard. It was pleasant to know that the spirit of amateur radio still exists despite what one reads in various letters to editors. Well done, YLs and OMs and thanks to the operators who helped on the day: Jack VK1FM, Jock VK1LF Barry VK1ABR and Ron VK1RH.

VK1 TECHNICAL WORKSHOP

The Division is now running a Technical Workshop each month in the Griffin Centre. The Workshop aims to expose all amateurs who have the slightest technical interest to a wide range of varied hands-on activities, and in so doing, raise the general level of technical competence within the Division. It is not just aimed at those who already have the skills, but to all amateurs who aspire to get more out of this hobby. The main emphasis is on explaining the basics of various RF techniques, modes, measurements, construction and equipment.

Searching for a Contact on Phone.

—Photograph courtesy Peter Cummins.



The RTTY Station.

—Photograph courtesy Peter Cummins.

The workshop is being run as an autonomous collective at present with the directions pursued being decided by those attending. The Workshop has been operating since February and, during that time, the subjects of Masthead Preamplifiers (theory and alignment), fault finding and alignment of the DSE Explorer, improvements to the DSE Commander, Packet Radio — the fundamentals, Amateur Television and what is inside the black boxes have been covered.

In the future we will be conducting tours of technical facilities, getting Fox Hunts back on the scene in the ACT, delving into all manner of technically related topics and, possibly, doing some group construction. We may also combine with the WIA class group to give them some experience before they sit the examinations. So, if you are interested in more than Black Box (or Gray Box) operation and are not afraid to pull the covers off some equipment and delve inside, come along and put the amateur experimenter back into amateur radio.

The Workshop is held on the second Monday of each month in Room 3 at the Griffin Centre (upstairs) at 7.30 for an 8 pm start. For further information contact Neil VK1KNP on (062) 64 4654 (BH) or (062) 54 3225 (AH) or listen to the VK1 Divisional Broadcast.

Assembling over 800 cars for the final Motorcade through Canberra.

—Photograph courtesy Dan Steiner VK1ST

REPEATER NEWS

VK1RIR, Canberra's 70 centimetre repeater, is now back on-air after what amounted to a major rebuild. Rob VK1KRM, advises that the only original component left is the chassis!

Users of VK1RGI, the two metre repeater on Mount Ginnini, may have noticed some degradation in performance over the last few months. It appears that, after nine years, the antenna had developed crystalline joints. As a temporary measure, a side mounted dipole has been pressed into service.

By this time, it is anticipated that a new antenna will be in place (hopefully before winter sets-in). It is expected that the new antenna will have different propagation characteristics. The Repeater Liaison Officer, Rob VK1KRM, would welcome any reports on its performance.

CASTROL WORLD CAR RALLY

Thanks to the many amateurs from around Australia who provided valuable assistance in making the Castrol World Car Rally one of the major successful events of the Bicentenary. Over 1000 cars from around the world joined in the largest vintage and veteran car rally ever held anywhere in the world. Dennis VK1DG, was the amateur communication co-ordinator and he deserves his share of the credit for the event's success.

ar

Station AX1ITU.

Alex VK1ZDX (left) and Rob VK1KRM, beside a magnificent vintage Rolls Royce.

—Photograph courtesy Dan Steiner VK1ST

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW, 2150

COUNCIL MEMBERS AND OTHER OFFICERS — New South Wales Division, 1988/89

*President	Roger Henley VK2ZIG
*Vice-President	Tim Mills VK2ZTM
*	Dave Horsfall VK2KFU
*Secretary	Andy Keir VK2AAK
Treasurer	Dave Horsfall VK2KFU
Assistant Treasurer	Dave Thompson VK2BDT
*Affiliated Clubs Officer	Julie Kentwell VK2XBR
*Education Service Liaison	Terry Ryeland VK2UX
WICEN Liaison	Tim Mills VK2ZTM
NTAC (NSW Technical Advisory Committee	Tim Mills VK2ZTM
Publications Officer	Dave Horsfall VK2KFU
Property Officer	Tim Mills VK2ZTM
Station Engineer	Jeff Pages VK2BYY
*Broadcast Officer	Steve Pullan VK2KXX
Mini-Bulletin Editor	Tim Mills VK2ZTM
JOTA Officer	Andy Keir VK2AAK
Membership Secretary	Julie Kentwell VK2XBR
Library Officer	Aub Topp VK2AXT
Correspondence Course Supervisor	Cec Bardwell VK2IR
Education Service	Ken Hargreaves VK2AKH
OSL Manager	Frank Stoddart VK2FGS
Divisional Historian	Jo Harris VK2KAA
Member Services	Roger Henley VK2ZIG
Publicity Officer	Julie Kentwell VK2XBR
Federal Councillor	Jeff Pages VK2BYY
Alternate Federal Councillor	Tim Mills VK2ZTM Roger Henley VK2ZIG
Honorary Solicitors	Trenches
Administrative Secretary	Maureen Lavery
Intruder Watch Co-ordinator	Vacant — volunteer welcome
Slow Morse Supervisor	Vacant — volunteer welcome
Awards Manager	Col Stevenson VK2CS
Postcode Contest Manager	Peter O'Connell VK2EMU
Returning Officer	Peter O'Connell VK2EMU

* Divisional Councillor

The July Postcode contest on Friday 31, 9 to 11 pm, covers both 10 metres (28.100 to 28.600 MHz) and the microwave bands, 23 centimetres and above. Details on the Sunday Broadcast.

Trash and Treasure will be held on Sunday, July 26, at 2 pm, in the Parramatta car park.

Are you prepared for the 1988 Remembrance Day Contest?

Applications for the VK2 Awards are starting to arrive for the Contest Manager. A list of the first claims will be published next month.

NEW MEMBERS

A warm welcome is extended to these new members during May.

J M Alcott, Assoc, Thurgoona
N J Bongiorno, Assoc, Smithfield
B Casson, Assoc, Maclean
P J Chambers VK2MJC, Hornsby
J J Cubitt VK2FLE, Chatswood
R A Fenton, Assoc, Balhurst
A J J Gapps, Assoc, Glenbrook
J D Gooday, Assoc, Potts Point
W J Le Cornu VK2MEI, Ives
P S Milliken VK2XMR, Raymond Terrace
F Noel VK2CCN, Ryde
A J Pengelly VK2BUP, Croudace Bay
R C Upton VK2PPV, Lethbridge Park
C F Weston, Assoc, Smithfield
V R Wise VK2PEN, Willmot

VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

THANKS

The WIA would like to thank the following for their donation of QSL cards towards the WIA collection:
Bill VK3JT
Bruce VK2BDX
Ron VK3RN
George VK5RX
Wally VK3MJ
Lionel VK3NM
Mac VK6MG
Norm VK3ANT
Edgar VK7RY
Mrs Ivy Griffin for the QSLs of her late husband, Ian VK3VS
Martin VK5GN, for QSLs of Peter VK5RB
Mrs Ivy Bryant, of Nagambie, for QSL cards of her recently deceased husband, Sid VK3CI
Peter VK3NPL, for QSLs of Silent Key, George VK3FM.

—Contributed by Ken Matchett, QSL Collection Curator

OFFICE BEARERS

The results of the 1988 council elections were announced at the Annual General Meeting of the Victorian Division on the evening of Wednesday, May 11. Councillors elected are:
Peter Mill VK3ZPP
Bill Trigg VK3PTW
John White VK3KJW
Jim Linton VK3PC
Peter Barclay VK3FR
Steve Harrington VK3BYI

The outgoing President, Barry Wilton VK3XV, in his address, emphasised several points made in his Annual Report. He confirmed that the Division is in a sound financial position, but stressed the need to streamline and the urgent need of greater participation in Divisional matters by more voluntary workers because, without this, members services cannot be maintained on a balanced budget.

The 1988 Council met for the first time, briefly on the same night. John Ambler VK3DJE, was appointed to Council. Office bearers were elected and are as follows:

President	Jim Linton VK3PC
Chairman	Peter Barclay VK3FR
Acting-Secretary	Peter Mill VK3ZPP

The Mount Macedon two-metre repeater, VK3RMM, should by now have undergone a frequency change. This is necessary to avoid interference to a new service operated by the owner of the tower. The new frequencies are: receive — 147.850 MHz; transmit — 147.250 MHz.

The Victorian Division Office is mailing an information kit to all VK3 Novice licensees — both members and non-members. This kit includes voice repeater guidelines and the two metre bandplan.

—Contributed by Bill Trigg VK3PTW, VK3 Council

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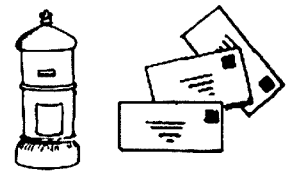
Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Over to You!



MOST GRATEFUL — IT PAYS TO ADVERTISE!

Thanks to the insertion of my inquiry in *Amateur Radio*, I have to hand *The Australian Official Radio Servicing Manual, Volume 1* for which I am so grateful. After the request was published in Hamads, April 1988, Pounding Brass Editor, Gilbert Griffith VK3CQ, from Bright, offered me Volume II. Unfortunately, Volume I was the particular edition I was seeking. Shortly after, Snow Campbell VK3MR, from Clyde, advised that he was able to provide the very volume I required and has since supplied same.

I would sincerely like to thank these members, as in desperation, I had been in touch with the National Library in Canberra, who informed me that the State Library of Tasmania and the Sydney Technical College at Broadway were the only known libraries to hold this volume. As it was printed in 1937, my chances of obtaining a copy were extremely slim. However, all bouquets to these staunch and faithful members of the WIA. It certainly proves that radio men read their magazine, especially the editorials.

Thank you AR, Gilbert and Snow, you have all been the cause of another success story.

Gratefully yours,
Frank Elliott
15 Lincoln Street,
Forster, NSW. 2428

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NOVICES ON TWO METRES

This letter might be somewhat controversial but, it does represent the feelings of many full and limited call operators in my areal

I understand that novices will now have FM privileges from 146-148 MHz, including the use of repeaters.

May I congratulate the Federal Council of the WIA on obtaining these unearned and unwarranted privileges for novice operators and offer my commiserations to all full and limited licence operators whose licences have been debased and degraded by this self-same action.

Let it be clearly understood that I have no quarrel with novice operators themselves; anyone who can get an improvement in conditions for no effort at all is to be envied, not condemned. No, my quarrel is with the Executive Council of the WIA and the fact that they appear deliberately to have misrepresented the feelings of the majority of full and limited call holders.

Consider the following:

a. At the Forum held in VK2 in May and July 1987, the general consensus was that whilst it was a good idea to have a band common to all classes of licence, that band should not be two metres. 70 centimetres was the preferred option. (AR, September 1987, page 56).

b. The VK5 survey held on this subject was against novice privileges on two metres. (AR, October, 1987, page 57).

c. The VK3 survey was in favour of Novice operation on two metres but over a small segment only, namely 150 kHz.

d. A survey conducted by the St George ARS, of which I am a member, was overwhelmingly against such privileges. Only five out of a membership approaching 170 voted in favour.

e. Listening to on-air discussion of the topic around the May-September 1987 period gave the distinct impression that few full and limited call operators were in favour of the proposal.

I believe that indeed most full and limited call holders are still not in favour of granting such a large slice of two metres to novices, and furthermore, I believe that the Federal Council went against this main body of opinion and was determined to get novices on two metres no matter how anyone else felt. Bear in mind that it was the WIA who asked the DOTC for this change in regulations. The Department did not initiate this move.

It is now too late to change things — though I do believe that the novice segment on two metres should be reduced to no more that 500 kHz. I worked very hard to obtain my full call, as I am sure most people did. I am proud of my full call and don't think much of a council that degrades it without so much as a by-your-leave. Where is the incentive to upgrade now? If the Federal Council continues in this fashion what will be the point of having different classes of licence? Perhaps the council would really like to see amateur radio debased to CB standards. It might even increase the membership of the WIA and think of all the good equipment the advertisers could sell!

Unless I am convinced by the Council that their action is truly representative of the majority of full and limited call holders, then at subscription renewal time I shall very carefully consider whether or not to continue my membership. I see no real point in paying just to be kicked in the face.

Could this be why so many others are also voting with their feet?

Yours faithfully,
Clive Wallis VK2DQE
3 Douglas Place
Miranda, NSW. 2228

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COMMENTS ON WIA FTAC PACKET PAPER

I have studied the background paper entitled "Packet Radio on the 14 MHz Band" dated January 1988, prepared by the WIA's Federal Technical Advisory Committee (FTAC). My comments are limited to activities and operation of packet BBS stations on 14 MHz as the FTAC paper deals specifically with this band.

Particularly, I should like to point out that the information furnished by FTAC is of questionable accuracy inasmuch as it presents a biased argument influenced solely on the domestic problem concerning potential interference by packet BBS stations, operating under automatic control on the 20 metre band, to one particular SSB net operation, namely the Travellers' Net.

From the information that I have received as well as from informal observation, it appears that FTAC has not addressed the problem in an adequate and objective manner and chooses to ignore the need to draw any recommendations in line with point (4) of the IARU Resolution 86-2 (as quoted in the FTAC paper). Point (4) of Resolution 86-2 reads:

"(4) that member Societies are urged to address, through their regional organisations, the need for specific provisions for packet radio operation in their band plans consistent with world-wide activity."

FTAC has not acquainted its members with a clear understanding of the packet radio operations concerning packet BBS stations.

I am of the opinion that packet radio operations cannot successfully co-exist with other modes, particularly the operation of packet BBS stations, and to confine packet radio, by regulation or strict adherence to the IARU band plan, to the RTTY and AMTOR sub-band would present the same sort of problems that stimulated recent IARU discussion on the subject.

According to the FTAC paper, the allocation of amateur sub-bands for specific modes is not a regulatory matter of the Australian Administration. The WIA recommends and has adopted the idea of a "Gentlemens' Agreement" policy to resolve any conflict of band usage, and tends to rely on this policy.

However, as noted above, the WIA has neglected to take into consideration, the need for specific provisions for packet radio operation in this band plan policy consistent with world-wide activity. It is absolutely necessary for such provisions as discussed in Point (4) of Resolution 86-2 be addressed in order to facilitate the development of packet radio.

Sincerely yours
73
Gil E Mays VK6AGC
PO Box 53
Hillarys, WA. 6025

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MORE ON TILTING THE YAGI

I would like to draw attention to an error In the circuit accompanying my article "More on Tilting the Yagi", which was printed in the May issue of AR.

The Green LED, which lights to indicate that the Polarity switch is in the Horizontal position, LED 2, has its polarity incorrectly shown which would result in *both LEDs* being lit in the Vertical position as illustrated, and *neither LED* being lit in the Horizontal position.

The amended control portion of the circuit is shown in Figure 1.

I hope that this will serve to put the record straight.

73
Harold French VK3ZRM
RMB 1190
Yinnar, Vic. 3869

ar

See page 61 for Figure 1. . .

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I AM PLEASED. . .

I am pleased to see colour on the cover of the magazine and find the technical articles, and to a lesser extent, club news the best reading.

Yours sincerely
Mike O-Keefe VK4YOB
22 Ash Street
Kirwan, Qld. 4817

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HANDBOOK ERROR (MAYBE LETHAL!)

I would like to bring to readers attention, an urgent matter that concerns the Prentice Hall publication, advertised in the April issue of *Amateur Radio*, Radio Theory Handbook for Amateur Operators, page 3.

On page 218 of this manual, in which a power line (240 volts AC) filter is described, the schematic contains a *lethal* error. The circuit shows transposition of the *active* and *neutral* lines from the input end of the filter, to the output. Anyone using this circuit description to assemble such a filter places their life in jeopardy!

I have informed the WIA VK2 Division, and an article was carried in the Divisional Broadcast to that effect. I will also inform the office of Prentice Hall at the very first opportunity.

This type of power line filter enjoys much popularity amongst computer users, and an unwit-

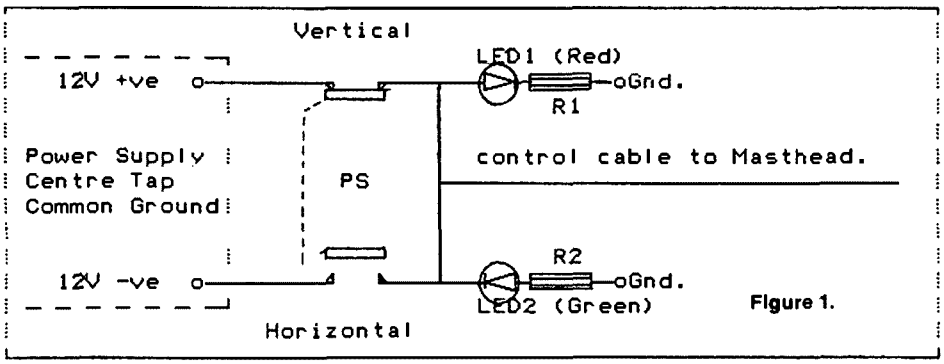

Figure 1.

ting or inexperienced constructor could place him/herself and others in great danger. Thanks for another great year of the AR publication, keep up the good work.

73

Colin Stevenson VK2CS
WIA VK2 Divisional Awards Manager
PO Box 109
Mount Druitt, NSW. 2770

ar

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MAY EDITORIAL

Referring to the May Editorial — I suggest the Editor give some thought to using country members to assist with editorial (or any) tasks. I can spare another couple of hours each week.

I offered to help the Victorian Division even as an assistant's assistant, however they were not enthused.

Communication should not be a problem.

Regards

Lindsay Lawless VK3ANJ
PO Box 112
Lakes Entrance, Vic. 3909

ar

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A HAPPY READER!

I enjoy the magazine very much, especially the technical articles. It is a bright spot at the beginning of each month.

Thanks to all.

Yours sincerely

Murray Young VK3BNH (ex-VK3PKV)
69 Kangaroo Ground Road
Warrandyte, Vic. 3113

ar

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SURPRISE!

I read with great surprise the changes proposed by the DOTC for the operating of amateur radio club stations.

In Jim Linton's review of the Department's DOC 71 Brochure, it appears that club stations will require written permission from the State Manager of the DOTC for any operation of the station away from its usual location. If this is the case, it will make it almost impossible for clubs and groups, such as schools, Scouts and St John Ambulance, to participate at functions of which long prior notice could not be given.

I was given to understand that part of the re-writing of the regulations for amateur radio was to allow greater self-regulation. This move would seem to be totally at odds with this stated intention.

It would seem to me that, with the number of clubs around Australia, and the potential for portable operation, that the Department could be creating a huge work load for its state managers. This will see amateur radio miss out on a lot of activities as the Department finds itself unable to rapidly process the requests. One only has to note the time it takes for licences to be turned around to see the lead-time required. I am also left to wonder just why the Department has suddenly become so interested in radio club portable operations. Are there moves afoot to ban or at least restrict this sort of activity?

I suppose that, under the "user pays" principle, we can expect to pay for the increase in work this ludicrous regulation will cause. I would hope that the WIA will petition the Department to make some changes in this area.

Yours faithfully,

Peter B O'Keefe VK3YF
PO Box 654
Shepparton, Vic. 3630

ar

TANK CIRCUITS AND OUTPUT COUPLING (VK5BR)

AR, May 1988
Corrections to Mathematical Expressions.

1. Page 8, Second Column, third expression
Class C RL = Eb/2Ib

2. Page 8, Third Column, first and fourth expressions

$XL = Xc = RL/Q$

$NS = Np\sqrt{RA/RL}$ ...d

where Ra = Antenna or transmission line load resistance

3. Page 10, First Column, all inclusive

$XL1 = RL/Q$
$XC1 = XL1$
$RX = RL/(Q^2+1)$

where Q = loaded Q (say 12)

$$XC2 = \sqrt{\frac{RX \cdot RA^2}{RA-RX}}$$

$$XL2 = \frac{XC2 \cdot RA^2}{RA^2 + XC2^2}$$

3. Page 10 Second Column, last expression

$$XC = \frac{XC1 \cdot XC2}{XC1 + XC2}$$

1. Page 11, Second Column, Second Sentence, should read:
"To achieve a satisfactory filter response, aim for a high Q in the inductors (at least 50) and avoid capacitors with high loss resistance such as is often found in ceramic capacitors."

2. Page 10, Third Column, last word should be "and".

3. Page 11, Third Column, Fourth Line — "valve" not "value"

—Lloyd Butler VK5BR

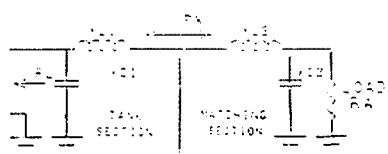
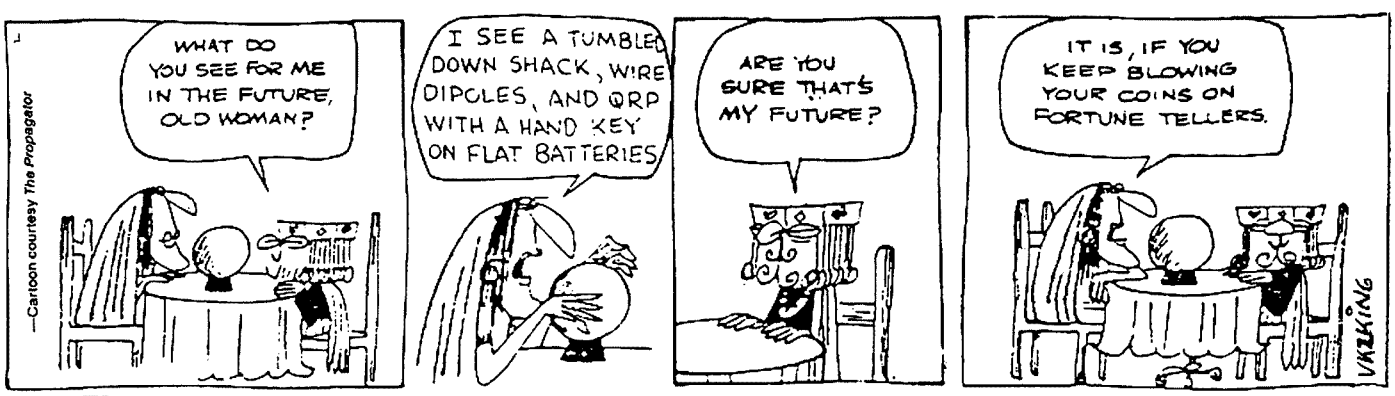


Figure 3: PI Network spilt into two sections for analysis.



Silent Keys

It is with deep regret we record the passing ot:

MR ROBERT HUGHES BLACK	VK2QZ
MR GORDON CASSIDY	VK2DEG
MR NORMAN COLLINS	VK3AOC
MR R H GRUNDY	VK5BG
MR R B MONFRIES	VK5RB
MR DONALD BOYD SCHRODER	VK2SM
MR JAMES WOOD SWAN	L40161

Obituaries

ROBERT HUGHES BLACK VK2QZ

Robert Black died at his home on March 17, 1988, after a long and distressing illness.

Robert was born on December 20, 1917, in the small country Victorian town, Willaura, about 80 kilometres west of Ballarat. His father was a bank manager who suffered the peripatetic penalties of his profession, as did his family. Robert attended 18 schools before completing his Leaving Certificate at Parramatta High School and eventually attending Sydney University as a medical student.

In 1941 he enlisted in the Royal Australian Army Medical Corps at Cairns. His work took him from the tip of Cape York to a casualty clearing station in Lae, New Guinea. He was discharged in 1946 with a distinguished service record.

There are a number of articles by Robert in *Amateur Radio* which include highly technical matters, but also some interesting titles such as "Heinrich Rudolph Hertz — a paper on his life and work" and "Pink Pages for Prolix Professor". Amongst his many awards is the 1971 Amateur Radio Award for technical articles.

Sympathy is extended to his wife Gail, son Robert, daughter-in-law Celia, and grandchildren Katherine and Robert.

ar

ANTHONY (TONY) TAYLOR VK4FOX

T T liked to think he was something of a FOX. His tongue- in-cheek on air comments and remarks about topical subjects provided a catalyst for stimulating discussion among North Queensland amateurs.

Against a background of a Malayan birthplace in colonial days (the currency bore his father's signature), schooling in England and Cranbrook, Sydney, Tony worked as a plantation manager in Papua New Guinea before joining the airline, TAA in PNG. Tony's new wife, Pam, convinced him that her hometown, Innisfail, was the place to settle and raise their two daughters. Tony started a small business and eventually became a local authority on music and Hi Fi.

In 1977, he discovered the joys of radio communication via CB radio, and eventually obtained his AOCR

Amateurs visiting the area and calling in on the Cairns repeater would invariably be invited to "Drop In and have a cup of coffee" by the always-listening VK4FOX. Tony's shop was a centralised meeting spot for local amateurs and CBers whom he always encouraged, often successfully, to try for their novice licence.

His regular participation in nightly 80 metre nets will be sorely missed by many, and the Cairns and District Amateur Radio Club mourn his passing.

Misunderstood by a few but admired by many, T T was a person you could not ignore.

Vale Tony Taylor VK4FOX — Silent Key May 16, 1988.

ar

ION MORRISON VK4MO

Ion passed away on April 26, 1988.

Born in Grafton some 60 years ago, ion was educated at Kings College in Sydney, and graduated from Sydney University which he had entered when he was 16.

He practiced medicine at Nowra, Hawthorne (Brisbane), before specialising in asthma and allergies on the "Terrace". In latter years Ion enjoyed semi-retirement at Manly.

Ion saw service in the RAAF and retained an interest in aviation medicine, a field in which his son Ion, practices.

Always a keen radio amateur, never afraid to experiment, he was a familiar and popular figure at radio outings. During several medical emergencies conducted on amateur radio Ion's professional advice was sought.

ion is survived by his wife Deil, daughters Penny, Jenny, Lindy and son Ion, to whom all amateur's sympathy is extended.

—Peter Brown VK4PJ

ar

NORMAN COLLINS VK3AOC

Norman passed away at the age of 81 years on March 20, 1988, following a stroke.

He was first licenced in 1949 and was mainly active on two, 40 and 80 metres. Born in Northern Ireland on August 30, 1906, he came to Australia with his brother and sister in 1927 following the death of his parents.

Norm was employed by the food processing company Kia Ora until his retirement in 1962.

When World War II commenced, Norm enlisted in the 2nd AIF and served in the Middle East, Syria and the Desert.

Norm was very active from his QTH in East Saint Kilda prior to moving to Torquay in 1984. His wife Beth predeceased him in the early 1950s.

—J K Cosgriff VK3WM

ar

BOB GRUNDY VK5BG

Bob Grundy became a Silent Key on April 19, 1988.

He was born in Murray Bridge, South Australia on March 13, 1915.

Bob was interested in radio from the time he left school and received his amateur licence in late 1937.

In the Depression Days, when work was difficult to find, Bob pencilled for a bookmaker after leaving school. He then became a linesman for the Murray Bridge Corporation erecting power lines. For a short time he also did radio repairs for a local radio retailer.

He became involved with the local radio station, 5MU and subsequently had the opportunity to become Radio Operator with the Leichhardt Search Expedition, in 1938, which was led by Dr A Grenfell Price. This expedition was formed to search for the remains of Leichhardt who perished in 1848, presumably in the Simpson Desert, whilst attempting to cross Australia from east to west. Bob had daily contacts with the expedition in the field from his post at Oodnadatta, and sent regular press releases on the progress to *The Advertiser* newspaper.

In March 1952, Bob was appointed Technician-in-Charge at 5PI, Crystal Brook, coinciding with the installation of a new tower. Bob then lived in the residence at the tower site and continued his amateur radio activities, not withstanding the RF that was ever present. His family recounts the story of how that station could be heard whilst lying in the bath — it was rectified from the Chip Heater. On other occasions, whilst conducting tours for youth and local church groups, Bob would demonstrate the RF by showing how bright a fluorescent tube would light up.

Bob remained at the tower residence until his retirement in 1980, when he moved into the town of Crystal Brook. Here he remained until his death.

Bob's memory was *extraordinary*. He could recall happenings in contacts down to the most intricate detail, giving names and, in most instances, dates.

He will be sadly missed by his many friends and contacts. Sincere condolences are extended to his family, wife Margaret, two sons and two daughters.

—Lionel Medlin VK5ACW

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GORDON PROCTOR

Although he did not hold an amateur radio call sign, Gordon Proctor, who passed away on April 19, 1988, will long be remembered by the amateur fraternity.

Born 96 years ago, Gordon set-up business as a car dealer in Grenfell in 1912. From 1948 he resided at Gosford.

A lifelong interest in youth, mainly with the Scouting movement, gave Gordon the opportunity to teach young people basic electronics in his specially designed workshop. Many amateurs today owe their beginnings in electronics to the grounding given by Gordon.

All will remember his many home-brew gadgets designed to demonstrate electronics, ranging from a simple torch bulb to a mini-watt transmitter and receiver, all transistorised.

He will also be remembered at the Gosford Annual Field Days as the gentleman at the "Calls Present" board, where amateurs affixed their OSL card to indicate their presence. Declining health has caused Gordon to miss the last couple of Field Days.

Gordon held Honorary Membership of the Gosford Rotary Club and the Central Coast Amateur Radio Club, primarily because of his service to youth and the community. He will be sadly missed.

Ed Dyring VK2ED

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NEW FROM ICOM

What is being billed as the ultimate HF amateur radio station is soon to be released by Icom.

The station will have a 100 watt transmitter, two receivers, a data terminal, spectrum analyser, a cathode ray tube monitor and a large capacity memory facility.

One unofficial estimate put its cost as high as US$10 000. Full details are expected soon from Icom Headquarters, Japan.

IONOSPHERIC SUMMARY

For the month of March 1988, the monthly values were 10 cm flux 115.8, sunspot number 75.8, A index 11.7, I index 60.5 and there were 21 flares.

Solar activity was moderate during two periods. The first period was March 16 to 18 when there was a total of 17 M-class solar flares. The largest of these was an M8 flare on March 16. The second period was March 24 and 25 when there were four M-class flares. The number of energetic solar flares during the month was the highest since the beginning of the solar cycle. Likewise, both the monthly averaged 10 cm solar flux and the monthly averaged sunspot number reached their highest values so far this solar cycle.

The daily 10 cm solar flux peaked on March 31, with a value of 134, the highest daily value since May 21, 1984. Details of the flares during March are:

March 15, 6; March 16, 7; March 17, 2; March 18, 1; March 24, 2; March 25, 2. The longest periods of fade-out occurred on March 15 from 1144 to 1222 UTC, and March 2 from 2047 to 2126 UTC.

The geomagnetic field was generally active throughout the day on March 6. March 8 saw minor storm levels especially early in the day, and from March 14 to 16, the field was at mostly active levels. From March 26 to 30, the geomagnetic field became disturbed towards the middle of March 26, and was at storm levels by later in the day. The field was at active to minor storm levels throughout March 27 and 28. The field was again at minor storm levels at times on March 29 and 30. The level of magnetic activity wa low for the first half of the month. The feature of the second half was the extended disturbance during March 26 to 30.

M or X class flares refer to the Xray classification system for solar flares. In this system, X class flares are more energetic than M class.

A index values are:

0 to 7 — quiet
8 to 15 — unsettled
16 to 24 — active
25 to 35 — minor storm
36 and above — major storm.

Radio Australia gave an A index value of 41 for April 6 and 30 for April 22.

—Contributed by Frank Hine VK2QL

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Magazine Review

Roy Hartkopf VK3AOH
34 Tadangi Road, Alphington, Vic. 3087

G — General
C — Constructional
P — Practical without detailed constructional information
T — Theoretical
N — Of particular interest to the Novice
X — Computer program

RADIO COMMUNICATION — March 1988. Desk Microphone with automatic gain. (C N). DXing with Dipoles. (C N). Vertical Antennas with no ground-plane. (P N).

BREAK IN — March 1988. Wellington VHF Group issue. (G). Loop Yagi Antenna. (P). National Link Extended. (G).

HAM RADIO — February 1986. Switched Half-Octave Filters. (P X). Amateur Packet Radio. (G). Microwave band Designs. (P). Radial Line Stub Design. (T X).

73 MAGAZINE — March 1988. Antenna issue. (G). Reviews and Construction suggestions.

QEX MAGAZINE — April 1988. ARRL Experimenters' exchange and AMSAT Satellite journal. 125 Watts on 903 MHz. (C). Parabolic Reflectors. (T).

BREAK IN — April 1988. NZART Annual Conference. (G).

AMSAT-UK OSCAR NEWS — April 1988. General news. Details of OSCAR 9. MIR Satellite special supplement. (G).

VHF COMMUNICATIONS — 3/1987. Electronically Switched Attenuators. (P). Broadband HF Power Amplifiers. (P). SSB Signal Processing. (P).

CQ MAGAZINE — March 1988. World-Wide SSB Contest results. (G). Simple Antenna System. (P N). Hamoholic Testimony. (G). Mysterious Interference solved. (G N).

QST — March 1988. ARRL Annual meeting. (G). Radiosport in the USSR. (G). Traps for VHF Interference. (P N).

ar

TELEVISION SCREEN EYEGLASSES

In the next five years, scientists plan to develop eyeglasses with tiny colour television screens instead of lense.

The device will enhance what vision is left in people who suffer from degenerative eye disease.

The proposal comes from researchers at Johns Hopkins Wilmer Eye Institute in Baltimore, USA, who, with NASA's National Space Technology Laboratories, will develop and manufacturer the system.

The device will resemble wrap-around sunglasses with small lense at the upper outer corners, connected by optical fibres to a battery-powered computer at the waist.

The lense capture the field of vision, and images will be conveyed to miniature solid-state television cameras in the waist pack.

The images are computer processed and displayed on the television screens which will replace normal glass lenses.

HOTEL DELTA ZERO ANTARCTIC

Listen on the DX bands for HD0AE, which stands for "Antarctic Ecautoriana". It is believed to be the first time a station from Ecuador will be active from the Antarctic continent.

HOW TO WORK IY4M ROBOT

A robot beacon is operating on 28.195 MHz. It puts out a call in CW at 15 words per minute signing "IY4M IY4M" followed by a 15 second long note, interrupted by three dots every three seconds.

To finish its calling transmission it sends "IY4M ROBOT QRV QRV". At this point the robot switches to receive for about 30 seconds and will automatically adjust both its transmitting and receiving speed to the speed of the incoming signal.

To contact IY4M, listen for the beacon sending IY4M ROBOT QRV. Send your call twice being careful not to leave any extra space between your characters.

If the robot hears you, it will ask for a signal report then send you a report and a greeting in English, or one of several other languages.

SOLUTIONS TO LAST MONTHS PROBLEMS

1. R4 in parallel with 100 ohms of R3 = 2 amps.
R5 and R6 in parallel = 100 ohms also and are in parallel with R4.
Therefore two amps flows through R4, R5, R6 and 7.5 amps is the total current through the circuit.

2. Currents = $$\frac{E \pm \sqrt[2]{E^2 - 4R1W}}{2R1}$$

Currents = $$\frac{25 \pm \sqrt[2]{25^2 - 4x50x2}}{2x50}$$

Currents = $$\frac{25 \pm \sqrt[2]{625 - 400}}{100}$$

Currents = $$\frac{25 \pm 15}{100}$$

25 + 15 / 100 = 0.4 amp and 25 - 15 / 100 = 0.1 amp.

The two circuit currents are, 0.4 amp and 0.1 amp.

—Contributed by Frank Wright VK2BZ, 18 Second Street, Blackheath, NSW. 2785

All copy for inclusion in the **September 1988** issue of *Amateur Radio*, including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162,** at the latest, by **9 am, July 18, 1988.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No inquiries at office please . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

RADFAX: Hires radio facsimile Morse and RTTY program for IBM PC/XT on 360K 5¼" floppy + Doc. Need CGA SSB HF & AEM3500 project. Support the author first $30 each + $3 postage. Send orders to 42 Villiers Street, New Farm, Qld 4005. Ph: (07) 358 2765.

WANTED — NSW

ARGONAUT TEN-TEK: in good condition; or comparable low power rig for portable use. Dick VK2AHU, QTHR. Ph: (048) 71 2270.

CIRCUIT DIAGRAMS & MANUALS: for Kenwood 2200G. Also Yaesu FP-301 power supply. Also General Coverage Receiver. John VK2VJD. Ph: (047) 51 4257.

YAESU FT-101B: in good condition. Reply to VK2GZ, 43 Bringagee Street, Griffith, NSW. 2680 stating price wanted, QTH & condition of same. Ph: (069) 62 3576.

KYOKUTO 2025A MK2: FM 2 metre transceiver. Prefer good condition original owner. Norm VK2ENT, C/- PO Wyndham, NSW. 2550 or Ph: (064) 94 2192.

SIGNAL GENERATOR: capable of covering from about 150 kHz to 220 MHz. Advance type 62 or similar. Ross VK2CRJ. Ph: (049) 32 6742.

WANTED — VIC

DICK SMITH 70cm EXPLORER: Condition no important. Price to VK3LS, QTHR. Ph: (03) 379 3619.

SERVICE BOOK & CIRCUIT: for receiver Hallicrafter SX-110. Photostats will suffice. Also pair Brown Junior head phones, speaker & Cats Whisker type crystal detector. Willing to pay reasonable prices. Please contact Neil VK3YLW, 52 Fifth Street, Mentone, Vic. 3194. Ph: (03) 580 4312.

TELETYPE MOD 14 TAPE DISTRIBUTOR: Siemens T send 77 Distributor. Wiring details of Siemens T Loch 15a. Teletype tapes or pictures for collection. Colin Gracie, PO Cavendish, Vic. 3408. Ph: (055) 74 2319.

WANT TO SWAP: Any of these official radio service manuals Nos: 4, 5, 8, 9, 12, 13, 14, for three others — Nos 10, 6, 2. Will sell other 4 at $7.50 each plus freight. Contact Bill VK3BWS, QTHR. Ph: (052) 9 3337.

YAESU LINEAR AMPLIFIER: FL-2100Z or FL-2100B. Must be in perfect working order preferably with new tubes. Roth Jones. Ph: (03) 725 3550 (AH) or (03) 877 6655 (BH).

WANTED — QLD

ELECTRONIC KEYER: Dmitri Perno VK4BDP, 110 Panorama Drive, Nambour, Qld. 4560. Ph: (071) 41 6026.

WANTED — SA

HEALING TV: Wanted for 12" Black/White Healing solid state TV AC/DC. Turret 13 channel tuner or biscuits for channels 3 & 4. Tuner type TUR 4D3AR-2CM4A-TNV-360. Hugh VK5BC, QTHR. Ph: (085) 62 2690.

WANTED — TAS

GENERAL RADIO: Type 874 Airlines, Pads, Adapters, Attenuators, Terminations, etc. Trevor Briggs VK7TB, 9 Norfolk Street, Perth, Tas. 7300. Ph: (003) 98 2118 (AH) or (003) 24 4289 (BH).

FOR SALE — NSW

TWO-METRE TRANSCEIVERS: One IC-22, good average condition, many repeater channels. $130. Also, mint condition Azden PCS-3000 extended control. $300. Scanning, etc. VK2SW, QTHR. Ph: (069) 22 6082.

BEAM ANTENNA — 204BA: 4 element monobander on 20 metres. $200. Rotator, Emotator, heavy duty, 1103MSAX with controller, manuals. cables, etc. $300. Tono-Theta 7000 Communications Computer, with TOEI mono monitor, complete with cables, manual, etc. $200. B W Thomas VK2FD, QTHR. Ph: (063) 62 5705.

COLLINS 75S RECEIVER: 32S transmitter. 30L1 RF Linear with handbooks & 240/110V transformer $1000. HG TH6DXX Thunderbird. $450. Tower, 2 section wind-up 50 ft with guys & fittings. $190. Two metre FT-227RB transceiver. $200. VK2AJX, PO Box 1135, Bathurst, NSW. 2795. Ph: (063) 31 4376.

COMPLETE KENWOOD SYSTEM: TS-620S transceiver (incl MC-50 mic) with match R-820 receiver offering full remote VFO facilities & covering all shortwave broadcast bands. The SM-220 monitor-scope is fitted with a Pan Adaptor. Also SP-820 speaker & AT-200 antenna tuner. Complete matching system looks too good to split & is yours for $1750. Tony. Ph: (02) 226 4606 (BH).

COMPLETE STATION: FT-707 & power supply. As new condition. Book, microphone, key, headphones, car cradle, aerial tuner EAT-300. $1100 ONO. George VK2YT, QTHR. Ph: 625 2602.

CORNELL-DUBLIER VHF ANTENNA ROTATOR: with control box & 15m cable. Good condition. $60. Ceramic silver-plated roller inductor, 20 micro-H, 18 x 9 x 6 cm. Excellent condition $30. Paton pre-war serviceman's multimeter, collectors item. Large 0-1 mA movement, battered, but working. $10. Freight buyers care. VK2AHR, QTHR. Ph: (064) 95 9275.

DENTRON ANTENNA TUNERS: (USA made). One model MT3000A 2 kW $600 & one model 160-10 1 kW $400. Both never used. Kel VK2MW. Ph: (02) 449 2439.

FT-200 & POWER SUPPLY, SPEAKER: good condition. Black face, cables, fan, Japan & New Zealand books, H/phones, valves, mic. $400. VK2QB, QTHR. Ph: (049) 43 3392.

TANDY DPM-105 DOT MATRIX PRINTER: manual & cables. Never used. $250. Ross VK2CRJ. Ph: (049) 32 6742.

WILSON WE-800 2 METRE VHF FM TRANSCEIVER: 144-148 MHz, 1 or 12 watt output, portable or base operation. Has internal Nicad batteries. $300. New Hidaka V5-33 triband Yagi $550. Hidaka V5-41 10-40 metre vertical $225. Emotator 5025AX Antenna Rotator, new. $495. Ph: (02) 817 4803.

YAESU FT-110 LINEAR AMPLIFIER: Never used, suit FT-301S or FT7. $300. No offers. VK2DMY. Ph: (02) 957 3964 or (043) 23 3109.

YAESU FT-401B: in very good condition. Fully aligned on all bands. Output over 150 watts on all bands. Finals neutralised, carrier xtals adjusted. With mic, carton & handbook. Price $400 ONO. AMATEURS ONLY. Jack Evans VK2CX, 25 Tomaree Street, Nelson Bay, NSW. 2315. Ph: (049) 81 1582.

YAESU HF TCVR FT-102: Spkr SP-102. Hardly used. Dcd Estate. Ph: (02) 525 5559.

FOR SALE — VIC

BEAM: CE35DX 5 element triband beam 10/15/20 $230. Siewa SV-230 13 channel 2m FM transceiver, 30/5 watts $80. Model 15 teleprinter with power supply complete with full manuals & home-brew modem. $50. Erik VK3AKJ, QTHR. Ph: (03) 756 6958.

COMPLETE DRAKE STATION: T-4X tx, R-4B rx, matching spkr/pwr sup, speech processor, Ameco PCL-P preamp, digital dial, factory tuned. Many spares included. The lot $850 ONO. Bill VK3WK, QTHR. Ph: (055) 67 1048 (AH).

DECEASED ESTATE OF NORM COLLINS VK3AOC: Kenwood TS-430S $925. Kenwood PS30 Power Supply $350. Kenwood AT-130 $125. Call Keith VK3BVK. Ph: (03) 528 3674 (AH). Licensed Amateurs Only.

ICOM 720A: $900 ONO in box. VK3BSM, PO Box 339, Moe, Vic. 3825. Ph: (051) 27 4229 AH.

ICOM HF TCVR: $1800. 2 metre gear, IC-271H 100W new $1500. IC-25H 45W $550. **DSE** Commander prol tuned, SM-5 mic $65. P supplies Icom PS-30, PS-20, Yaesu FP-757GX available. WW 20 metre beam $200. All as new. George VK3OO (ex-VK3CGK). Ph: (03) 337 4903. Licenced Amateurs Only.

ICOM IC-720A TRANSCEIVER: all amateur bands inc WARC, plus general coverage rx. Has 5 kHz AM, 2.3 kHz SSB & 500 Hz CW xtal filters installed. Matching Icom IC-PS15 20A. Regulated PS, IC-SP3 External Speaker & all handbooks. $900 the lot. VK3ARY, QTHR. Ph: (03) 807 4798.

SKILL DRILL: 10 mm, 2-speed, trigger control with snaplock attachments — 5" circular saw, 6" grinder, sander & jigsaw. Drill power source for attach. Like new. $160. Ph: (055) 62 6016.

FOR SALE — QLD

ICOM IC-701 HF TRANSCEIVER: 200W PEP with speaker/AC Power Supply, as well as IC-RM2 computerised remote control with memory. Ex-cond $850 ONO. VK4AKS. Ph: (071) 47 2367.

ICOM IC-R71A HF COMMUNICATIONS RECEIVER: 100 kHz to 30 MHz, excellent condition with ops manual & circuit diagrams. $950. Noel L40185, 41 Crocker Street, Kirwan, Qld, 4817. Ph: (077) 73 1492.

KENWOOD R-1000: 100 kHz to 30 MHz General Coverage Receiver. 12V/240V, as new $490 ONO. Yaesu FLdx 2000 linear. $690. Kenwood Trio TX-599 & JR-599 tcvr, X-mode, X-band operation, incl 2m. $680 ONO. High performance Datong RF Speech Clipper/Processor, fits onto any tcvr $145. Yaesu FT-501, 400W tcvr, needs repair. $130 ONO. Ask for Jeff VK4ABJ. Ph: (079) 28 1105.

FOR SALE — TAS

KENWOOD TS-930S HF TRANSCEIVER: includes auto-ATU & gen cov rx. $1875 ONO. As new condition. Also, Kenwood TM-221A 2 metre FM mobile 50W (H) 10W (L). As new. $480 ONO. Yaesu FT-75GX. Good condition HF gen cov tcvr. $1100. Daiwa CNA-1001 80-10 (inc WARC). Auto Ant Tuner. $360. As new. Ken KR-400 rotator with control box & cable. Good cond. $200. VK7AN. Ph: (003) 31 7914 (AH) (003) 39 2002 (BH).

KENWOOD TS-130S HF TCVR: $575. SP-120 Ext Spk $30. Yaesu FP-301, 20 amp power supply spkr. $170. Werner Wulf 5 el 10m Yagi. $95. All above in excel cond. Arthur Bell. Ph: (003) 76 1721 (AH) (003) 76 1799 (BH).

FOR SALE — NT

YAESU FT-726R: 6m, 2m, 70cm, all mode transceiver. All options fitted. Good cond. $1990. Yaesu FT-690R, 6m all mode transceiver. As new in carton. $350. Corona HP50UDX, 70cm 10-50W linear. GaAsFET preamp. Good cond. $250. Jeff VK8GF, QTHR. Ph: (089) 52 1016 (AH).

STOLEN EQUIPMENT

The following equipment is missing, believed stolen. Yaesu FT-290R 2m all mode transceiver, including the microphone and mobile mounting bracket. Serial number 5G450016. Anyone with any information about the above should contact Herman Westerhof VK7HW, on his home telephone number (002) 39 9466. Thank you.

Advertiser's Index

SONY

Sony revolutionizes the world of radio. Again.

We've packed world-band performance into an incredibly small, complete receiver system.

Sony is known for breakthrough radio technology. And for bringing it to you in ever-smaller packages.

But this time, we've really outdone ourselves.

Introducing the Sony ICF-SW1S world-band receiver system.

As you'd expect, it brings you broadcasts from around the world.

What you may not expect is its remarkably small size. Its wealth of features.

And its unique, total system design.

The ICF-SW1 weighs just 230 grams with batteries, yet offers precise 10-key direct access PLL-synthesized tuning. FM stereo, MW, LW and SW bands. Auto-scan and manual tuning.

Memory presets. And a digital clock with alarm and timer.

The ICF-SW1 receiver, by itself, is a world-class performer.

And there's a host of system accessories, starting with an active antenna, to further enhance its performance.

So don't let the fascinating world of world-band radio go unheard.

Get the Sony ICF-SW1S. And stay forever tuned.

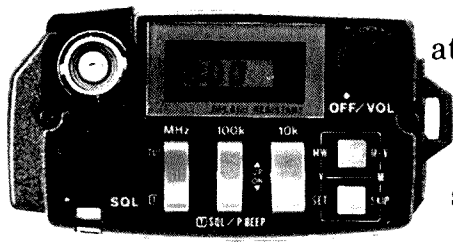
WORLD-BAND RECEIVER ICF-SW1S

For further information contact: Sydney (02) 887 6666 Melbourne (03) 836 4011 Brisbane (07) 844 6554 Adelaide (08) 212 2877 Perth (09) 323 8646 Launceston (003) 319291 Wollongong (042) 715777

SNY078

ICOM PUTS POWER IN THE PALM OF YOUR HAND.

Seven watts of power is a respectable output for any transceiver. Now imagine the possibilities of that much power packed into a multi-functional handheld.



That's what you get when you attach the optional IC-BP7 battery pack to the new IC-2GAT from ICOM. And even the IC-4GAT pumps out 6 watts with the same battery pack.

Plus you also get plenty of advanced features in the one simple-to-use package.

There are twenty memory channels and one call channel. With programmed scan and memory scan built in. A pocket beep function lets you know if particular subaudible tones are being transmitted.

The top panel digital touchstep switches and readout make frequency entry simple, especially when the unit is belt mounted. And the squelch monitor unit makes squelch control easier too.

After dark operations are no problem because the LCD backlight shows all displays. Then the light turns itself off when you're not using the unit.

In fact, all models have a power saver function built in.

So we don't just give you more power in the palm of your hand. We help you keep it there as well.

Call (008) 33 8915 or (03) 529 7582 for your nearest ICOM stockist.

They'll give you all the power you ever wanted.

ICOM

Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

VOL. 56, NO. 8 AUGUST 1988

TWO METRE PROPAGATION AND TEMPERATURE INVERSION

REPORT TO EXECUTIVE ON SPECIAL CALL SIGNS

THREE AUSSIES AT DAYTON HAMVENTION

20 AMP POWER SUPPLY

TREASURER'S REPORT

SATELLITE TELEVISION

KENWOOD

TS-680 HF TRANSCEIVER

100 WATTS OUTPUT ON 160 to 10 METRES
10 WATTS OUTPUT ON 6 METRES

The TS-680 is a high-performance HF transceiver designed for SSB, CW, AM and FM modes of operation on all Amateur bands. Covers Amateur bands 160 metres to 6 metres, combining the ultimate in compact size with advanced technology.

Compact and lightweight. CW Full Break-In, Semi Break-In and VOX Circuit. Superior receiver dynamic range. The receive front end has been specifically designed to provide superior dynamic range. The intermodulation dynamic range is 102dB, with an overall intercept point of + 12dBm, noise floor level of — 138 dBm. (when the optional 500 Hz CW filter YK-455C-1 installed). 31 Memory channels with split memory channels and memory scroll. Built-in dual-mode noise blanker ("Pulse" or "Woodpecker".) IF shift circuit. Adjustable VFO tuning torque. Switchable AGC circuit (FAST/SLOW) and built in speech processor, RF output power control and "F.LOCK" switch. Non-volatile operating system. Fluorescent tube digital display and squelch cicruit (for FM mode).

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.

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Further, beware of dealers not listed in this advertisement who are selling Kenwood communications equipment All Kenwood products offered by them are not supplied by Kenwood Electronics Australia Pty. Ltd. and have no guarantee applicable.

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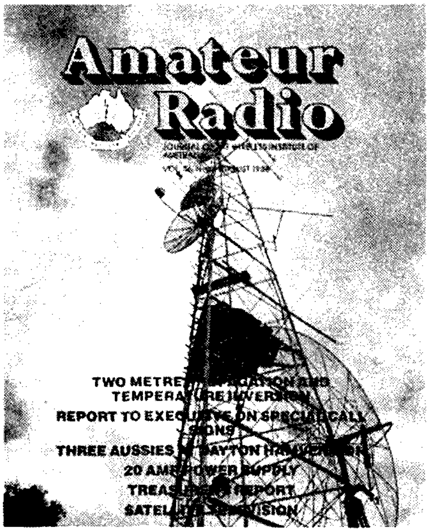
Amateur Radio



—Photograph courtesy Brian Green

A group of antennas to make any amateur envious, particularly after reading the article on two metre propagation by John VK3DNK, (see page 8). The proud owner of this antenna farm is Wally VK6WG, a 1296 MHz Record Holder (page 33, May AR). Wally also gains many mentions from Eric VK5LP, in the VHF-UHF columns.

Special Features

Technical Features

Regular Features

DEADLINE

All copy for inclusion in the October 1988 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, August 22, 1988.

Amateur Radio

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EDITOR
BILL RICE* VK3ABP

NEWS EDITOR
JIM LINTON VK3PC

TECHNICAL EDITORING CO-ORDINATOR
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TECHNICAL EDITORS
EVAN JARMAN* VK3ANI
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MARKETING
BRUCE KENDALL* VK3WL

CONTRIBUTING EDITORS
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Joy Collis VK2EBX
Brenda Edmonds VK3KT
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Inquiries and material to:
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Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

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Opinions expressed by individuals are not necessarily those of the Wireless Institute of Australia.

Editor's Comment

THE BUCK STOPS HERE!

When General Eisenhower was President of the United States, he was said to have on his desk a plaque bearing the above inscription. His subordinates might have the good old Public Service privilege of passing the hard decisions further up the line, but when they reached the President he was "stuck with it"!

I have been reminded of this in a number of ways in the last few days. By the time you read this, Mr and Mrs VK3ABP will have returned from a two week trip to Sunny Queensland (to visit Expo of course!), travelling by road to Brisbane and back. Naturally such a trip demands a usable two-metre FM transceiver. The VK3ABP home-brew mobile began to display the worst kind of fault about three months ago, not only intermittent but also temperature sensitive, and steadily deteriorated until it refused to transmit at all on any frequency! Obviously it had to be fixed. By whom? It would take anyone else a week to find their way around the unit. The buck stops here!

While I was investigating whether it was merely some sort of cumulative alignment drift, or something worse, there was another little problem which couldn't be postponed much longer. This editorial had to be written! The August deadline is tomorrow. Even if someone else could do it, they would be entitled to a few days warning. I've left it too late! The buck stops here! I can't see it; no idea what this kind of buck actually looks like; but nevertheless it's right here! I am happy to say though, that it seems much less ominous now, half way down the page, than it did an hour ago!

We receive many letters, and publish most of them, on a number of persistent themes. Essentially, they all boil down to one, that something about the present state of amateur radio is not as good as it should be, and something ought to be done about it! By whom? Usually by almost anyone else than the writer! Certainly, the WIA exists to do things for its members which they cannot, as individuals, do so well. But there are cases where the individual can do a great deal. Before you "pass the buck", think again whether your problem is one in which, at your QTH, "the buck stops here!".

Bill Rice AX3ABP
Editor

RAG CHEWING

The most popular operating activity is chatting, called rag chewing by amateurs. The ARRL issues a special award, Rag Chewers' Club (RCC), designed to encourage friendly contacts and discourage the "contest" type of QSO with nothing more than an exchange of call signs, signal reports and so on. Your very first contact as a licensed radio amateur may very well earn this award! The only requirement is to spend a solid half-hour or longer of pleasant "visiting" with another amateur, discussing subjects of mutual interest.

Rag chewing is particularly interesting when one contacts a foreign (DX) amateur. Many amateurs put a world map on the wall, locate the city of the foreign amateur's country or island, and insert pins in the map to show the locations of these contacts. These chats develop more appreciation and knowledge of languages, customs of other countries, postage stamps, time zones, and many other things. It is surprising how many foreign amateurs know enough English to carry on a good chat with you! And, if you use CW (Morse code), it is possible to carry on a chat with foreign amateurs with no knowledge of English!

First there are the "Q" signals, three letter groups beginning with Q, that mean the same thing in every language. For example, "QTH?" means what is your address? To answer, one *sends* "QTH" followed by the address.

Then there are a number of books one can purchase that contain a few standard sentences in many languages, that can be sent in code. One such book, *K3CHP's DX QSL Guide*, contains 12 standard sentences in 54 different languages, and is very useful for filling out QSL cards that are exchanged to confirm the DX contact. Sentences like "I have been a radio amateur for . . . years", "My age is . . . years" can be used *in* short chats.

Another such book is titled *CW Into Foreign Languages* by VE3EIM. Pronunciation of the foreign words is no problem because there are no spoken words — your Morse key is your voice!

After using these books for awhile, many amateurs pick up enough of some languages to carry on short chats without difficulty!

Rag chewing with amateurs across the United States is also fun. Of course, there is no language problem! One meets amateurs of all ages, from youngsters to very senior citizens, and often has the opportunity to meet some of these friends in future trips, for what is called an "eyeball QSO".

Rag chewing is frequently followed by exchanges of letters, photographs, maps, and other items. It is a fun way to make friends around the world, and to promote friendship and understanding between peoples of all countries.

—Written by Bill Levin NJ7G and contributed by Bob Clifton VK5QJ

TREASURER'S REPORT

Following the acceptance of the Acting Treasurer's 1987 Financial Report at the 1988 Federal Convention, pertinent figures from the accounts which were audited by accountants Touche Ross and Company, are now published.

CATEGORY	BUDGET	ACTUAL
Amateur Radio Income	*$ 37 000*	$ 36 483
Amateur Radio Expenditure	*$167 000*	$166 050
Amateur Radio Cost to Members	*$130 000*	129 567
Federal Office Income	*$248 996*	$241 786
Federal Office Expenditure	*$253 000*	$242 732
Loss	*-$ 4 004*	-$ 964

COMMENTS ON SOME OF THE MORE INTERESTING ASPECTS OF THE 1987 PROFIT AND LOSS RESULTS

Amateur Radio Magazine

The result of only 0.3 percent variance from the budget was excellent and was due mainly to the efforts of:

1. The then treasurer, Ross Burstal VK3CRB, in dramatically bringing to Executive's attention his concern about the financial situation at the time, particularly the rapidly escalating costs of paper and printing (rising at rates approximately 500 percent greater than the rise in CPI);
2. The decisions eventually made by Executive to attempt to counteract these costs; and
3. Ken and Bett McLachlan, the proprietors of Betken Productions who, by searching for cost effective alternatives, and then by a mixture of cajoling and hard-nosed negotiation, succeeded in effectively reducing several of the costs of producing AR.

The end result of this was that an average number of 8086 members for the year each received a monthly issue of AR posted to their address for $1.45 per issue. This was surely unequalled value for money!

Advertising

Substantially due to the lack of support from several Divisions, and partially due to the economic reasons of which we are all aware, income from advertising was 3 568 below budget. Fortunately, this was offset by an increase in Direct (Overseas) Subscriptions, and unbudgeted income from Inserts.

Drafting

The large increase in drafting costs was due to a considerable increase in the number of technical drawings published in 1987, particularly because of the Building Blocks series of articles. At the moment, AR only has one draftsperson!

General Income

Fortunately the $3 556 shortfall in Subscriptions income, mainly due to a lack of a successful recruitment policy and/or campaign to maintain/increase membership, and the $5 410 lack of income because of the non-production of a Call Book, were substantially offset by the $4 759 higher then expected Interest Received and income from the Technical Equipment Advisory Committee.

General Expenses

Audit Fee

Auditors — Other Services

The Auditor's fees seem excessive for the size of our organisation, but they have been doing all the Journal, General Ledger, and Financial Statement accounting for the Federal Body, as well as the auditing. The only accounting work performed in the Federal Office (apart from the highly efficient computerised membership records), and the Debtors Ledger invoices and statements, was a rough cashbook. It is expected that these fees will reduce by $1 500 to $2 000 in 1988 because of the new accounting package being installed in the Federal Office.

Awards and Special Projects

Most of this amount was used to manufacture a sufficient supply of the "Taylor" medals to last approximately 10 years. About $3 000 of this expenditure should have been removed from **General Expenses** to **Current Assets** on the Balance Sheet, with a corresponding improvement in the year's performance result.

Bicentenary Provision

RSGB 75th Anniversary Travel Provision

Because of concern about the state of the finances of the Federal Body, no funds were applied to these budgeted items.

Long Service Leave Provision

It seems that this amount was under-budgeted because of a lack of understanding of the method of calculation of the provision.

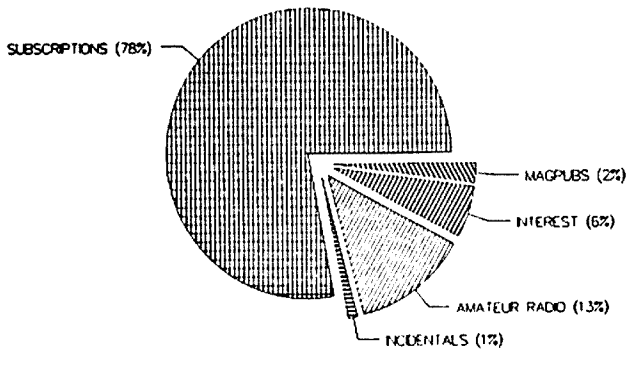
SUMMARY

Despite some very real concerns during the year, it could be argued the end result for 1987 was quite acceptable. However, the major source of income to the Institute is from members subscriptions. Therefore, it is rather disturbing to note that, although there was a 4.3 percent growth in the number of licensed amateurs in Australia in the 1987 calendar year, there was a 2.3 percent decrease in the number of members of the WIA in the same period.

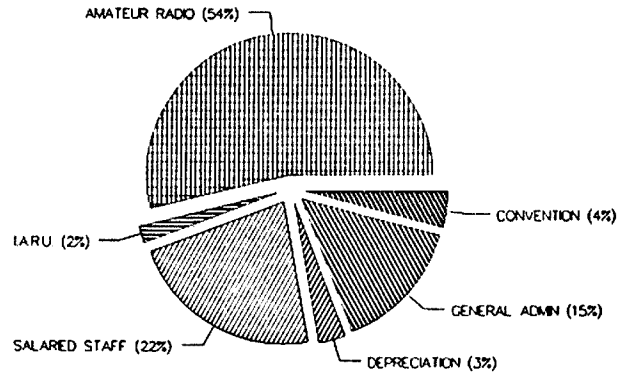
It seems fairly obvious that the Institute must take urgent steps to lift its performance and to become more attractive to amateurs, and that Divisions and Clubs must become more actively involved in substantially increasing our membership.

If members require the detailed audited Financial Statements for 1987, including a copy of the Acting Treasurer's Report to the 1988 Federal Convention, please write to the Federal Office.

1987 INCOME



1987 EXPENDITURE



—Bill Roper VK3ARZ, Acting Federal Treasurer from November 27, 1987 to April 24, 1988

20 AMP POWER SUPPLY

. . . with overvoltage and overcurrent protection

Moorabbin and District Radio Club
PO Box 88, East Bentleigh, Vic. 3165

A power supply which incorporates fixed overcurrent limiting and short circuit protection.

FOR NEARLY 20 YEARS the Moorabbin and District Radio Club (MDRC) has, from time to time, published articles to help with kits for these supplies.

To date, three "Marks" have been introduced. In every case a redesign has been necessary only to overcome supply problems — usually when a specific component has gone off the market.

The Mark 3, first introduced some three years ago, used a 78HG primary regulator. These are now no longer available and a redesign to overcome this problem has led to the "Mark 4"which is described in this article.

Whilst overvoltage protection has always been a feature of these supplies, it was decided that the new "Mark" would also incorporate fixed overcurrent limiting and thus short circuit protection. Finally, it was decided to include protection against mains borne "spikes" which can lead to the unwanted operation of the overvoltage trip facility.

The voltage output is variable between eight and 15 volts.

Figure 1 gives the circuit diagram whilst Figure 2 gives the layout of the components (enclosed within the dotted lines on Figure 1) on the 153 millimetres by 153 millimetres circuit board.

Input from 220/240 volts AC mains is fused and switched in the normal way. Across the input to the transformer is a 275 volts AC varistor. This device has a very high resistance until the voltage across it rises above 275 volts AC. It then rapidly becomes a short circuit and thus clips any high voltage spikes. The component used is a GEC V275LA20A, or equivalent. It is rated to withstand a short circuit current of 4500 amps for periods of up to 20 microseconds.

The transformer is designed to Club specifications and has a very generous continuous duty secondary rating of 20 amps. The secondary AC output is rectified by a 35 amp bridge rectifier and smoothed by 33600 mfd of capacity (six 5600 mfd 40 volt high ripple current capacitors in parallel). Since the rectifier generates some 30 watts of heat, it is essential that it be mounted on a good heat sink. A 75 millimetre length of *Minifin* is recommended.

A 200 ohm 20 watt resistor, consisting of two 100 ohm 5 watt units, is paralled across the capacitor output as a safety measure. It ensures that the large (and dangerous) charge in the capacitors is quickly bled off when the power supply is switched off. (It is recommended that these five watt resistors and also those in the 2N3055 emitters be mounted on standoff spacers to reduce the heat they could apply to the circuit board. —Tech Ed.).

The smoothed DC then goes through a heavy duty relay whose contacts are in the closed position if the relay coil is unenergised. When and if the coil is energised, these contacts open, DC to the rest of the supply is cut off, and an overvoltage indicator LED lights up.

The primary regulator is a 723 14 pin DIL device. It has been around for a long time and is an industry standard, consequently, its long term availability is assured.

The circuit configuration of the 723 is quite conventional and is taken straight from the maker application data except that some additional 1n0 ceramic capacitors have been strategically placed around it to prevent RF interference and subsequent malfunction in strong RF fields.

The output of the 723, whose level is set by an on board 1k0 trimpot, drives the base of a singe 2N3055 which, in turn, drives the bases of eight parallelled 2N3055 pass transistors. The 2k2 resistor (between the base of the driver 2N3055 and earth) assists stability and the 1.0 mfd 100 volt *Greencap* across it provides some additional mid-frequency smoothing.

The use of eight 2N3055 pass transistors is quite deliberate. It is true that a 2N3055 can pass 10 amps but, at this current level, the DC gain has dropped to an alarmingly low level and little or no regulating capability remains. Assuming that the 2N3055 is at the lowest end of its DC gain specification then each pass transistor should carry no more than 2.5 amps if the capabilities of the driver transistor and the 723 are not to be overtaxed.

Like the rectifier, these pass transistors **must** be mounted on adequate heat-sinks and it is recommended that four 150 millimetre lengths of *Minifin* be used, with two transistors on each piece.

Each of the eight pass transistors has a 0.22 ohm five watt "current sharing" resistor in its emitter. The other ends of these eight resistors are joined and go to the output terminal through three parallelled 0.1 ohm five watt resistors. These three resistors have an effective resistance of 0.1/3 = 0.033 ohms. At 20 amps drain or greater, the voltage drop across this 0.033 ohms exceeds 0.67 volts and is applied across pins two and three of the 723, whose internal circuitry then progressively reduces its voltage output, and thus the voltage and current drawn by the external load.

The overvoltage protection acts as follows:
For outputs of up to 15 volts, the Zener diode does not conduct. Above 15 volts it does conduct and a voltage appears across the 470 ohm resistor between the zener and earth. This voltage is filtered and applied to the BD139/ BD140 combination which causes them to draw current through the relay coil. This breaks the DC supply to the regulating section and energises the overvoltage indicator LED. The supply will remain in the cut off condition until AC is removed from the transformer primary and the capacitors discharged through the 200 ohm 10 watt resistor across them.

Optional voltage and current monitoring can be obtained by means of a 0 to 30 amp meter in series between the output from the PCB and the front panel positive terminal, while voltage can be measured by a 0 to 20 volt meter across the output terminals.

It will be noticed that the supply is "floating", ie the supply is **not** connected to the mains earth. The mains earth is connected only to the electrostatic shield of the transformer and to the metalwork of the case used. It is recommended that this mains/shield/case earth lead be brought to a separate front panel terminal for connection to the negative supply output terminal if required. The PCB corner mounting holes are not connected to any "earthy" tracks on the board itself.

Normally the voltage setting potentiometer is on the control board and is set to give one, and only one, output voltage. However, if required, this pot can be omitted and replaced with a 1k0 *linear* standard pot which can be mounted on the front panel. This will enable the output voltage to be varied as required between a low of eight volts and the upper limit of 15 volts determined by the overvoltage circuitry.

Connections shown in Figure 1 by the thick black lines should be in wire capable of handling at least 20, but preferably 30 amps.

The supply can be "packaged" to suit individual requirements although it is strongly recommended that some sort of enclosed case/cabinet be used for safety reasons.

Anyone wishing to construct this supply can obtain further information and advice, by writing to:
The Project Officer, Moorabbin and District Radio Club, PO Box 88, East Bentleigh, Vic. 3165.

ar

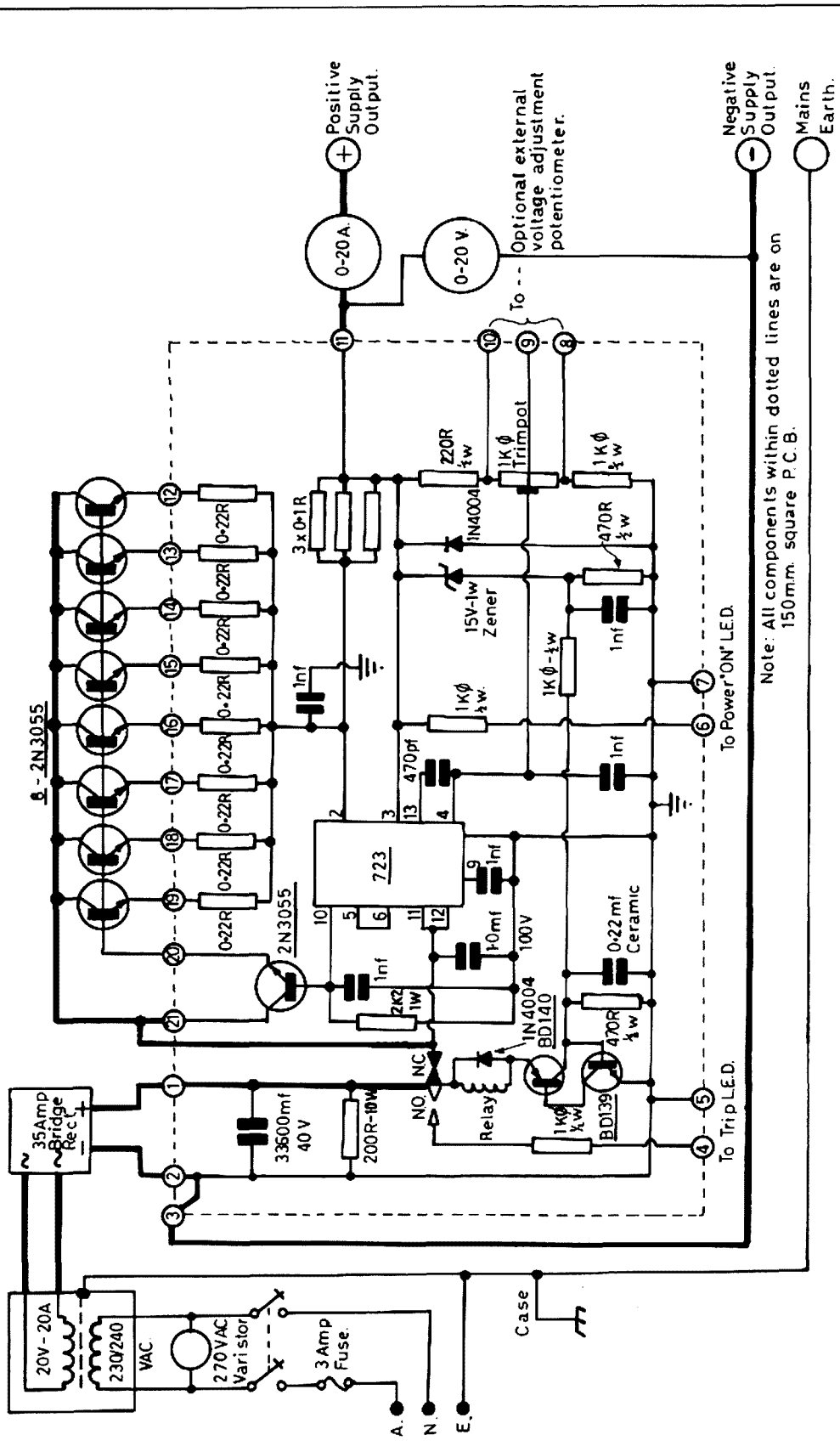


Figure 1: Mark IV 20 Amp Power Supply.

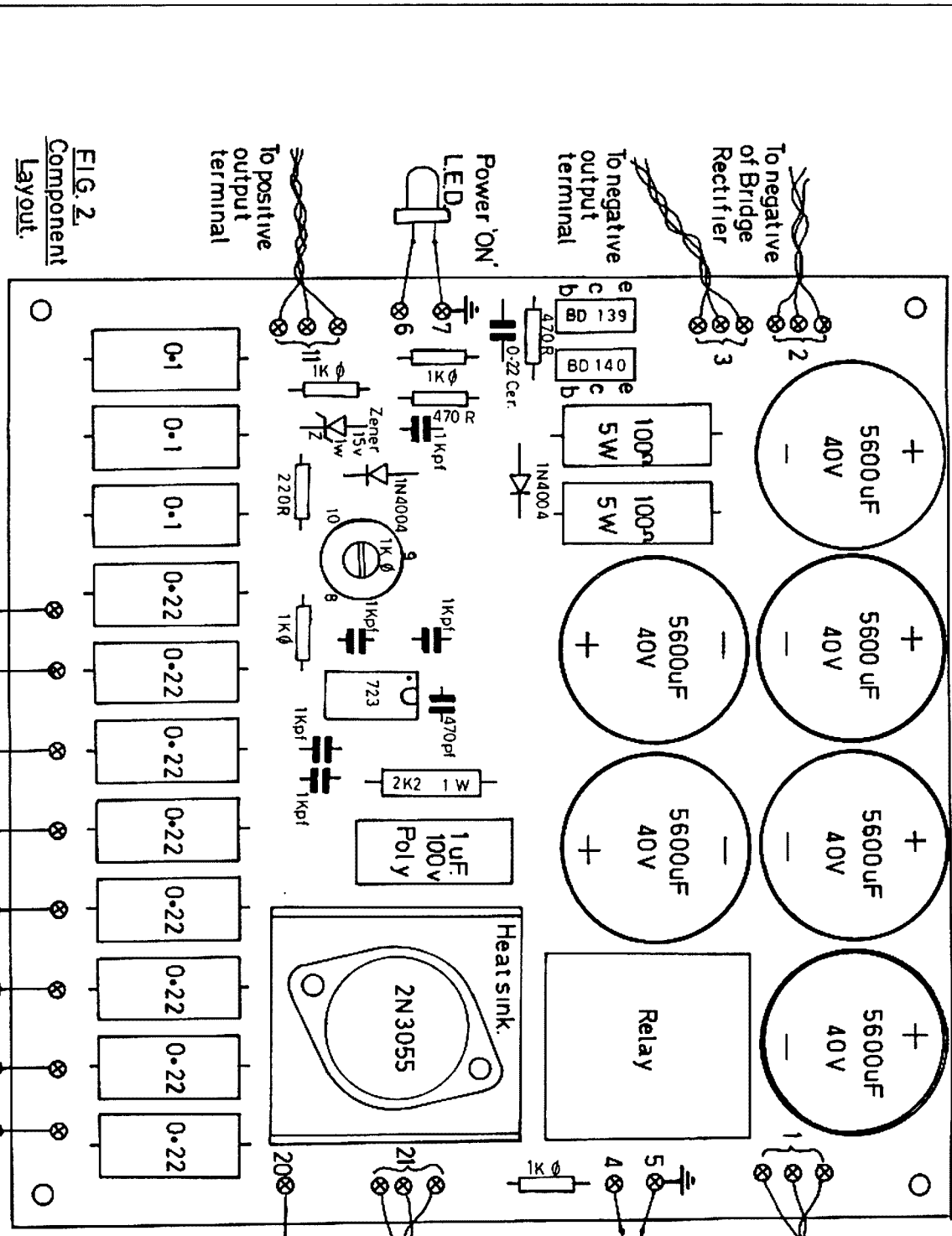
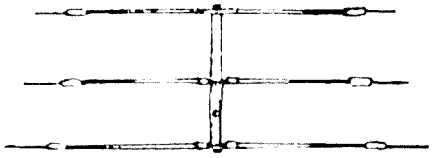


Figure 2: Component Layout.

MADE IN AUSTRALIA

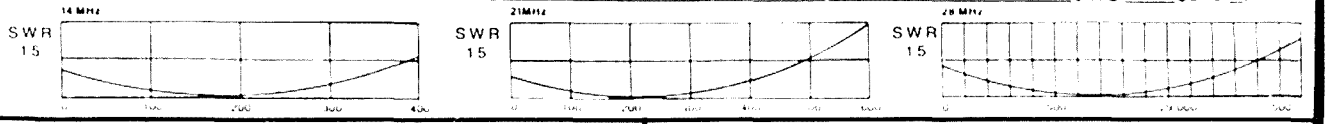
TET-EMTRON ANTENNAS

Dr Mac Taniguchi of TET Japan has now joined Emtron Industries and improved his already famous "phase-feed" matching system based on "HB9CV" concept. This new matching system provides an increase in gain, roughly comparable to adding another element to the antenna, while significantly improving the front-to-back ratio. The performance exceeds even conventional Yagi-Uda design and these new TET-Emtron multiband beams exhibit extremely flat VSWR over a wide frequency range. Our new antenna factory, "TET-Emtron", a division of Emona Electronics, is now producing a range of antennas aiming especially at the export markets of Japan, USA and Europe.



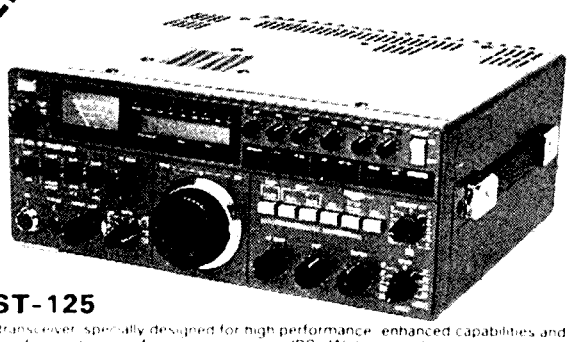
SPECIFICATIONS:

	HB33DX	HB43DX
Frequency (MHz)	14 21 28	14 21 28
No of elements	3 3 3	4 4 4
Gain (dBd)	6.5 8.7 8.3	9.4 9.5 9.8
F/B Ratio (dB)	22 24 21.5	24 24.7 22
V.S.W.R.	1.5 or better	1.5 or better
Power rating	2 KW	2 KW
Impedance (OHM)	50 OHM	50 OHM
Element Length (metre)	8.25 m	8.25 m
Boom length (metre)	4.0 m	6.0 m
Turning radius (metre)	4.54 m	5.1 m
Wind surface area (m²)	0.58 m²	0.74 m²
Wind Load (EIA Std 80 mph)	56.7 kg	72.7 kg
Weight (kg)	15 kg	19.2 kg
Price	$479	$579



NEW

JRC HF TRANSCEIVER



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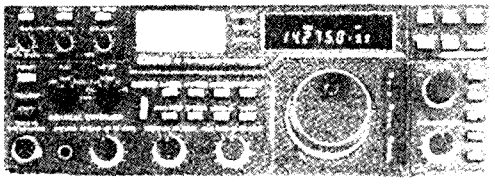
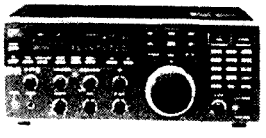


IC-751A HF TRANSCEIVER
GENERAL COVERAGE RECEIVER

COMM. RECEIVERS & SCANNERS



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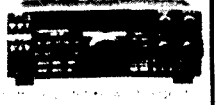

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KENWOOD

TS-680 HF TRANSCEIVER

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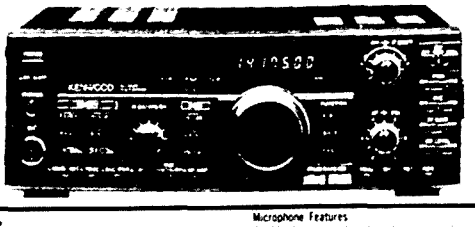

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Ph: (03) 67 8551 or 670 0330
FAX: (03) 670 0671

QUEENSLAND:
416 Logan Road, Stones Corner
Qld. 4120.
Ph: (07) 394 2555

TWO METRE PROPAGATION AND TEMPERATURE INVERSION

John Byrne VK3DNK
5 Stanley Street, Wodonga, Vic. 3690

With two hobbies, amateur radio and flying, it has been possible to unite the two in two ways.

THE FIRST NECESSITY was to be able to receive Morse code at 10 words per minute to enable the attainment of an Instrument Rating. This directly led to amateur radio and possibly the first licensee to pass the CW test before beginning to study for the Theory Examination.

The second, and more relevant necessity to this article, was the acquisition of a good working knowledge of Meteorology. Ears were "pricked up" when it was learned that VHF propagation was enhanced by Temperature Inversions. This interest was further enhanced when, after obtaining the amateur licence, it was realised that the *home* QTH was *in an area of* poor propagation and that there were a number of two metre repeaters within range and the ease, or otherwise, with which they could be accessed were all different. This is because of their varying distances from the QTH in Wodonga.

The main repeaters within reach with a FT-290R fed into a 30 watt Alinco linear and using an Isopole antenna are as follows:

1. WODONGA — local and always with a half-watt.
2. WAGGA — about 100 kilometres away with some hills in the way. Often reachable with 30 watts, but rarely with 2.5 watts.
3. CANBERRA — about 180 kilometres away with much of the Great Dividing Range in the way. Less often with 30 watts and rarely with 2.5 watts.
4. SHEPPARTON — about 130 kilometres away with some hills in the way. Rarely with 30 watts and only once or twice with 2.5 watts.
5. BENDIGO — about 200 kilometres away. Harder to reach than Shepparton and always 30 watts required.

The ability to reach the various "difficult" repeaters is clearly related to the presence of Temperature Inversions. Over the years, the writer has come to some conclusions about this, much of which is logical but there are also times when one would expect propagation to be excellent, only to discover it is not! This article is not intended to be a definitive treatise, but rather to incite some discussion and hope that some other readers may be able to answer some of the questions which I can not.

TEMPERATURE INVERSIONS

Under normal circumstances, as one rises in the Troposphere, ie the lower part of the atmosphere from ground level to the start of the Stratosphere, the temperature normally *falls* at an average rate of two Centigrade degrees per 1000 feet. This can be shown graphically. (See Figure 1).

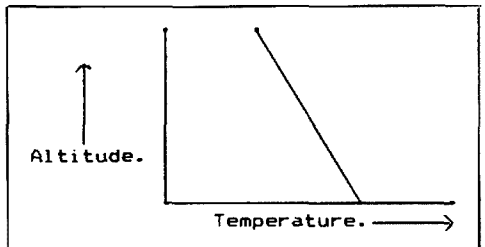

Figure 1.

A Temperature Inversion is said to occur when this "*normal*" temperature drop is reversed, ie temperature *rises* as we go higher in the Troposphere.

This can be shown graphically as in Figure 2.

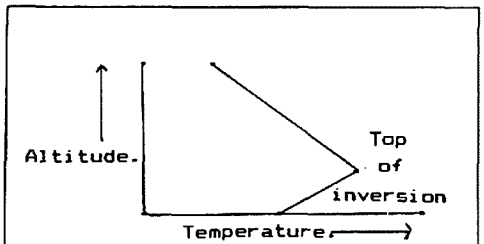

Figure 2.

It needs to be realised that for a parcel of air to rise in the atmosphere, that parcel of air must be warmer than the surroundings. This is because the warm air is less dense than its surroundings, ie it is lighter and thus can rise.

If one considers *an inversion* it soon *become* apparent that, as the temperature actually rises with height, any air which attempts to rise will rapidly stop, as it will become cooler than its surrounds and thus sink. Not only will air be unable to rise when an inversion is present, but neither will any particles which are in the air, such as smoke. Thus, one frequently sees smog around large cities under inversion conditions, as the smoke and other impurities will be unable to rise and therefore be dissipated in the atmosphere.

Under inversion conditions, the atmosphere is said to be stable. It should be realised that there is a definite upper limit or "lid" to an inversion. It is this lid which traps VHF waves and prevents their escape into space and ducting occurs providing both antennas are in the inversion layer.

TYPES OF INVERSION

1. Radiation Inversion

This type of inversion occurs on a clear, windless night. The ground radiates heat out into space and the air near the ground becomes cold. This cooling effect is generally limited to about 100 to 200 feet above ground level. Thus, we find that the air near the ground is colder than that higher in the atmosphere and consequently a temperature inversion exists.

One would expect that the inversion would increase in intensity as the night went on as more heat was radiated away from the ground. This, in fact, is what happens and this type of *inversion* reaches its *maximum* intensity around sunrise. Further to this is an effect that the first rays of the sun may have on the inversion. The sun can cause mild turbulence in the air around sunrise and mix up the air in the inversion. This has the effect of colder air rising in the inversion and intensifying the difference in temperature between the inversion and the air above it. Thus the boundary line between the two (or the inversion lid) is more marked.

RADIATION FOG — Fog occurs when air is saturated to 100 percent. This temperature is termed the Dew Point Temperature. The colder that air becomes, the less water vapour it is able to hold. Clearly, then, if air is cooled enough and there is enough water vapour in it, there comes a time when Dew Point will be reached and water vapour will condense out of the air. When the air is cooled as a radiation inversion is formed and conditions are right, then water vapour can condense out as fog.

As the cooling occurs in consequence of heat being lost by the radiation of heat, the fog is termed Radiation Fog. Clearly also, when radiation fog is about, we will have a temperature inversion. It could be said that the presence of radiation fog is a visible indication that a radiation inversion is present.

2. Subsidence Inversion

This type of inversion forms in a high pressure system. In a high *pressure* system, air high in the troposphere sinks into lower levels. This is termed subsidence. This subsidence effect tends to be more pronounced at higher levels than at ground level. When air subsides, it is compressed causing the air to be heated and thus the temperature of this compressed air rises. Now, as subsidence occurs to a greater extent at higher altitude, it follows that the temperature will be higher at higher altitudes. We now have a rise in temperature with increase in altitude and consequently a temperature inversion.

The "lid" for this type of inversion is much higher than it is for radiation inversions and is often up to an altitude of 5000 to 6000 feet. The strength of this inversion is greatest near the *centre* of the high. The strength of this type of inversion is nowhere near as great as a surface or radiation inversion. It is the subsidence

inversion which causes the smog which is seen around cities.

3. Sea Breeze Inversions

Sea Breezes occur on the coast. The breeze flows from the sea to land, beginning during the morning, reaching maximum about mid-afternoon and fading off at dusk. They are less intense on cloudy days.

Sea Breezes occur because, as the sun beats down on land and sea, the land heats up quicker than the sea. As a consequence of this, the air above the land also heats quicker than that of the air above the sea. Thus, air above the land expands, becomes less dense and consequently rises. Cooler air from the sea flows in to take its place. To complete the cycle, air which rose over land, now flows out to the area of lower pressure over the sea and air which was at some height over the sea now descends to the sea. We thus have one big convection current as illustrated in Figure 3.

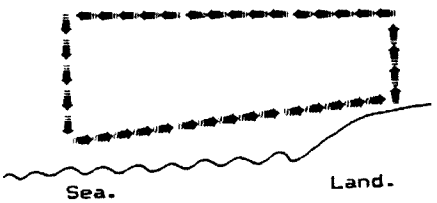

Figure 3.

The important thing from out point of view is that we now have cooler air from the sea in contact with the land and the warmer air which was previously in contact with the land has risen and we have a temperature inversion.

Note here also, as the air in the inversion has been in contact with the sea, it will have a high moisture content. This will also aid two metre propagation as the air above the inversion lid will be drier and will intensify the boundary between the two air masses.

The lid of this inversion is about 500 feet above the ground and these inversions often *continue for* hundreds of kilometres *down* the coast.

There are other types of temperature inversions such as frontal and turbulence inversions. As this article is not a full treatise on temperature inversions, but only as they effect two metre propagation, they have not been included in this discussion.

To conclude this part of the discussion, we know that a temperature inversion is present if we have:

(a) Sea Breeze — Sea Breeze Inversion
(b) Cloudless Windless Night — Radiation Inversion
(c) Radiation Fog — A visible indication of a Radiation Inversion
(d) High Pressure System over the top — Subsidence Inversion
(e) Smog or Haze — will usually be a visible indication of a Subsidence Inversion

EFFECT OF TEMPERATURE INVERSIONS ON TWO METRE PROPAGATION

Living in an inland area, experiences of long distance two metre propagation largely relate to inland areas.

RADIATION INVERSIONS are common inland and are more intense in the winter months. There s no doubt that this type of inversion improves propagation and is responsible for the ability to get into repeaters late at night, when one is usually able to during daylight hours. The writer has found that radiation inversion by itself does not achieve enormously great distances. With pure radiation inversion it is usually possible to reach the Wagga and Canberra repeaters, but not the Shepparton or Bendigo ones from the Wodonga QTH.

THE EFFECT OF SUNRISE is something that had not been considered until the writing of this article. However, it has been found that this intensifying of the inversion improves propagation, sometimes very dramatically. One morning, it was impossible to reach any repeater other than the local Wodonga repeater, however, half-an-hour later it was possible to work both Wagga and Canberra on 2.5 watts. It is not known how long this effect lasts as it occurs at the same time as departure time for work.

It is a generally known fact that radiation inversions dissipate at around 1100 in the morning. Whether this enhancement will last this long is unknown!

RADIATION FOG can enhance propagation. There has been no great experience of this at this QTH but it has been noticed on several occasions that it is possible to access the Shepparton repeater during the day when radiation fog has been present. On all of these occasions there has been fog of great height and possibly subsidence inversion has also been present. Be that as it may, the message is that it is worth trying for long range two metre propagation when significant fog is around.

SUBSIDENCE INVERSIONS are commonly seen in this area, sometimes with inversion haze. It has been realised that, when inversion haze is evident, especially in the winter, outstanding propagation is very likely to be achieved. There is no doubt that when inversion haze is present in the day, improved propagation is available. However, as very little two metre operation is conducted during daytimes, outstanding propagation has not been experienced, but others may have different experiences! On purely theoretical grounds one would not expect spectacular propagation in the day as subsidence inversions are not all that strong.

It is a completely different matter at night. Here we have added to the subsidence inversion, the nocturnal inversion and this is capable of producing some very spectacular contacts.

Whilst writing this article, the weatherman obligingly dumped the most intense high pressure system over Victoria since 1925. The Barometric Pressure peaked at 1043 Hectopascals in Wodonga. This high arrived on June 30, 1987 and finally departed on July 10, 1987. The centre of the system wandered from the south of Melbourne over most of Victoria and finally, on the night of July 9, 1987, it centred itself over central New South Wales. It reached just into Victoria and the barometric pressure was still 1040 in Wodonga although the centre was at least 600 kilometres away. It had been noticed during the day that there was moderate inversion haze to the north and that propagation was excellent. That night, whilst working in the shack and listening to the Wagga repeater, it was noted how clear the repeater was. I decided to put out a call to Wagga, but instead called on Channel 1. Bob VK2XEH, in Lithgow, and Alan VK2BAS, in Sydney, replied to the call and I thought how well they were doing to get into Shepparton, especially when Bob commented that he was using a hand-held! It finally evolved that I was working into the Western Blue Mountains Repeater at Oberon. This QSO began at 2005 EST and concluded at 2030. There was also a short QSO with VK2CBD, at Dubbo, before he was drowned out when the Shepparton repeater could be heard, but not accessed. Following this was a 30 minute QSO, on the Orange repeater, with Reg VK2ELG, who lives near Albury. We were joined by Peter VK2ETK, mobile in Orange.

Following these two contacts, both repeaters faded at 2150 EST. How is this explained?

The two long range QSOs are explained by the fact that the area was under the influence of an intense high and there was visible evidence of a subsidence inversion. Further, it was a cloudless night. Thus there was a radiation inversion adding to the effect of the subsidence inversion. My experience of this is very definite that, when these two types of inversion are present, we have nights of exceptional two metre propagation. The propagation was to the north as that is where the high, with its inversion, was present.

Channel 1, at Shepparton, was not accessible, even though the same channel at Oberon was accessible at very much greater distance, because it was not in tne centre of the high. Also, there was some high cloud in the area which would have reduced the intensity of the radiation inversion at Shepparton.

Why did propagation fold-up at about 2200 EST? One would have expected that propagation would have continued to improve as the radiation inversion continued to intensify. This was not a "once off" observation. If it was, then it could be explained by the movement of the high and a consequent loss of inversion. On the contrary, it has been found when these exceptional nights occur that it shuts down between 2200 and 2300 EST *every time!* I am at a total loss to explain this.

No practical experience of propagation allowed by SEA BREEZE INVERSIONS has been experienced. However, whilst holidaying at Iluka, on the north coast of New South Wales during May 1983, I was advised by some locals that long hauls were very common up and down the coast. If the sea breeze inversion is responsible, it follows that good propagation should occur in mid-afternoon when the sea breeze is at its height.

CONCLUDING

1. Pure radiation inversion causes a moderate improvement in propagation late at night.
2. Subsidence inversion causes moderate improvement in propagation in the day.
3. Spectacular propagation occurs at night when radiation and subsidence inversions combine. It occurs relatively early in the evening about 2000 to 2100, and ceases between 2200 and 2300 every time.
4. Considerable improvement in propagation may be present in the day when heavy fog is around and covering a wide area.

Have any other readers any theories on the following:

1. Why does propagation cease between 2200 and 2300 every time on nights of spectacular propagation?
2. How long does the "sun stirring" effect last?
3. Do sea breeze inversions cause long range propagation on the coast in the afternoon? If not, are there regular times when long range propagation occurs on the coast and can this be explained by temperature inversions?

REFERENCES

1. Manual of Meteorology, Part 1. General Meteorology.
2. Manual of Meteorology, Part 2. Aviation Meteorology.

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REPORT TO EXECUTIVE ON SPECIAL CALL SIGNS

In examining call signs and extant WIA policy three categories can be identified; these are call sign suffixes, call sign prefixes and special call signs.

CALL SIGN SUFFIXES

Call sign suffixes are allocated as follows:

All two-letter suffixes except AA and WI — full call licensees.
AA — official DOTC call signs.
WI — usually assigned to WIA.
Three letter suffixes:

AAA — AZZ	Full call licensees.
BAA — BZZ	Full call licensees.
CAA — CZZ	Full call licensees.
DAA — DZZ	Full call licensees.
EAA — EZZ	Full call licensees.
FAA — FZZ	Full call licensees.
GAA — GZZ	Not allocated.
HAA — HZZ	Not allocated.
IAA — IZZ	Not allocated.
JAA — JZZ	Combined licensees.
KAA — KZZ	Combined licensees.
LAA — LZZ	Not allocated.
MAA — MZZ	Novice licensees.
NAA — NZZ	Novice licensees.
OAA — OZZ	Not allocated.
PAA — PZZ	Novice licensees.
QAA — QZZ	Not allocated, can be confused with Q codes.
RAA — RZZ	Beacons and repeaters.
SAA — SZZ	Not allocated, except Scout groups.
TAA — TSZ	Limited licensees.
TUA — TZZ	Limited licensees.
UAA — UZZ	Not allocated.
VAA — VZZ	Novice licensees.
WAA — WZZ	WIA emergency, Divisional and club call signs.
XAA — XZZ	Limited licensees.
YAA — YZZ	Limited licensees.
ZAA — ZZZ	Limited licensees.

Note: Certain "non-standard" suffixes are allocated including:
RAN, GGx, TTx, ITU, BSx, SJx, etc.

CALL SIGN PREFIXES

In addition to VK, the prefix AX was authorised for special events upon application to DOTC. The 1981 agreement as to "special events", as contained in AR, May 1981, was:

"Stations in the amateur service will, for as long as the prefix is not required by the Australian Administrations for the identification of stations in any other service, be permitted (at the amateur licensees option) to use the prefix "AX" in lieu of the prefix "VK" on the following conditions:

1. Except in special circumstances, such use shall be restricted to a continuous period of two months, not earlier than two years from the last day of the previous period of such use.
2. The time of such use shall be nominated by the Wireless Institute of Australia, and then only to coincide with, or relate to an event of National, and not local, importance.
3. Except in special circumstances, and in order to allow the Administration to give some notifications as are necessary, the nomination of the period shall be made by the Wireless Institute of Australia at least six months prior to the first day of the period nominated.
4. Any question as to whether "special circumstances" as referred to 1 and 3 have arisen shall be resolved by discussion between the Wireless Institute of Australia and the Department.

We have provided for exceptional circumstances of 1 and 3 of the conditions to meet the case of an event of national importance that may not be foreseen, for example, the coronation of a monarch."

The 1982 Federal Convention confirmed this policy (82.121) noting the value in keeping the prefix "exclusive". At a later date VI was sought and approved as an alternative as a special prefix.

SPECIAL CALL SIGNS

At the request of the WIA, DOTC have sought approval for and authorised special call signs not constructed to the international format. These have been for limited use on national occasions, (thus satisfying 82.121) and included:
VK75A, VK5JSA, VI88ABC, ACT, NSW, WIA, and XPO, etc.

RECENTLY PROPOSED DOTC POLICY

Recently DOTC proposed a policy, expressed in a letter dated May 10, 1988, which can be summarised as follows:

AX
- for special national and international occasions.
- available for all amateurs.
- fixed duration (of the occasion).
- available only through WIA representation.

VI
- for special state and local occasions.
- available for any group or individual.
- fixed duration (of the occasion).

Six months notice applies for requests for either prefix.

IMPLICATION OF DOTC POLICY

The new DOTC policy above retains the exclusiveness of AX, through its limited use, however VI is downgraded to a lesser status. Given the need to cover both situations and the fact that the WIA does not have to be involved in seeking approval for use of VI the conditions are acceptable.

A further possible variation is the WIA offering to control the authorisation of VI, a little like the RSGB manages the GB series of special event prefixes.

—Ron Henderson
May 30, 1988
ar

Try This!

Peter Brand VK3BPB
436 Raymond Street, Sale, Vic. 3850

ADJUSTABLE GUY LENGTHS FOR MASTS

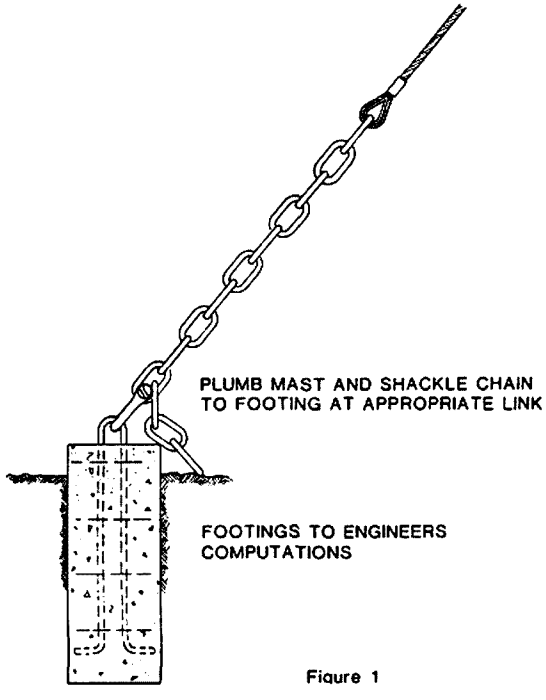


Figure 1

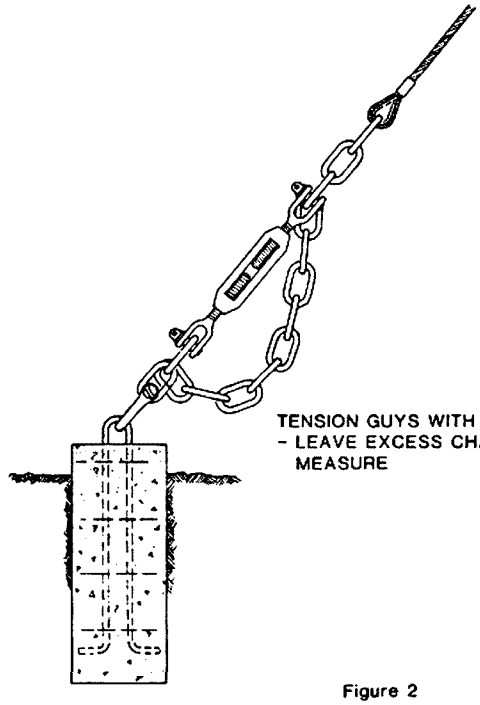


Figure 2

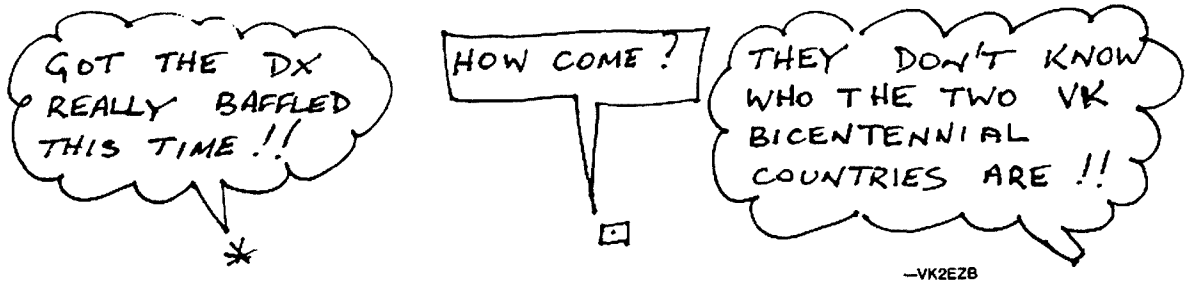
The problem of determining the lengths of guys before the erection of a mast can be quite difficult particularly on sloping ground.

To have considerable adjustment on each guy in many instances would be of great value but hard to achieve. However, by finishing each guy with a piece of chain (as in Figure 1), does achieve this to a certain degree. Two guys are secured, at their correct length, to their footings with a shackle at the appropriate link. The third guy is secured loosely to its footing in the same manner. The system being tensioned up by installing a turnbuckle in the last chain as in Figure 2.

If "little fingers" get at the turnbuckle and undo it then your mast is still safely held up on its chains. By adjusting which link you shackle on to the footing, you can plumb your mast quite accurately. Swaging the chains directly on to the guy wires looks neat and quite professional. Try a local "yachtie" if you don't have access to a rigging service.

ar

FACELESS



—VK2EZB

INTELSAT

Welcome to the fascinating world of television receive only (TVRO), commonly known as "Satellite TV".

Although commercial users have been using satellite for many years, the size and cost of most of the large installations necessary in the early days made it prohibitive for hobbyists to become involved.

However, recent launches of more powerful "Intelsat" series satellites, as well as a mass production of hi-technology receiver components for the American and European markets has enabled Dick Smith Electronics to bring the world of Satellite TV to the backyards of enthusiasts in Australia.

Following is information to give a better understanding of how Satellite TV works and what is required to allow the hobbyist the receive these television signals.

SATELLITE TV — HOW IT WORKS

A television signal originates at the television studio where it is fed to a dish that "uplinks" the signal to one ot the many orbiting satellites, 37 800 kilometres above the surface of the earth. The satellite receives that signal, alters its frequency (it cannot receive and transmit on the same frequency) and then beams the signal back to another part of the earth via the "downlink" where a satellite dish receives it.

The downlink signal leaving the satellite is quite weak and, by the time it reaches us, the signal is extremely feeble, far weaker than a normal television signal. Depending on the satellite and the on-board transponder used, most returning signals are aimed at the equator and the intensity of the signal decreases as one moves north or south.

The pattern of satellite signals made on the earth's surface is known as "the footprint". On paper, a footprint looks like a concentric circle created by dropping a stone into a still pool of water. At the centre of the innermost circle, the signal is strongest and grows proportionally weaker the further away from that central point. This means that the further one lives from the centre of the circle, the more sensitive receiving equipment is required.

Only a few pieces of equipment are needed to receive the satellite signals:

1. a suitably sized parabolic dish antenna
2. a low noise "block converter" (LNB)
3. a feed horn assembly
4. low loss coaxial cable
5. a suitable satellite receiver, and
6. a multi-standard television or video monitor.

The dish antenna is made of highly reflective materials which gather and focus the weak satellite signal into the feed horn, which is mounted at the focal point of the dish. The feed horn channels the signal into the low noise block converter where it is greatly amplified, and the entire "block" of satellite frequencies (3.7 GHz to 4.2 GHz) is then translated down to a lower, more usable "block" of frequencies (950 MHz to 1450 MHz) before being sent down the coaxial cable to the receiver. The satellite receiver operates in a similar manner to an AM/FM tuner, it provides the controls to tune various channels — like the various stations on a tuner. (Each transponder on the satellite, and there are many, can downlink a different channel).

The satellite receiver provides sound and picture outputs for a suitable video monitor or television. Unfortunately, there is no one world standard for colour television signals. Because of the international nature of Satellite TV, several different transmission standards are often receivable from the one satellite: the satellite simply relays the same standard as was uplinked to it.

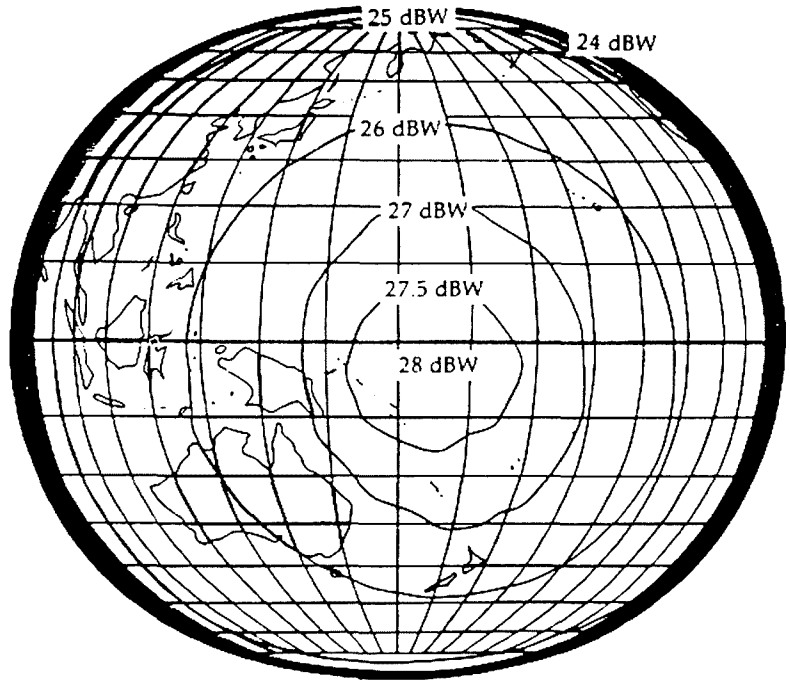
To watch colour pictures from all countries of origin a multi-standard video monitor (now readily available) or separate televisions or monitors is required. The major transmission types are PAL (as used in Australia, New Zealand, Britain, and some of Europe), NTSC 3.58 (similar to NTSC used in the USA and Japan) and SECAM (as used in France, USSR and French possessions).

The particular satellite we are interested in is called *Intelsat 5-F8*, which is located above the equator at 180 degrees East. This satellite, which operates in the 4 GHz "C" band, provides a number of transponders of differing signal strengths to the Australia/New Zealand area. Depending on the location, dish size and accuracy, and the program originators, it is possible to receive the following signals as of March this year.

1. AFRTS (Armed Forces Radio and Television Service) — an NTSC transmission designed to be received by US military personnel in the Philippines, Korea and the Pacific area. This signal is presently the strongest one of the satellite. There are also two FM radio stations on this transponder, but their signals are very weak, and would require special external filters for satisfactory reception. Most AFRTS programs are of a news/sports/current affairs type and primarily originate in the USA.
2. JISO — an NTSC transmission bringing programs from the USA to Japan, mainly in Japanese language. Because this signal is primarily intended for Northern Hemisphere reception, it is very weak, and requires a larger dish and/or a northerly location for satisfactory reception. As of early 1988, only sporadic use of this transponder has been noted.
3. BBC/NZBC — a PAL and/or NTSC transmission bringing programming from the USA to New Zealand and the Asian region. This signal is also weak, but is usually acceptable when viewed on a narrow band satellite receiver.
4. RFO — a SECAM transmission covering mainly local news and events in French possessions in the Pacific area. This program is in French, and is assumed to be uplinked from Tahiti, or possibly New Caledonia.
5. CNN (Cable Network News) — a new NTSC transmission originating in the USA. Programming is news-oriented, much of it is of domestic USA interest, but with some emphasis on world news.
6. World-Net — a PAL transmission prepared by the US Information Service to commence in late 1988. Programming is expected to follow similar lines to present transmissions to the Middle East and South Asia (approximately three hours daily).

There are also several downlinks to Sydney television stations TCN-9 and ATN-7, but these signals are encoded using a system called Thompson CSF videoplexing, and are not watchable by the home viewer without suitable decoding equipment. Their material may also be subject to copyright.

As Intelsat 5 is not yet fully utilised, intermittent use is made of spare transponders for video feeds: these often spring to life for short periods, then disappear. It is worth tuning across these transponders occasionally in search of new program material.



Intelsat V Global Beam, Pacific Ocean Region.

QUESTIONS AND ANSWERS

Following are some of the most commonly asked questions on Satellite TV.

How large a dish will I need?
This depends on where you live and the quality of reception that you require. If you live in northern parts of Australia (eg Darwin or Northern Queensland) or in Papua New Guinea you can use a minimum dish size of 3.3 metres diameter.

If you live in the central or southern parts of Australia then a larger dish (eg 4.5 metres or more) would be required. The size of the dish is also influenced by the noise temperature of the LNB used (higher noise LNBs require larger dishes for satisfactory operation). A 45 K noise temperature unit is suggested.

Will rain or snow interfere with my Satellite reception?
Unlike AUSSAT signals, which operate on a much higher frequency, severe rainstorms cause only a very slight amount of interference to the satellite signals.

How far from my house should the dish be?
Ideally, the dish should be situated no more than 20 metres from the house: longer distances would require additional cable runs of lower loss cable, and possibly special in-line amplifiers to ensure you receive the best possible signals. The dish must also be placed so that there are no obstructions between it and the satellite (eg trees, houses, power lines, etc) for best reception.

Is the installation of a Satellite receiving system legal?
Yes, there is no requirement by the Australian Government for you to have a license to operate a home satellite receiving system providing the dish antenna is no larger than five metres in diameter. It is wise to check with your local council regarding building permits that may be required before you install the dish.

Can I run more than one television or monitor from my system?
Yes, this can be done in two ways. Firstly, you can run several suitable televisions or monitors using similar techniques to those used in normal video installations (eg each unit shows the same picture).

Secondly, you can install special "block" style amplifier/splitters in the cable run between the LNB and the receiver, and run a number of "block" outputs to separate Satellite receivers in different locations. This method requires a separate receiver and monitor combination at each location, but allows each user to tune to a different transponder. This would also allow people to split the cost of the Satellite dish system among several nearby households, however care would need to be taken that this did not contravene any Department of Transport and Communication (DOTC) or other Government regulations.

Can I paint my dish to blend in with the environment?
Yes, as long as you do not use paint with a metallic base, there should be no problems doing this providing you choose a reflective finish to reduce heat problems. This really means — do not use black!

What is the probability of lightning striking my satellite dish?
The probability of lightning striking the dish is about the same as lightning striking a normal roof top television antenna — a risk, but not very high. When was the last time you heard of a lightning strike on a television antenna?

How do I know where to point my dish?
To accurately point your satellite dish you need to know the magnetic bearing and elevation of the satellite relative to your location. Using a computer program or printed co-ordinates based on your latitude and longitude it is relatively easy to obtain these figures.

How long will I be able to watch Satellite TV?
Australian hobbyists have been watching the Pacific Intelsat Satellites now for many years. As traffic on Intelsat satellites in general has increased dramatically over the last five years, it would appear certain to continue. The re-location of Intelsat 5-F8 with its increased television capacity and higher signal strengths should provide a variety of material for you to watch on your Satellite TV system.

How do I obtain multi-standard Video Monitors in Australia?
Suitable multi-standard video monitors are now readily available from many sources in Australia. These include the following companies: Sony, Sanyo, National, and JVC. Screen sizes vary from around 14 inches up to 27 inches.

How do I know what programs are on at what time?
As most of the transponders on Intelsat 5-F8 are of a commercial news/sport feed nature, it is difficult to predict their program content and times of operation. However, the AFRTS network does publish program and time details in several US monthly publications.

Can my Satellite system suffer from local interference?
Because of the extremely high frequencies used by the satellite system, the chances of local noise sources (eg car ignition, etc as are seen on standard television sets) interfering with the satellite signal are extremely remote. However, in some parts of Australia, microwave frequencies are used to carry information over short distances (usually between dish antennas mounted on towers in elevated locations). These signals can cause interference if they are close to your satellite system — it is wise to check with the relevant authority concerned if you are located near one of these microwave towers.

GENERAL NOTES

Good reception of satellite television signals depends on absolute minimisation of losses within the ground system. We are dealing with signal levels far below those encountered in normal radio and television reception. After all, the satellite signal has to travel around 38 000 kilometres to earth and the loss of this path is approximately -198 dB.

For these reasons, it is essential that all connections are perfectly made, and that the dish is very carefully assembled.

It is unfortunate that the signal levels found in Australia are one-tenth the intensity of those found in the USA. This is due to the type of antenna beam being used by the satellite. A hemispheric beam gives a reasonable signal level over a smaller area; the global beam used by Intelsat 5-F8 distributes a weaker signal over a larger area.

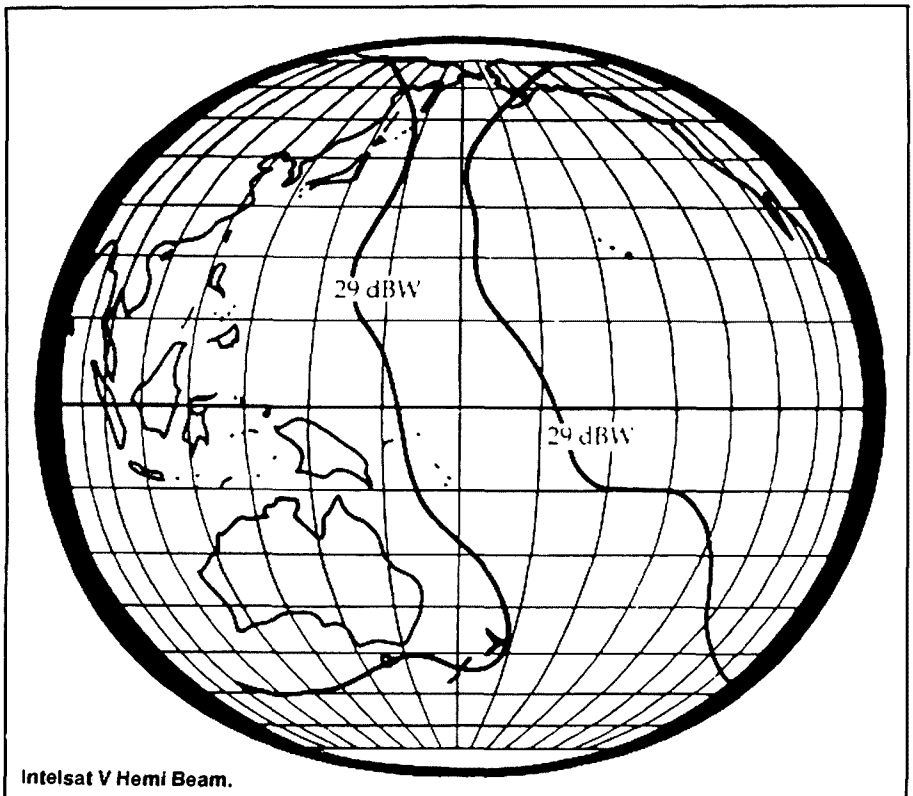
The assembly of a complete 4 GHz satellite receiving system is complex but the results are immensely satisfying. However, it cannot be overemphasised the importance of accurate assembly of the system. Failure to assemble the dish correctly will definitely result in a very poor picture or no picture at all.

THE SATELLITE: INTELSAT 5

Unlike their predecessors, the Intelsat 5 satellites are three-axis stabilised satellites with a 51 feet solar wing span. They are equipped with two global coverage horns, two hemispheric zone offset fed reflectors and two spatially isolated cerebral 11 GHz spot beam reflectors.

The hemispheric and zone beams are spatially separated as were those of the Intelsat 4A series. To allow a four fold increase in frequency over the Intelsat 4 series, zone beams use left hand circular polarisation while the hemispheric beams use right hand circular polarisation. This is referred to as cross polarisation and allows simultaneous use of hemispheric and zone beams in both the westerly and easterly direction.

Some of the Intelsat 5 satellites also carry additional transponders for INMARSAT (the International Maritime Satellite Organisation), to provide communications for ships at sea. The mari-



Intelsat V Hemi Beam.

time sub system is capable of providing the equivalent of 30 full time voice circuits.

SPECIFICATIONS

Receiver Specifications

Input frequency: 950 to 1750 MHz.
Input impedance: 75 ohms.
IF bandwidth: 25/15 MHz.
Switchable input range: -60 to 0 dBm.
Threshold: >8 dB C/N.
Tuning: 79 channel PLL plus fine tuning.
Video output level: 1 volt p-p into 75 ohms.
Video response: 30 Hz to 4.2 MHz.
Audio tuning range: 5 to 8 MHz.
Audio bandwidth: 150/450 kHz switchable.
Energy dispersal rejection: 40 dB.
Power requirement: 240 volts AC 50 Hz 25 watts.
LNB power: 18 volts DC, 250 mA through coaxial cable.
Video output polarity: switchable.
Video de-emphasis: CCIR 405 NTSC.

LNB Specifications

RF frequency range: 3.7 to 4.2 GHz (RF input CPR229G wave guide).
Output frequency range: 950 to 1450 MHz.
LO frequency stability: plus 2.5 MHz (-40 to 60 C).
Gain: 64 dB (typical).
Gain flatness: plus 1 dB p-p.
Output power: plus 5 dBm (at 1 dB gain compression).
Output impedance: 75 ohms.
Noise figure: 45 K (maximum).
DC supply: plus 15 volts to plus 25 volts DC at 200 mA.

Dish Antenna Specifications

Gain dB; (plus 0.2 dB steady state): 44 dB at 4 GHz.
Beamwidth (-3 dB): 1.2 at 4 GHz.
First sidelobe level: -22 dB at 4 GHz.
Noise temperature at 30 elevation: 23 at 4 GHz.
F/d ratio: 0.38.
Diameter: 4.5 metres.
Material type: Aluminium mesh.

GLOSSARY OF TERMS

"C" Band:
3.7 to 4.2 GHz microwave frequency band.

C/N Ratio: Carrier to noise ratio (the ratio of carrier level of noise level measured in decibels -dBw power over one watt.

Base Band: Video output signal from a satellite receiver.

dB: Decibel — a means of expressing ratios logarithmically. dB = 10 x log. Power1/Power2 eg if power is doubled from 10 to 20 watts, then dB = 10xlog (10/20) or 3 dB (approximately). Therefore, if a signal level footprint shows a difference of 3 dB between one area and the next, only half the signal level is available for reception.

dBi: Antenna gain, expressed in decibels, relative to an isotropic (or theoretical "point") source.

Downlink: The transmitted signal from a satellite to a ground receiving station.

EIRP: Effective Isotropic Radiated Power — accounts for total satellite output by combining transmitter RF power and transmitter antenna gain.

Elevation: Degrees above the horizon; 0 indicates the horizon, 90 is overhead.

Energy Dispersal: A low frequency signal added to the baseband signal before modulation to reduce interference potential. Is removed by satellite receiver.

F/D: Ratio of focal length to diameter of a dish antenna. Varies with each antenna — the higher the ratio the higher the aperture (and efficiency).

Feedhorn: Provides gain by capturing reflected microwave signals from the dish and concentrating them into the LNB.

Footprint: A signal strength map showing the EIRP in dBw contours.

Global Beam: Downlink beam covering the entire visible Earth surface as seen by the satellite.

Hemispherical Beam: Shaped downlink beam (usually east or west) that covers approximately half of the Earth's surface, as seen from the satellite.

Kelvin (°K): Abbreviation (supoK) is a symbol for degrees Kelvin, a temperature scale measured from absolute zero. Used to compare the extra noise added by the amplifier in the LNB.

Look Angle: The elevation of an antenna from the horizon.

Microwaves: The name given to a range of extra high frequency signals (above 3 GHz) such as those used in satellite systems.

Parabolic Dish: A dish-shaped receiving antenna, normally round, covered with a metallic reflector surface and accurate as a perfect parabola. Focuses all received microwave signal to a single point at the focus of the parabola.

S/N: Signal to noise ratio, expressed in decibels.

Sparkles: The streaks or dot interference on a satellite television picture, caused by weak signal levels.

Uplink: The signal from the transmitting earth station to the satellite.

Wave Guide: A specially shaped rectangular tube designed to prevent signal loss at microwave levels.

FURTHER READING

To further increase your knowledge of Satellite TV the following publications are available direct from the USA.

1. *World Satellite Almanac.* 4300 West 62nd Street, Indianapolis, Indiana, 46268 USA.
2. *World Satellite Update.* MLE Inc, PO Box 159, Winter Beach, Florida, 32871 USA.
3. *Coops Satellite Digest.* International Edition, PO Box 100B5B, Fort Lauderdale, Florida, 33310 USA.

DISCLAIMER

Due to the volatile nature of international feeds, it is not possible to guarantee that changes (either additions or subtractions) of those program sources listed will not occur. While every care was taken in the preparation of this information, it is intended as a guide only, and details should be confirmed with relevant authorities before commencing purchase or construction of either individual components or a complete satellite station.

The above information was compiled by Dick Smith Electronics. Further information and equipment for a Satellite TV receiving station may be obtained from Dick Smith Electronics stores and agencies throughout Australia. Illustrations are reprinted from the *World Satellite Almanac.*

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A SIEMENS M100 TELEPRINTER 100 VOLT 50 MA POWER SUPPLY AND TTL INTERFACE

Ron Mills VK5XW
13 Taylor Terrace, Rosslyn Park, SA. 5072

Many RTTY users have Siemens M100 teleprinters and many different types of modems. The accompanying circuit can be used for interfacing the M100 to a home-brew system or to more sophisticated commercial units such as the Tono Theta 5000/7000/9000 series.

All parts are readily available at minimum cost. The power transformer used to achieve 100 volts by voltage doubling is an *Arlec AL7VA/30.* Dick Smith stores sell a larger 1 amp 30 volt multi-tapped transformer M6672, as well as the 470 mF 65 VW capacitors and five watt 3K9 wire wound resistors. Although both of the transformers are nominally 30 volts, the final DC voltage is almost exactly 100 volts. Provision is made for TTL IN and OUT with TTL IN available either Normal or Reversed. A HOLD/RUN switch stops the teleprinter from printing or running "open". The transistor TR1 in the LOOP circuit must be of a high enough rating to stand 100-plus volts, eg BF337.

The unit was fitted into one of the multi-purpose plastic boxes, eg 130 x 130 x 75 millimetres. The front panel has the power ON/OFF switch, a red LED power-on indicator, a green LED LOOP indicator and the HOLD/PRINT switch. The rear panel has a three pin AC power socket to feed the teleprinter motor (controlled by the AC ON/OFF switch), a teleprinter LOOP socket (two-pin microphone type) RCA in/out sockets for the TTL levels. A fuse is fitted to the 240 volts AC input and the 12 volt 7812 regulator heat-sinked. (The 12 volt supply was found to be necessary to drive the BF337 hard enough to give good clean pulses to the teleprinter magnets).

To stop excessive heat dissipation in the 7805, fit a resistor RX of suitable value to drop the voltage from the 12 volt rail to a value just high enough so that the 7805 does not drop out of regulation. The 7805 will then not need to have a heat-sink.

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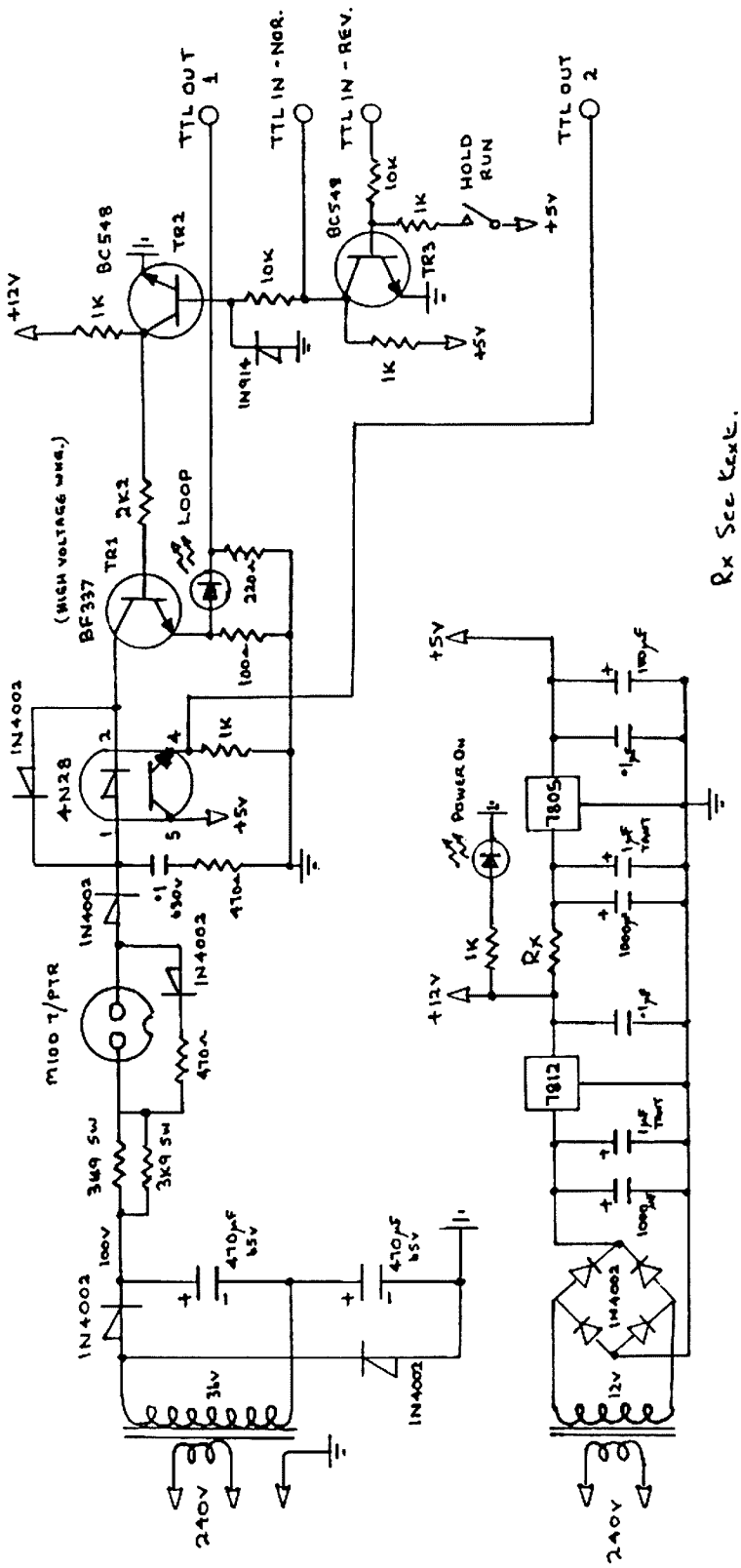

Figure 1 — Power Supply and TTL Interface.

FUTURE OF AMATEUR RADIO
As seen by a Novice-to-be)

R A Fenton L20530
PO Box 1062, Bathurst, NSW. 2795

I reply to *Future of Amateur Radio* from Peter VK6NNN (now VK6BWI) in the May issue. As a relative newcomer to amateur radio, still working towards my novice ticket, I feel strongly about changes to the hobby to which I am attracted, to which I will give many hours of study, and to which I look for many more hours of pleasure. My comments are not those of a brash school learner, eager to take the world by storm, but of a person of nearly 50 years, who has studied hard to attain professional qualifications at post-graduate level. (I hold a MA in psychology and practise as a psychologist).

To comment on the points Peter raised in the order he gave them —

1. LACK OF YOUTH INVOLVEMENT

Yes, not a lot of amateurs are under 20 years, and to judge by the voices on both Novice and Full Call frequencies, not a lot of under 50 years either!

It seems that the younger amateurs spend fewer hours of operating as well as having briefer OSOs.

I cannot agree that an examination fee of $30, a $6 NAOCP fee and $28 a year for a licence is the barrier. $64 seems very little when I look at the money 18 to 30 year olds spend on other things around my locale. I would suggest that $5000 transceivers are not too expensive either — consider the costs of obtaining and running a high performance car or motor cycle; learning to glide or fly; learning and playing golf; taking part in amateur sport; maintaining a record/tape/disc collection with the latest hits — no, cost of establishment and running costs are not the identifiable cause of the absence of interest.

I do find the "I built a crystal set" argument, so often proposed, to be quite specious. My generation built crystal sets and one valve receivers — my children's generation had expensive bicycles and surf boards, video games and computer games — the current group of pre-schoolers — who knows? but I doubt, given the cheapness of "trannie radios", that they will ever build a crystal set — any more than we would have, if a week's pocket money could have bought us a radio receiver. We built crystal sets to get radio reception from commercial stations because the average house had one radio set — our parents controlled it and selected the programs. The children around me get an average of $10 a week pocket money — one week gets an AM transistor, three weeks get AM and FM reception and $100 plus tape decks with AM and FM radio installed are common birthday and Christmas presents.

I'd suggest that the near-ubiquitous CB radios offer the last chance to get young licence holders for our hobby. Instead of sneering at them, we should be out there recruiting like mad while they are still interested! I run 27 MHz and 477 MHz on the country property where we live, for easy and convenient communication with neighbours and as a mobile to base medium. There are at least 60 CB operators within easy range and I have yet to hear a Novice or Full Call "plug" the hobby — the nearest amateur organisation meets in Orange, about an hour and a half away by road and may as well be in Africa as regards its local profile.

We need to look at our public profile and our contact with potential young members, not bewail the fact that nobody builds crystal sets anymore or that the YRCS ended — after all, if the YRCS had attracted floods of licenced persons, we wouldn't have the problem, would we? and the YRCS would be such a success we would never end it, would we?

2. LESS EXPERIMENTATION

I could not agree more with Peter on this point — yes, open up interest in new modes, encourage experimentation as far as possible. *However* — why do I keep reading the idea that experimentation must equal building *all* one's own equipment? This is not a logical statement! Does one have to *build* an oscilloscope in order to use it? or a racing car in order to compete in non-professional events with a car club? or a skiboat, outboard and water skis in order to liven up the local river on weekends?

NO — experimentation takes different forms in this technically advanced era — and to *need not*, indeed probably *should not*, include owner construction as a necessity. The basic need for a sophisticated transceiver, able to operate on several modes across several bands, now seems well established. This need is readily met at much less than the cost of a secondhand car — it leaves much for experiment — antenna systems, ancillary equipment, new modes, portable operation, and so on.

3. SLOW GROWTH IN OUR POPULATION

Yes, it is a case of "use them, or lose them" with commercial interests' eyes on our band allocations. We need to recruit more operators, and (dare I suggest it?) give Novices more access — and that means *all* bands that they care to use. I believe this to be the best answer to under-used spectrum space — get the Novice in there on low power and let them experiment with antennas to get out better. Unless the bands are used more, they will go, just as 11 metres went to the CBRS. There is a growing demand by commercial interests for spectrum space — and they will pay government very well to get access. We have to occupy, and be seen to occupy, if we are to have any chance of keeping what we have been lucky enough to have.

4. COST

I asked a group of 20 to 30 year olds recently what they owned that was hobby orientated — and the average was $15 000 worth! This included stereos and record/tape collections, hot cars, motor cycles, ski boats, sporting equipment, firearms, sail boats and catamarans, equipment for snow skiing and so on. I really think it is time we killed the myth that there are hundreds of people out there — all keen to get into radio but unable to afford it. The facts seem to be that they are out there, but spend their money where their interests lie — and they usually do not lie in amateur radio!

Or do we only want to attract the people who are too broke to do anything else? Would we keep them once they got a dollar?

5. PUBLIC AWARENESS

Yes, Peter has said it all. It is time, we do need a higher profile, we do need to be talking/demonstrating in schools, community organisations and service club meetings, at rural field days and local schools — in shopping centres — anywhere we can be seen and talked to.

6. SUGGESTED APPROACH

And this is where I feel that Peter is barking, not only up the wrong tree, but up the wrong entire forest! he wants is to reduce power, go back to basics, build it ourselves — why not revert to pedal powered spark gap transmitters? Several points need making:

a) The sophisticated equipment makes, their agents in Australia, the retailers — all these form a formidable lobby group working for the hobby. Why alienate them and lose their support?

b) Take a close look at the other things people spend money and time on in their leisure activities — most are characterised by sophisticated assemblies, power, ease of operation, specialised service organisations, warranty periods of increasing length, disposability, a thinning secondhand market, and some degree of "throw-away-ability". If we want to match appeal we must influence people's opinions and tastes also. Consider compact disc players and home radios — both cost big dollars, have a relatively short life before being outmoded (by model changes rather than wearing out) and are serviced by specialists. If radio is to re-instated should it be different?

There will always be room for the home-brewer in radio, just as there is in people's other recreations, but to change the activity only to allow owner-builders will be to kill it stone-dead.

c) Rather than restricting activity to a single band — for that invites acquisition of other bands by commercial users — why not, as I suggested earlier, get the newcomers in on *all* bands, but restrict their power, using power gain as the bat to progress to Full Call status?

d) "We may expect that, by introducing home construction of equipment to new amateurs, it is quite likely that they will be the future technical pioneers" — I quote and dismiss this on several logical grounds:

i) It is like suggesting that the apprentices are the best source of innovation in a trade, rather than the pioneer tradesmen. It just isn't logical!

ii) The necessity to home-brew may well introduce a proliferation of kits and "plug-together" assemblies so new folk can get on the air — that's what the hobby is mostly about at first — *being on the air.*

iii) When was the last technical innovation or breakthrough recorded as coming from amateur ranks and then adopted by the professionals? With Japanese, American and European R and D projects spending millions of dollars, the idea of new Novices making a breakthrough seems wildly optimistic.

iv) It will drive away more than it encourages. Look at the example of UHF CB — how many would have gone on the air, repeaters at all, if they had to home-brew it? Yes, it is very easy to build a FM transmitter for 477 MHz — but the potential users would have stayed away in droves if they had to do it — and the spectrum space would long since have been allocated to commercial two-way operators, or so I think!

v) A comment on power limits — I feel that 25 to 50 watts is appropriate for newcomers, with the main bait to get them up to Full Call status being access to more power — *and that alone.*

Let them taste every band, get to know what goes on there, populate it to keep the authorities and commercial operators at bay, then increase their power allowances improving performance in return for passing advanced examinations. Where is the sense in keeping Novices away from the Full Calls where they could learn more? How many Full Calls use the Novice areas or talk to Novices? How many Novices drop out after a year or so? Why?

7. MODES

Yes, open it up for Novices — get them in a position to taste all the modes on low power. It is from their ranks that the Full Call operators on RTTY and computer packet transfer will come — on all modes, in fact.

Again, the more the allowed bands are used, the better for all of us.

8. EXAMINATIONS

I cannot understand how Peter can propose Novices creating technical innovation — then he resumes the need to understand VFOs, SSB, superhet circuits and so on. This is illogical.

I think that the present Novice examinations are just about "spot on". A reasonably intelligent person who is interested can learn enough to pass. A reasonable entry standard exists, so that exposure to other modes and experience on other bands, plus the prospect of more power, will keep them studying towards the Full Call licence.

And now to Morse — the source of so much argument amongst amateurs and would-be amateurs alike. Let us discard sentimentality — not that it has no value, but in order to deal *logically* with the issue for a paragraph or two:

Yes — Morse has

1. low cost

a) for home-brewers.

b) but not if sent via an expensive transceiver, as it *mostly* seems to be.

2. simplicity of transmitting equipment

— see a) and b) above

3. penetration through interference

— agreed, though not everybody would want to bother — they operate on telephony or shutdown — it is a hobby after all.

4. more miles-per-watt

— Agreed, but see 3. above

5. narrow bandwidth

— agreed, but in substantially unpopulated spectrum space does this matter? Cramming the Morse operators in narrow sections of the bands creates a need for this feature. Now there is a little inside-out logic to ponder upon!

6. speed — you jest! The human ear and brain can cope with phonemes, the units which make up morphemes, which are the units which make up words, at a faster rate than they can translate letters into words. I will bet anyone that I can speak (intelligibly) faster than they can send. In addition, my voice will carry extra information in intonation and stress characteristics.

7. "Most importantly of all — fun". I could not agree more — but only if one finds it so. Water skiing on bare feet is fun too, but not every skier wants to do it. Current practices in amateur radio make it compulsory to be a barefoot skier at expert level just to start the sport!

What else does Morse do?

1. It acts as a "mechanism of closure", as the sociologists would phrase it. In other words, it restricts access and keep people out. It creates an elite who are "in" . Logically, is this needed at this time in this activity? I do not think so, but others like the idea. It is a question of *values*, not logic.

Just consider the Spanish experience (May issue, page 59) which *doubled* the number of licence holders. Were they all "idiots and good buddies" — this extra 15 000? Did they create problems on the air? It sounds to me as if the other amateurs in other countries were the malefacters — they abused legally licenced operators (under the laws of the time). Who operated ethically? Consider the variation in Morse standards required by various countries, is there any real uniformity? What of licence categories which do not require Morse at all? In Australia, the limited licence demonstrates that Morse proficiency is *not* a requirement for responsible operation on the amateur bands. Logic wins again, if the reader sets sentiment aside.

2. It provides communication in emergencies and the old chestnut of a ship's radio being broken down and only CW equipment being available is again trotted out. It is really time that this myth was also laid to rest:

a) current technology extends beyond a single, undependable transceiver on ships at sea.

b) portable satellite communication equipment out performs that used on the amateur bands.

c) there really are other operators out there monitoring for ship's in distress — and ship's carry standby equipment to speak to them.

d) when was the last time a ship at sea or an aircraft in trouble was saved by an amateur who knew Morse hearing a broadcast and notifying the authorities?

As I said, a myth which does not either acknowledge the state of the art in commercial equipment, to the realities of emergency procedures in maritime emergencies.

9. RECIPROCAL LICENSING

I am not sure where this one came from, but it does raise several usefully considerable points:

a) Current practices render reciprocal licensing a difficult area. Various countries have various standpoints, ie no one standard has been accepted world-wide. If we want this activity to continue and even flourish in Australia, we would do well to examine our own population of potential amateurs, then set standards to meet local needs.

An aside, what proportion of Australian amateurs ever seek a reciprocal licence in another country anyway? Or is this another myth — that all of us will be disadvantaged eventually unless we restrict our numbers by adopting a system of licensing that enables reciprocity, with even the hardest of other standards?

In conclusion, I would only say that the continuation of an elite, small in numbers when compared to the spectrum space they nationally occupy, invites the reduction of that space by governments searching for revenue. To adopt practices that keep people out, instead of encouraging them to meet reasonably high standards of *technical* knowledge in order to get in, seems foolish.

To ignore or deride CBers is to abandon a source of potential members. Only three of the 60 CB operators in my net area are working towards Novice tickets. The others use radio mostly as a tool, not as a recreation, so see no need. Their needs for easy and convenient communications are being met with 27 MHz sets, plus 477 MHz sets and a local repeater. The three that are going ahead see radio as a valued recreation , an interest, a hobby — so work hard to get the qualification we need to gain entry to it. We do this in total lack of contact with local amateurs. There is no local organisation, no classes, no venue for contact; the amateurs are out there, but we cannot make contact — and they do not seem to want to, unless we have already become "one of them". I have to ask; do they want more people on amateur bands around here?

I suggest several changes:

1. Novices to have access to all bands.
2. Novices to be able to use all modes.
3. Novices to be restricted to 25 watts (or maybe 50 watts) power output.
4. Full Calls to be allowed substantially more power than Novices — maybe 500 watts or 1000 watts?
5. Morse operation at 10 words per minute (send and receive) to be a licence endorsement allowing those licence holders access to the Morse segments of bands, this to apply to Novices and Full Calls alike.
6. Abandonment of the LAOCP. It would no longer be necessary to have it.

The outcome of these changes, plus a concerted recruiting effort by existing amateurs would be the attraction of more people to a valuable recreation resource. It would bring in younger people to allow the activity to continue through future generations. It would provide a useful voting block to impress the governments of the day with the need to provide for the activity, to protect it, and to use it well for the enjoyment of those who see value in it.

I agree with Peter — "Ensure Australia adopts a licensing system which will benefit all — not just a few greedy zealots who want more for less. Remember that many empires/governments fell due to greed on their own part. Let us ensure that the amateur service does not suffer the same fate." It is only that I see the zealots and the greed which leads to exclusion of otherwise enthusiastic operators to be *inside* the system, not knocking on the gates. The few who occupy the available spectrum and keep as many out as possible can only become fewer — it will not be the "outsiders" who collapse the empire, but the commercial operators who want our substantially unused spectrum.

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When inquiring about products you have seen in AR, don't forget to mention where you learned of the product!

HELP WANTED

The Federal Office receives a number of excellent reciprocal copies of amateur society magazines from sister societies in other countries.

We need assistance from amateurs who would be prepared to peruse several of the foreign language magazines with a view to keeping us informed of events in those countries, and of interesting technical articles.

Are you fluent in Italian, German, Japanese, Dutch or Korean? Would you like to help, and get to keep the magazines? If so, please contact the Federal Office by writing to: Foreign Publications, WIA Federal Office, PO Box 300, Caulfield South, Vic. 3162.

BICENTENNIAL CALL BOOK ENTRIES

Australian amateurs are advised that, subject to the following paragraph, all Australian amateur radio licensees will have their call sign/s, names and notified address, included in the Bicentennial Call Book to be published in November 1988.

However, those amateurs who wish to have their name and/or address deleted from details to be printed, are advised that they may make such a request in writing to the Federal Office, setting out what they wish to have suppressed. Any such requests must be received by the Federal Office on or before August 31, 1988.

The Wireless Institute of Australia will take all reasonable care to meet licensees' wishes, but the Institute will not be responsible for any errors or omissions. Insofar as its members are concerned, the Institute will rely on information as to current addresses held in its own records.

THREE AUSSIES AT DAYTON HAMVENTION

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

"It's absolutely incredible — something that has to be seen to be believed." That was how Ron Fisher VK3OM, described the experience of his first Dayton Hamvention.

The 1988 Dayton Hamvention, Ohio, attracted some 37 000 people said to be a 30 percent increase on last year's attendance.

The registration fee of $8 covers admission to the three days of the Hamvention held at the Hara arena, about 10 miles north of Dayton, plus a free shuttle bus service to your hotel accommodation.

On the Saturday night, the Hamvention banquet at an additional charge was held in a big convention centre in the city of Dayton, also serviced by shuttle bus.

Ron Fisher guessed that in excess of 2000 sat for the dinner. "Everybody who was anybody was there," he said.

One interesting character was Ken 'Judge" Glanzer K7SCO, of Seattle, a prolific author on antennas and associated items. As a result of his meeting with Ron, articles from Judge will be appearing in the WIA journal, *Amateur Radio.*

The Hamvention starts at noon on the Friday and goes through to the Sunday afternoon.

The Hara Arena consists of three large halls, and an arena used for indoor sporting events. Inside the halls were 500 stall spaces for wholesalers, retailers, manufacturers, organisations such as the ARRL, magazine publishers, and shortwave listener groups.

Ron said: "It was an amazing scene with probably about four big retail distributors in stalls with enormous quantities of gear stacked 10 feet high and up to 50 feet long, ready for sale.

The Emtronics stall at Dayton Hamvention.

The Flea Market site.

"In general, probably the gear was priced two thirds or less two thirds that you could expect to pay in Australia."

Well placed near a main arena entrance was Rudi Breznik VK2AOT, manager of Australia's Emtronics. Rudi has been to Dayton about seven times, but this was the first occasion he had set up a booth. It was decked out with Australian national flags, the boxing kangaroo flag of America's Cup fame, and toy Koalas climbing the TET-Emtron HF beam.

As if that wasn't enough to catch the eye, Rudi had up a large poster of Michael "Crocodile" Dundee.

Rudi said there was great interest in the TET beam and the other products by Emtronics on display.

Using his salesman's pitch for virtually the entire three days he was said to have notched up orders for the TET beam. On return to Australia, he reorganised his factory to meet the demand in the US and Japan.

Rudi also found time to meet those from England, South America, Africa, and Germany who gather at Dayton to discuss industry trends and swap ideas.

In addition to the selling stalls, the arena has about seven large auditoriums where forums were held for the three days. These forums were

on every subject you could imagine — DX, antennas, specialised techniques, and short-wave listening.

"You could literally go to the forums doing nothing else," Ron said.

Ron was pleased to have caught up with his on-air friend, Hal Slater G3FXB, giving an interesting slide talk about his various trips to Russia.

Dayton's famous car park Flea Market was so large Ron only managed to see half of it, but was not very impressed. He said everything from new equipment, secondhand gear from good quality to absolute junk, was being offered. But, generally speaking, the prices for recent gear was fairly high — for example an FT-101E was labelled at $US400 — in VK you would expect to pay about A$400 for the same unit.

Accompanying Ron was his wife Lynette. She took in some of the Hamvention, but also enjoyed the very big program of alternative activities for YLs. These were at a separate location, and serviced by a shuttle bus. The activities ranged from weaving, cooking, breadmaking, to genealogy, and was described by Lynette as "quite enjoyable".

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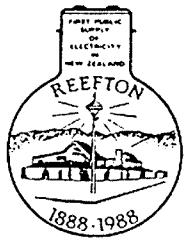


REEFTON — a world leader in electricity

Before New Zealand's main centres, before Australia's thriving cities, even before the fashionable suburbs of London and New York — Reefton had its own power supply.

The Reefton electric power scheme was completed and potential consumers offered connections from August 4, 1888. It was the first public supply of electricity in New Zealand and among the first in the world. People's lives were about to change as electricity not only lit up their streets, but eventually powered new labour-saving devices in their homes, shops, offices ad other workplaces.

The Reefton Electrical Transmission and Lighting Company was formed at a meeting on December 6, 1886. There were 65 shareholders, all locals, ranging from hairdressers and clerks to tailors and tinsmiths.

It took 20 months to build the race, install the machinery and wire the town. Total cost was £7000.

The powerhouse was equipped with a 70 horsepower Rafel vertical turbine which drove a 20 kilowatt Crompton bi-polar dynamo, designed to light 500 lamps of 20 candlepower.

First reticulation was about 1.5 kilometres long.

Power was generated by turbines harnessing waters from the Inangahua River in the power station. The turbines were tested at 7 pm on August 1, 1888. Three nights later a public exhibition of electric lighting was given at the Oddfellows' Hall by English electrical promoter, Walter Prince the man behind the idea of installing an electric power scheme in Reefton.

By mid-September 130 lamps were installed, with more on order. Lights were installed by a local tinsmith, Peter Shepherd for £1 a time. He also installed electric doorbells.

In the beginning, power was supplied from sunset to sunrise for £3 per light per year, no matter how much was used. Later the hours of transmission were extended each Tuesday — ironing day.

Reefton is a small town of 1500 people (in 1988) in the South Island of New Zealand, about 50 miles inland from Westport and Greymouth.

A week of festivities, in Reefton, is planned to celebrate 100 years of electricity. As part of these festivities, Branches 62, 49 and 36 of NZART will operate special call sign ZL6REC from August 1 to 6, 1988. It is anticipated to use the 40 and 80 metre bands. The groups have unrestricted use of a large empty shop premises on the main street of Reefton.

A special QSL card is being produced and will be sent via the bureau to all contacts logged (County Hunters note — Inangahua County). Please do not send QSLs in reply.

Visiting amateurs would be most welcome to join in the celebrations and assist with the operation.

For further information contact: Dave Oates ZL3MF PO Box 20, Westport, New Zealand.

—Compiled and condensed from information supplied by Bill Stevens VK4YN and Dave Oates ZL3MF

TOPICAL TECHNICALITIES

Lindsay Lawless VK3ANJ
PO Box 112, Lakes Entrance, Vic. 3909

The subject of transmitters causing "key clicks" is well-known to licensed transmitters but I have doubts about the theory; the following might provide some food for thought and rekindle the debate.

The output of a transmitter will not contain sidebands if it is a pure sine wave.

If the transmitter responds immediately to 'key down' the beginning of the output wave will be sine wave.

If there is a rise time in the response, the beginning will not be sine wave.

If the transmitter output ceases immediately on 'key up' the output will retain the sine wave shape.

If there is a decay time, the end of the output will not be a sine wave.

Therefore, a deliberately shaped transmitter output wave will radiate sidebands on 'key down' and 'key up'; an unshaped output will not.

Key clicks are the result of 'shock excitation' of the receiver aerial system and associated tuned circuits. It is a proximity effect at the receiver and not a transmitter fault. An unshaped transmitter output may cause clicks only on near zone receivers and near zone receivers can experience click interference from a shaped high power transmitter output.

'Shock excitation' produces a damped oscillation in the receiving aerial system at its resonant frequency; the transmitter can be on a different frequency. The magnitude of the oscillation depends on the Q of the aerial circuits. High Q selective circuits produce the largest 'clicks'.

As always, there has to be a compromise; transmitter output shaping is usually effective but it must not be overdone to the point where sidebands defeat the purpose and also limit the signalling speed. The signalling speed can be limited by overlapping of rise and decay time preventing resolution of 'mark' and 'space'.

If clicks are reported on your transmission, investigate the other person's receiver as it might have better selectivity than appliances with broadband front ends.

Radio telephone transmitters also have problems, not the least of which is the distracting noises which fill in the pauses in speech. The main cause is over enthusiastic use of speech processors.

Speech processors at the modulator input include a constant volume amplifier which 'compresses' loud passages and 'expands' low levels. It is a very successful method of maintaining a constant average modulation or sideband output when used in a very quiet studio-type environment, but a dismal failure if misused in noisy environments. Most amateur operating positions are noisy; even the average home ambient noise level is only 20 or 30 dB below normal conversational speech level. A compression of that order will amplify the ambient noise to equal the speech level if pauses are longer than the release time.

The noise in the cabin of a "bush-bashing" four-wheel drive vehicle is higher than normal speech and programs from that source sound like noise interrupted with speech. Another example of the misuse of compression is the transmissions from fishing trawlers on 4.535, 4.620 or 2.164 MHz; the wheel house of these vessels is usually directly above one or two diesels and the noise insulation is the thin steel deck. Trawler skippers have loud hoarse voices, because of that, and barely intelligible radio transmissions.

The remedy: if there is a compression control, reduce it to 10 or 15 dB and experiment with the attack and release times or better still, switch it off.

This year, 1988, is the 40th anniversary of the *Mathematical Theory of Communication* devised by Claude Shannon and Topical Technicalities will celebrate at least one discussion paper about the subject.

Shannon' theory has had a profound effect on the development of communication systems but, is mostly ignored by amateurs. Many amateurs have never heard of Shannon and look disbelieving if told that his theory is probably more important to radio communication than others more familiar.

Shannon showed engineers how to defeat noise with signal encoding and how to achieve reliable communication with low error rates and at the same time minimise band width requirements. Pulse Code Modulation and the misnamed data communication systems would not have reached the present stage of development without Shannon's guiding principles.

There is scope for amateur experiments based on Shannon's philosophy and hopefully someone will accept the challenge before the 50th anniversary.

Possible projects are:

a) develop a compression expander (compander) and digitised speech system for use in four-wheel drive mobile vehicles and trawlers.

b) revise the Morse code and replace the present characters with others related more to their information value.

Most Morse characters use more bits than warranted by their information value. The letters Q and Y, for example, each have an information value of approximately seven bits; the code allocates 13 bits to each. The letter E has an information value of three bits, the code allocates only one bit.

Another anniversary which is worth remembering is that Kay Cottee completed the first ever 'alone around the world' by a lady on June 5, just three weeks short of the 90th anniversary of the first sail alone around the world completed by Captain Joshua Slocum, on June 27, 1898.

What a contrast in equipment; Kay could talk to home and friends almost any time; Captain Slocum mostly talked to himself. Kay could have left her chronometer and sextant at home — with modern radio navigation aids and satellites, position fixing is a breeze. Slocum did leave his chronometer at home because he did not want to spend $15 having it "cleaned and rated". He used a satellite to assist his navigation; Lunar observations and Lunar tables (not published now?) substituted for chronometer time. The only time-piece on the *Spray* was a battered tin alarm clock which, part way through the voyage, lost it's minute hand.

The difference in equipment used in those two voyages is a measure of 90 years advance in marine communication and navigation, advances due in no small measure to amateur yachtsmen and amateur radio operators.

Topical Technicalities hopes to include information about the role of radio in amateurs yachting in later issues contributed by a radio amateur with special knowledge of the subject.

QRP HISTORY ARTICLE WANTED

The AR news desk recently received, from different sources, two historical snippets which might lead to an interesting article.

Firstly, an obituary on Loren Windom W8GZ (Silent Keys, AR magazine, June 1988), said that a world low power record was set in 1926. "Windy" Windom 8GZ, using a total input of 0.567 watt contacted Australian station 5BG.

Another reference to low power operation was also found in the souvenir program of the first Wireless and Electrical Exhibition and Convention, held by the WIA Victorian Division, in 1924.

The program said signals had been transmitted from Sydney to New Zealand with a power of .0037 of a watt.

Is there someone among our readers who can supply details for an article on historical and/or modern low power QRP operation?

Material should be sent to the News Editor, Jim Linton, Amateur Radio magazine, PO Box 300, Caulfield South, Vic. 3162.

BICENTENNIAL CALL BOOK ENTRIES

Those amateurs who wish to have their name and/or address deleted from details to be printed, are advised that they may make such a request in writing to the Federal Office, setting out what they wish to have suppressed. Any such requests must be received by the Federal Office on or before August 31, 1988. Write to:

Call Book Details
PO Box 300
Caulfield South, Vic. 3161.

RF IMPEDANCE MATCHING USING FERRITE TOROIDAL CORES

Stephen Bushell VK3HK
74 King Parade, Knoxfield, Vic. 3180

Part 1: Transmission Line Transformers.

Possibly one of the least understood subjects in amateur radio is that of impedance matching. In this series of four articles various methods of impedance matching and transformation using ferrite toroidal cores as a medium will be discussed. There are many applications where impedances must be matched in order to obtain the best interstage energy transfer.

Recently, the writer was faced with the prospect of outlaying in excess of $250 for coaxial cable with which to feed a two element Yagi. Not surprisingly, especially as the antenna was self-designed and constructed in order to save money, the cable was considered rather expensive!

After a few moments reflection, it was recalled how a similar feedline problem had been overcome when a colour television antenna was installed which the salesman had insisted would only operate from coaxial cable. Instead of the "required" coaxial cable, 300 ohm ribbon feeder had been used, attaching it to the antenna terminals marked 300 ohm (it seems strange that they should have these when you can only feed with coaxial cable!).

A store-bought balun was fitted at the television set to match the 300 ohm feeder to the 75 ohm coaxial input to the receiver.

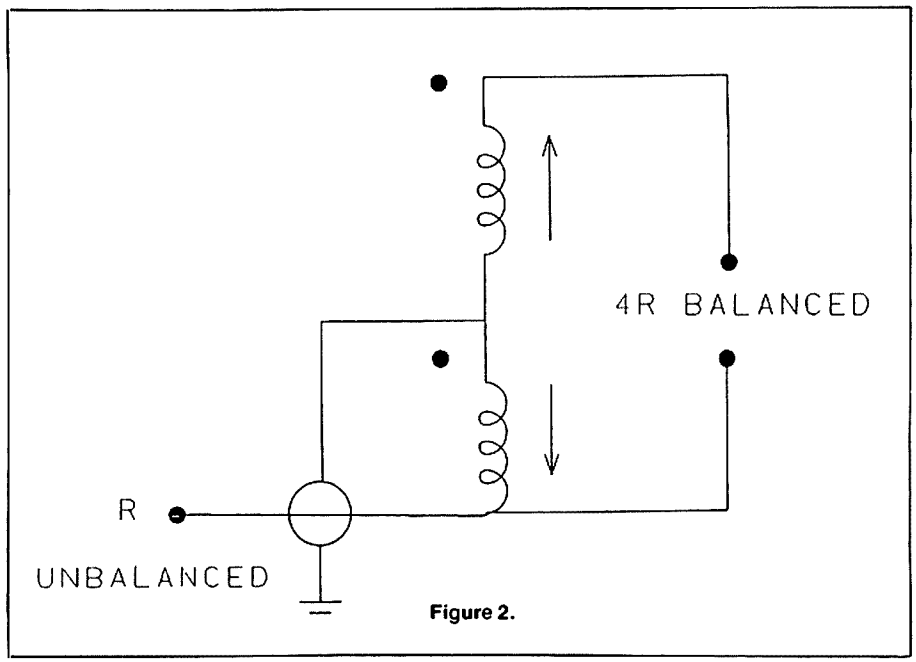


Figure 2.

Without doubt, this was the most inexpensive method of feeding the antenna.

On the home-brew antenna, a split dipole driven element would be used to take a balanced feedline. A balun would be required to match the 35 ohm driven element impedance to the 300 ohm feeder. Another balun would be necessary at the base of the feeder to match into the 75 ohm coaxial cable which contains the SWR/Power meter and feeds the transceiver. (See

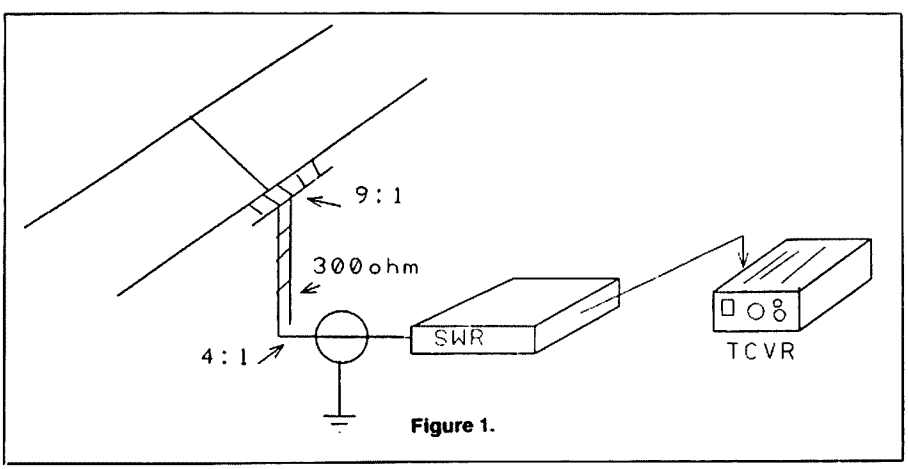


Figure 1.

It was confidently anticipated that, with only a small amount of judicious adjustment initially to the element lengths, a relatively broadband beam would be achieved with a minimum of fuss and expense.

A pair of baluns, one 9:1 and the other 4:1, would be required.

Firstly, a closer look at these baluns. A balun is a matching device used to couple balanced and unbalanced circuits. In fact they are RF transformers which fit into one of the three following categories:

1. Transmission Line Transformers
2. Auto-transformers
3. Conventional Transformers

1. TRANSMISSION LINE TRANSFORMERS

In its classic balun-form, the transmission line transformer consists of two identical windings, a tap being placed at the centre junction giving a

4:1 impedance transformation from input to output. See Figure 2.

In this specific case, the distinguishing feature of the transmission line transformer is that the winding is composed of two conductors with equal and opposite currents flowing in each, as with conductors in a balanced transmission line. The net magnetising force (ampere-turns) in the core is therefore theoretically nil. As a consequence, ferrite cores with a relatively small cross sectional area can remain unsaturated at relatively high power levels.

In a transmission line transformer the inductance is directly proportional to the permeability of the core material on which the transformer is wound. A high permeability material placed close to the transmission line section will act on the external magnetic field thus magnifying the inductance appreciably. There is no influence on internal magnetic fields or the characteristic impedance of the transmission line. The power being transferred from input to output is not coupled through the ferrite material but rather through the dielectric medium separating the two conductors in the transmission line windings. See Figure 3.

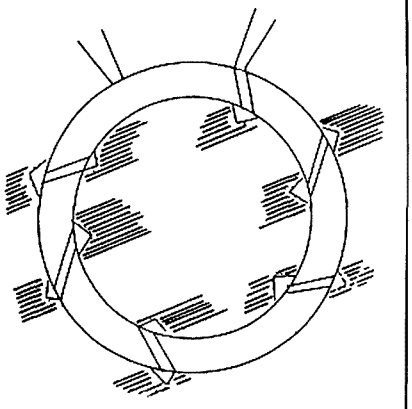


Figure 3: Power is transferred in the area immediately about the windings.

A major advantage resulting from the increased inductance provided by the ferrite core is the ability to operate over the range 1 to 30 MHz without having to resort to up to a quarter wavelength of wire for each winding which could be necessary in an air wound transmission line transformer. In practice, six to 10 turns wound onto a ferrite core are usually sufficient to provide the required transmission line simulation.

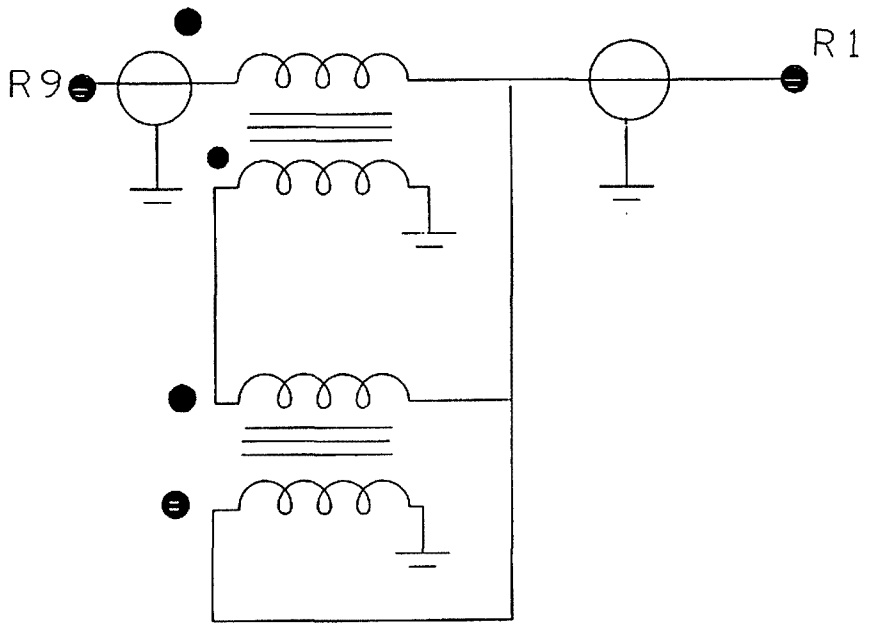
A true transmission line transformer can only have an impedance ratio equivalent to an integer greater than one squared: 4:1, 9:1 and 16:1 are the most common. To achieve these ratios it is necessary to combine various 4:1 structures on the same or separate cores. See Figure 4.

Now back to the task at hand — the two baluns required.

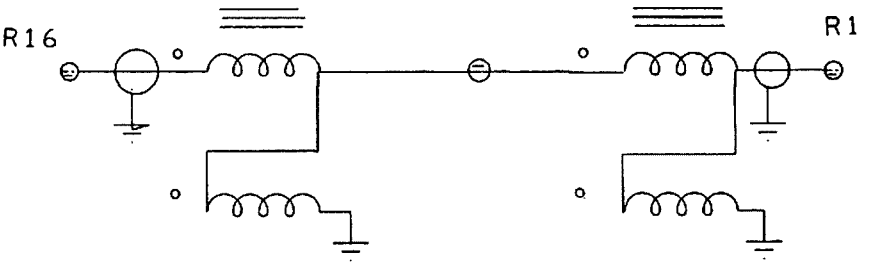
It can be seen from Figure 2 that the transformation from 300 ohm balanced twin feeder to 75 ohm unbalanced coaxial cable is covered (4:1) so that it leaves the 9:1 unit.

Unfortunately, the split dipole driven element presents a balanced load and the 300 ohm twin line is also balanced.

Figure 4.



(a) 9:1 unbalanced to unbalanced.



(b) 16:1 unbalanced to unbalanced.

Following on from the derivation of the word balun, ie balanced to unbalanced, a balbal would be required (balanced to balanced). Upon checking the usual sources of amateur information, no such word could be found. These devices do exist though as there are several at the writer's shack.

Due to phasing requirements however, a 9:1 balanced to balanced transition is unobtainable in simple transmission line transformers of the type discussed here.

Auto-transformers offer a simple solution to the balanced to balanced requirement and to a wide range of other problems.

This subject will be investigated in Part 2.

SOLAR CYCLE PEAK MAY BE EARLY

The peak of the next solar cycle may occur as early as late this year, being the most intense cycle ever measured according to Dr Patrick McIntosh, Director of Solar Physics Research at NOAA's Space Environment Laboratory in Boulder, Colorado.

Dr McIntosh's statements conflicts with the prediction based on traditional methods of 1992 being the year of maxima. Nevertheless, the present rapid rise could flatten out, however NASA are apparently taking some precautionary measures with their low earth orbiting satellites, protecting them from the 'drag' that increases during periods of high solar activity.

—Adapted by Ken McLachlan VK3AH, from ARRL Newsletters Vol 7, No 10 & 11

RENEWED YOUR STATION LICENCE?

The onus is clearly on radiocommunication licence holders to renew the licence when it falls due.

The Department of Transport and Communications send out renewal notices and if you value your call sign, prompt payment is recommended.

DOTC has told *Amateur Radio* magazine that there is the possibility under its computerised licence system for a call sign to be listed as having lapsed, if payment is not made.

This means the call sign then becomes available for re-issue.

One radio amateur recently heard his call sign on air, and found upon investigation he had failed to renew his licence.

FL-2100B and FL-2100Z WORKING WITH SOLID-STATE TRANSCEIVERS

Ron Mills VK5XW
13 Taylor Terrace, Rosslyn Park, SA. 5072

Following are one persons experiences with a problem that has always existed with the FL-2100 series linear amplifiers interfacing with solid-state transceivers.

These linear amplifiers present a mismatch to the transceiver, resulting in a high SWR reading, in particular on the 21 to 28 MHz bands. This is very noticeable when the transceiver is working with the linear in the standby or off position. Typical SWR readings are 1.7:1 on 21 MHz and 2.5:1 on 28 MHz. (Lower bands are only marginally affected). This unwanted SWR causes the solid-state transceiver to reduce output power by as much as 20 percent on 28 MHz. The FL-2100 series was not designed for solid-state operation but for transceivers with valve outputs such as the FT-101, etc, where any mismatch caused by the insertion of the linear into the circuit is better tolerated.

With the FL-2100B in the OFF position, the RF from the transceiver goes from the "RF IN" SO-239 socket via a change-over relay, to an old style SWR bridge then to the "RF OUT" SO-239 socket. All of this wiring is done with heavy silver-plated wire. Numerous ways were tried to reduce the mismatch and the only success achieved was to remove the wire from the relay to the SWR bridge and route it directly to the "RF OUT" socket. This brought the SWR on both 21 and 28 MHz to around 1.3:1, but made the SWR bridge inoperative. The SWR problem could be overcome somewhat with the linear operative by retuning the input circuits for each band. (This is only possible on the FL-2100B and the FL-2100Z (pre-WARC band model)). The FL-2000 does not have tuned input circuits.

In December 1986, an article appeared in a local radio magazine regarding this problem in the FL-2100 (models not specified). The author claimed that by replacing the silver-plated wire with coaxial cable the problem had been solved. Thinking something must have been overlooked in my original attempts I retraced my steps gradually replacing the SWR bridge and the wiring with coaxial cable only to find it made no difference to the FL-2100B. The coaxial cable was then taken out and the original wiring replaced, again bypassing the built-in SWR bridge. Things were left like this until a FL-2100Z, with WARC bands fitted, was purchased.

I am now using am IC-751 which has its own built-in SWR bridge. As the same high SWR was being encountered with the FL-2100Z, a search began again in an attempt to get rid of the mismatch as much as possible, as the majority of operating at this QTH is barefoot and the linear is sitting inoperative in-series with the IC-715.

The IC-751 was connected, via a short length of RG-213U coaxial cable, to the FL-2100Z, then via the same type of cable to a Welz CT-300 dummy load. The SWR read on the IC-751 was again around 1.7:1 on 21 MHz and 2.6:1 on 28 MHz.

Imagine my surprise when I removed the bottom from the FL-2100Z. There were now two relays in the input/output circuit. The first relay from the input SO-239 socket was a small one and the one that takes the full output power with the linear operating was the same large type used in the FL-2100B and the non-WARC FL-2100Z (the non-WARC Z model still only uses the one relay). The SWR bridge in both models were now using a compact toroid type SWR bridge mounted right at the output SO-239 socket. What made things even more interesting was the fact that all of the RF wiring was done in coaxial cable (so much for the theory of replacing the wiring with coaxial cable!).

The large output relay has two change-over sets of contacts. By using the second smaller input relay, one set of contacts became vacant on the output relay. These contacts were then paralleled with heavy gauge tinned copper wire to those in use and immediately the SWR dropped to around half the original readings. The coaxial cable used for the input circuits, ie from the "RF IN" SO-239 to the small relay and from the small relay to the large output relay change-over contact was quite small in diameter. This small cable also went from the non-operated change-over contact of the small relay to the input circuits of the linear proper — incidentally, the input circuits for each band on the Z model are non-tunable — the non-WARC Zs are tunable.

An attempt to replace this thin coax with the same length of RG-58 C/U gave exactly the same SWR. On impulse, the original thin coax was paralleled with the length of RG-58 C/U. The SWR went down. The coax was then paralleled from the small relay to the output relay with RG-58 C/U of the same length. The SWR had now dropped to 1:1 on both 21 and 28 MHz. I have no explanation why this paralleling of the two coaxial cables of nominal 50 ohms each finally removed the mis-match in combination with the paralleling of the relay contacts, however, it works! This has been verified by two other amateurs who replicated the above with similar results.

An interesting side effect of these modifications relate to the FL-2100Z built-in SWR meter. As delivered, the SWR meter would not move off zero unless there was a very large mis-match in the antenna system. After the alterations, it operated as it should! This was also verified in the other two FL-2100Zs modified.

Hopefully the above may prove useful to other amateurs who do not like losing power with their solid-state transceivers due to the impedance mis-match of the FL-2100Z.

Do not forget that there are ***very lethal*** voltages inside the linear when on (standby and operating) so ensure that the linear is unplugged from the mains power when doing any work on it.

I have shifted the voltage tap on the power transformer from 850 volts to 620 volts. This reduces the output voltage from 2400 volts to 1800 volts. PEP of 400 watts is still easily available with reduced stress on the 572B valves and there is less likelihood of any flash-over due to antenna mis-match during tuning.

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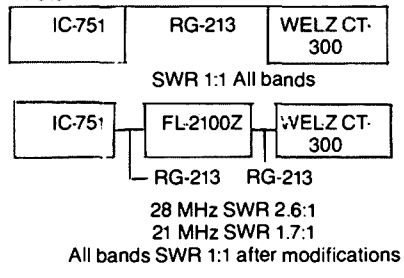
Figure 1: Test Set-up using the IC-751 SWR Meter.



MEASUREMENT OF INPUT / OUTPUT IMPEDANCE

Ken Kimberley VK2PY
21 Nicoll Street, Roselands, NSW. 2196

A short article describing a method used by the author to determine both the input and output impedance of several instruments under development.

These projects include an analogue frequency meter, a high power square wave/sweep generator, and a frequency multiplier for audio generators. In due course, each will be presented in AR. The time scale depends upon how much energy and enthusiasm for writing can be drummed up now that 10 metres is coming good for DX!

The method of measurement now about to be presented is quite simple, non mathematical and is repeatable.

A. INPUT IMPEDANCE

Often a piece of equipment is built or purchased secondhand and, as usual, the handbook is missing, or is otherwise unavailable.

As we all know, both input and output of equipment should be terminated with their respective impedance. This condition gives optimum performance, ie lowest VSWR, maximum power transfer, correct attenuator calibration, etc.

Now, having gone through the preamble, let's see how the above mentioned parameters may be determined. For the purpose of a simple explanation, consider the case of an old amplifier purchased at the local flea market. It is intended to use this in conjunction with an existing record player. The player has a ceramic cartridge which requires a load impedance of around 2 Mohms. Both output and frequency response will suffer if the cartridge doesn't see this load.

The following equipment will be required:

1. Source oscillator with, preferably, a low impedance output.
2. If this impedance is higher than, say, 10 ohms a suitable step down transformer should be used.
3. A calibrated "Resistance Decade Box" or, at a pinch, an ordinary carbon potentiometer (RV).
4. An output measuring device, such as a level meter, CRO, receiver, etc.

PROCEDURE

Connect as in Figure 1, set RV to minimum and switch all equipment on. After a suitable stabilising time, set the source level so that the output level is exactly FSD or any other well defined point. Care must be exercised to avoid overloading the amplifier under test (AUT) otherwise misleading results will be obtained.

Next, gradually increase RV, being careful to maintain all other conditions constant. Continue until the output has decreased to half (-6 dB).

At this point the resistance of RV plus the source R (RS) is exactly equal to the input of the AUT. Since the effective impedance of the source/step down transformer combination should be very low it may, for practical purposes, be neglected in most cases (inputs 600 ohms and up).

If a carbon potentiometer was used it will be necessary to measure the adjusted value with the station ohmeter.

B. OUTPUT IMPEDANCE

Output impedance is measured in a similar manner. Suppose that an oscillator with unknown output characteristics has been obtained or built and it is necessary to determine the impedance for matching purposes.

Proceed as follows:

Referring to Figure 2, connect the level meter, etc, across the output terminals, which at this stage should be unloaded. Switch on and then adjust its attenuator for a full scale level reading (as per input measurement).

Next, load the oscillator using RV1. Adjust same until a level reduction of 6 dB is obtained. At this point the value of RV will be equal to output impedance (Z).

LIFE IS NOT EASY

Now that was really simple, wasn't it? However, there are certain constraints to consider when using the above technique.

These problems are the ever present hidden parameters of stray reactance, consisting of capacitance and inductance, which will influence the results as frequency and impedance is increased.

Let's consider the use of a decade box. These usually have wire wound resistors in the lower value decades and metal film, etc, in the higher. Despite efforts to eliminate the inductive effect sufficient remains to cause problems. The stray "C" of a standard five decade is usually in the order of 30 pF

Hence, it is prudent to restrict the decade box to measurements below about 100 kHz. A carbon potentiometer will be useful up to around 20 MHz, especially with impedances below 1 kohm. With care, it is possible to extend the upper frequency limit of this technique by substituting single resistors for RV until a match is obtained.

Another problem which arises, especially when measuring output impedance, is power dissipation. imagine feeding your "Super Dooper" 100 watt audio amplifier into an ordinary carbon potentiometer. It wouldn't last a second. Wire wound resistors are the order of the day here. Also, some power amplifiers do not take too kindly to working into an open circuit. Here it will be necessary to pre-load the "AUT" with a suitable resistor, say R2.

The resultant test figure, so obtained, will be the combined parallel value of Z + R2. Knowing R2 and Z + R2 makes it a simple matter to calculate Z.

Thanks to Mrs B Brown, of Burrill Lake, for typing the manuscript.

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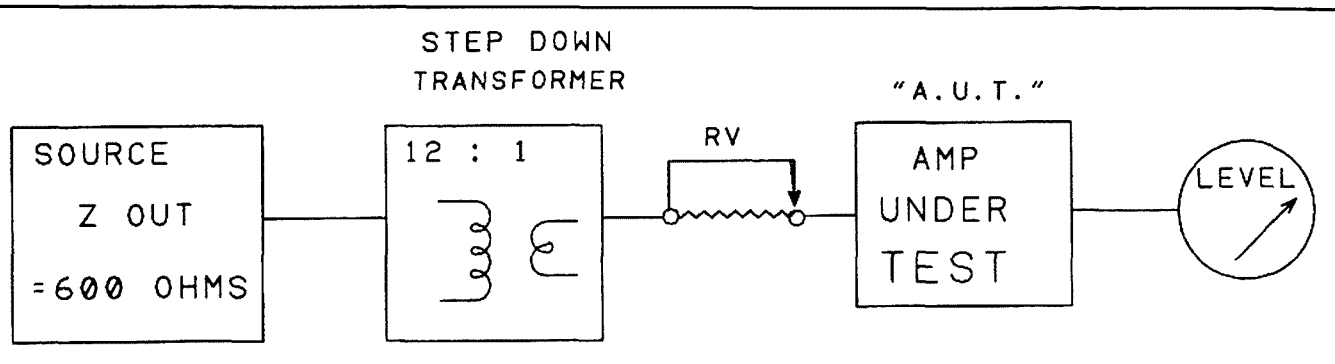


Figure 1: Test Set-up — Input "Z" Measurement.

NOTE: 12:1 Step Down Transformer is optional. If deleted, then source Z *must* be added to result.

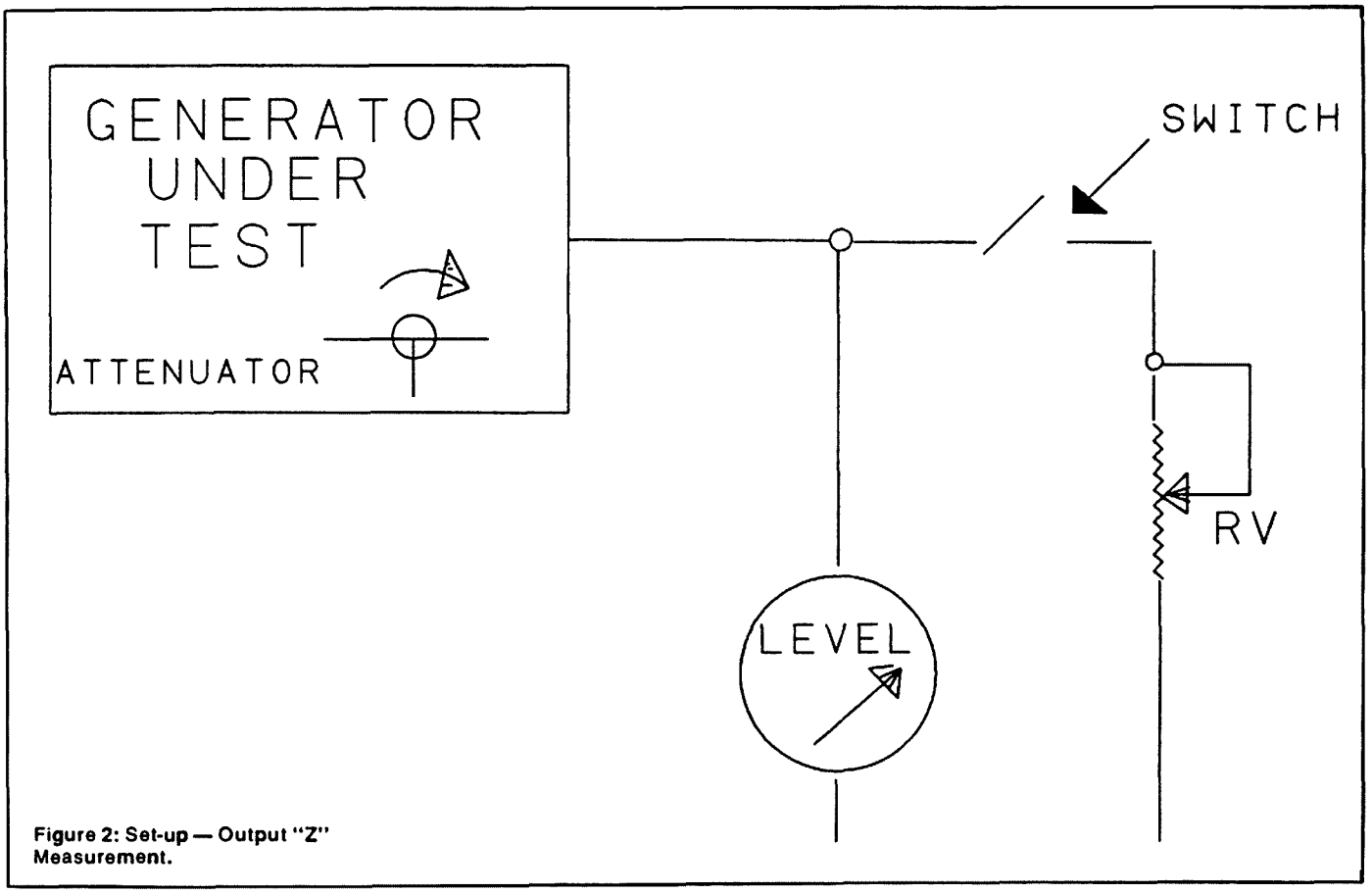


Figure 2: Set-up — Output "Z" Measurement.

ODDS AND ENDS

THE SHIRT THAT WORKS

How to recruit WIA members without really trying!

The WIA New South Wales Division Administrative Secretary, Maureen Lavery, has signed up new members she has attracted to the Institute simply by wearing a WIA leisure shirt.

Maureen says the shirt has helped her recruit four members in the past 18 months. People look at the shirt and ask "what is the Wireless Institute?", she says.

"I was in my local post office and a lady asked about the shirt, and then told me her husband was interested in amateur radio and did not even know such a thing (the WIA) existed," Maureen says.

The next day Maureen gave the lady some WIA Pubic Relations material and a membership application form, resulting in her husband becoming a new member.

The message illustrated by Maureen's efforts is that *it pays to advertise.*

SIGN OF THE TIMES

The South East Queensland Teletype Group (SEQTG) has ceased to exist, but has been superseded by QARDATA Incorporated.

The Queensland Amateur Radio Data and Teleprinter Association held its inaugural meeting after the final AGM of SEQTG was closed on March 4, 1988.

The postal address for QARDATA is PO Box 184, Fortitude Valley, Qld. 4006.

SITUATION VACANT

WANTED: Newshounds for the WIA journal, *Amateur Radio* magazine. The only requirement is a news-sense — an easily acquired skill. A definition of "news" is something that is new and of interest to someone else.

In the diverse hobby of amateur radio, things are happening all the time which could, if put down on paper, make interesting reading. Even just a news tip-off or an accurate snippet could lead to a worthwhile article.

Just spend a minute and give thought to whether you know of some news. Is your radio club or group doing something you think would be of interest to others — then submit an article.

If you see something printed about our hobby in a newspaper or elsewhere — take a clipping and put it in the post without delay. Remember to mark the clipping with the name of the newspaper or publication, and the date it appeared.

News offerings from amateur radio equipment suppliers and retailers about new products and industry developments are also most welcome.

ADDITIONS & DELETIONS

The ARRL has added Western Sahara (S0) to its DXCC countries list. However, it has decided that Western Sahara is a re-activation of Rio de Oro (Spanish Sahara, EA9) so Rio de Oro has been deleted from the list and S0RASD operations are now creditable for DXCC as Western Sahara.

PRESSURE ON 80 METRES

Italian radio amateurs have recently been given some bad news that their primary status on 80 metres has been downgraded to secondary service status.

The allocation covers 3.5 to 3.8 MHz. The Italian Government is reviewing all frequency allocations below 27.5 MHz in conjunction with the Italian Ministry of Defence.

FRENCH ON SIX METRES

France has made some permits available to its radio amateurs so they may operate under restrictive conditions on 50 to 51 MHz.

Power levels are very small but allow experimentation from fixed stations using CW, SSB, RTTY and Packet.

Like Australia, France has television broadcast stations using the band. Under the permit system, radio amateurs at a distance of 150 kilometres from such a television transmitter are permitted three watts ERP, extending to 10 watts at a distance of 200 kilometres.

France became the third European country behind Britain and The Netherlands to attain access on six metres.

BBC NZ OUTLET?

Discussions have been held between the BBC and Radio New Zealand about the possibility of the BBC having a relay station in New Zealand.

If this proposal went ahead it would give the BBC World Service a powerful signal into the South Pacific.

From the Westlakes *Amateur Radio* Club newsletter

ROYAL AUSTRALIAN AIR FORCE EX-SIGNALS GROUP

Peter Alexander VK2PA
"Nandari", Rollands Plains, via Telegraph Point, NSW. 2441

The Royal Australian Air Force ex-Signals Group, was formed shortly after the end of World War II and consists of any ex-Airforce signals members who were trained in the art of using Morse code amongst other skills for communication.

THE MEN CAME from all walks of life, and on "joining up" soon mastered the art of CW. The W/T operators air (air crew) pass-out speed was 20 to 25 words per minute, and after eight months of intensive technical training at Ultimo or West Melbourne Technical College, and then further technical training and flying at Point Cook Signals School, were posted to various squadrons, units and operational bases throughout the theatre of war, including the Middle East, United Kingdom, and Papua New Guinea. Many held their amateur certificates of proficiency and, in fact, it was the amateurs that formed the bulk of the RAAF Signals Reserve prior to 1939 and the backbone of RAAF Signals.

The duties of the wireless operator were many and varied, providing communication where required, as air crew and on the ground. They were transmitting station technicians, signals office operators, W/T operators on the crash and air/sea rescue boats with the Marine sections, HF/DF (directional finding) operators, and they maintained and repaired equipment.

The ornate Signals Banner was handmade and embroidered by Olive Macey, sister of the late Lem Macey, who was better known for his activities as a Wireless Operator with Antarctic Expeditions during five tours-of-duty. Lem was awarded the Polar Star Medal and his son still attends the reunions proudly wearing his Father's medals in remembrance.

President of the Air Force Signals Group, John Williams, at the 1988 Reunion.

With the diversity of the requirements and duties of a wireless operator after four or five years service, it is not uncommon to note that most served on at least a dozen different units and squadrons.

The straight telegraphist and wireless air gunners also played an important role, not so technically trained, but nevertheless good Morse operators and highly skilled in their field.

Those who were made instructors, also played an important part in training the increasing intake of wireless operator trainees.

This Morse Key is similar to those used at the Signals School, Point Cook, Victoria, by Trainee Air Wireless Operators from 1940 onwards. It was fully restored to better than its original condition by Alan Appleby VK2BF. It was mounted on an extended block, and an inscribed presentation plate fixed to one side. The presentation is being performed by Alan VK2BF on behalf of the Signals Group to Snow Hodder VK2DV, a foundation member and president from 1950 to 1985, in recognition of his service.

Many, of course, did not survive to see peace, and since many more have passed on.

It is a long time ago now, but we still march on April 25, in commemoration.

The accompanying photographs were taken at the 1988 RAAF Signals Reunion on April 25, at Sydney. Photographs are courtesy Pete Alexander VK2PA.

Those who may be interested in learning more of the history of RAAF Signals, *The Saga of Achievement* by Bonn Hall is well worth reading.

PER ARDUA-AD ASTRA

ar

Left:

Raising their glasses in a toast to the 1988 Reunion — ex-W/T Operator Keith Scott, Gerrald Sabin VK2AGS and Alf Wess VK2AHW.

Below:

Three old Brass Pounders — Jim Carr VK2JV, Gordon Lanyon VK2AGL and Pete Alexander VK2PA.

QSP

MORE ABOUT THE VK6NNN TRANSMITTERS

A letter has been received from Peter Parker VK6BWI (ex-VK6NNN. Congratulations Peter!) to tie up a few loose ends regarding the two almost identical circuits on pages 29 and 37 of March AR, and referred to in the "Murphy Department" on page 40 of June. He recommends that HT not more than 200 volts be used with the 6GV8. Unfortunately the circuit showing a 200 volt supply, which should have been the only one published, was the one which had an error elsewhere! Some readers have queried the wisdom of keying the oscillator, but Peter claims reports have stated his keying to be "as good as commercial equipment".

—AX3ABP

Book Review

RADIO THEORY HANDBOOK FOR AMATEUR OPERATORS

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

A comprehensive electronics and radio communication theory book set at the level used in Amateur Operator Certificates of Proficiency examinations is now available, filling a long need for such a publication.

It has been wide recognised that no existing book adequately covers both the DOTC Novice and AOCP theory syllabuses. Class instructors, prospective radio amateurs and those wanting to upgrade had to ferret through a number of theory books, including the ARRL Handbook. But, these publications were not specifically tailored at the right (syllabus) level for Australia.

Often they went too deeply into a topic, or some syllabus items just didn't seem to be covered at all, and this hindered those studying theory.

Responding to the problem, Fred Swainston VK3DAC, drew on his more than a decade of continuous teaching of amateur radio theory to compile this new book. Fred had worked most of his life in the radio and electronics field for a State government body, and in recent years entered the teaching service. He began teaching amateur radio theory in 1977 with formal classes and a number of small group tutorial sessions.

Since 1978, he has taught theory classes at the WIA Victorian Division. Fred is the VK3 Division's Education Officer.

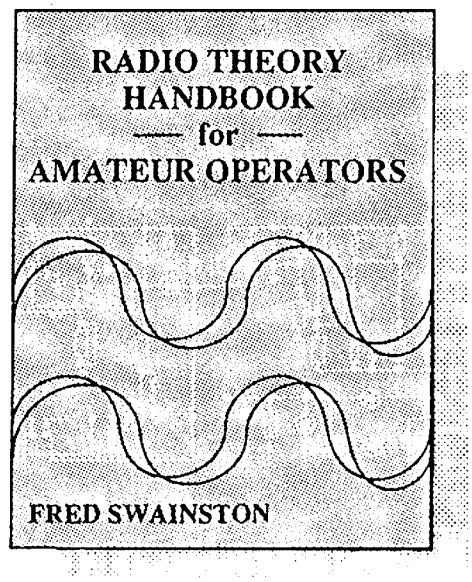
During the past 10 years he has been innovative by introducing highly successful theory revision weekends for examination candidates, and organised and ran practical classes. Representing the Victorian Division, he was a member of a WIA Federal Executive committee which developed the recently released Novice Study Guide.

His handbook can be used as a stand-alone text to be studied in conjunction with classes or by those preparing themselves for amateur theory examinations.

But, why cover both the Novice and AOCP theory in the one text? Fred says: "The level of the Novice theory is so close, in general terms, to the AOCP.

"From a personal point of view, that gap between the two is narrower than I would prefer, and there appears to have been a drift upwards in the Novice exam."

The handbook has been put together so the chapters follow a proven and logical study sequence, successfully used by the WIA Victorian Divisional class instructors.



Chapter 1 "Matter and Electricity" is an explanatory introduction to the basic concepts, some fundamental theories, rules and laws of physics which are important in understanding radio theory.

The following chapters cover DX Circuits, Cells and Batteries, Magnetism and Electromagnetic induction, Capacitors, AC Theory, Vacuum Tube Theory, DC Measurements, Semiconductors, Amplifiers, Oscillators, Continuous Wave Transmitters, Amplitude Modulation, Microphones and Speakers, Receivers, Single Sideband, Frequency Modulation, Power Supplies, Interference, Transmission Lines, Antennas, Propagation, Test Equipment, Specialised Techniques, Safety and Mathematics.

The final and 26th chapter on mathematics is well presented and worth the handbook's cover price alone for those rusty or seemingly hopeless with figures.

Fred firmly believes the teaching of vacuum tube theory is important and this view is reflected in the handbook.

"If a lay person is studying the concepts of amplification, it is easier for them to first grasp the idea of electronics flowing through a vacuum, and then relate that to electron flow in solid state material," he explained.

The specialised techniques chapter gives an overview sufficient for the examinations, but is not intended to be an in-depth text on the advanced modes and techniques that can be used by radio amateurs.

Each chapter is clearly written, printed on good paper with an easy-to-read type-face, and excellently illustrated.

At the end of each chapter there is a set of multi-choice questions to help test the reader's grasp of the theory. The correct answers are supplied in the back of the book. A series of trial theory examinations for both the Novice and AOCP as also included.

The book has a list of contents and is well indexed at the back in normal text book fashion.

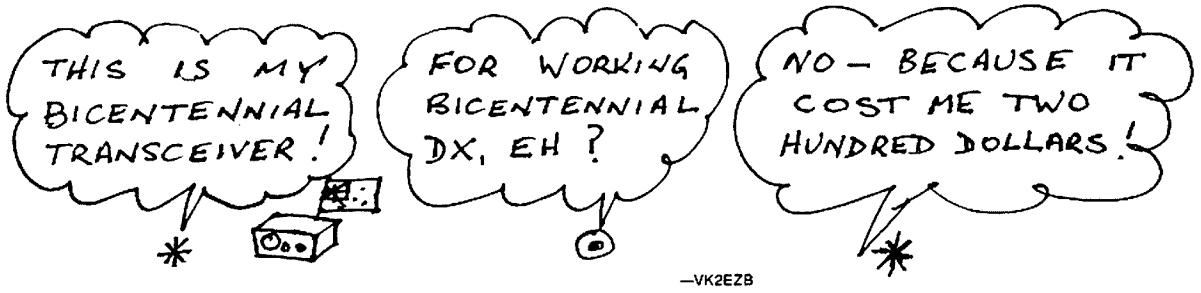
But, a revolutionary additional feature is reproduction of the DOTC Novice and AOCP Theory Syllabuses, with each syllabus topic cross-referenced to the handbook text. This provides the theory student with the ability to find text on any syllabus topic. The cross-referencing of syllabus is excellent in helping those needing to strengthen any theory knowledge weaknesses shown up by attempting trial or actual examination papers.

The copy supplied by the publishers, Prentice Hall of Australia Pty Ltd, came with an erratum stating that a mains filter diagram on page 218 was incorrect. This concerns erroneously marked polarity on mains terminals.

This 345 page handbook is an excellent text for those who have no knowledge of radio and electronics theory. It is also a handy reference for those who have already passed their amateur examinations or are working in the electronics industry.

The *Radio Theory Handbook for Amateur Operators* by Fred Swainston is now available from the WIA Victorian Division Bookshop for $38.00 each including postage to anywhere in Australia.

FACELESS



—VK2EZB

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AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.005	H44HIR	*Honiara*
50.005	ZS2SIX	*South Africa*
50.011	JA2IGY	*Mie*
50.020	JE6ZIH	*Japan*
50.028	JA7ZMA	*Fukushima City*
50.075	VS6SIX	*Hong Kong*
51.020	ZL1UHF	*Auckland*
52.013	P29BPL	*Port Moresby*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*
52.345	VK4A8P	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.445	VK4RIK	*Cairns*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
52.510	ZL2MHF	*Mount Climie*
144.022	VK6R8S	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3HTG	*Glen Waverley*
144.445	VK4RIK	*Cairns*
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
144.950	VK3RCW	*Melbourne* [1]
145.000	VK6RPH	*Perth*
432.066	VK6R8S	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK1RBC	*Canberra*
432.420	VK2RSY	*Sydney*
432.440	VK4RSD	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*Macleod*
432.540	VK4RAR	*Rockhampton*
1296.198	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.440	VK4RSD	*Brisbane*
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
2304.445	VK4RIK	*Cairns*
2306.440	VK4RSD	*Brisbane*
10445.000	VK4RIK	*Cairns*

Mark VK5AVQ (ex-VK0AQ), advises the VK0MA beacon has ceased operation due to his departure from Mawson. At the moment there appears to be no one at Mawson interested in keeping the beacon operational.

1. John Martin VK3ZJC, reports the VK3RCW beacon uses AFSK (ie FM carrier with a keyed audio tone), not FSK as earlier reported. The antenna is vertically polarised. Despite this it is heard more often than VK3RTG In VK5.

After struggling for months to obtain the information, the present beacon list is almost complete. The only beacons about which I lack information are VK6RTU at Kalgoorlie on 52.350, and VK6RPB at Port Hedland, on 144.565 MHz. Even lacking definite information on these two beacons, the present list should now be the most accurate list available and should be noted by FTAC.

I note, with some concern, the new Packet Radio allocation of 144.800 to 144.900 MHz, and the problem it is already causing in VK3 with the reception of VK5VF, the two metre beacon on 144.800 MHz. It would seem more logical to include the allocation in the space above 145 MHz.

It will be said, of course, that VK5VF is not on its primary frequency allocation of 144.450 MHz. Through these columns I have outlined the reasons on at least two occasions, but it may be necessary to do so once again.

VK5VF operates from a very prime position on Mount Lofty near the Channel 7 television tower and has been located there for around 20 years. Because of the intervention of the Mount Lofty Ranges there are few locations in line with Adelaide and VK3 (in particular) that are suitable for the siting of a beacon. The present site serves the eastern States and VK6 (Albany, in particular) very well indeed and many contacts have been initiated as a result of hearing VK5VF

Unfortunately, this same prime siting is not helpful to certain areas of the Adelaide metropolitan area when contacts are attempted in reverse as the reception of stations in Victoria, in particular, are made with antennas pointing straight at the beacon antenna, with the latter providing an S9 + 60 dB signal in the better areas. A signal of this magnitude causes all *manner of* problems for weak signal reception, from front-end overload to cross-modulation with its associated side effects. Relative harmony has been achieved so far by keeping the beacon higher in the band than its preferred frequency. Some years ago tests on 144.450 MHz indicated just how bad the problem could be. I am not sure that the position has changed.

When I last wrote about the problem, I received letters from interstate which said the writers had similar problems with beacons in their local area but had been able to overcome the disturbances by various means. Although some of the writers were, in fact, very close to the beacons and were not being worried by them unless they tuned very close to the beacon frequency, around the prime 144.100 MHz area, they had little or *no* interference. However, as far as could be ascertained, none of these people actually had to fire right through the beacon antenna when receiving weak signals around the calling frequency. That is the crux of the problem in Adelaide.

What can be done about the matter at this stage I am not sure. I suspect the users of the packet radio have no need to use the beacon for their purpose. Because of this lack of need they are most likely unaware of the existence of VK5VF If they were aware of its existence, and I am sure some would have known, then it may have been courteous to have ascertained the position from South Australia before going ahead with the establishment of a band segment (and/or frequency) to the detriment of a *long* standing user of that portion of the spectrum. May the flak now fly!

MELBOURNE ON TWO METRES

In response to the comments of Gordon VK3XX, in May AR regarding the low level of activity on the low end of two metres in Melbourne, John VK3ZJC, says in a letter "I can't understand how anyone can say two metres isn't active! Regular stations are VK3s UM, NM, ALZ, APW, AQU, AUG, AUU, BBB, KUB, XRS, YTV, ZAT, ZBJ, ZGJ, ZJC, and others I've forgotten to mention. On weekend mornings, 144.200 and 432.200 MHz are active with aircraft reflection contacts to VK1 and 2. On Saturday morning, 28/5, there were 12 stations active in VK1, 2 and 3 on two metres — a real dog-pile!

It is encouraging to know such activity exists. I wonder what total activity can be found in the other capital cities? It seems the aircraft enhancement contacts initiated by Doug VK3UM and Gordon VK2ZAB have acted as a catalyst in the promotion of weekend activity, at least. Is anyone prepared to put pen to paper from the other capitals stating the position please?

John VK3ZJC also raises the matter of band planning, pointing out some problems which have been appearing on two metres; eg packet radio on beacon frequencies; calling frequencies; voice repeaters; and FM nets on beacon frequencies and in the satellite segment. He queries whether part of the problem is that band plans need more and frequent publicity and could be the subject of a special article in AR.

Other points to be raised by John are: he has now worked Gordon VK2ZAB, via aircraft enhancement four times on 432 MHz following next in line after Doug VK3UM. Others on 144 and 432 aircraft enhancement include VK1s BG, VP, BUC, AU and has heard VK2DVZ and VK2ZRE. On 28.5 excellent signals from VK5NY. On 6/1 worked VK5s LP, ZDR and ACY on 144 and 432, but finding 432 signals better than on 144 MHz.

On 1296 MHz, Lionel VK3NM should be added to the earlier list. He runs one watt on SSB/FM and has worked into VK7. Arie VK3AMZ, is building equipment for 1296. Dick VK2BDN, is also on 1296 MHz.

Roger VK3XRS, at a very good location 160 metres above sea level, at Bairnsdale sends excellent signals to Melbourne on 144 and 432, and is working on a dish for 1296 MHz. He has just increased power from 10 watts to 100 watts on two metres and has acquired a monster Yagi from David VK3AUU.

David VK3AUU, is still the most active two metre operator in Victoria. He is now able to work Gordon VK2ZAB, virtually whenever he likes — so much for line of sight! It is understood he has worked nine countries on EME and has recently received a high power permit. . .Doug VK3UM, has been quiet lately but could be back on 432 soon. . .Mike VK3APW, has 400 watts on two metres and has just put up a bay of four long Yagis.

VK3ZJC is also attempting aircraft enhancement contacts on 1296 and sending automated CW calls in the Canberra and Sydney directions every Saturday and Sunday morning from 2215 to 2315 UTC. Frequency 1296.100, cycle 15 seconds transmit "VVVV de VK3ZJC VK3ZJC" and then 15 seconds receive. Two stations are listening so far, Eddie VK1VP in Canberra, and Dick VK2BDN in Sydney. Eddie is willing to go portable to make a contact as his aircraft window to Melbourne is blocked by Black Mountain.

Thanks for the newsy letter John — bits and pieces like this cover a lot of territory on the bands and helps to keep other abreast of VHF/UHF happenings.

THE SOLOMON ISLANDS

John VK4PU, advises that, from June 5 1988, for

three months, the amateurs at Honiara will be be permitted to use the prefix H44X to commemorate and celebrate their 10 years of independence. Special cards will be printed and made available to those fortunate enough to make QSOs. This information originated from Greg H44GP

SOUTH EAST RADIO GROUP (SERG)

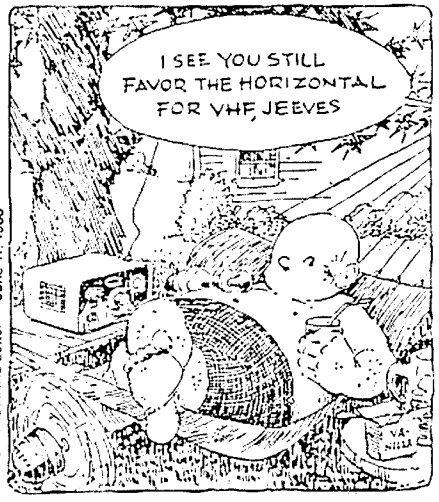
The 24th Annual SERG Convention took place over the Queen's Birthday holiday weekend in cool, but fairly reasonable weather considering Mount Gambier's position on the Continent. There was a good representation from VK5 and VK3 with the usual very strong attendance from the North East Radio Group (NERG). I also believe VK6 and VK7 were also represented.

Part ol Saturday afternoon and evening and most of Sunday was spent tracking down hidden transmitters, fox hunts, scrambles, etc on both the VHF and HF bands. There are some very keen enthusiasts who enter almost everything provided to test their skills. The outright winner of the SERG trophy was Geoff Hudson VK3CGH, of NERG.

Other activities included many trade displays entering much mouth-watering equipment, secondhand equipment sales, a display of microwave technology by Des VK5ZO, who had also gone to the trouble of preparing a video depicting the art of microwaves, a continuing demonstration of packet radio, a full size HF antenna display.

Ivan VK5QV, throughout the day gave a rather awe-inspiring demonstration of the potential of the Tesla Coil, earlier versions of which had been used for spark transmission. He was able to draw a continuous arc for more than 30 centimetres. Bill Verral VK5WV and Eric Jamieson VK5LP, together mounted an antique radio display which created considerable interest, particularly as the old wireless sets presented were put-through-their-paces to the delight of the audiences.

The home-brew section attracted eight entries and Eric VK5LP decided the winners were Trevor VK5NC, for his 2304 and 1296 MHz power amplifiers featuring water cooling of 2C39 valves, and Bob VK3BVS, for his 160 metre linear amplifier and antenna tuner. Later in the evening, Eric issued a challenge to the fraternity to construct a two valve AC operated broadcast receiver based on the Reinartz design and provided a circuit diagram and certain other parameters which would need to be followed; the finished product to be tabled for testing at the 25th Anniversary Convention in 1989. First and second prizes were offered. Eric said he would construct one which would be used as the "standard of comparison" and expected that, from amongst those which may turn up, there would be some which performed better and others which did not. He saw the competition as a challenge not only to the older amateur, but the younger people and said they did not have to be operating amateurs, SWLs and the like would be equally welcome to enter.



—From *The ARRL Letter* — June 11, 1988

All the 30 or so copies of the circuit which were provided were taken. If only half return active models it will be an interesting exercise. Any readers of this column who would like to try their hand at the construction of a relatively "simple" receiver (but which has its peculiarities, I can assure you) and can bring it to the 1989 SERG Convention, may obtain a circuit and details from me by sending a SASE. It is a fun thing after all but one which will no doubt create a lot of interest. If constructed properly there is no reason why the radio cannot be used around the home afterwards as it will have loudspeaker output.

The SERG officers had provided the usual excellent trophies with the NERG people receiving the bulk. Following these presentations, the President, Trevor Niven VK5NC, called upon Brenda VK3KT, who represented the Federal Executive of the WIA, to speak, and she called Eric VK5LP to the rostrum to receive the certificate for the recently awarded Ron Wilkinson Achievement Award. In responding, Eric said he was proud to receive such an award and hoped that, had Ron Wilkinson been here, he would have approved of him as a recipient.

Following that presentation, Eric was rather stunned to be called again and Trevor VK5NC, presented him with the award of the first Life Member of the South East Radio Group, in recognition of many years of support for the Group's activities. It is not often Eric is stuck for words, but he seemed to be at this point, but was able to say that for this award too, he was proud to be a recipient, and would continue to give as much support as possible to SERG, as he believed the Group was truly helping to promote the spirit of amateur friendliness and co-operation. The fact that so many amateurs and friends turned up year after year indicated they were on the right track.

The evening concluded with the usual great SERG evening meal provided by the ladies of the Group and their helpers, a very fitting wind-up to a great weekend.

FROM NEW CALEDONIA

A letter from Phillip FK1TS, is, as usual, full of information which is now to be passed on to readers.

Phillip is constructing a six metre beacon and this should be operational by the time you read this; it will run 10 watts to a Swiss Quad antenna beaming east-west. He says he is more inclined to go for a vertical collinear of some description but will have to be content with what is on hand for a start.

Phillip's latest plans for DXpeditions are confirmed as late August/early September, to 5W1 (West Samoa) and KH8 (American Samoa). He will be operating as 3D2TS from Fiji for most of September. In late September and most of October as ZK1?? from Cook Island. If he has good propagation from there to JA, he plans to fly to the North Cook Islands, which is a separate DXCC country. He plans to have some "nice" cards printed in Fiji.

Phillip will be using VK and ZL television as indicators of band openings and, as quite a deal of his time away will be during the equinox, he is hopeful of F2 openings to VK, ZL, JA and many Pacific areas. Although Phillip has not indicated frequencies, past experience tells me he will be operating around 50.110 and 52.050 MHz, although if 50.110 becomes busy he will be on 50.120. He has found signals are consistently better on 50.120 than 52.050 MHz, and the openings last for longer periods. In support of this he mentions working VK2VC at 0539 and VK2FLI at 0546 on 19/5 on 50.120 MHz, when signals remained 5x9 + 20 dB with 50 much better than 52 MHz. He also worked VK2XJ at 0510 on 18/5 and again at 0511 on 19/5 on 52 MHz.

ADVICE FROM JAPAN

The letter from Phillip FK1TS, also included a copy of a letter from Nori JI1CQA, which should be required reading for six metre DX operators.

Nori sends details of the JA7ZMA beacon on 50.028 MHz (shortly to shift to 50.027 MHz) which runs 10 watts output from a TR-9300 to a six element Yagi at 15 metres and beaming south. Operating time is daily from 2200 to 1100 UTC, but sometimes extending to 1500. The beacon is located at Fukushima City, about 250 kilometres NNE of Tokyo in the shack of JH7DHS, and with Grid Locator QM07. JH7DHA said they hoped to transfer to a neighbouring mountain soon to allow the beacon to operate 24 hours. For further details and reception reports to Kinya Honda JH7DHS, 110 Yoshikuranagura, Fukushima City, 960, Japan.

The following information is also contained in the letter:

AL7C in Anchorage, Alaska, worked JA1, JA2 at 0540 on 31/5 on 50.110 MHz. The AL7C signal was very weak with heavy QSB and believed to be Es multi-hop path.

The 9N88ITU expedition by JAs opened 14 and 15/5 from 0300 to 0500 on 52.125 MHz with very strong signals.

Nori believes the VS6SIX beacon may be off the air as he has not heard it during several strong VS6 openings during April and May. VS6s EL, XMT, XRC and XWR are all active on six metres.

BY1PK, BY4AA and BY4RB are all active from China on six metres.

JH7EAY/JD1 is on six metres now.

The JD1YAA beacon on 50.110 is now off the air. (This was already known. . .5LP).

KX6DS is an active six metre station, also HLs 1IE, 1JD, 1AAY, 5BIV, 5BNU and 9TM.

Nori also mentions the 9V1ES expedition for June 3 to 12, by JAs to Singapore and this was the first occasion there had been any six metre operation from that island. Also, the VK4KCW/VK9X by 9V1ES expedition team, June 17 to 24. Both of these have passed by the time you read this.

JE3MAS is planning to operate as 5H1HK from Zanzibar Island, Tanzania on six metres. The beacon generator is being produced by Nori and JG1ZGW. At the moment the beacon frequency is unknown but the licence to operate has been approved.

Thanks to Nori JI1CQA and JG1ZGW, for alerting us to the above six metre news.

SOUTH AFRICA

Hal Lund ZS6WB, advises that the April report of "The 50 MHz Reporting Club" from Ray Cracknell G2AHU, says; "Rising sunspot numbers have led to extensions of the TEP zones. Whereas in October 1987 the southern limit was roughly the Tropic of Capricorn, by March 1988, stations as far south as Pretoria were working into southern Europe. By solar maximum stations as far apart as all but the southern tip of Africa and the southern (?) half of the British Isles should be able to contact each other on 50 MHz provided the maximum sunspot activity rises to the same levels as 1979/80."

As I pointed out last month, Cape Town is about the same latitude as Adelaide and Pretoria, the same as Maryborough in Queensland, which is roughly 300 kilometres south of the Tropic of Capricorn. It will not be hard for anyone to interpolate the South African situation to that of Australia. Thus, with more southern European countries allowed six metres, it is inevitable they will work that far, the same as we work to Japan.

SV0FE and SV1DO, in Athens, Greece, have been granted two year permits for six metres. The former station is Mike, who, as an American living in Greece, was a very active VHFer in the US.

All this leads up to saying that, with the main F2 period coming in September and October, stations in VK6 particularly should spend some time looking west particularly late in the day or early evening as the morning sun shines down on Africa.

NOVICE LICENSING CONDITIONS

Novice amateurs may now operate on the two metre band between 146 and 148 MHz using up to 10 watts of FM. This gives them access to repeaters, as well as any simplex operating they may choose to undertake.

In welcoming them to the VHF spectrum I hope some will find a desire to upgrade their licences to permit them to enjoy the great opportunities which exist on the other parts of the band in addition to the other bands which could be available to them.

With two metres now open to novices, a band is now available to all amateurs, whatever their licence structure, and this must, in the long run, only be to the betterment of band usage and the amateur service generally.

BITS FROM EVERYWHERE

Ian VK3AQU, lives at Myrtleford, 200 kilometres north-east of Melbourne, in a mountainous region and is able to copy the beacon VK3RTG most of the time while VK3RCW fades in and out of the noise. David VK3AUU, is very strong with Arie VK3AMZ, even better. He says the VK3RAI beacon runs five watts at present but needs the power supply upgraded for best results. Ian always monitors 144.100 MHz when in the shack.

The West Australian VHF Group Bulletin lists the two remaining beacons VK6RTU at Kalgoorlie and VK6RPB at Port Hedland, as being operational. That being so, it means the final checking has been done on the beacon list which, for the time being, should be accurate.

Practical Wireless, April 1988, per favour Steve VK5AIM, reports that, despite no six metre operation being permitted closer than 150 kilometres to a television station and/or to a number of other designated areas, there are still 38 defined areas with unrestricted operation and two partly affected. Although low power restrictions apply, no rules apply to antenna gain.

Some form of six metre operation is now permitted in the UK, France, Ireland, Holland, Gibraltar, Portugal, Norway, Iceland, Malta, Greece and Cyprus. With the latest projections indicating the possibility of Cycle 22 being an all-time best, contacts between some of the areas and Australia are a distinct possibility. It is perhaps, unfortunate for VK that such a large area exists to out north-west, where, as a rule, no six metre operation is permitted. Perhaps something might change this!

50 — 54 MHZ DX STANDINGS

DXCC Countries based on information received up to June 15, 1988. Cross-band totals are those not duplicated by six metre two-way contacts. Credit has not been given for contacts made with stations when 50 MHz was not authorised.

Column 1: Six metres two-way confirmed
Column 2: Six metres two-way worked
Column 3: Cross-band (6 to 10) confirmed
Column 4: Cross-band (6 to 10) worked
Column 5: Countries heard on 50 MHz
Column 6: Countries heard on 52 MHz

CALL SIGN	1	2	3	4	5	6
VK8GB	42	42			13	
VK4ZJB	31	31				4
VK2BA	30	30				
VK2VC	27	27				
VK2QF	26	26				
VK2DDG	25	26		2	12	3
VK3OT	25	26			10	
VK3AWY	22	22				
VK2KAY	21	23				
VK5LP	21	22			6	3
VK2BNN	20	21				
VK4ALM	20	20				
VK3XQ	19	20			1	1
VK4TL	19	19				
VK7JG	18	20			2	
VK4ZAL	18	18				
VK3AMK	17	17				
VK9XT	17	21				
VK3AUI	17	21				
VK3NM	16	17				
VK4ZSH	15	16				
VK2ZRU	15	16			1	3
VK3ZZX	12	13				
VK9YT	12	14				
VK6OX	10	10	1	1		
VK6RO	9	9	3	3	2	3
VK4KHZ	8	10				
VK6HK	8	13		3	2	
OVERSEAS						
JA2TTO	48	48			6	

A minimum of five countries confirmed (including VK) is required for an operator to be listed.

The list position is determined by the number of confirmed contacts. Where two or more operators claim the same total, those first date listed with that total can only be displaced by another having a greater number of confirmed contacts.

The next list will appear in February 1989, and entries will need to be on my desk no later than December 15, 1988. Claimants are reminded that full details of all contacts are required; viz date of contact, time in UTC, call sign of station worked, country, mode, report sent and received, QSL sent and whether received, split frequency contacts should be indicated. Please add your own call sign, signature and date.

I reserve the right to request and examine any QSL cards which may be needed to support an application for listing. To assist your claim a useful idea is to include photocopies of the back and front of the QSL cards.

FTAC NEWSLETTER

The June 1988 newsletter contains the FTAC Annual Report plus considerable other material including details of the 10 GHz Provisional Band Plan (published in May AR). If you have a worthwhile submission to make on the suggested band plan, then I urge you to start writing. The narrow band segment is listed between 10.368 and 10.370 GHz, and includes a segment for beacons.

It pleases me, now-a-days, to be included in the disseminated information from FTAC, especially as I have specific interests in band planning and beacons. In return, I am now in a position to advise FTAC of the accurate position of active beacons in VK and those areas within out VHF range. I leave the HF beacons to those directly involved!

LATE INFORMATION

Maurie VK3XEX writes to say that six metres opened on June 11, between 0740 and 0840 to VK4s CEU, ANP, KUY, KU and ZMF Also heard VK2 working into VK7.

Maurie also says the Ballarat beacon on 432.535 MHz has been off the air for about two years, but is expected to be operational again in about two weeks. I will give it time to get back on and will start listing it again from next month.

Graham VK6RO, has sent details of contacts reported in the Japan *ham radio* magazine of May 1988, covering contacts between 28/2 and 24/3. In all, there are 286 listings and the majority are with VK stations.

I note there was an opening to VK3 on 28/2 around 1830, when VK3s BDL, AMZ, XQ and AZY were worked. For the next month, the beacons VK8VF, in Darwin, and VK6RTT, at Wickham, figure prominently as also does VS6SIX at Hong Kong. Obviously the earlier report that it was not operating was incorrect.

VK8 stations to be worked include VK8s ZLX, KTM, ZMA from Alice Springs and VK8ZWM from Darwin. There have been contacts right down to Perth and include VK6s RO, KXW, WD, IU, JQ, OD, AWE. Of these, VK6IU appears to be the only station in the north-west to take advantage of VK6RTT being heard so often.

Prominent stations from VK4 include VK4s RIK, LE, ALM, KU, FXZ, DEA, FNQ, FXX, WL, KT, JH, DO, IZ, JXZ and ACG. Also noted was VK2EMA.

From other areas P29s PL, ZEF, ZFS, ZWM, ZJS; VK9LJ; YB0CXN; KG6DX; FT1TS; VS6VF, VS6EL, YC0UVO, H44GR, H44DL, KH2F, T22JJ, H44GP, FK1TK and HL9CB.

It is significant that most of the contacts so far have been above the Tropic of Capricorn. Given the rising sunspot numbers, it is conceivable that September could see the area being worked shift below the Tropic. The warnings are out — get your equipment in working order or miss out on TEP contacts plus some early F2 openings.

It appears the only station on six metres in Darwin is VK8ZWM, as this is the only station to be listed from there apart from VK8VF, the beacon which was being heard almost on a daily basis throughout March.

MICROWAVE STANDINGS

Bill Tynan W3XO, in his columns *The World above 50 MHz* in *QST* for April 1988, has a Microwave Standings list which may interest VK operators. On 902 MHz the greatest distance claimed is 478 miles (770 km) by W2PGC; 1240 MHz 2519 miles (4056 km) by N6XQ; 2300 MHz 940 miles (1513 km) by W8YIO and KD5RO; 3300 MHz 288 miles (464 km) by WB5LUA/5; 5600 MHz 331 miles (533 km) by K5PJR and W5UGO/0; 10 GHz 414 miles (667 km) by W6SFH/6 and N6GN/6; 24 GHz 165 miles (266 km) by KX0O and 47 GHz 14 miles (23 km) by WA3RMX/7 and WB7UNU/7.

Australian operators now know what distances they require to better some of these distances. For 2.3 and 3.3 GHz, the VK distances are well in excess of those listed.

CLOSURE

As I was sitting in front of the typewriter wondering if I had missed anything, I was idly observing the map of the world in front of me. I could not but help notice how far we are from South America. Adelaide to Buenos Aires in Argentina is about the same distance as to London! Both around 12 000 kilometres and a long way even for six metres.

Congratulations to Trevor VK5NC, for winning the last Ross Hull Memorial Contest. He put a lot of effort into the contest and deserved to win.

It had been hoped to present the Ross Hull Trophy to Trevor at the SERG Convention over the June holiday weekend. However, the trophy could not be found! Bill Rice VK3ABP, finally tracked it down in Perth where it was in a deplorable state having been neglected for several years. Repairs are to be carried out in Adelaide after which the trophy will be presented to Trevor on an appropriate occasion.

Closing with two thoughts for the month: "The definition of a free society is one where it is safe to be unpopular" and "To entertain some people all you have to do is listen.

73 The Voice by the Lake.

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IS YOUR STATION QSQ?

At first glance, a listing in the *Penguin Dictionary of Science* appeared to be a Q-Code.

But that was not the case. Did you know that QSG stands for Quasi stellar galaxy — a quasar that is not a radio source. Quasars are sources of high energy electro-magnetic radiation.

Perhaps QSG can be appropriately added to the Q-Code to denote an inactive amateur radio station?

DID YOU FIT THE DEFINITION?

The *New Dictionary of American Slang* has just been published. It says a computer enthusiast in slang is called a "Chiphead".

FUTURISTIC AUSSAT

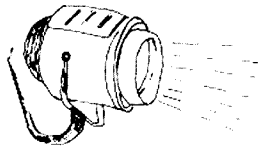
The next generation of AUSSAT, due for service from 1992, is likely to include a transponder for mobile radio.

Tenders for AUSSAT mentioned transponders operating in the 1.5 GHz "L" band which could give Australia a world lead in the development of domestic mobile satellite communications.

It would allow communications with moving vehicles such as cars, trucks and trains as well as aircraft and boats.

It has been suggested that as many as 50 000 mobile terminals could be in use within 10 years of introducing the service.

The AUSSAT payload is also likely to have an experimental 28 GHz radio beacon.



Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

As I am writing this we are in the middle of Winter here in northern Tasmania. So far, it has been comparatively mild, although very damp, after a prolonged drought. Being indoors has meant that I have spent some time in the radio shack. As the Solar Flux has increased, so has propagation and I have been having "a ball", particularly on 14 and 24 MHz, two of my favourite bands.

Listening about on other frequencies has also proved extremely interesting with plenty of odd signals about. There was a anti-Nicaraguan clandestine operation on 6.214.5 MHz around 1150 UTC, on June 11. Naturally, it was in Spanish and it was a typical fast paced delivery with numerous slogans, jingles, etc. I was surprised to hear the identification change on the hour. Before 1200, it was the well-known "R. 15 Septembre" which has been the voice of one of the "Contra" factions. The different identification from 1200 was "R. Liberacion". Immediately I reached for my back copies of the *International Listening Guide* and checked. Sure enough, on 5.890 MHz several "Contra" stations were listed from 1100 continuously to 0300 UTC. Besides the above two stations, there was a third — "R. Miskut". All three belong to different factions and apparently came together in a untied effort, presumably under outside pressure.

I did check on 5.890 MHz, but it was clear, so it appears as if they have altered to the 6 MHz channel. Yet it is an odd choice as it is in the middle of the small ships radio-telephone channels world-wide. I firmly believe that this operation is probably shifting about in a "cat and mouse" game with Nicaraguan jammers. Interestingly, at the same time, the Nicaraguan Sandista Government and the "Contra" guerrillas were engaged in abortive peace talks in Managua. I did notice, on the American network news, via the AFRTS, that there had been a falling out among some contra factions, so presumably these groupings were establishing themselves on radio The "ILG" stated that the "Contra" station was running 10 kW.

Whilst on the subject of clandestine stations, I came across "R. Magallanes" on 11.860 MHz around 0230 UTC. This USSR based-station has been operating since the fall of the Allende Government in Chile during 1973. We usually hear it very well on numerous frequencies here in Tasmania, for the beam comes right over Tasmania after hitting Chile. Programs naturally support the Chilean Government in exile, ie the Communist Party which is banned, as are all political parties in Chile. Broadcasts are in Spanish, of course.

Another USSR based station broadcasting in Spanish is "R. Pax y Progresso" — Radio Peace and Progress. This station also has been around for many years and states it is "the voice of Soviet public opinion". I think it's recent operations may have been cut back as it mainly targets Latin America and China. I remember monitoring their English language broadcasts several years ago to south-east Asia. Although it has shared facilities with Radio Moscow, it apparently comes under the control of the KGB. There are other Soviet based stations including "R. Rodina" — Voice of the Homeland, which targets Russian emigres worldwide. R. Atlantika; and R. Rikihy Okean" — Pacific Ocean are stations specifically designed for the Soviet merchant marine and fishing fleets. The latter even has reportedly a five minute news bulletin in English on Saturdays.

I recently took part in a two-way exchange between Japan and Australia, specifically between the Nara Amateur Radio Club and the Northern Branch of the Wireless Institute of Australia, here in Launceston. This was arranged by the Launceston branch of the Australian Japan Association, to coincide with a visit by a delegation from that city to the Nara Silk Road Expo 88.

A sched was arranged for 21.300 MHz at 0400 UTC, on June 4. However, although conditions were excellent that day, JA signals were well down and swamped by signals coming from the Americas, Europe and even Africa. It was ironic that the day when we specifically wanted to contact JA on 15 metres, it was very much easier to go elsewhere in the world. The station at the Nara end was 8J3SLK and was located in the Kasugano area of the Nara Expo in the Cultural Communications Pavilion.

Contact was established a few kilohertz off the nominated frequency and also was one hour earlier than originally planned. We utilised the call of VK7NB/P and had the local president of the Australian Japan Association and his daughter-in-law, who happened to come from the area. The delegation from Launceston was at hand in Nara, but due to poor propagation and probably much crowd noise in Nara, we were not able to successfully exchange two-way communications.

I note that Radio Beijing has increased the number of times they broadcast to the Pacific area. For a long time they have been on from 0830 to 1025 daily on 9.700, 1.755 and 15.440 MHz. Now they come through as well at 1100 and 1300 UTC using 00B channels. The frequencies are 7.820 Mhz and 11.290 MHz. The former frequency is very loud, with traces of over-modulation but the 11 MHz signal is down, at least here in Launceston. They are in English, naturally.

Well, that is all for August. Don't forget the RD Contest on August 13 and 14. Good luck!

73 de VK7RH.

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LET'S REMEMBER OUR BASICS

Geoff Taylor VK5TY
16 Fairmont Avenue, Black Forest, SA. 5035

There was a voltage on the aerial terminals of the little portable television set. Every time anyone touched them they received a "bite". The set had been returned to the manufacturers but they could find nothing wrong.

So, let us make some checks. A multimeter shows 40 volts from the aerial connection to earth, so that is what is giving the "bite". A look at the circuit reveals that there is simply no 40 volts at any point in the circuit. More probing with the multimeter only produces answers that agree with the voltages the circuit says should be at the places where they should be. *Except* that there is still 40 volts on the aerial terminals!

When all else fails, let's go back to the basics.

The portable television has no mains transformer (to save on weight) so the 240 volts from the mains goes straight to the chassis. There is, however, an isolating capacitor in the aerial line, so the 240 volts cannot appear there — it's 40 volts, not 240 volts that we read from the multimeter.

Let's look at the isolating capacitor. Say, for example, it is a 100 pF capacitor (this is about what would be expected!). The multimeter reading shows 40 volts through 100 pF. What does that really mean? What about the internal impedance of the multimeter?

Most multimeters are relatively high impedance (typical 100 kohms per volt). Now we shall calculate the impedance between the mains and the external aerial terminals.

If we look at the mains voltage and it's frequency we have:

240 volts
50 Hertz

Applying the formula

$$X(c) = 1/2\Pi fc$$

so, on 50 Hertz

$$Xc = 1/2\Pi \times 50 \times 10^{-12}$$
$$= 10^{9}/\Pi$$

or approximately 30 Mohms.

(the same capacitor at 60 MHz has a reactance of about 25 ohms).

From Ohms Law, with 240 volts AC applied, the current through a 30 Mohm impedance is 8 microamps.

Reverting to the multimeter reading, moving-coil meters are current operated devices, and since the 30 Mohm impedance is far higher than the internal resistance of the meter, (on the 100 volt range) the current through the meter will be restricted by the 30 Mohms independent of the meter resistance. Changing the range of the multimeter will not necessarily change the reading of the meter.

Since it is usually accepted that 50 milliamps can be fatal, the maximum current under these circumstances is approximately 1/6000 of this value.

Thus, we have a situation where you can get a "bite" from the aerial, however the current is limited to a safe limit.

The solution? A smaller value capacitor would reduce the "bite" but not remove the problem. An insulated aerial connector would leave the aerial itself alive. A resistor from the exposed metal to earth would solve the problem entirely but what do you use as an earth with transformerless devices? The most practicable solution is to reverse the active and neutral connections at the mains plug so that the neutral is connected to the chassis and not the active.

The problem is peculiar to transformerless mains operated radio equipment, so if you should encounter this problem, this article may help you find a solution.

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Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7251

CONTEST CALENDAR

AUGUST 1988

— 6 YL/OM SSB Sprint
13 — 14 WIA Remembrance Day Contest (Rules July issue)
13 — 14 European DX Contest CW Section (Rules July issue)
27 — 28 All Asian CW Contest (Rules June issue)

SEPTEMBER 1988

10 — 11 European DX Contest SSB Section (Rules July issue)
24 — 25 CQ WW DX RTTY Contest

OCTOBER 1988

1 — 2 VK-ZL-Oceania DX Contest (Rules this issue) SSB Section
8 — 9 VK-ZL-Oceania DX Contest CW Section
8 — 9 IRSA Radiosporting Contest
29 — 30 CQ WW DX SSB Contest

NOVEMBER 1988

11 — 13 Japan International DX Contest
12 — 13 European RTTY Contest
26 — 27 CQ WW DX CW Contest

YL/OM SUMMER SSB SPRINT

Rules:

From 1800 until 2200 UTC, Saturday, August 6, 1988.

As the name implies, this is a short four-hour contest organised by the YLRL. Only contacts between YLs and OMs count. Use all HF bands from 80 to 10 metres. No net or repeater contacts. No WARC bands.

Exchange — Call sign, RS, Name, and State, Province or DX Country.

Scoring —

A) One point per QSO. The same station may be worked once on each band.

B) Alpha-numerical multiplier, using the last number and the first letter following that number of the call; ie W1XZ is 1X, W22GLB/7 is 2G, 9Y4A is 4 A, etc. A total of 260 combinations is possible, 26 letters with each number.

C) Low power bonus of 1.5 for stations using 200 watts PEP at all times.

D) Final Score: Total QSO points (A) times the multiplier (B), times the low power bonus (C) if applicable.

Frequencies — 3.955, 7.255, 14.265, 21.395, 28.395 MHz, plus or minus 15 kHz.

Awards — Certificates to the highest scoring YLs and OMs. Also to the top scoring YL and OM in each US district, VE province, and DX country (minimum of 10 valid contacts).

Print or type logs, showing scoring, and the signature of the operator is also requested.

All entries must be received by September 15, by Mary Lou Brown NM7N, 504 Channel View Drive, Anacortes, Washington, 98221. USA.

This contest would be a good opportunity to work the YL stations on the 15 and 10 metre bands from our area, especially those who are going for the many awards that are available from the ISSB, etc. (Ed).

Good luck to you all in the Remembrance Day Contest. Please take note of the general rules for WIA contests, and the Contest Disqualification Criteria, that was published in the June issue of AR. And, get logs in early, please.

Rules of the 1988 VK-ZL-OCEANIA DX CONTEST

FOR OVERSEAS ENTRANTS

1. SSB

Within a 24-hour period from 1000 UTC Saturday, October 1, to 1000 UTC, Sunday, October 2, operate for a **maximum** of 12-hours. Take your operating periods in one hour blocks, based on "even hour to even hour" in UTC; eg 1000 to 1100 UTC, or 1300 to 1500 UTC, etc, with **minimum** periods of one hour.

CW

Within a 24-hour period from 1000 UTC Saturday, October 8, to 1000 UTC, Sunday, October 9, operate for a **maximum** of 12-hours. Take your operating periods in one hour blocks, based on "even hour to even hour" in UTC; eg 1000 to 1100 UTC, or 1300 to 1500 UTC, etc, with **minimum** periods of one hour.

Receiving

SSB and CW Combined in the above times (maximum total of 24-hours).

2. Only one contact per mode per band is permitted. All bands may be used except WARC bands.

3. SCORING

For stations operating outside Oceania, score two points for each contact with VK, ZL or Oceania stations. Oceania stations score two points for all contacts.

NB: Oceania stations are those which qualify as Oceania for WAC.

4. FINAL SCORE

Multiply total QSO points by the sum of all VK/ZL/O prefixes worked on all bands. (The same VK/ZL/O prefix worked on a different band counts as a different unit).

5. CIPHERS

Exchange a five or six digit number composed of RS/T report, plus a three digit sequence number beginning at 001 and increasing by one for each QSO on that band.

6. LOGS

a) Separate logs for each band please and for SSB and CW.

b) Show date, time UTC, call sign of each station contacted, ciphers sent and received.

c) Indicate clearly each new VK/ZL/O prefix worked. (Underline, highlight or show in separate column, as in CQ WPX).

d) State QSO points claimed for each band.

e) State VK/ZL/O prefixes claimed for each band.

f) Summary sheet to show:

** Call sign, Name and Address
** Total QSO points claimed on all bands.
** Total VK/ZL/O prefixes contacted on all bands.
** Total points claimed.
** Declaration that the rules were observed.

Post logs to: NZART VK/ZL/O Contest Manager, ZL1AAS, 146 Sandspit Road, Howick, New Zealand. Logs to arrive by February 15, 1989.

7. SWLs

A VK, ZL, or Oceania station must be heard in a contest QSO — logs to be set out as for transmitting section.

8. AWARDS

Separate awards for SSB and CW.

a) Special certificate to the top scorer in each continental area.

b) Special certificates to the top scorers in each country.

c) Participation certificates to all entrants on request (One IRC for postage please).

**Copy of relevant results available on request (One IRC for postage please).

FOR VK and ZL STATIONS

Check the rules for Overseas Stations.

Rules 1, 2, 5, 6 as for Overseas stations except . . . in Rule 6.

3. VK and ZL stations are permitted to contact each other only on 160 and 80 metres. VK/VK, ZL/ZL and ZL/VK contacts are permitted on these two bands.

4. SCORING

Different points for contacts on different bands are as follows:

160 metres — 20 points
80 metres — 10 points
40 metres — 5 points
20 metres — 1 point
15 metres — 2 points
10 metres — 2 points

Total score will be the total QSO points multiplied by the total number of prefixes worked. The same prefix worked on a different band is counted. NOTE: K1, W1, AA1, N1, etc, are all different prefixes. W1AAA/6 would count as W6 not W1.

6. CHANGE

Logs to arrive by December 9, 1988.

7. SWL SECTION

As for Overseas but. . .

* VKs must hear and log ZL or other stations (no VK stations)
* ZLs must hear and log VK or other stations (no ZL stations)

8. AWARDS

Separate awards for SSB and CW.

a) Special certificates to top scorers in each prefix area.

b) Special certificate to top scorers on each band.

c) Participation certificates to all entrants on request. (One IRC for postage, please).

Any further information can be obtained from: The NZART VK/ZL/O Contest Manager, John Litten ZL1AAS, 146 Sandspit Road, Howick, New Zealand.

RADIO OLD TIMERS' CLUB

Members are reminded of the 80 metre VK/ZL Old Timers' QSO Party on Monday, August 8, 1988.

Rules in Capital OTN 4.

THE 12TH WEST AUSTRALIAN ANNUAL

3.5 MHz CW and SSB CONTESTS
Transmitting and Receiving

1.DURATION:

CW — Saturday and Sunday, July 30 and 31, 1988.
SSB — Saturday and Sunday, September 17 and 18, 1988.

On both days between the hours of 1100 and 1330 UTC; ie five operating hours in all for each contest.

2. FREQUENCIES:

All contacts to be made in the 3.5/3.7 MHz band using frequency allocation applicable to your licence conditions.

3. CALLING:

Stations will call CQ WAA using the three times three technique, infringement of this rule by the use of long CQ calls may entail disqualification as will prearranging of a QSO.

4. SCORING:

Points for contacts are as follows:

Within Western Australia — five points per contact
WA to all Mainland Eastern States — two points per contact
WA to VK7 — four points per contact
WA to VK0 and Overseas — eight points per contact

Three points per contact with WA stations only.

5. MULTIPLIERS:

A multiplier of two per Western Australian Shire worked will apply to the final score. For Western Australian stations north of the 26th Parallel an additional multiplier of 1.3 per contact confirmed,

with stations south of the 26th Parallel will also apply.

6. CONTACTS:

Stations may be worked twice on each night; ie once between 1100 to 1300 UTC and again between 1300 to 1330 UTC. These contacts will count for points. Each time the contact for WA stations will take the form of an exchange of five characters comprising RS/T and Shire letters; eg a station in *Northam* sends 579NM or if in *Harvey* 579HY, this helps towards the Worked All Shires Award. Eastern states and overseas stations will send RS/T plus a running number starting at 001.

7. LOGS:

Contest logs are to be set out on one side of a quarto or foolscap sheet with columns headed as below.

DATE:	CALL:	OPERATOR:

TIME UTC	CAL-L WK-D	RST OUT	RST IN	SHIRE LETTERS	SHIRE MULT.	POINTS CLAIM

Column seven to be totalled at the foot of the each page and the running totals brought forward. The last page to contain the following summary: Total number of points scored, Input power, Equipment and Antennas used, along with comments on the contest in general. SWL participants score as above using the outgoing transmit score.

All logs to be addressed to WAA Contest Committee, 42 Kennedy Street, Melville, WA. 6156 and posted so as to reach the destination not later than October 14, 1988 for both contests. The results for both contests will be published in December's issue of *Amateur Radio*.

SHIRE LETTERS

1. Albany Town	AT	70. Leonora	LA
2. Albany	AL	71. Mandurah	MB
3. Armadale	AK	72. Manjimup	MP
4. Augusta Margaret River	AM	73. Meekatharra	MK
5. Bassendean	BA	74. Melville	MV
6. Bayswater	BW	75. Menzies	MZ
7. Beverley	BV	76. Merredin	MD
8. Boddington	BD	77. Mingenew	MW
9. Boulder	BD	78. Moora	MA
10. Boyup Brook	BB	79. Morowa	MR
11. Bridgetown Greenbushes	BG	80. Mosman	MS
12. Brookton	BK	81. Mukinbudin	MU
13. Broome	BE	82. Mullewa	ME
14. Broomehill	BH	83. Mundaring	MG
15. Belmont	BL	84. Murchison	MH
16. Bruce Rock	BR	85. Murray	MY
17. Bunbury	BY	86. Mt Magnet	MM
18. Busselton	BN	87. Mt Marshall	ML
19. Canning	CA	88. Nannup	NP
20. Capel	CL	89. Naremben	NN
21. Carnamah	CH	90. Narrogin	NG
22. Carnarvon	CN	91. Narrogin Town	NT
23. Chapman Valley	CV	92. Nedlands	NL
24. Chittering	CI	93. Northam	NM
25. Claremont	CT	94. Northam Town	ND
26. Cockburn	CR	95. Northampton	NH
27. Collie	CE	96. Nungadin	NG
28. Coolgardie	CG	97. Peppermint Grove	PG
29. Coorow	CW	98. Perenjori	PJ
30. Corrigin	CS	99. Perth	PH
31. Cottesloe	CD	100. Pingelly	PY
32. Cranbrook	CK	101. Plantaganet	PT
33. Cuballing	CB	102. Port Hedland	PD
34. Cue	CU	103. Dualrading	DG
35. Cunderin	CD	104. Ravensthorpe	RT
36. Dalwallinu	DU	105. Rochingham	RM
37. Dandaragan	DN	106. Roebourne	RB
38. Dardanup	DP	107. Sandstone	SS
39. Denmark	DK	108. Serpentine Jarrahdale	SJ
40. Donnybrook Ballingup	DB	109. Shark Bay	SB
41. Dowerin	DR	110. South Perth	SP
42. Dumbleyung	DG	111. Stirling	ST
43. Dundas	DS	112. Subiaco	SU
44. East Framantle	EF	113. Swan	SW
45. East Pilbara	EP	114. Tambellup	TP
46. Esperence	ES	115. Tammin	TM
47. Exmouth	EH	116. Three Springs	TS
48. Fremantle	FM	117. Toodyay	TY
49. Gingin	GG	118. Trayning	TY
50. Gnowangerup	GP	119. Upper Gascoyne	UG
51. Geraldton	GN	120. Victoria Plains	VP
52. Goomalling	GM	121. Wagin	WN
53. Gosnells	GS	122. Wandering	WD
54. Greenough	GR	123. Wanneroo	WD
55. Halls Creek	HC	124. Waroona	WR
55. Harvey	HY	125. West Arthur	WA
57. Irwin	IN	126. Westonia	WS
58. Kalamunda	KA	127. West Pilbara	WP
59. Kalgoorlie	KL	128. Wickepin	WI
60. Katanning	KG	129. Wiluna	WU
61. Kellerberrin	KN	130. Williams	WL
62. Kent	KT	131. Wongan Ballidu	WB
63. Kojonup	KP	132. Woodanilling	WG
64. Kondinin	KD	133. Wyalkatchem	WY
65. Koorda	KD	134. Wyndham East Kimberley	WE
66. Kulin	KU	135. West Kimberley	WE
67. Kwinana	KW	136. Yalgoo	YD
68. Lake Grace	LG	137. Yilgarn	YN
69. Laverton	LV	138. York	YK

FIRST ANNUAL "59 PLAUQE" JAPAN INTERNATIONAL DX CONTEST

November 11-13, 1988

The monthly DX magazine called *Five Nine* "59", announces that a new DX Contest will be held in November 1988. *Five Nine* was established in 1985 as a DXers magazine by DXers for active DXers in Japan. The purpose of this contest is to accelerate the activity of radio amateurs in Japan and to establish as many contacts as possible between Japan and world-wide stations during the contest period.

1. CONTEST PERIOD: 48 hours from 2300 UTC November 11, to 2300 UTC November 13. Only 30 hours operation out of the 48 hours contest period is permitted for DX Single Operator stations.

Off periods consisting of at least 60 minutes each time must be clearly marked in the log. Multi-operator stations may operate the full 48 hours.

2. BAND AND MODE: 80 ~ 10 metres (except new WARC bands), Phone.

3. ENTRY CLASSIFICATIONS:

1. Single operator multi-band.
2. Single operator 80 metre band.
3. Single operator 40 metre band.
4. Single operator 20 metre band.
5. Single operator 15 metre band.
6. Single operator 10 metre band.
7. Multi-operator, multi-band.

One transmitted signal at any given time. Once the station has begun operation on a given band, it must remain on that band for at least 10 minutes, listening time counts as operating time.

4. CONTEST EXCHANGE:

1. JA station: RS report plus Prefecture number (No 01 to No 50).

2. DX station: RS report plus progressive three-digit contact number starting with 001 for the first contact.

5. POINTS:

1. Contacts among DX stations or among JA stations will neither count as a point or a multiplier.

2. For one completed contact on the 80 and 10 metre bands: two points. For 40 ~ 15 metre band: one point.

3. The same station may be worked only once per band — no cross-mode, cross-band or repeater contacts.

6. MULTIPLIERS:

1. JA Station: The numbers of different DXCC countries (except JD1) worked on each band.

2. DX Station: The total numbers of different Japanese Prefectures plus Ogasawara Island (JD1). Minami-Torishima Island (JD1) and Okino-Torishima Island worked on each band. Maximum of 50 (see the list) per band.

7. SCORING:

QSO points times multipliers equals the final score.

8. LOGS:

1. Use separate sheets for each band.

2. All time in UTC.

3. Fill in blanks of "multipliers" by countries or prefixes, only the first time on each band.

4. The 18-hour non-operating periods must be clearly shown on logs.

5. Logs must be checked for duplicate contacts and correct points. Duplicate contacts must be clearly shown. Computerised logs must be checked for typing accuracy. Original logs may be required if further cross-checking is required.

6. Entrants with more than 500 contacts in total must include cross-check sheet (dupe sheet).

9. PLAQUES:

1. Plaques will be awarded to the top scorer in each entry category on each continent and Japan.

2. Additional special plaques will be awarded to the top single operator multi-band and multi-operator multi-band in the three United States areas which are divided by CO Zones.

10. AWARDS:

Certificates will be awarded to those who win the highest score in each entry in proportion to the number of participants from each country and also from each call area in the United States and Japan.

a) The number of participants under 10. . . Certificates to the highest scorers only.

b) From 11 to 20. . . Certificates to the runner up.

c) From 21 or more. . . Certificates to the top third.

11. SPECIAL CONTEST AWARD:

Any entrant who worked all the Japanese prefectures (No 01 to No 47) during the contest period can request a Special Contest Award with the contest log — no IRCs needed.

12. REPORTING:

1. Submit a summary sheet and logs of only one classification.

2. The log and summary sheets should be postmarked by December 31, 1988 and addressed to Five Nine Magazine, Japan International DX Contest, PO Box 8, Kamata, Tokyo 144, Japan.

3. Entrants may have the contest results by enclosing one IRC and SAE with logs.

13. DISQUALIFICATION:

1. Violation of the contest rules.

2. False statement in the report.

3. Taking points from duplicate contacts on the same band in excess of two percent by the total.

—Contributed by Toshi Kusano JA1ELY, Editor

RSGB 21/28 MHz SSB CONTEST — 1988 Rules

Transmitting Section

ELIGIBLE ENTRANTS — British Isles: RSGB members only. Overseas (including Eire): All licensed amateurs.

PERIOD — 0700 to 1900 UTC, October 9, 1988.

SECTIONS —

a British Isles Single Operator
b British Isles Multi-operator, Multi-band
c Overseas Single Operator
d Overseas Multi-operator

FREQUENCIES AND MODE — 21 and 28 MHz telephony only. Entrants are requested to operate within the bands 21.150 to 21.350 and 28.450 to 29.000.

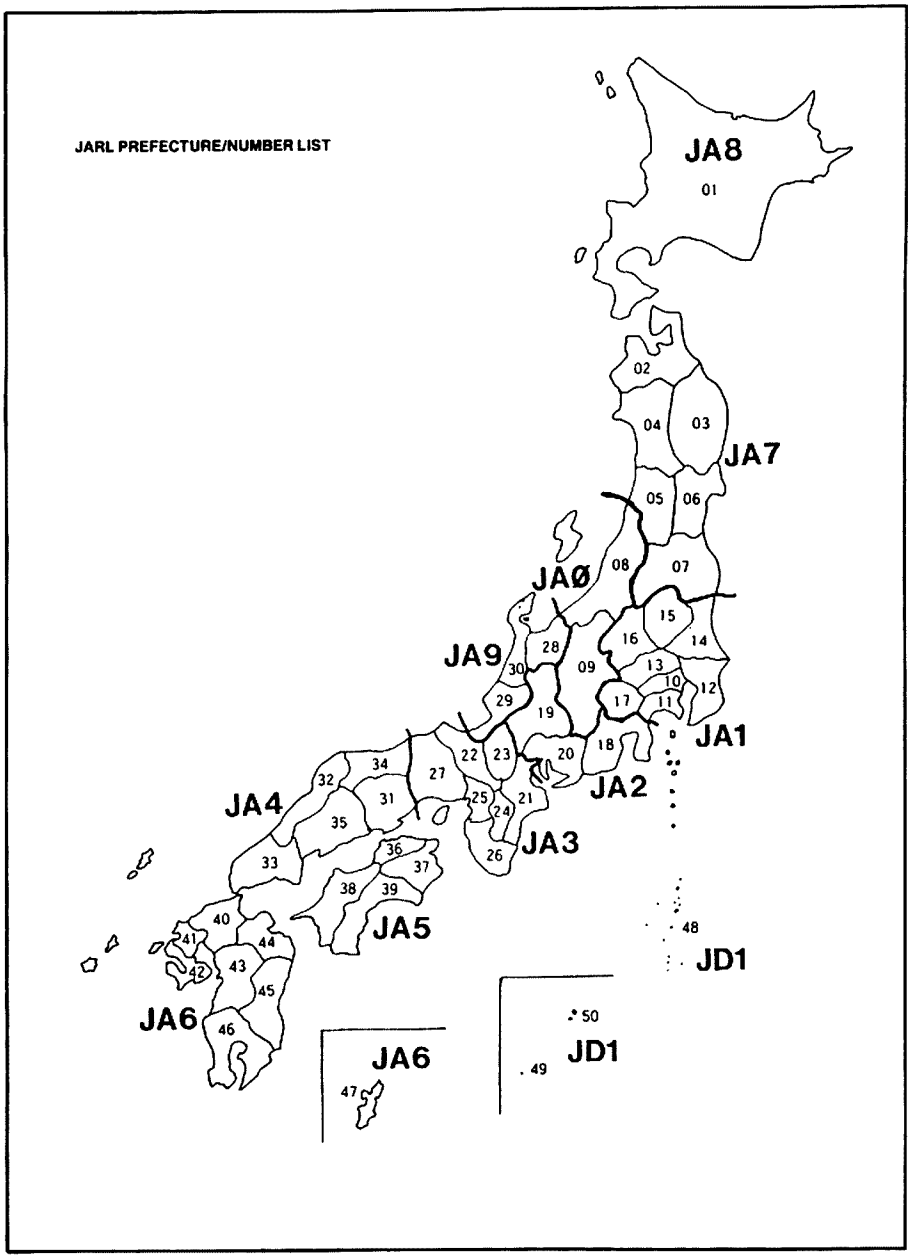
QSY RULE — An entrant who QSYs from one band to the other and makes a scoring contact may not change bands again until at least 10 minutes has elapsed since the last scoring contact on the original band.

EXCHANGE — RS report and serial number starting at 001.

SCORING FOR NON-UK STATIONS — Three points for each completed contact with a station in the British Isles. Multipliers are: G2, G3, G4, G5, G6, G8, G0, GD2, GD3, GD4, GD5, GD6, GD8, GD0, GI2, GI3, GI4, GI5, GI6, GI8, GI0, GJ2, GJ3, GJ4, GJ5, GJ6, GJ8, GJ0, GM2, GM3, GM4, GM5, GM6, GM8, GM0, GU2, GU3, GU4, GU5, GU6, GU8, GU0, GW2, GW3, GW4, GW5, GW6, GW8, GW0. Contacts with GB stations will not count for points or multipliers. For all entrants, the total score will be the number of points on each band added together, multiplied by the total number of multipliers gained on each band. Unmarked duplicate contacts for which points have been claimed will be penalised at the rate of 10 times the claimed

Nr	Prefecture	Area	Nr	Prefecture	Area
01	Hokkaido	JA8	26	Wakayama	JA3
02	Aomori	JA7	27	Hyogo	JA3
03	Iwate	JA7	28	Toyama	JA9
04	Akita	JA7	29	Fukui	JA9
05	Yamagata	JA7	30	Ishikawa	JA9
06	Miyagi	JA7	31	Okayama	JA4
07	Fukushima	JA7	32	Shimane	JA4
08	Niigata	JAϕ	33	Yamaguchi	JA4
09	Nagano	JAϕ	34	Tottori	JA4
10	Tokyo	JA1	35	Hiroshima	JA4
11	Kanagawa	JA1	36	Kagawa	JA5
12	Chiba	JA1	37	Tokushima	JA5

13	Saitama	JA1	38	Ehime	JA5
14	Ibaraki	JA1	39	Kochi	JA5
15	Tochigi	JA1	40	Fukuoka	JA6
16	Gunma	JA1	41	Saga	JA6
17	Yamanashi	JA1	42	Nagasaki	JA6
18	Shizuoka	JA2	43	Kumamoto	JA6
19	Gifu	JA2	44	Oita	JA6
20	Aichi	JA2	45	Miyazaki	JA6
21	Mie	JA2	46	Kagoshima	JA6
22	Kyoto	JA3	47	Okinawa	JA6
23	Shiga	JA3	48	Ogasawara Is.	JD1
24	Nara	JA3	49	Okino-Torishima Is	JD1
25	Osaka	JA3	50	Minami-Torishima Is.	JD1



points. Entries with more than five unmarked duplicates are open to disqualification.

LOGS — Logs sheets to be headed date, time UTC, station worked, RS and serial number sent, RS and serial number received, multiplier, points claimed. A summary sheet listing multipliers worked on each band must be included.

DECLARATION — With each entry there must be a declaration, signed and dated, that the station was operated within the rules and that the decision of the council of the RSGB shall be final.

ADDRESS FOR LOGS — All logs must be sent to RSGB Contest Committee, PO Box 73, Lichfield, Staffs, WS13 6UJ, England. These entries must be received by December 5, 1988.

AWARDS — Overseas stations will be awarded certificates for the leading three entrants overall and, at the discretion of the contest committee, to the leading station in each country.

RSGB 21/28 MHz SSB CONTEST — Receiving Section

Rules as for the transmitting section except as varied below.

ELIGIBLE ENTRANTS: British Isles: RSGB members only. Overseas (including Eire). All SWLs.

Note that transmitting licences for frequencies above 30 MHz only may enter the receiving section.

QSY RULE: This does not apply to receiving stations.

SCORING — Overseas SWLs should log only British Isles stations in contact with overseas stations taking part in the contest. Scoring and multipliers as the transmitting section.

LOGS — Logs to be headed date, time UTC, call sign of station heard, RS and serial number sent by station heard, call sign of station being worked, multiplier, points claimed. A summary sheet listing multiplier heard on each band must be included. NOTE: In the column headed station being worked, the same call sign may only appear once in every three contacts logged except when the logged station is a new multiplier for the receiving station. Also, the station heard may only be logged once on each band for the purpose of scoring.

DECLARATION — Each log must be accompanied by the following declaration "I declare that this station was operated within the rules of the contest and I do not hold a transmitting licence for frequencies below 30 MHz."

AWARDS — As in transmitting section.

RSGB 21 MHz CW CONTEST — 1988

Rules

Transmitting Section

ELIGIBLE ENTRANTS: British Isles: RSGB members only. Overseas (including Eire). All Licensed Amateurs.

PERIOD — 0700 to 1900 UTC, Sunday October 16, 1988.

SECTIONS —

a British Isles Section
b QRP British Isles Stations using less than 10 watts input
c Overseas Section (including Eire).
d QRP Overseas Stations using less than 10 watts input

FREQUENCIES AND MODE — 21 MHz, CW only. Entrants are requested not to operate in the band 21.075-21.125 MHz.

EXCHANGE — RST report and serial number starting with 001.

SCORING FOR NON-UK STATIONS — Three points for each completed contact with a station in the British Isles. Multipliers are: G2, G3, G4, G5, G6, G8, G0, GD2, GD3, GD4, GD5, GD6, GD8, GD0, GI2, GI3, GI4, GI5, GI6, GI8, GI0, GJ2, GJ3, GJ4, GJ5, GJ6, GJ8, GJ0, GM2, GM3, GM4, GM5, GM6, GM8, GM0, GU2, GU3, GU4, GU5, GU6, GU8, GU0, GW2, GW3, GW4, GW5, GW6, GW8, GW0. Contacts with GB stations will not count for points or multipliers. Unmarked duplicate contacts for which points have been claimed will be

penalised at the rate of 10 times the claimed points. Entries with more than five unmarked duplicates are open to disqualification.

LOGS — Log sheets to be headed date, time UTC, station worked, RS and seriel number sent, RS and serial number received, multiplier, points claimed. A summary sheet listing multipliers worked on each band must be included.

DECLARATION — With each entry there must be a declaration, signed and dated, that the station was operated within the rules and that the decision of the council of the RSGB shall be final.

ADDRESS FOR LOGS — All logs must be sent to RSGB Contest Committee, PO Box 73, Lichfield, Staffs, WS13 6UJ, England. These entries must be received by December 31, 1988.

AWARDS — Overseas stations will be awarded certificates for the leading three entrants overall and, at the discretion of the contest committee, to the leading station in each country.

RSGB 21 MHz SSB CONTEST — Receiving Section

Rules as for the transmitting section except as varied below.

ELIGIBLE ENTRANTS: British Isles: RSGB members only. Overseas (including Eire). All SWLs.

Note that transmitting licences for frequencies above 30 MHz only may enter the receiving section.

SCORING — Overseas SWLs should log only British Isles stations in contact with overseas stations taking part in the contest. Scoring and multipliers as the transmitting section.

LOGS — Logs to be headed date, time UTC, call sign of station heard, RS and serial number sent by station heard, call sign of station being worked, multiplier, points claimed. A summary sheet listing multiplier heard on each band must be included. NOTE: In the column headed station being worked, the same call sign may only appear once in every three contacts logged except when the logged station is a new multiplier for the receiving station. Also, the station heard may only be logged once on each band for the purpose of scoring.

DECLARATION — Each log must be accompanied by the following declaration "I declare that this station was operated within the rules of the contest and I do not hold a transmitting licence for frequencies below 30 MHz."

AWARDS — As in transmitting section.

CONTEST DISQUALIFICATION CRITERIA

A standardised approach is taken to the disqualification of logs entered in all of the contests which come under the direct control of the Federal Contest Manager appointed by the Federal Executive.

It is suggested that you take note of this particular issue of the magazine for reference to these general rules in the case of all contests for the ensuing year. Details are as follows:

DISQUALIFICATION: A entry in WIA conducted contests may be disqualified if, upon checking the logs, it is necessary that the overall score be reduced by more than two percent. Score reduction does not include correction of arithmetic errors. Reductions may be made of unconfirmed QSOs or multipliers, duplicate QSOs or other scoring discrepancies.

An entry will be disqualified if more than two percent duplicate QSOs are detected as being claimed for credit.

For each duplicate or mis-copied call sign removed from the log by the contest manager, a penalty of the deletion of three additional QSOs of equivalent value to the offending claim may be applied.

The penalty will not be considered as part of the two percent disqualification criterion.

If a participant is disqualified under these aforementioned provisions that operator will be barred from entering the contest for that particular mode in the ensuing year: eg Disqualification from the 1988 RD Contest, phone section will prohibit an entry for the 1989 RD Contest, phone section. However, participation in the 1989 RD contest's CW section would be allowed.

Logs which are very untidy, illegible or incorrect in layout to a major degree may also be disqualified. The call signs of disqualified participants may be listed in *Amateur Radio* magazine, together with the contest results.

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How's DX?

THANK YOU

Thank you for making our DXpedition to Cocos-Keeling (VK9Y) and Christmas Island (VK9X) such a great success! Over 37 000 QSOs were made. Most of the contacts were on the 15 metre band, followed by 10, 20, 40, 30, 12 and 160 metres, with CW and SSB contacts being 50/50.

The first three weeks were spent on Cocos-Keeling using the call signs VK9YT and VK9NKG. The radio club equipment of VK9YY was used for this part of the DXpedition (TS-440, linear, eight-element Log Periodic on a 25 metre tower, six-element Log Periodic on a 20 metre tower, two-element 40 metre Delta Loop, dipoles and long wires). It was a perfect location for DX and would make an ideal contest location as it consists of eight old school rooms that could be used for separate shacks! From Cocos-Keeling all 40 CQ Zones were worked and almost 200 countries.

The next four weeks were spent on Christmas Island using the call signs VK9XT and AX9NKG. Only a little over 17 000 contacts were made but all zones were again worked.

As there is no longer a club station on Christmas, the TS-440 was loaned from Cocos Radio Club and was used in conjunction with a variety of dipoles, long wires, verticals and a Rhombic.

Another DXpedition to a Pacific island is now in the planning stages.

All QSLs are requested to be sent direct to the home QTHR of the operator (any donations would be greatly appreciated).

Scotty Martin W7SW/VK9YT/VK9XT, 7847 SW 11th Avenue, Portland, Oregon, 97219. USA.

George Koutsoukos VK6NKG/VK9NKG/AX9NKG, 154 Warwick Road, Duncraig, WA. 6023.

—Contributed by Scotty Martin W7SW

WORKING THE RARE ONE IS POSSIBLE. . .

It always amazes me when and where a rare DX station may appear. I consider the following experience rare because I personally have not worked any Canadian stations for a considerable period of time.

The other Saturday I took my family for a pleasant drive in the country near Mittagong. My wife enjoys long-stitch tapestry and a store was having a sale. This excursion cut into my afternoon leisure activity of "playing radios". Consequently I did not get on-air until about 1200 UTC.

After tuning for about 40 minutes and having thoughts of going QRT, especially as conditions were poor, I heard CI8CW working a number of US stations. Propagation was almost non-existent, however I decided to give a call. I was heard and reports were 5/5 both ways!

It only goes to show that working the rare one is possible if you try, no matter what power you may be running. In my case, it is sometimes harder than most as my output is about five watts to an antenna system of a simple long wire!

CI8CW is one of the stations of the USSR/Canada Expedition which became operational on March 1. It comprises skiers of the SKITREK Expedition travelling from Cape Artichesky on Severnaya over the North Pole to Cape Columbia on Ellesmere Island. This expedition is a privately funded operation and I believe QSL cards should be sent to Box 313, D Mills, Ontario, Canada, M3C 2S7.

Following is a list of stations heard on 20 metres during April and May.

APRIL

N7DF/NH2 — QSL to K0HDW
HP3EP
AP2SP
FR4DN — QSL to P Mondon, CD18, Avirons, 97425, Reunion Island.
K9AJ/KH5 — QSL to WA2MOE

MAY

C31UA
EM3MW — QSL to UZ3AZO
EU0A — QSL to UG7GWA
V44KAR — WV2LCH
4S7RO

WORKED DURING MAY

OA4BTO; EA8AMX; JP1AAZ; UB4EXP; EO5BGH (Special prefix used on May 9, 1988, to mark end of WWII hostilities in Europe).
EO5BGH — QSL to RB7GG
G4APL; EO2PPP; VI88SA (Moota Bay Scouts); HG9R; HG6N; UB4CWW; HG7B; UZ6YWB; HA5KKC; YU30I; IT9NDP; Y34K; NT2X; EA3EGB; HB0CZS; DL0JK; KI0G; VI88NSW; DK2MH; WE7B; K3EST; LU4FM; CI8CW; IO3EVK; I4JBJ; VE6CRP; VE7CZE; CI8CR WY5L/KH3 (Johnston Island QSL to N5DAS).

—Contributed by Bob Demkin

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RAAF RADAR REUNION

The Air Force Association announces a reunion, the first of its kind to be held in Canberra from September 13 to 16, 1988. It is for all Air Force personnel who served during World War II on radar stations or in squadron radar operations. More information from Ms Jo Dunbar (02) 913 8643, Bob Balfour (02) 875 1068, or write to Radar Branch President, W Fielder-Gill, 1 Douglas Avenue, Chatswood, NSW. 2067.

—Contributed by W Fielder-Gill and P Williams VK5NN

QSLs from the WIA Collection

Ken Matchett VK3TL
HONORARY CURATOR
PO Box 1, Seville, Vic. 3139

Looking every bit like a QSL card from Denmark, OZ4XC is, nevertheless, from New Zealand and it has an interesting history.

In the latter part of the 1920s, more and more amateurs in foreign countries were exchanging signal reports. The need for a call sign identification which indicated each station's country was obvious. The International Amateur Radio Union (IARU) devised the system of "intermediates" that became effective from February 1, 1927.

If, for example, New Zealand station 4XC were to call Brazilian station 2AB, the operator would no longer call 2AB (three times) de 4XC (three times) as with a local call, but would transmit 2AB (three times) sboz 4XC (three times). The combination "sboz" was known as the "intermediate" between the two stations and was always written in lower case. The "sb" stood for South America(s) Brazil(b). This was followed by oz standing for Oceania(o) New Zealand(z).

Unfortunately, as international traffic increased, the intermediate was frequently lost in the QRM. Later it was suggested that each intermediate precede the station call (for example, oz4XC, sb2AB) and that the intermediate "de" (French for from) again be used as previously between the two stations' call signs. This the above transmission became sb2AB de oz4XC.

A later proposal was that the old intermediates be used as "prefixes" to the call and, moreover, that they become an integral part of the station call sign so much so that they be written in capital letters like the rest of the call. So OZ4XC became the station call OZ4XC.

This system of intermediates was soon to be replaced, however, by our present system of prefixes and block call sign allocations on January 1, 1929, as a result of the historic international Radiotelegraph Convention at Washington.

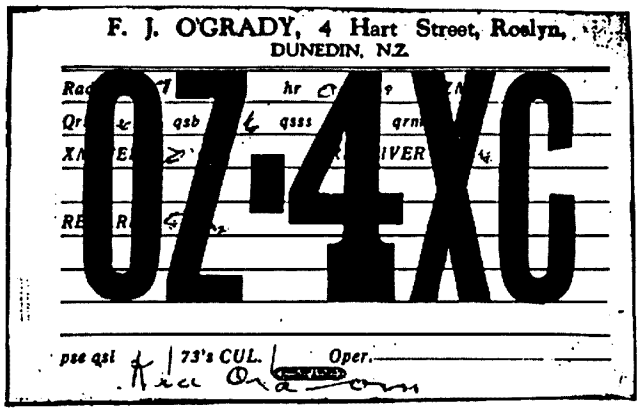
The card, XNU7EFF, as well as having a very long call sign, contains the interesting X prefix. The letter X in the call sign of experimental stations has a very long history. The first experimental stations in Australia bore this prefix (although it was seldom, if ever referred to as such in those days before World War I).

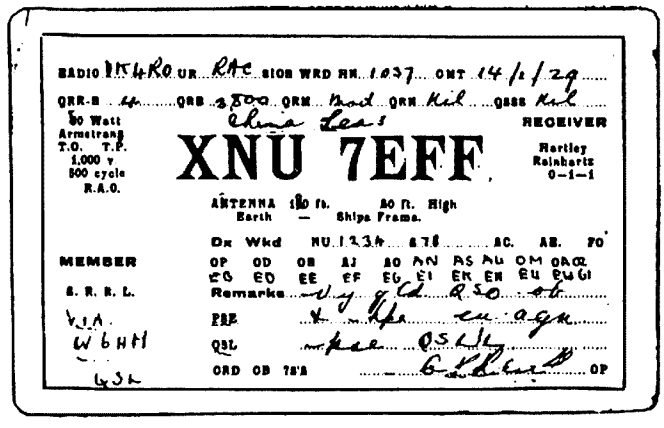
The letter X placed before a normal station call sign had quite a different meaning. Sometimes it meant "portable" but more often it indicated a ship's station with an amateur call, and in the 1920s was generally written with a lower case "x", eg xnu 7EFF Only in the latter part of the 1920s, both the intermediate "nu" together with the "x" were written in capital letters as on this QSL card. The NU in those years showed the licensee to be from the United States of America.

There were several ship stations in the late 20s operating with amateur call signs. Amongst them were xop1DR (Phillipines), xoa5AM (Australia), xen0CP (Netherlands), XEB4WK (Belgium).

A station, XOXR, in Australia operated frequently on the amateur bands in the early 1930s with a portable call sign XUOXR (anyone save prefixes?).

The ship operator of XNU7EFF was using only a modest 50 watts to a Tuned Grid — Tuned Plate (TGTP) circuit, an antenna 120 feet long (probably a halfwave dipole on the old 3.800 MHz band) with the frame of the ship as an earth. The Australian operator, Percy VK4RO, (now VK2EPW) was using the newly issued VK prefix when he made his QSO with this ship somewhere in the China Seas.





Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

THOUGHT FOR THE MONTH: If you remember the thought for last month, then this is the sequel: "With no transceiver in the shack, one must be doubly patient!" However, with any luck, I will have the unit back in a couple of weeks.

Many reports are coming in regarding the Asian intrusions on 28 MHz. There have been 266 AM mode transmissions reported for May, and most of those were the Asian nuisances. I have written to the DOTC about it, but received no acknowledgment, as yet. Perhaps it would help if a lot of AR readers sent a note off to the Department?

There were 83 cases of intrusions using CW; 230 on RTTY; 120 using other modes, and 18 intruders sent their call signs. Many thanks to the following for helping out with reports for May:
VK2s EYI and JJM; VK3s DID, DSW and XB; VK4s ADY, BHJ, BTW, BXC, FBA, IS, KAL and OD; VK5s GZ and TL; VK6RO, VK7RH; VK8s HA and JF

I recently received a letter from Michael VK3EMJ, with an accompanying report of the problem on 10 metres, and Michael is asking; "What can be done about it?"

Well, as I have mentioned before, you can send In reports to the Intruder Watch. These complaints are forwarded to the DOTC. If nothing is done by the Department, then I can only suggest that each individual amateur who protests the presence of illegal stations on the *amateur 28 MHz allocation* writes to the Department. The IW can only draw the attention of the Department to the problem. I know that the administration of at least one of the countries concerned knows what is going on, and is trying to stop it, but the problem is so widespread, that the effect is minimal. The other country's Administration is either not aware of the problem, or doesn't care. This is typical of the attitude of a lot of Administrations overseas, particularly the USSR.

So, all we can do is to keep tabs on the problem, and keep complaining. Send in those reports. . .

See you later, and good DX.

TECHNICAL MAILBOX

with AR's Technical Editors

Why are novice amateurs allowed to run 30 watts output on SSB, but only 10 watts on AM or CW?

Why is it, if I put a 20 watt fluorescent tube near my ATV to the G5RV it lights, even though my output is about four to five watts?

When the tube is near the pi network on the transmitter it does not light. Why? Recently, I have improved the ATU by putting in a more efficient coil, but I cannot get the tube to light. Is it because more power is going into the air and not being wasted in the ATU?

Firstly, it is great to hear from our younger novice members.

Both questions could involve quite lengthy explanations but I will try to keep the answers as short as possible.

Why the 30/10 watt limit was placed upon novice amateurs by DOTC is something you would have to ask the Department. The answer could be most revealing! Let us guess and say it may be part of an incentive licensing scheme. It surely could not be due to personal safety aspects associated with the differing levels of theory required for the licences. . .

Simply put, a single sideband speech signal of 30 watts Peak Envelope Power (PEP) equates approximately to 10 watts steady carrier whether Amplitude Modulated, or not.

However, what is the comparison as far as *useful received signal level* is concerned?

Let me turn the question around and ask *you* the difference in dB between the two signals as quoted. Consider the power in each sideband of the AM transmission and the fact that only one is necessary at the receiver (SSB) end, compared with 30 watts of single sideband, You could also go as far as taking into account the difference in the maximum band width required of an AM receiver. (10.79 dB and 13.79 dB respectively).

Considering the actual difference, you may still ask the question. Why?

Now, in the second question regarding the fluorescent tube — again, I will not go too deeply into the subject. Basically the fluorescent tube requires a potential difference across the internal gas to make this gas ionise. When the gas ionises, this in turn excites the internal coating of the tube and causes this to fluoresce and emit light.

The potential difference or electric field must exceed the breakdown voltage of the internal gas which may be expressed as a field strength in volts per metre.

In your case, by placing a 20 watt fluorescent tube near your ATU you have placed it within the RF field. The strength of this field will naturally be dependent on the voltages present at the ATU (assuming it is, of course, not shielded). If the RF voltage (electric field) exceeds the breakdown voltage of the tube it will glow. It may, at first, seem strange that a 20 watt tube will light up from a five watt source, but you will notice that the light output from the tube is nowhere near what it would be when consuming 20 watts at its rated voltage.

When you place the tube near the Pi Output Tank you have observed that it does not light. Obviously, the field strength here is lower than the tubes breakdown voltage. From this you can deduce that the ATU is radiating and not all your power is reaching your antenna.

With the later type of coil in the ATU, the tube does not light. This may mean more power is going to the antenna, but it may also mean that the changed shape or size of coil produces less external field. The only sure deduction is that the field strength is now less than it was in the place where the tube formerly lit.

If you were to place the tube near a voltage point on the antenna (say, at one end), it might then give some indication of power in the antenna, but at best, it would be only crudely qualitative.

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REPEATERS AND BEACONS

Tim Mills VK2ZTM
FTAC BEACON CO-ORDINATOR
PO Box 300, Caulfield South, Vic. 3162

10 GHz BAND PLAN

Do you have any comments on the plan published in May AR? Please convey them to either your Federal Councillor, Divisional Technical Officer or to FTAC, via the Federal Office.

REPEATER — BEACON LISTINGS

The list published in January is being updated. Does your group have any changes to be included?

PAGER INTERFERENCE

There has been little comment received to items about the problem in these notes. Your input is desirable so that the conclusions to the investigation includes your viewpoint.

50 CENTIMETRE BAND

ATV operation overlaps part of channel 35. Later this year there will be a translator at Brokers Nose, Wollongong, using 35. The planning of UHF television surrounding Sydney has used up the majority of the UHF band. Wollongong is the first major centre to have a wholly UHF service. Commercial WIN-TV will have 1000 kW EIRP on Channel 59. It would appear that Newcastle will change at a later stage also to a total UHF service.

UHF — MICROWAVE SURVEY

Have you supplied your input to this recent survey. Contact your Divisional Technical Officer for details.

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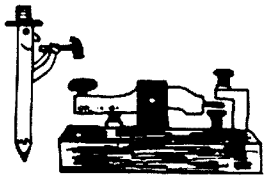

Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

Having just posted off July's column yesterday, I thought I would strike while the weather is bad and say "gidday Morsiacs" again as soon as possible. You never know when the chance of a holiday will come along. So, if you are waiting to see your name in print, my lead time this month is about 10 weeks!

Next month will be the anniversary of "The Morseman" column in *Break In* (the NZART equivalent of AR), written by Gary Bold ZL1AN. Good on you Gary. Gary arranged for me to be sent a copy of *Break In* and he gets a copy of AR, so that I can copy some snippets from his column. I say that because he always seems to write three or four times as much as I do, and his editor actually puts up with it! He also received a *free* 8044 chip from Curtis Electro Devices to do his write-up on. Following is a snippet from one of his earlier columns.

Back in the early days of Morse (and Vail), in their original (American) code, introduced in 1938, 11 letters were different from the ones we now use. Morse's "T", "L", and "O" were represented by dashes of different lengths. "J" and "Q" were both "dididahdit" (our "F"), and "F" was didahdit, while "R" was "dit didit". Some letters had internal spaces! "C" was "IE", "O" was "EE", "Y" was "II" and "Z" was "SE". The correct letter combination was apparently determined by context! The ampersand (&) was then commonly used, even in formal writing and was defined as "dit dididit" or "ES". This "binary symbol" has persisted to this day as the standard CW abbreviation for "and". (Isn't that incredible?).

Last year, or maybe the year before, everybody and his dog were complaining to Phil VK3CDU, about the clipped sound of his dots. I admit that some of us may have exaggerated a little in the interests of general stirring, and caused Phil a bit of worry at the time. But now, thanks to Gary, I have been enlightened.

Problems with weighting on Morse are not only caused by the keyer or key. It seems that minor variations in weighting were used by the Allies to identify particular U-Boat transmissions in World War II (see an engrossing article by John Roscoe G4QK in *Morsum Magnificat*, number 5). Do we subconsciously recognise CW friends by their fist or by the weighting on their signals?

Slight and unnoticed feedback can hold the keying circuit on for a few milliseconds too long. In some cases a good dose of RF feedback will hold the transmitter on permanently, (a problem you can sometimes solve over the air if you recognise the symptoms). This problem often shows up on a particular band or antenna while using high power. During the John Moyle Field Day this year, I was setting up portable on Mount Hotham and my 15 metre dipole on over 40 watts caused the rig to lock on transmit. I cured it in about five seconds by wrapping the earth-bus braid around a joining connector in the line from the keyer to the rig. Don't ask about the half-hour off the air because I bumped the squelch knob.

A sluggish keying relay can cause either heavy or light weighting. Can you think of any other causes?

How can weighting be checked? The side-tone oscillator is not a reliable guide, as it doesn't reflect exactly what goes up the coax. You can look at the RF with a scope, but it is difficult to see the small timing difference, and not everybody has a scope.

The best way is to use a field strength meter, in the shack, picking up stray RE The meter should have a longish time constant, and a linear scale. You can put one together with a junk-box diode, a tuned circuit, a microammeter, 1 Mohm and 1 microfardad — gives the one second time constant for good averaging. Wind the speed right up on the electronic keyer and send continuous dots. Note the meter reading (which is proportional to the average level of the RF). Now switch to a continuous carrier at the same power level. Divided the meter reading for the "dot stream" by the "continuous carrier" reading. The answer should be *one half*. If it is less then this, you have negative weighting or "clipped" elements. And vice-versa. If your rig has a meter reading output power that is reasonably linear you can use that instead. Note down the meter reading when sending a continuous carrier. Send a string of very fast dots and note the reading, it should be exactly *half*. If you know the keying speed, you can work out the weighting error using the equation T = 1200(2R-1)/W where T is the weighting error in milliseconds, R is the ration of "dot-stream" to "carrier" readings, and W is the keying speed in WPM. T positive means too heavy, and vice-versa.

If the weighting is wrong, what can you do? Check for RF feedback and use shielded cable for connections in the shack, especially from the paddle to the keyer and keyer to rig. Check that your equipment is all earthed properly, preferably with a heavy braid. I use the braid from old RG213 coax. Keep the length as short as possible to the ground stake/s. A friend ran his earth-bus back a few metres to his house and found he picked up the local AM radio station which was probably mixing with his signal. A simple test on air cured the problem. If weighting is too light, try testing it with the rig in both full break-in and semi-break-in modes. This will show up a problem in the antenna relay.

(Phil tells me my rig clips the dits on full break-in, but I don't believe him!). You can tell the amount of delay a station is using on his semi-break-in by hearing the clipped dits on the beginning of words following a space which is long enough to allow his receiver to drop in, it is fairly easy to tell if he is hearing between words or only between the longer breaks.

Of course, you can simply adjust the weight control on your 8044ABM to compensate, it is great for that, but you will have to readjust for different speeds. Well, I already do that anyway.

Don't let's forget the Remembrance Day Contest on August 13 and 14.

The All Asian CW Contest is on August 27 and 28.

Let us show all amateurs that CW is alive and well — and the way to go!

If you have any old magazines, CW equipment in any condition, or books that you would like to see going to a good home, please give me a call or drop me a line. I am too far from the city to do the usual fossicking. Items I have gleaned from conventions usually wind up in a budding novice's shack or are sent, following requests by amateurs needing hard to get items. I am not considering starting a museum, even though my junk room is overflowing from its place at work to the garage at home.

I enjoy resurrecting old keys and keyers and passing them along to operators who will *use* them, also if you have a need for anything like the above, do not hesitate to write and ask. (Also software for CPC6128 on amateur subjects, which I don't have time to write!).

How I envy the old timers who have a spare rig or more in the junk box either to loan to a friend or even use themselves on field days, or for mobile operation. Aside from a couple of spare keyers, all I have at present is a chirpy QRP transmitter, brew receiver, and a spare fuse for the main rig! Hopefully, by the time you read this, I will have resurrected the Army 62 set for CW at least, so Mario VK3NI, you can borrow it, but only if it doesn't interfere with your studies!

Thanks Lindsay VK3ANJ, for your contribution on American Morse. Lindsay also says; "It is interesting to read (in the notes he sent copies of) of the standard of maths and physics required by those early telegraphists, equal, at least to present year 12. As demand increased for operators, the education standard decreased, probably concentrating more on practical subjects centred around familiarity with standard equipment. A pattern which continues to the present at the expense of a better understanding of the art."

Way back in May this year, I received a letter from Tony Smith G4FAI, who is producing *Morsum Magnificat*. He says; "I am having to raise the price of MM from the Autumn issue (Number 9) to take a more realistic view of the cost of airmail. Up to now all the overseas copies have gone airmail for the cost of seamail. From Number 9 the airmail cost will be £8.50 with a surface mail option enabling subscribers to continue to receive MM at the old price of £7.00 if they don't mind waiting for their copy. New subscribers starting with the summer issue (Number 8) will however be accepted at the old rate and their first year's copies will still be sent airmail. So if anyone has been thinking about subscribing they still have a chance before the price goes up!"

Until next time, 73 Gil.

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic. 3199

Since examination devolvement has now become a reality, it seems to be time to reconsider some of the aspects of organising examinations. I do not yet have a lot of information about which groups intend to conduct examinations, or when, but I have received some comments and views which are worth mentioning.

From surveys, discussions and responses received when the devolvement was first mooted it is apparent that one of the major concerns for most people was that the entry standard for the hobby should not be allowed to fall. A few correspondents were worried that the standard may rise. Some of us placed more emphasis on the standard being even throughout than on the actual level.

The Department considers that the monitoring procedures being established will maintain both the present standard and the uniformity which we have come to expect from examinations prepared by only one body.

Besides the actual question papers or tapes, there are many other facets to an examination. Much criticism has been directed at the present system, especially at some of the larger centres. There has also been praise, from those who have appreciated the efforts made by DOTC staff to put candidates at ease. These comments often come from those who sat at the smaller centres or were eligible for special examinations. Those who are intending to conduct examinations would be well advised to seek feedback from recent candidates before finalising their planning.

It is unlikely that any group will be in a position to conduct an examination on the scale of a DOTC quarterly event. One of the biggest advantages of the devolvement is that we can now avoid that situation. I would expect that the need to cater for more than about 20 candidates will not occur very often. This is a number that can probably be fitted into a club meeting room, a school room or perhaps a local library after normal hours.

No organisational procedures have been specified apart from checking candidate identity and maintaining security of the actual paper, so the organiser is free to arrange the venue to suit. In most cases it is hoped that the costs involved will be minimal so that candidates are not required to pay unreasonable fees, and organising bodies are not out of pocket.

It may be harder to find a venue with appropriate furniture. Ideally, there should be separate tables for all candidates, or at least tables large enough to allow plenty of space between candidates. This is necessary not only to avoid cheating, but also for the comfort, concentration and peace of mind of the candidates. Again, the use of a school room may be recommended, or a library well fitted with individual carrels. Please, organisers, check that the chairs and tables do not either wobble or squeak when in use!

Seemingly small matters assume major importance when an individual is under stress. Have a clock visible from all points in the room. Make sure the chairs are a suitable height. Keep to the published timetable, but if there are problems, do not allow candidates in until all the papers are on the tables. If holding both AOCP and Novice examinations, run them separately to avoid distraction of one group moving out while others are still going. Have at least two supervisors in the room at all times, even for very small groups. Try to have the room at a comfortable temperature.

Of course the situation for the CW sending and receiving will be different again.

I could go on, but I am sure that if the organisers give some thought to these minor matters they will be able to extend the list considerably, and the groups who attend to them all will develop a reputation for efficiency and understanding.

A reminder to those sitting for the Regulations in August — the questions will be based on the Handbook which has been in use for some years. The November paper will be based on the new leaflets from DOTC.

My best wishes to all who are making an attempt in August. Remember, ***read the question***, and ***all*** the answers.

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WICEN News

WICEN VICTORIA MOVES AHEAD

It is more than five years since the Ash Wednesday bushfire disaster. A restructured WICEN has since emerged in Victoria.

The disaster showed WICEN's strengths and weaknesses. A restructure plan was started following a major debriefing after the fire.

WICEN's self-examination and government investigations into the State's disaster preparedness also resulted in a reshaping of the Amateur Radio Service role.

A major effort has been in the standardisation of WICEN procedures throughout Victoria.

This is in recognition that should a major disaster occur over several days, members could be deployed from anywhere in the State. Volunteers from within WICEN have written a training manual for WICEN operators. A second publication — a regional co-ordinators handbook — is also about to be published covering the key areas of WICEN's role, structure, procedures and field practices.

A WICEN Central Committee has been dealing with a wide range of issues including liaison with State Government Statutory Committees and WICEN user groups.

Some other matters it deals with include preparation of public relations material, ID cards for WICEN members, State-wide nets, portable repeaters and examination of technology to enhance WICEN communication facilities.

Other projects now being undertaken are a promotional video on "Car Rallies and WICEN", an instructional video "Repeater and Portable Repeater Operations", and a compilation of footage from various events such as the Murray River Canoe Marathon, bike rides, horse riding marathons, vintage car rallies and yacht races.

WICEN has much greater recognition and a higher profile among the emergency services and government agencies. The awareness of WICEN has also resulted in more requests for its participation in exercises, with in excess of 50 exercises expected in this the Australian Bicentenary Year.

The two biggest events of the year will be the Castrol Vintage Car Rally which was held in March, and the forthcoming Caltex Bike Ride from Melbourne to Sydney via Canberra, in November and December.

WICEN has been making a plea, through radio clubs, for radio amateurs to take part in exercises which provide operators with excellent field and traffic handling experience.

—Contributed by Jim Linton VK3PC with acknowledgment to WICEN Co ordinator, Leigh Baker VK3CDP

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SILENT KEY

Well-known retired Ambassador William Porter, a Life Member of the ARRL, became a Silent Key earlier this year. This gentleman had a lifelong career with the Foreign Service.

During the course of his duties he activated such rare calls as CN8EP, FA2VX, 7X2VX, XV5AA, HL9AA, 7Z1AB to name but a few. The family tradition of the hobby will be carried on by his son, William Porter KA4NAU.

AMATEUR OPERATION FROM KC6

KC6, the Federated States of Micronesia (FSM), formerly the East Caroline Islands, is now a sovereign, self governing nation in free association with the United States of America.

The FSM has yet to establish operating procedures for the licensing of radio amateurs and until this is done the FCC will assist by controlling the licensing arrangements.

RECIPROCAL IDENTIFICATION

The FCC has changed the identification procedure for reciprocal licence holders in America. As from July 18, 1988, the wording of the regulation is:

"When the station is operating under a reciprocal permit, the call sign transmitted in the identification procedure must be that issued to the station by the licensing country, preceded by the appropriate letter-numeral designating the station location, separated by the slant mark '/' or by the word 'stroke' or 'slash' during radiotelephone operations. At least once during each intercommunication, the Identification announcement must include the geographic location as nearly as possible by city and state, commonwealth or possession, stated in the English language".

—Adapted by Ken McLachlan VK3AH, from ARRL Newsletters Vol 7, No 10 & 11

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR

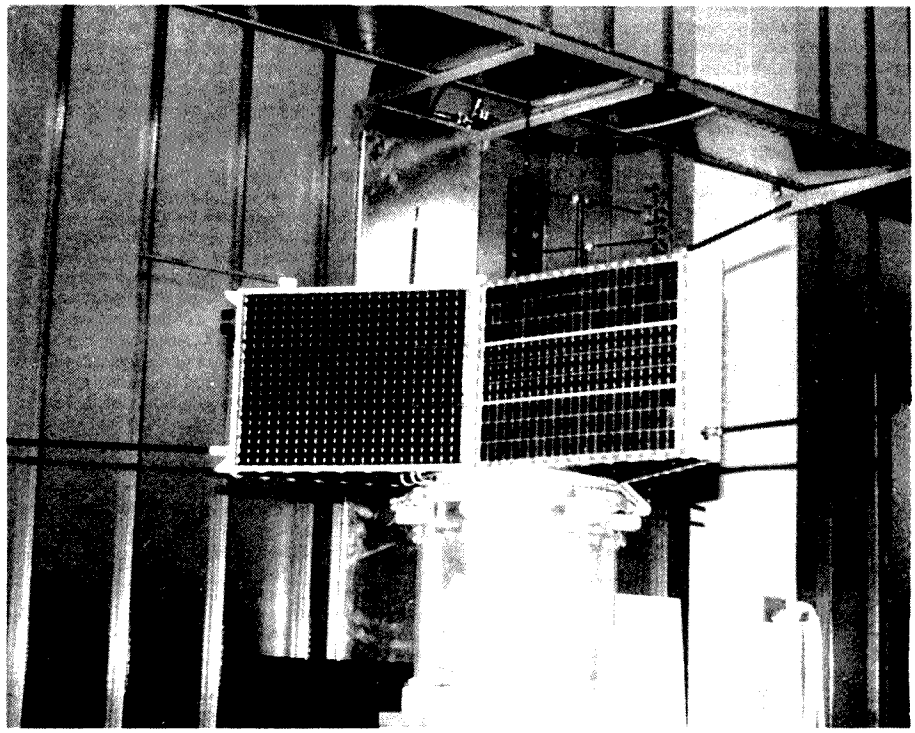
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC Sunday
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements, from the AMSAT Australia net. This information is also included in some WIA Divisional Broadcasts.

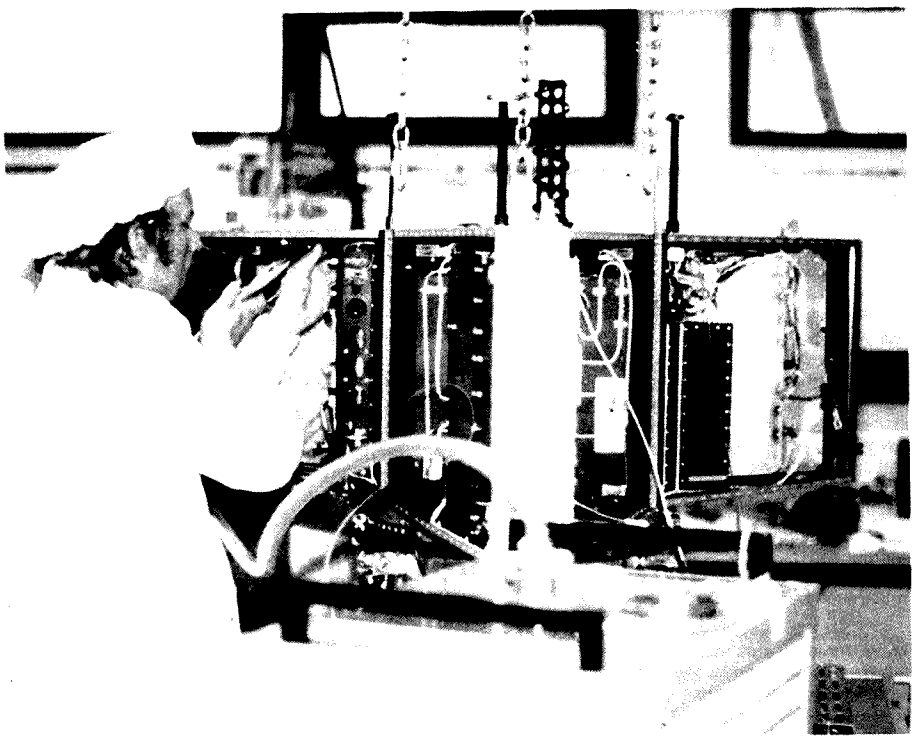
AMSAT OSCAR 13 LAUNCHED

On Wednesday, June 15, AMSAT OSCAR 13, previously known as Phase 3C was successfully launched. The following compendium of notes has been obtained from various bulletin boards in the time between launch and the deadline time for these notes. In the coming weeks there will, no doubt, be a dearth of technical literature released on AO-13, now that the launch has been made. By all accounts, everything is operating as planned, and to quote Graham VK5AGR, "everything is nominal".

During the month I received the photographs included in this month's column from one of our erstwhile W-friends, Ross Forbes WB6GFJ. (The photographs are courtesy of Ross, AMSAT-DL and AMSAT-NA). Ross has been a contributor and ardent supporter of AMSAT-Australia and this column for many years. Ross in fact, donated the tungsten shields to protect the tops and bottoms of each radiation hardened memory chips contained in the Integrated Housekeeping Unit (IHU). From us all "down-under" thanks Ross.



The Phase -3C satellite sits on the shaker table ready for vibration tests in West Germany in December 1987. The spacecraft was subjected to simulated launch vehicle vibrations to isolate any mechanical resonances.



Wolfgang Mueller (AMSAT-DL) with a Helium sniffer looking for leaks in the Phase-3C propulsion system. None were found!

THE LAUNCH ANNOUNCEMENT FROM AMSAT-AUSTRALIA

To: ALL AT AMSAT
From: VK5AGR June 15/1728
Subject: OSCAR-13 Successfully Launched

AMSAT OSCAR-13 was successfully launched at 11:19:04.330 UTC on June 15 aboard the new Ariane 4 Launcher from Kourou, in French Guiana.

The first telemetry signals were copied in Adelaide when the General beacon on 145.812 MHz switched on at 14:03'35 UTC. The beacon was transmitting 400 Baud Phased Shift Keyed (PSK) telemetry. The first block received was an "M" block one of the four types of message blocks that can be transmitted on the PSK telemetry.

The message read:
DANKE KARL

This message and the K, L, and N message blocks were preloaded before launch but I have included the "M" block because I feel that it sums up well the feelings of most — in that we all owe Karl Meinzer DJ4ZC, a debt of gratitude

for his efforts (with the help of many others) in ensuring that OSCAR-13 became a reality.
The launch itself went very smoothly with no known problems at this stage. ESA I am sure will be analysing all the data transmitted by their new Ariane 4 launcher to confirm that the launch was a 100 percent success.
Currently, the General Beacon on 145.812 MHz is transmitting CW at 10 WPM on the UTC hour and half-hour. 50 Baud RTTY on the quarter and three-quarter hour with 400 Baud PSK telemetry for the rest of the time. The CW and RTTY run for approximately five minutes each.
The PSK telemetry indicates that all systems on AO-13 are within specification. The average temperature in the spacecraft is 10 degrees Celsius. All voltages are on target. The attitude of the spacecraft is as expected, Longitude 270 and Latitude -20, which gives a Sun Angle of -21 degrees and the spin-rate is a very respectable eight RPM.
Peter DB2OS intends to re-orientate the spacecraft as soon as possible in preparation for the first kick-motor firing within the next week.
73 Graham VK5AGR (June 15, 1988 1722 UTC).

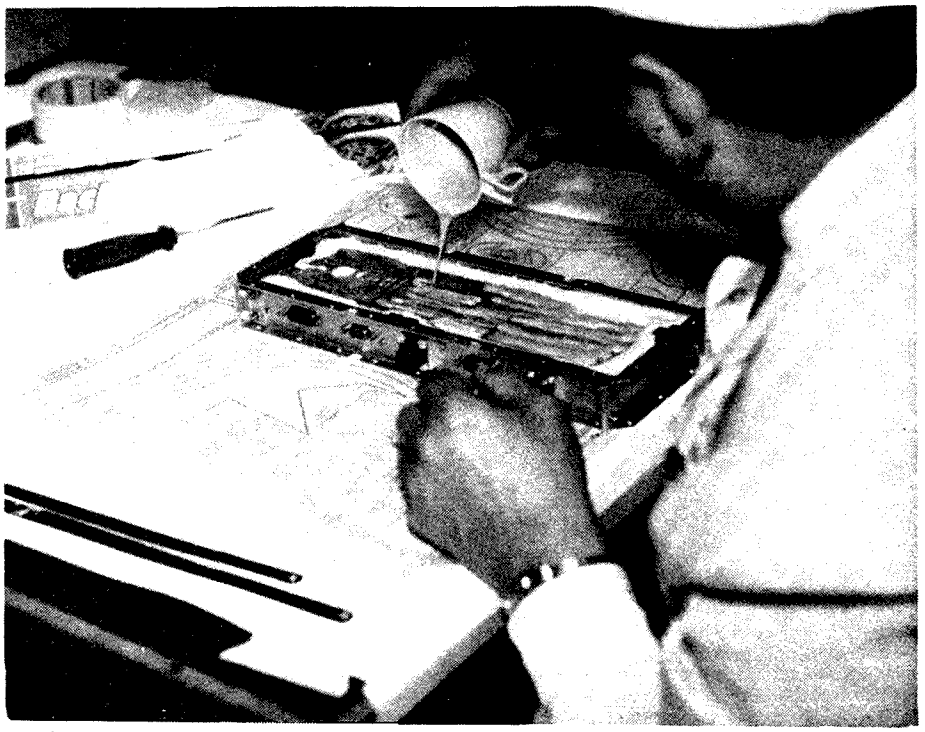
FIRST FEW DAYS OF AO-13's LIFE

HR AMSAT NEWS SERVICE BULLETIN 163.06
FROM WA2LQQ
WARWICK, NY June 11, 1988
To all radio amateurs BT

Following ejection from the carrying structure at T+80 minutes, a series of carefully planned activities is implemented. After a period of outgassing, establishing thermal equilibrium and topping of the batteries, the Mode B beacon is activated at about T+170 minutes.

When the first frames of telemetry are received by command stations, they will be carefully checked to establish that all electrical, thermal and pressure values are within tolerance. An important assessment to be made as soon as possible is the attitude and spin rate of the satellite. If all seems according to plan, a decision will be made to activate the higher power engineering beacons (EB) on either two metres or 70 centimetres. Then, careful monitoring of the telemetry will proceed thereafter in parallel with the first major task following launch — orbit determination.

Working in league with various government tracking facilities around the world, AMSAT engineers will attempt to get a good fix on AO-13 on the first few orbits. During this period, commands will be issued to the satellite which activate the magnetorquers during perigee passages. These devices, interacting with the geo-magnetic field, will change the orientation of the satellite to the desired one and spin it up like a top to a relatively high spin rate. The spinning, perhaps as fast as 60 RPM, will add stability when the kick motor is fired within about a week or two of launch depending on satisfactory orbital determinations, attitude maneuvers and system operating conditions.

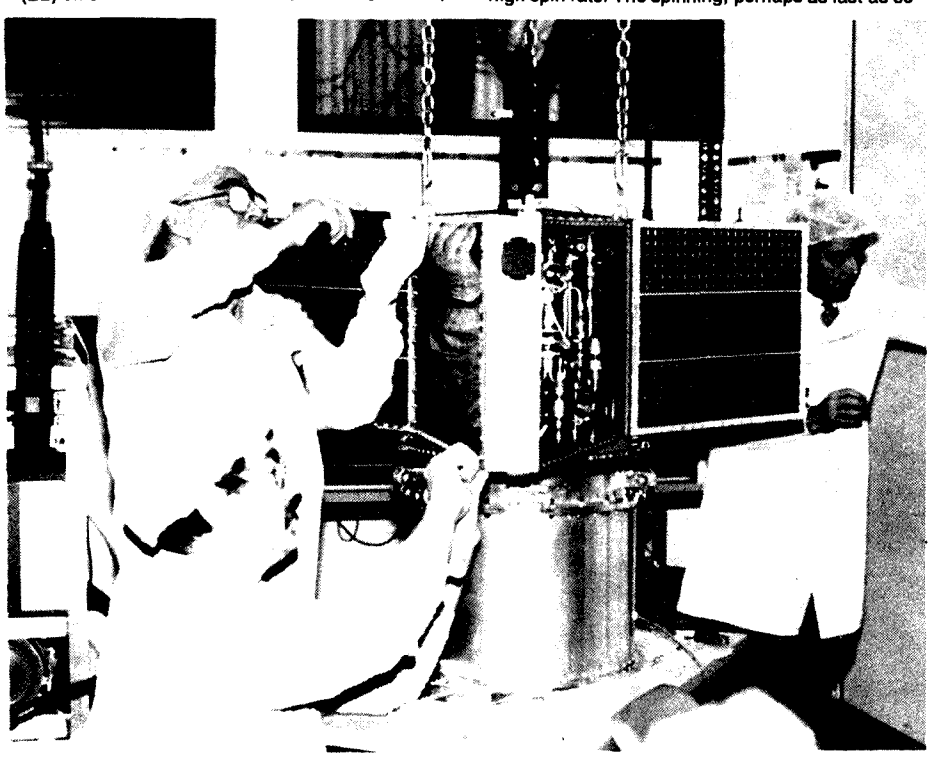


Werner Haas DJ5KQ, applies a potting compound to the Liquid Ignition Unit (LIU) of the Phase-3C spacecraft. The LIU is part of the propulsion system and controls the on-boars kick motor.

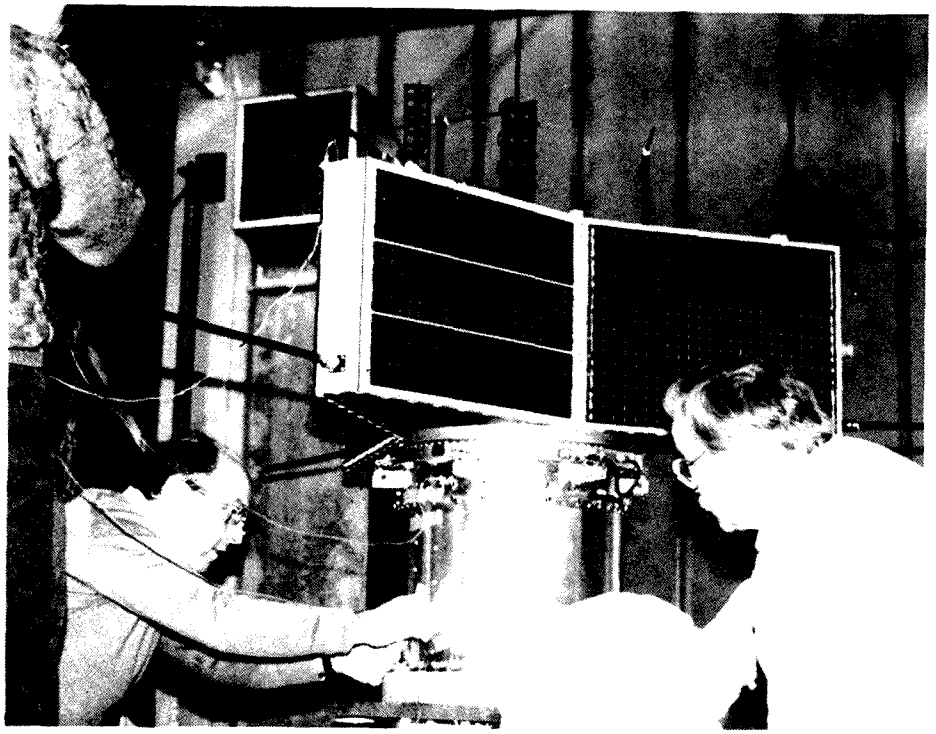
The next major task is to modify the GTO to a more usable one. The initial orbit as provided by the Ariane will have a 222 kilometre perigee; 36 000 kilometre apogee; 10 degree inclination. The desired final orbit has perigee at 1500 kilometres; apogee at about 36 000 kilometres and inclination at 57 degrees.

The orbit modification will be accomplished using the on-board rocket engine called a kick motor. This small rocket produces a thrust of 400 Newtons or a little under 100 pounds. That is enough to keep a small car rolling against frictional and aerodynamic forces on level ground. But on the 140 kilogram spacecraft, the result is much more noticeable. In a series of not less than two and likely not more than four episodes, the kick motor will be ignited to modify the GTO. The resultant acceleration imparted to AO-13 is an amazing 0.9 miles per second or about Mach 5. AO-13 could, in a sense, out run an SR-71 based on the acceleration yielded by the little MBB kick motor it carries.

The first kick motor burn will be accomplished as soon as possible; within a week of launch is likely. Plans call for a first burn yielding a delta V (change in velocity) of 454 m/sec, giving an intermediate orbit of 856 kilometres x 36086 kilometres with inclination of 26 degrees. Then, burn #2 would require a delta V of 904 m/sec giving a final orbit of 1500 kilometres x 36086 kilometres inclined 57 degrees. The first burn gives an opportunity to calibrate the motor performance by analysing the actual intermediate orbit. Quick and accurate ranging during this period will be essential. If the



AMSAT-DL technicians apply a protective cover to the Phase-3C solar panels.



Preparing the Phase-3C satellite for vibration tests in West Germany in December 1987. On the left is Karl Meinzer DJ4ZC, who is applying the accelerometers to the satellite prior to the shake test. Konrad Mueller of AMSAT-DL observes.

burn is a little short, another one with the same orientation can be accomplished to make up the difference.

PHASE 3C OPERATING FREQUENCIES

HR AMSAT NEWS SERVICE BULLETIN 149.07
FROM AMSAT HEADQUARTERS
WASHINGTON, DC May 28, 1988
To all radio amateurs BT

As previously announced, here are the Phase 3C operating frequencies.

Mode B	Uplink	435.420 — 435.570 MHz
	Downlink	145.975 — 145.825 MHz
	GB	145.812 MHz
	EB	145.985 MHz
Mode JL	L Uplink	1269.620 — 1269.330 MHz
	J Uplink	144.425 — 144.475 MHz
	RUDAK up	1269.710 MHz
	L Downlink	435.715 — 436.005 MHz
	J Downlink	435.990 — 435.940 MHz
	RUDAK down	435.677 MHz
	GB	45.651 MHz
Mode S	Uplink	435.601 — 435.637 MHz
	Downlink	2400.711 — 2400.747 MHz
	Beacon	2400.325 MHz

PHASE 3C KICK MOTOR BURN PLAN

HR AMSAT NEWS SERVICE BULLETIN 149.06
FROM AMSAT HEADQUARTERS
WASHINGTON, DC May 28, 1988
To all radio amateurs BT

After months of planning, AMSAT engineers and scientists in several nations have jointly determined what they believe to be an optimal series of maneuvers to change the orbit of AO-13 from its initial value to a stable, useful one. They will achieve this, they say, with minimum risk given the anticipated engine performance. To accomplish this involves close measurement of the orbit, careful calculation of the motor performance and timely execution of at least two kick motor burns.

The Ariane 4 launcher will place the three payload satellites in a so-called GTO or geosynchronous transfer orbit. With a perigee height of only 222 kilometres (137 miles), it is necessary to use the kick motor to boost the perigee as soon as possible. Each of the three satellites in the stack employs its own kick motor.

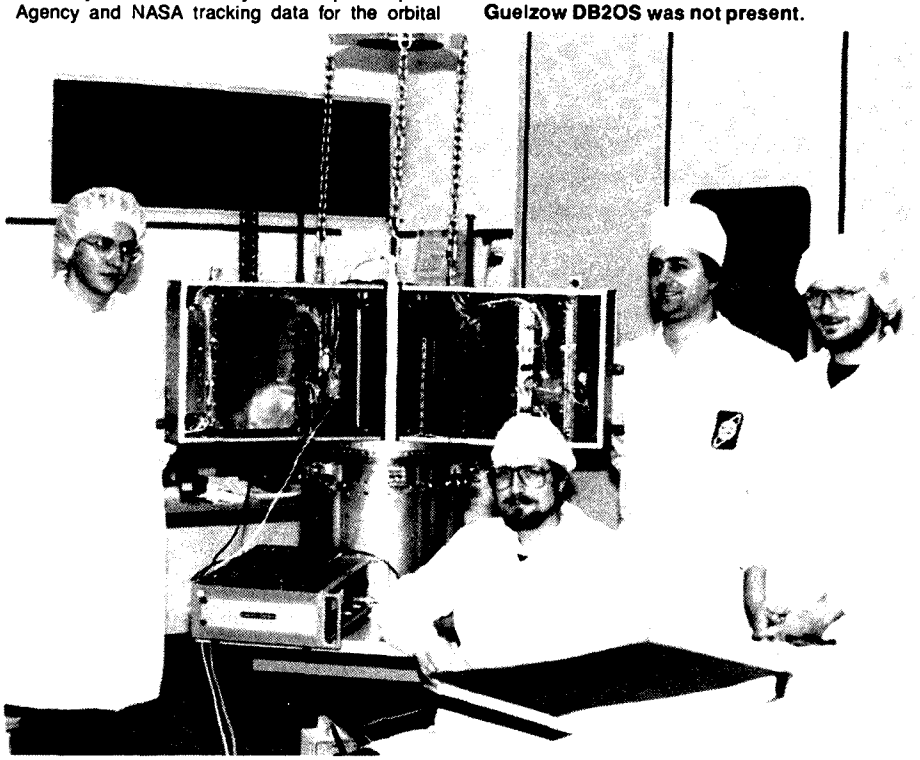
Initially, AMSAT will rely on European Space Agency and NASA tracking data for the orbital data. During the first few days AMSAT will employ its own tracking system for calibration only. AMSAT's technique depends on active ranging using round-trip delay time measurements to the satellite. Then after kick motor burn, AMSAT will do its own orbit determination. Because of the small radar cross-section of AO-13, it is very difficult to find at 36 000 kilometres. In a general sky-search using even the most power ground-based radars, it could not be located. However, given a fairly small vicinity in which to search, the large government radars can track with precision thereafter. AMSAT will thus narrow the search range using its own equipment and ranging techniques to provide vital hints to officials operating the radars.

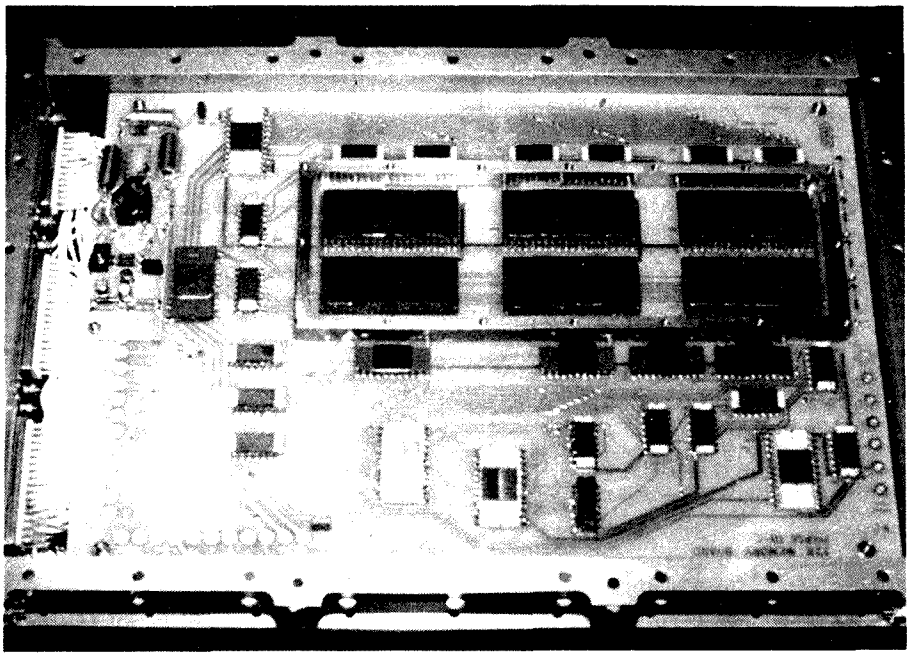
The initial orbit as provided by the Ariane will have a 222 kilometre perigee; 36 000 kilometre apogee; 10 degree inclination. The desired final orbit has perigee at 1500 kilometres; apogee at about 36 000 kilometres and inclination at 57 degrees.

The first kick motor burn will be accomplished as soon as possible; within a week of launch is likely. Atmospheric drag would cause the satellite to fall from orbit in a few weeks if nothing were done to raise the perigee. The strategy worked out by KA9Q, N4HY and G3RUH, is a conservative one which, according to KA9Q, uses the first burn to "make the second one safe. That is," he says, "the first burn should be just long enough so that at no time during the second burn will the instantaneous perigee decrease below a safe value of 500 kilometres."

Thus the plan calls for a first burn yielding a delta V (change in velocity) of 453.735 m/sec, giving an intermediate orbit of 856 kilometres x 36086 kilometres with inclination of 26 degrees. Then, burn #2 would require a delta V of 903.899 m/sec giving a final orbit of 1500 kilometres x 36086 kilometres inclined 57 degrees. The first

The Phase-3C satellite RUDAK digital repeater team from Munich consists of Gerhard Metz DG2CV, Hanspeter Kuhlen DK1YQ, Knut Brenndorfer DF8CA, Stefan Echart DL2MDL. Team member Peter Guelzow DB2OS was not present.





The Phase-3C Integrated Housekeeping Unit (IHU), a sophisticated computer which controls the satellite, now contains radiation hardened memory donated by Harris Corporation. It was designed by Steve Robinson W2FPY and built by Gordon Hardman KE3D.

The plan calls for all burns to be done at apogee. No attempt will be made to change the argument of perigee. With an initial setting at 178 degrees, apogee will occur nearly over the Equator. Apogee will move north such that 3.5 years after launch, apogee will occur at 57 degrees North Latitude. In another 3.5 years, apogees will return to the Equator. Thus, apogee will remain in the Northern Hemisphere for the first seven years of the satellite's operation and in the Southern Hemisphere for the second seven years.

AMSAT-AUSTRALIA NEWS BULLETINS

A reminder for newcomers to the satellite ranks that the Sunday Evening News Bulletin, presented by Graham VK5AGR, (refer schedules at the head of this column) continues to be the best source of up-to-date and reliable news available anywhere in the world. With the successful launch of AMSAT OSCAR-13, the latest launch information, orbital elements, telemetry formulae, etc, will be disseminated by Graham as they come to hand. *Stay tuned.*

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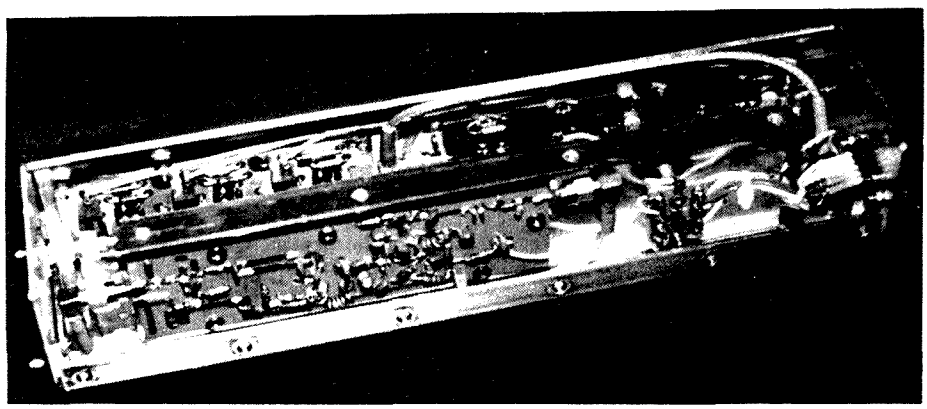
burn gives an opportunity to calibrate the motor performance by analysing the actual intermediate orbit.

Using available orbital data, DJ4ZC at AMSAT-DL will execute the first burn from Marburg, West Germany. KA9Q and N4HY in New Jersey, will then carefully determine the intermediate orbit and estimate the delta V of the satellite. This will calibrate the motor performance during the first burn. With this data in hand, a precise second burn can be planned and executed perhaps within two or three weeks of the initial burn.

Quick and accurate ranging during this period will be essential. If the burn is a little short, another one with the same orientation can be accomplished to make up the difference. "If it is a little long," says KA9Q, "we will be taking more of a 'insurance dog-leg' than is necessary but we'll probably still make it to the final orbit. Clearly it would be better to err on the short side."



The Phase-3C Mode-S transponder was designed and built by a Colorado team under the leadership of Bill McCaa K0RZ.

SATELLITE ACTIVITY FOR THE MONTHS OF MARCH, APRIL AND MAY 1988

1. LAUNCHES

The following launching announcements have been received:

INT'L NO 1988	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INC deg
027A	Cosmos 1936	Mar 30	USSR	89.0	290	189	64.8
028A	Gorizont 15	Mar 31	USSR	24hr36m	36560		1.3
029A	Cosmos 1937	Apr 05	USSR	100.1	813	774	77.0
030A	Cosmos 1938	Apr 11	USSR	89.4	316	209	72.8
031A	Foton 1	Apr 14	USSR	90.5	397	225	62.8
032A	Cosmos 1939	Apr 20	USSR	976	678	620	98.0
033A	OSCAR 23	Apr 26	USA	108.6	1302	1017	90.4
033B	OSCAR 32	Apr 26	USA	108.7	1316	1018	90.4
034A	Cosmos 1940	Apr 26	USSR	24hr01m	35849		1.2
035A	Cosmos 1941	Apr 27	USSR	89.3	293	217	70.3
036A	Ekran 18	May 06	USSR	23hr47m	35620		0.4
037A	Cosmos 1942	May 12	USSR	89.8	385	178	67.0
038A	Progress 36	May 13	USSR	88.6	262	193	51.6
039A	Cosmos 1943	May 15	USSR	101.2	876	851	71.2
040A	Intelsat 5AF13	May 17	ITSO	1373.3	35734	33364	0.9
041A	Cosmos 1944	May 18	USSR	89.4	311	205	64.8
042A	Cosmos 1945	May 19	USSR	90.3	391	217	70.4
043A	Cosmos 1946	May 21	USSR	11hr15m	19137		64.2
043B	Cosmos 1947	May 21	USSR	11hr15m	19137		64.2
043C	Cosmos 1946	May 21	USSR	11hr15m	19137		64.2

2. RETURNS

During the period 151 objects decayed including the following satellites:

1984-015A	Ohzora	Apr 20
1984-053A	Cosmos 1567	Apr 03
1987-076A	Cosmos 1881	Mar 30
1968-025A	Cosmos 1935	Apr 08
1985-030A	Cosmos 1646	May 12
1985-082A	Cosmos 1682	May 17
1988-024A	Progress 35	May 05
1988-027A	Cosmos 1936	May 18
1988-030A	Cosmos 1938	Apr 25
1988-031A	Foton 1	Apr 28
1988-035A	Cosmos 1941	May 11

3. NOTES

1987-101A Cosmos 1900:

According to Soviet authorities, radio contact with this satellite was lost in April 1986; the nuclear powered satellite will stay in orbit until August-September 1988. After that, it will cease its existence; the satellite is equipped with systems providing radiological security on the termination of the flight and the flight is constantly monitored.

1988-038A Progress 36:

Docked with space station MIR on May 15, 1988.

—Contributed by Bob Arnold VK3ZBB

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DEADLINE FOR OCTOBER IS AUGUST 22, 1988

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

Zdena Vondrakova OK2BBI.

1988/89 OFFICE BEARERS

At the Annual General Meeting, held on May 23, the following Office Bearers were elected:

President	Marilyn VK3DMS
Immediate Past President	Helene VK7HD
Vice-President and Secretary	Jenny VK5ANW
Vice-President and ALARA-Meet Co-ordinator	Maria VK5BMT
Treasurer and Souvenirs	Val VK4VR
Minute Secretary	Meg VK5AOV
Publicity	Joy VK2EBX
Awards Custodian and Historian	Mavis VK3KS
Contest Manager	Marlene VK3JAW
Librarian	Kim VK3CYL
Sponsorship Secretary	Gwen VK3DYL
Newsletter Editor	Bron VK3DYF

STATE REPRESENTATIVES

VK1/2	Joy VK2EBX
VK3	Bron VK3DYF
VK4	Josie VK4VG
VK5/8	Maria VK5BMT
VK6	Bev VK6DE
VK7	Helene VK7HD

Our thanks to retiring committee members, Margaret VK4AOE and Bobbie VK2PXS, for their services to ALARA over many years.

VI88NSW

On May 30-31, VK2 ALARA members operated the call sign VI88NSW. Those who participated enjoyed it very much, although Heather VK2HD was troubled by thunder storms during part of her operating time, necessitating "shutting up shop" for a while.

I began slowly on Monday, 30th with virtually no propagation on 20 metres, but things improved later in the day, and some interesting contacts were made. Unfortunately for me, work interfered on Tuesday 31st, limiting my time on air, but 80 metres was very good on both nights. Freda VK2SU, handled CW on three bands.

Perhaps the comment made by Margaret VK2PNG, summed it up: "Thanks, . . . I did enjoy the evening."

Our thanks to the VK2 Division of the WIA for giving us the opportunity to use a Bicentennial call sign.

BICENTENNIAL CALL SIGNS

Several of the Bicentennial call signs have been or will be used by ALARA.

VI88QLD	July 23 to 25.
VI88VIC	September or October. Date not determined.
VI88WIA	July 4 to August 1. October 31 to November 13. QSL information for ALARA's use of VI88WIA is via the VK5 Bureau.

BYLARA AWARDS

These awards are available for working YL members of BYLARA and are also available to shortwave listeners.

BYLARA Award	Work 15 BYLARA members
Advanced BYLARA Award	Work 30 BYLARA YL Members

If you already hold the BYLARA Award, you only need to work another 15 YLs and send the log details with your award number for checking.

Scottish BYLARA Award	Work 15 GM BYLARA YL members

Each award costs £1.50 or four IRCs.

Full log details should be clearly presented and should, if possible, include the BYLARA membership numbers of the stations worked. QSL cards are not required. Contacts can be made on any band and any mode, except repeaters.

Applications to Award Manageress: Joy Stirling GM0GUU, 43 Springfield Park, Kinross, Fife, Scotland.

MAVIS STAFFORD BICENTENNIAL AWARD

The Mavis Stafford Bicentennial Trophy continues to create interest. It may not be generally realised that the only ALARA contacts not counted for the Trophy are those made on the *official* 80 metre net on Monday evenings. Contacts on any other net, contest, etc, may be counted towards this trophy.

The ALARA Contest in November would be a good time to look for contacts. Hopefully, propagation will be good and some of our DX members will be heard at this time.

ALARA members are mostly active on YL Activity Day, the sixth of each month, and often on other YL nets, including 21.283 MHz, Wednesdays, 0600 UTC; 21.188 MHz, Fridays, 0400 UTC; 14.148 MHz, Fridays, 0500 UTC; and the 222 YL Net on Mondays, 0600 UTC on 14.222 MHz.

BITS AND PIECES

Our Birthday Activity Day was held on July 23, with some interesting Bicentennial call signs on air. President Marilyn VK3DMS, had the call sign VI88WIA, and Val VK4VR, was using VI88QLD.

On June 14, a presentation of books was made to Walford School, in Adelaide in appreciation of their assistance with the ALARA-meet held last September.

The next ALARA-meet will be held in Dubbo in September 1990.

Poppy VK6YF, was fortunate enough to have several contacts with Gwen VK3DYL/W. Gwen apparently has been having a marvellous time in the USA.

Mavis VK3KS, will operate VI88WIA during the ALARA Contest in November.

Marie VK2NKN, is now VK8NKN, and living in Katherine, NT.

AWARD UPDATE

No 139, to Bron Brown VK3DYF, on April 13. One endorsement sticker and one bicentennial sticker.

That's it for this month.

73/33 Joy VK2EBX

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BICENTENNIAL CALL BOOK ENTRIES

Those amateurs who wish to have their name and/or address deleted from details to be printed, are advised that they may make such a request in writing to the Federal Office, setting out what they wish to have suppressed. Any such requests must be received by the Federal Office on or before August 31, 1988. Write to:
Call Book Details
PO Box 300
Caulfield South, Vic. 3161.

SOLUTION MORSEWORD 18

Across: 1 dux 2 vow 3 real 4 fade 5 sawn 6 vast 7 gape 8 Texan 9 this 10 rents
Down: 1 bug 2 fix 3 steel 4 airs 5 aura 6 once 7 Manx 8 urge 9 raid 10 gibe

	1	2	3	4	5	6	7	8	9	10
1	—	•	•	•	•	—	—	•	•	—
2	•	•	•	—	—	—	—	•	—	—
3	•	—	•	•	•	—	•	—	•	•
4	•	•	—	•	•	—	—	•	•	•
5	•	•	•	•	—	•	—	—	—	•
6	•	•	•	—	•	—	•	•	•	—
7	—	—	•	•	—	•	—	—	•	•
8	—	•	—	•	•	—	•	—	—	•
9	—	•	•	•	•	•	•	•	•	•
10	•	—	•	•	—	•	—	•	•	•

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW 2209

COMMENT: The average citizen knows next to nothing about the duties and rights of licensed transmitter operators, the radio inspectors, the users of electronic entertainment equipment, or the manufacturers and associated EMC problems. Whilst radio amateurs can gain first hand experience as transmitter and receiver operators and users of all kinds of electronic equipment as well as the WIA efforts on EMC standards and EMC reports, it is left to the newspapers and the popular electronic magazines to make the public aware of EMC problems, and who is responsible. It is gratifying to see that at least the West German magazine *Funkschau* has undertaken in the past, and more recently (Nos 16 and 17, 1986) to educate the public on EMC problems and amateur radio.

(The writer appreciates the permission of the *Funkschau* Editor of Franzis Verlag, Munich, to use their publication for an EMC report).

PART 1: TROUBLE WITH HI FI, TV, and EQUIPMENT?
by Arno Weidemann DL9AH
"The legal position, when disturbances occur — tips to overcome disagreements"

Translated from Funkschau Magazine, Germany by Hans Ruckert VK2AOU

Stripes on the television screen — crackling sound reproduction — flickering video picture: even peaceful citizens get hostile when they experience these (BCI and TVI) disturbances. The apparently responsible person is easily found, if a radio amateur happens to live near by. The following explanation shows that the radio amateur is rarely to be blamed, how the lawmaker judges these cases, and how the "disturbance" can be overcome.

A "radio amateur" is a person, who deals with electronic receiver and transmitter operation only for personal interest. This is the definition in paragraph one of the Amateur Radio Law (AFuG). Radio amateurs are found in all countries of the globe, and they are mainly technically motivated persons, who are fascinated by electronics, and who wish to improve their practical experience and theoretical knowledge. One finds, among the radio amateurs, a substantial number of electronic experts, who look for a technical field as their hobby.

It is a sign of competence if a professional electronics engineer is also a radio amateur. It is therefore not surprising that a large number of this group is to be found in leading positions of all electrotechnical fields of commerce, research, teaching, etc. The Amateur Radio Law is additionally the only legal foundation for private scientific experimental wireless communication.

The importance of amateur radio has been underlined by the lawmakers in West Germany by the Law on Amateur Radio of March 14, 1949. It is a "lex specialis" (Special Law) and so pre-empts the general law on Radio Communication (FAG) and it includes a general right for all citizens, as long as they fulfill the entrance conditions.

A REVIEW OF THE LEGAL BACKGROUND

It was intended to underline the special status of the AFuG. Any form of political intervention, commerce and industry was to be excluded, and a separation of amateur radio from the international organisation (IARU) had to be prevented. This is also the reason why the AFuG states specifically its relation to the world communication treaty of Atlantic City (1947). The amateur radio law makes it a duty of the Federal Minister for Postal Services in paragraph seven to issue the necessary regulations for the operation of the law on amateur radio.

The preamble to the law (891/1949) states further: Regulation for the licensing and control of radio services: This office (German Federal Post Office) is obliged to adhere to the regulations of the International Telecommunication Conference of Atlantic City (1947) and later additions. These regulations and additions are found in Regulation-Funk (VO-Funk) §5. Chapter 32 states that all radio transmitter regulations are also applicable to amateur radio operators. This means that all transmitter services are only responsible for *interference* between other transmitter services.

The regulation VO-Funk defines the term "interference" under "common use of frequencies" No 160, paragraph 1 (1982) as follows, having become national law by ratification of International Telecommunication Agreement. 7.1 Interference: The appearance of *unwanted* energy at a receiver of a radio system; — And interference is not caused between radio services operating on different frequencies, and not by the *unwanted* and *permitted* fundamental frequency signals. Only unwanted energy classed as harmonics, spurious emissions and intermodulation products, etc, cause interference (BCI and TVI).

Should the radio disturbance measuring service of the German Post Office determine that a collision is caused by "unwanted energy" the operator of the amateur radio transmitter has to improve his deficient transmitter, in the same way as all other transmitter services listed in VO-Funk. The transmitter operator has to comply within a reasonable time limit. Otherwise he will face restriction of operation, which is a justified step in order to protect the operator of a good communication station from a deficient one. The position is totally different if an operator of a "clean" transmitter signal is involved in a collision. It is legally not a case of an "Interference", but a "Disturbance", if the collision is caused by a design feature or a deficiency of a Hi Fi or television receiver, etc. This is valid for all communication services and include according to the will of the lawmaker (AFuG), specifically the amateur radio service. The term "Disturbance" is actually not mentioned in the VO-Funk regulations of the International Telecommunication Treaty (legally binding for all radio services), nor in the regulations to the amateur radio law. The operator of a licensed, correctly operated transmitter cannot therefore be charged with a disturbance. This is because he did not cause the collision, nor is he responsible for badly designed and deficient equipment in his neighbourhood. The owner of the deficient receiver, etc, which causes the collision, has himself to see that his equipment is no longer affected. There are a number of laws to his aid, including the law of Manufacturer Liability.

Electronic receivers with the appropriate FTZ Number (approval), which also qualify for the recommendation of the German Post Office, are a good standard for comparison when purchasing. The FTZ Number (DOC Test Number) of electronic entertainment equipment is of no legal importance to the operator of a licensed, correctly operated transmitter. The radio station at Langenberg does not stop transmitting if a VCR with a FTZ Number is disturbed in a person's living room.

Don't be frightened. This legal position has not changed since 1949. The citizen (radio amateur) has the right to raise an objection, should a disturbance report or a misunderstood regulation caused an operation limitation to be imposed. The objection may comprise only two sentences, which have according to §80 of the regulation a deferring effect of four weeks or 12 months.

The citizen has the right to be heard. The citizen must be permitted to see the charge documents. The authority has the legal obligation to state the claim, and to state the measure of the legally imposed operation restriction.

The author is of the opinion that one should oppose any unlawfully imposed operating restrictions, thus fighting for the right of a citizen who is not to be blamed. Even though protected by Federal Government Law, the amateur radio operating citizen should offer assistance to resolve a collision case at an early stage, to avoid a court of law confrontation. Willingness to assist indicates a desire to maintain the neighbourly peace. The radio amateur should declare his willingness by trying to fix the fault — as far as possible, independent of any legal obligation to overcome the disturbance. The cost is usually small and is balanced by the learning benefit. The Federal Minister for Post and Communication issued a definition of the three cases of passive immunity of Hi Fi and television receivers against disturbances.

There are three possible ways for a radiated disturbance to enter a television set. They can appear singularly, mixed or all three at the same time. The possibilities to overcome the disturbances are now indicated by the following examples.

In Figure 4 the television chassis picks up 1) re-radiated RF field of a house (shaded area). 2) Radiation picked up by the television antenna and the braid of the feeder (and perhaps any masthead preamplifier). 3) Unwanted RF radiation conducted into the television set by the mains cable wires and cables from connected equipment (turntable, speakers, Hi Fi tuner and amplifier, tape recorder and VCR etc).

IMMUNITY (passive behaviour)

The immunity (ability to reject a disturbance) of a Hi Fi or television receiver is the ability to maintain a predetermined level and ratio of wanted to unwanted RF signal strength when both signals appear at the same time. Foreign signals are RF signals which appear besides a wanted tuned signal.

FRONT END IMMUNITY determines the ability to reject unwanted signals appearing at the receiver antenna terminal.

CONDUCTED CURRENT IMMUNITY determines the ability to reject unwanted signals, which could enter via connected cables and attached equipment.

RADIATION IMMUNITY determines the ability to reject unwanted RF radiation picked up by the equipment chassis, printed circuit boards, wires, components, etc. (FTZ (the same as our DOTC) measuring instruction 17 MV).

INADEQUATE CONDUCTED CURRENT IMMUNITY receives priority attention in disturbance investigations. This is not only so for receivers but also for turntables, electronic organs, telephone answering recorders, computers, etc. One has to look at a house (as if with Xrays) from a distance to appreciate the conducted current effect. The house appears as a complicated cable and pipe network, if we now consider only all metal objects.

This includes all pipes and the central heating systems, the lightening conductor, guttering, community antenna and all the mains house wiring, etc. Sections of all these metallic house installations may form resonances individually or via connected equipment. In Figure 4 a current, similar to one in a transmitter antenna, could flow in the television antenna if a piece of 220 volts mains cable (could be considered as a one core lead) resonates together with the feedline plus aerial at the operating frequency of a nearby shortwave transmitted. This form of outside radiated current goes through the attached television set, etc; the chassis PCB tracks (often now not earthed) now carry RF and the front end semiconductors become overloaded and operate non-linearly, generating harmonics selected by the tuned elements of the tuner, which could fall on television channels, causing a disturbance. Figure 5 shows disturbance current between PCB chassis track points. The manufacturer is responsible for this fault. One possibility manufacturers could use to avoid the disturbance would be to divert the unwanted current around the electronic stages and components. Figure 6 indicates one could prevent the unwanted current from flowing through the sensitive electronic components by diverting the current via the (necessary in any case) bypass capacitors, using the shortest possible path between the mains wires and the feeder braid. It is necessary to let the mains cable enter the television set very close to the antenna terminal. Such a measure would not cost one cent. If the manufacturers tried to save a few cents, by leaving out the necessary mains decoupling capacitors, even though if has been standard practice for 50 years, then unavoidably one must "Do now, what should have been done during manufacture".

The use of high impedance RF resistors in the mains and antenna lines is one further method to avoid unwanted conducted currents from reaching the receiver. A simple bifilar wound mains choke often works wonders, consisting of 30 to 50 turns of 2 x 0.5 mm² cable. It can be wound on an old ferrite television line transformer core. Figure 7 shows effective "conducted current" chokes (E-Dr) wound on various ferrite cores are equally effective for mains lines, antenna feeders as well as for Hi Fi and VCR cables. They are simply inserted between cables and equipment, having plugs and adaptors attached.

Ferrite cores are often obtainable from a television workshop. Defective line transformers are usually thrown away. Other ferrite shapes may, of course, also be used like antenna rods, ring cores, etc. The resulting inductances between mains wall socket and appliance should be as large as possible (at least 100 uH, X_L = 2.3 kohm for the 80 metre band). An additional unwanted signal rejecting choke may have to be placed between the antenna and antenna terminal of the receiver, if the mains line choke did not help enough. Wind 30 to 50 turns of thin coaxial cable as described above on a ferrite core, equipped with male and female plugs. Figure 8 shows effective decoupling between mains and antenna cables, by using (E-Dr) RF chokes in both cables. The aim of these measures is to place a television set "high as far as

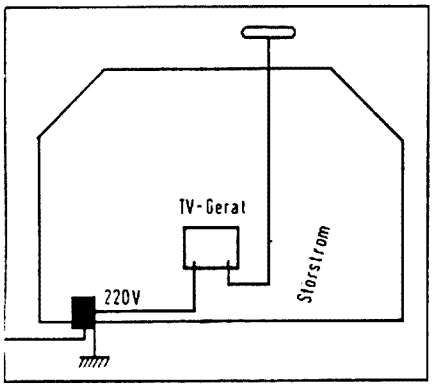


Figure 4: Diagram of house installation. Accidental resonances between metal parts can reinforce the interference field.

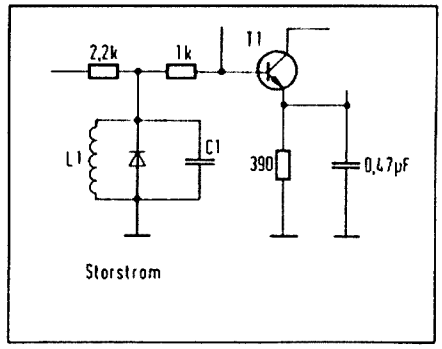


Figure 5: Interference current between earth connections. A design fault for which the manufacturer is responsible.

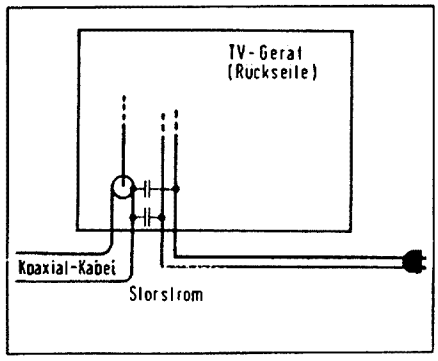


Figure 6: Ideal bypassing of interference current against entry to device. A constructive measure which costs the manufacturer nothing.

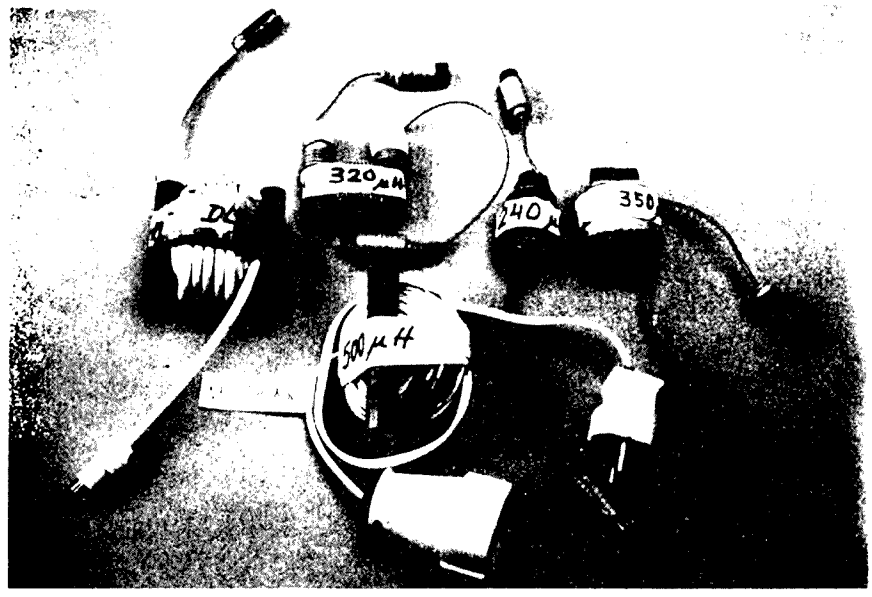


Figure 7: Effective "conducted current" chokes (E-Dr) wound on various ferrite cores. Equally effective for mains lines and antenna feeders, as well as for audio and video cables. Having plugs and sockets attached, they are simply inserted in the appropriate lines.

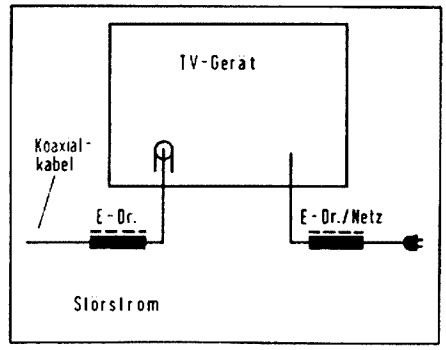


Figure 8: Effective decoupling between mains and antenna cables by using "E-Dr" chokes in both cables.

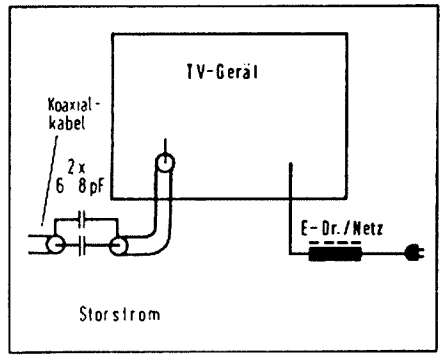


Figure 9: Interference minimisation for UHF The coupling capacitors can easily be inserted.

RF is concerned" between both cables for the unwanted current. There are other possibilities also available on the antenna side. The desired high RF impedance can also be obtained with capacitors. This is achieved with a "RF separation transformer" using the lowest possible winding capacitance between primary and secondary side. This means is effective but costly (20 DM per piece). The insertion loss increases above 700 MHz, where the third television program is usually found. The writer used a cheaper way with good results avoiding any further attenuation of the usually weak third program signal. The television feedline is cut about 20 centimetres from the antenna terminal, and the centre lead as well as the braid are reconnected via two 6-8 pF capacitors (see Figure 9). Practical considerations recommend the use of appropriate plugs and sockets to obtain a plug-in unit.

ar

WHAT IS 16K0F3E? ? ?

There were only five basic modes of emission in the 1950s. These were designated A1 for CW, A2 modulated CW, A3 phone, A4 facsimile and A5 television.

But, by the 1970s the list had grown to 14, ranging from A0 unmodulated carrier, to P for pulse transmissions.

Things became more complicated when, at the 1979 World Administrative Radio Conference, almost 1300 different emission modes were identified.

In January 1982, the International Telecommunications Union introduced a new method of designating emissions.

Those who have read the recently issued DOTC brochure DOC71 "Licence conditions and regulations applicable to the Amateur Service" will have seen it contains many ITU designators.

But what do the designators mean? You may well ask! The answer is to be found in AR magazine, September 1981, where an explanation is on pages 26-28.

You will need to refer to that article to interpret the modes in DOC71 and know which ones are available for your licence grade.

DOTC says the ITU designators will be included in the regulations examination question bank later this year.

SO! What IS 16K0F3E?

The first four characters are the bandwidth, with 16K0 meaning 16 kHz. F3E is FM telephony.

Awards

Ken Hall VK5AKI
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED IN MAY

WAVKCA

1589 Toshihiko Ino JH6JTE
1590 W A Ricallton G4ADD
1591 Neil Trottier VK3CNT
1592 William R Tippett W0ZV (on 160 metres)
1593 Michyuki Kikuhara JA1EPL
1594 Yasuko Daikoku JL3EGP
1595 Vitaly Besedin UA6AUT
1596 Emil Luft UL7PEN
1597 Borisov Ivan P UA4ABY
1598 Anatoly Tatarinov UA0ZBP
1599 Alexandr F Soldatenko UQ2GP
1600 Bogachev DG UA4HGL
1601 Alexandr V Norikov UA0ZDN
1602 Yakuchev SA UA3QHZ
1603 Donetsky Club Station UB4IXZ

HAVKCA

138 Victor Kostiuk UC2-006-1
139 Vinucow IW UA9-145-530
140 Serge V Stikhin UA9-154-5
141 Tenihim Vlad UA0-103-70

DXCC PHONE

364 Ken Gott VK3AJU
365 Steve Jenkinson VK3YH

DXCC UPDATES MAY

VK2AKP 284/286 phone and open
VK2AKP 117 CW
VK2QL 312/355 CW
VK3DP 215 open
VK5MS 318/365 phone
VK6AJW 292/294 phone
VK6LK 313/330 phone
VK6MK 318/361 phone and open
VK6RU 317/366 phone and open

OAA 1000 ODENSE ANNIVERSARY AWARD

On the occasion of the 1000 years jubilee of Odense, Denmark, the Odense Radio Club (a division of the Experimental Danish Radioamateurs) has sponsored the OAA 1000 Award.

The award is issued for contacts with one of the club stations, OZ1000, OZ3FYN or OZ5HCA and with other stations whose QTH is in the town of Odense, Denmark.

The award is issued for all-mode and all-band contacts without special stickers. Only contact between January 1, 1988 and December 21, 1988, will be eligible for this award.

Minimum report to count for the award is 33/9.

DX stations require five points.

Contacts with OZ1000 count five points, OZ3FYN and OZ5HCA count two points. Contacts with other stations located in Odense count as one point.

The special call station of the Hans Christian Andersen town, OZ5HCA, was only active from July 10, 1988 to July 17, 1988.

Each call only counts once on each band.

The award is also available to SWLs.

Send a copy of your log together with a fee of DKR 30,00; $US5 or 10 IRCs to EDR Odense Division, DK 5100 Odense C, Denmark. Applications to be postmarked no later than March 31, 1989.

ROTTERDAM AWARD

In 1987, the Rotterdam Award, which is issued by the Electronica Club Rotterdam (ECR), celebrated its 10th anniversary. Due to this occasion, radio amateurs and SWLs were able to apply for the award with a special sticker attached.

Due to the great demand and enthusiasm the award created, the ECR has decided to issue the award permanently, minus the special sticker. (The special 1987 award is still available until January 1, 1989 for those with enough points.).

Non-European stations require three points.

The points can be collected as follows:

Every member of the ECR, SWL as well as radio amateur, counts as one point on every band.

PI4RDM and PI4RDM/A, the club station, counts as three points on all bands.

The award can be worked mixed and there are no frequency or mode restrictions. However, repeater contacts are not valid. During every QSO which is being made by a member of the ECR, the counter-station will be informed of his membership and validity for the Rotterdam Award.

The award costs f1 10 (10 Dutch Guilders) or 10 IRCs. Send list of contacts, signed by two other radio amateurs, to:
ECR, PO Box 22160, NL-3003 DD, Rotterdam, The Netherlands.

Members of the ECR: PAs 0EKR, 3CCA, 3CLP, 3CMQ, 3DHW, 3DPR, 3DUF, 3EKI; PDs 0AGZ, 0IED, 0MFK, 0MLR, 0MOT, 0MXM; PEs 1DVB, 1DZR, 1FUM, 1IFP, 1KJS, 1KPI, 1LGD, 1LLA, 1LQS, 1MEL; PI4RDM, and DL4DBM.

Each SWL report which is sent by a SWL of ECR also counts for the Award.

ar

MALYJ VYSOTSKIJ

No I cannot pronounce it either, but it was the home of the signals originating from 4J1FS, with Marti OH2BH, in the group. Marti feels that it will be a new country, and really who doubts Marti's good word and standing in the amateur fraternity?

I was alerted to the presence of this rare prefix by an ISD call from the happy duo from Dorset, Ken G3NBC and his wife Kitty, who worked extremely hard to obtain her full call to compete with Ken on the bands. It has been said that since Kitty obtained her licence the power account has tripled, but one cannot believe everything they hear of course.

Ken and Kitty in their shack with the WIA Membership Certificate proudly mounted on the wall.

Ken G3NBC, was the first G residing in England to become a member of the Wireless Institute of Australia. He is an avid DXer and was a great source of assistance to me when I was writing 'How's DX", as was Kitty.

Congratulations to you both on what we hope will be a new country and what about an article from you on what it is like to amongst the real ORM, when one is trying to work that rare 'one' or have a sched with someone down under.

Congratulations to the lucky people with 4J1FS in the log, QSL to Marti OH2BH, and let us all hope he can convince Don Search, on the ARRL DXCC Desk, that Malyj Vysotskij Island, is really a new country.

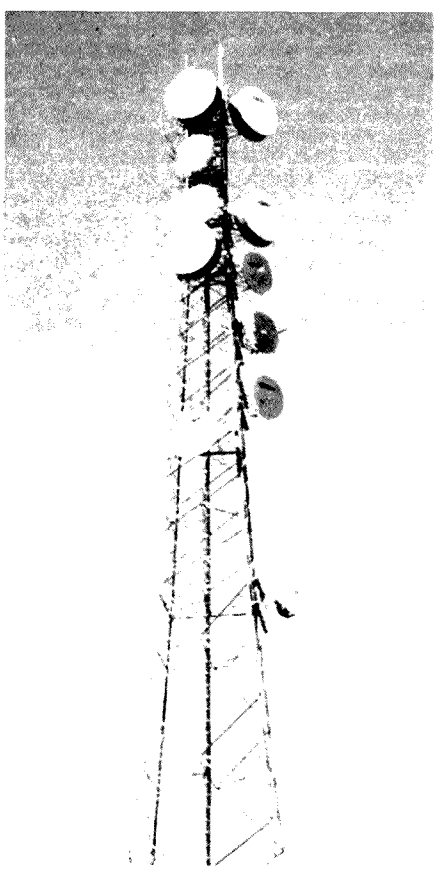
—Contributed by Ken McLachlan VK3AH

Listening Around

Joe Baker VK2BJX
Box 2121, Mildura, Vic. 3500

It's a long time since the last column, so today being very overcast (Sunday, May 15), I thought I had better do something about it. Particularly since I've had many "on air" requests asking why? I suppose it's *been due to personal problems and* wrestling with the technicalities of large television sets which I am beginning to hate. Why do people even bother to buy large and heavy televisions when small sets like mine which can be easily lifted in one hand, can do the task equally well. Then again, I could probably say, why did people in other days buy those heavyweight radiograms? Anyway, because of the dollar situation, I've got to take whatever work is brought to me, and try to keep the owners happy.

On this overcast Sunday, I am sitting here with this typewriter propped up on a newly acquired card table. Alongside me on another table is the Kraco CB set which I bought in July 1977 when the CB craze faded. A year of so before I decided that amateur radio might have something better to offer than CB radio at that time. Another reason for using the Kraco "cracklebox" now is because of troubles with my main transceiver, which I am determined to get back on the air. The Kraco, of course, was converted from 27 MHz to 28 MHz a long time ago and it's proved to be a wonderful standby set without which I would be off the air altogether.



In the telecommunications network which now almost encircles Australia, Mildura is an important link. This photograph shows the Telecom microwave antenna mast (there were 13 dishes at my last count) above the Telecom Building, in Langtree Avenue. These circuits connect much of the traffic passing from eastern States to the west, taking some of the load that would otherwise be routed via Melbourne.

Over the years that I've been involved with radio, I thought I have heard just about everything — the odd things that people say. But I think what follows just about "takes the cake". I just heard a JA called Hide tell a VK5 that he (the VK5) was "one point five *kilometres* off frequency!

Since I last wrote *Listening Around* I went to Melbourne. Trips to Melbourne are always full of surprises for me. Last time it was meeting with Bruce VK3JAX, of Sandringham. Bruce is a computer expert from America and will be spending a couple of years in Melbourne involved with computers.

Prior to visiting Melbourne I had been speaking to Bruce about a D104 Astatic microphone which I had acquired soon after World War II and used with a home-brew valve amplifier on a PA system. I told Bruce about how I liked the D104 and how I used to amplify the ticking of a kitchen clock to test its qualities. On one occasion I said to Bruce "I wish I had one of those microphones right now". (I bought mine in Sydney for about six pounds in 1947). Bruce said he thought he could get me one sent out from the US. Of course, I was very pleased but forgot about it until the visit to Melbourne, when I made contact with Bruce late one night on my two metre FT-208 from my motel room. Bruce said "Remember talking to me about the D104 a while back?" Of course I did. Bruce then said he had a D104 which he would like to give to me and asked me when I was due to get the train back to Mildura. "In the morning," I said. "Well," Bruce said, "I could bring the microphone to you right now, by car." And so, despite the late hour (it was nearly midnight), I called the desk and told them I was expecting a visitor and could they let me know when he arrived?

In due course, the phone rang — I went down and met Bruce in the foyer. Bruce was glad to meet someone so far only a voice from his radio, and there carefully packed in a cardboard box was the beloved D104 microphone. He explained that he hadn't got this one from the US just for me, but it happened to be a spare microphone which he was not using. So, here it is sitting upright on this card table right alongside this typewriter — and it's all nice and shiny — just like the original D104 which I had all those years ago — long before I got my licence. Ah well, that's what amateur radio is all about — helping one another — and I'm doubly grateful to Bruce for bringing me the D104 at that very late hour.

On that trip to Melbourne I met Graeme Parsissons — a shortwave listener and ex-Tasmanian who lives in a tall mansion called Gordon House in South Melbourne. Graeme took me right to the top of his 10 story penthouse from which he gets a wonderful view over Melbourne, and which is almost alongside the old ship *Polly Woodside*.

In fact, if you look out the window in Graeme's room, you look down onto the masts of the *Polly Woodside* at Melbourne's maritime museum. I told Graeme that when, and if, he goes for an amateur licence, he'd have a wonderful take-off point from *his* top floor. I always know when Graeme is listening to some of us night-owls because he gives me a pre-arranged tinkle on the 600 ohm line. I am beginning to think that it might be as difficult to get Graeme to try for his licence as it was for me to persuade another phone-liner and good friend of mine from my Broken Hill days. Alas, Reg Golding of Broken Hill has never bothered to get one, although he was very clever with electronics.

The antenna which I am using to monitor 28 MHz right now is a converted CB "Ringo" which I just happened to have in the shed. I bought it from a Mildura amateur some years ago and it sat in the shed so long that I got tired of seeing it, so decided to put it to work with the 11-year-old converted Kraco De Luxe. Getting the SWR ship-shape took a little time, but the Ringo is working now reasonably satisfactorily and 12 watts or so is getting me into JA, ZL and Western Australia. It would be nice to have more elaborate antennas but I have to use what I have.

As a result of my articles about Morotai Island during the war years, I received a set of black and white photographs from a Queensland amateur who was in the RAAF on Morotai at the same time as I was there. He was a driver and sent me his original RAAF transport driver's licence issued to him on Morotai. He gave me the photographs but at his request, I returned the special Morotai license after having it photocopied. He had been on Morotai at the time of the surrender to General Blamey, at the special parade of September 9 1945. Among the photographs was one showing nine high-ranking officers handing over their swords as they signed the surrender document. I saw this incident as it was happening!

There were many hundreds of American and Indian soldiers as well as Australian and members of the womens' services present at this *ceremony* which was broadcast on the island by an American Forces station called WVTL from their portable Outside Broadcast (OB) van.

WVTL was on the air a short time before the Australian Amenities station 9AD (on which I later worked). The former RAAF driver asked me not to mention his name in this column. Among the photographs was one of a native village (Nica) on Morotai. I never knew of its existence or of the Morotai War Cemetery. One photograph shows two of his RAAF mates standing guard at the entrance to the Cemetery. All this shows that the beetle-shaped island had areas which we were probably not allowed to see. I spent most of my time in the Peninsula, which jutted out into the China Sea. Here were the Army newspaper *Table Tops* and 9AD Morotai, on which I served. Anyone who served on Morotai may also remember the open-air Boomerang Theatre, where we used to have to sit on boxes or kerosene tins equipped with our gas capes in case it rained, water bottles in case we fell thristy (we were only two and a half degrees north of the Equator) and well sprayed with citronella to protect us from getting eaten alive by the malaria-carrying mosquitoes.

Those who served on Morotai may also remember the open air theatres run by the American Army. There were many of these. Before their main film came on, they had a special news service read from the projection box, which helped keep us in touch with things in other parts of the world.

A few days ago, on 80 metres, I worked another amateur who had served on Morotai. He said he would send me photocopies of the Army newspaper *Table Tops*. I will appreciate these for I now have only one copy of *Table Tops*, that of August 15, 1945, with the banner headline in red lettering *It's All Over*. I originally brought back four copies of this issue with me. Three were foolishly given away, after the RSL in Mildura said they didn't want them.

Since people are not interested in these things these days, it's now up to me to preserve that one remaining copy, also the manuscript of my trip from the Northern Territory containing names of some soldiers who were with me. Also, I have a booklet called *Manual of Air Navigation* which was issued to members of the RAAF who were serving in England — on bombing raids over Germany. This manual also contains names of crew members, logs and navigational details of what took place. I was not in the RAAF, but have had that book for so long now that I can't remember where I got it. What it contains is surely the history of those, even the reports on weather they encountered over the English Channel.

This particular book was printed at a time when there was a great shortage of paper and throughout the book, lines are drawn in red ink where some material has been cancelled, while elsewhere slips of paper containing corrected sentences are pasted over the original.

Now that winter is here, I hope to spend more time at this typewriter. I have lots more which I hope you will find interesting. In the meantime, if any readers would like to chat to me on air you will find me around 3.585 MHz., somewhere on the end of the Cocktail Net. And, if you hear nothing on that frequency in the wee small hours, I may be listening. I sometimes leave my set running on or near that frequency when all more sensible people are tucked up in bed. But that's not to say that I'm an insomniac — I'm not — I get plenty of sleep but as I'm a service pensioner aged 71, and my time is my own, I can sleep when I like! But if you wake from your slumber and would like someone to chat to, why not fire up around the above frequency?

73 till next time,
Joe VK2BJX

ar

MORSEWORD 18

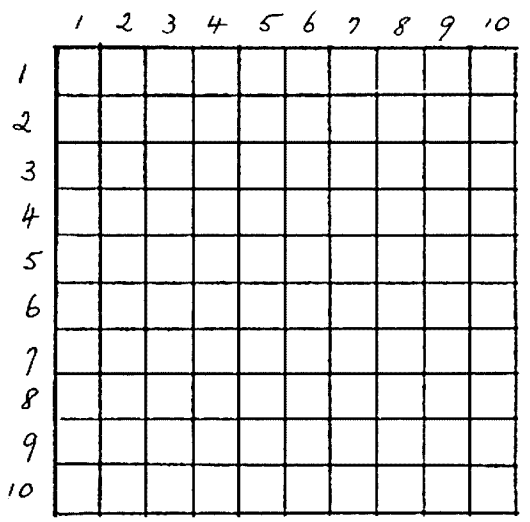
Audrey Ryan
30 Starling Street, Montmorency, Vic. 3094

ACROSS

1. Top of the school
2. Oath
3. Genuine
4. Lose colour
5. Cut
6. Immense
7. Stare with open mouth
8. He's from Dallas
9. Not that
10. Slits

ACROSS

1. Insect
2. Predicament
3. Metal
4. Pretensions
5. Emanation
6. Previously
7. Tail-less cat
8. Egg on
9. An attack
10. Scoff



Solution page 46. . .

Club Corner

SHEPPARTON AND DISTRICT AMATEUR RADIO CLUB INC

The Shepparton and District Amateur Radio Club hold it's annual *Communications Day* on Sunday, September 18, 1988. This event has drawn large crowds in previous years and the club expects a similar result this time.

It is anticipated a number of major dealers will be attending. Icom Australia have already indicated they will be there. The futuristic Icom Ic-781, which was reviewed in last months AR, will be just one of that company's latest offerings on display. This model, was so desired by someone in Sydney that he stole it from a reviewer.

The event draws radio amateurs and communications enthusiasts from throughout Victoria and southern New South Wales.

If you have ever wanted to find out more about amateur radio, shortwave listening, digital communications or anything electronic, you will be made most welcome.

Dealers or other groups who have not participated in previous events, but would like to be involved, should contact the club immediately. Space is limited and indications of interest have already been received.

For more details, contact the Shepparton and District Amateur Radio Club Inc, PO Box 692, Shepparton, Vic. 3630, or Peter O'Keefe VK3YF on phone (058) 21 6070.

—Contributed by Peter O'Keefe VK3YF

ar

COLAC AMATEUR RADIO CLUB — VK3CRC

Communications in Difficult Areas

The Cape Otway National Park nestles between the sea and the main ridge of the Otway Ranges. Over a distance of some 10 kilometres "as the crow flies", they rise from sea level to an elevation of some 680 metres. The northern slopes then fall to an elevation of around 60 metres at the township of Gellibrand, then rise again on another ridge to around 280 metres before levelling out on the plains around Colac, which is at an elevation of about 130 metres.

The Park is in a fire prone area, consisting as it does, in the main, of a dense blue gum forest with its associated undergrowth. The section between the sea and Colac is a difficult one for communications. It is greatly under-serviced for television, with some farms running coaxial cable for distances of almost a kilometre and inserting boosters in the cable to obtain indifferent television reception.

It was with these considerations in mind that the Colac Amateur Radio Club decided to run some tests to confirm, or otherwise, that reliable communication between the southern fringe of the Park and Colac could be established. This would be vital in the event of a serious fire in the Park.

Accordingly, VK3s XGR, PCM and XJW set up a station on Mount Chapple, at Wyelangta, using 146.500 MHz and HF frequencies.

VK3 TCE and 3KJ set up another station on the southern fringe of the Park, also using 148.500, 7.150 and 3.600 MHz. VK3s DFI and YZZ maintained a watch on all frequencies in Colac.

Results were as follows:

146.500 MHz: Communication between the Park location and Wyelangta were okay using handhelds, although higher power was also used. Also, Wyelangta could work into Colac as well as being able to access repeaters on Mounts William, Buninyong, Macedon and Anakie, as well as the Warrnambool repeater.

7.150 and 3.600 MHz: Although inferior to a set-up using Wyelangta as net control on 146.500, VK3TCE and VK3KJ could work directly into Colac on both frequencies.

CONCLUSION

In the event of WICEN being called on to provide emergency communication, the 146.500 set-up could be regarded as 100 percent reliable, particularly with repeater backup. The HF frequencies would be useful as backups in the event of the set-up at Wyelangta being itself threatened by fire.

—Contributed by Dudley Stalker VK3KJ

ar

VK4 DISABLED PERSONS RADIO CLUB — VK4BTB

The VK4 Disabled Persons Radio Club will celebrate the Fifth Anniversary of its opening on Sunday, August 28, 1988.

The Club Station will be on-air from 10 am until 4 pm local time. This period is likely to be extended according to the availability of willing operators, but will be off-air from approximately 2 pm until 2.30 pm as the formal part of the day will take place at this time.

Intended frequencies are 3.590, 7.090, 14.190, 21.190 and 28.490 MHz, as dictated by time-conditions.

Best wishes *from* VK4BTB and we look forward to working *you* on the day.

—Contributed by Roley Norgaard VK4AOR, Station Manager for VK4BTB

ar

CAMBERWELL GRAMMAR SCHOOL RADIO CLUB — VK3BCG

Camberwell Grammar School Radio Club, VK3BCG, has always been a very active group, but in the last three years the enthusiasm of all members has surpassed any previous year. Equipment has been purchased and antennas erected — a vertical for VHF and dipoles for HF work.

After a long hassle with the Camberwell City Council, a permit has been granted for a radio tower to be erected in the near future. Stimulated by their eagerness to extend their knowledge and by the high cost of *manufactured* equipment, much home-brewing is attempted, both in the club rooms and at home.

The radio field day contests, especially the John Moyle Memorial Field Day, create an enormous amount of enthusiastic activity, which was rewarded last year when the club gained first place in the D Section, 24 hour Section. (The club is now eagerly awaiting the 1988 results).

Each boy who is interested in becoming a radio amateur operator has to endure a three month trial period, to ensure he is really bitten by the "Radio Bug". He is required to study electronics and regulations in the first year of membership, and is enrolled by the school for the LAOCP examinations arranged by the DOTC, not later than one year after Club Membership is granted. The Club Rules have been successful because, from 1986 to 1988, the following students have obtained their licence.

Andrew Conway — VK3KKU (now ex-CGS student)
Simon Kay — VK3XSK (now ex-CGS student)
Graeme Callaghan — VK3TGC (now ex-CGS student)
Matthew Robinson — VK3TAY (Year 11)
Miles Tobias — VK3TNT (Year 11)
Ronald Killeen — VK3TCF (Year 11)
Christopher Hart — VK3TIT (Year 11)
David Phillips-Rees — VK3TDS (Year 10)

The next target will be the AOCP.

Parents have also become involved with amateur radio as, in May 1988, Frank Callaghan became VK3ZFC.

I wonder how many Amateur Radio School Clubs, in Victoria, or even Australia, can boast that all their members are licensed?

—Harry Lodder VK3AXJ, Club Leader, VK3BCG

ar

QUEENSLAND AMATEUR RADIO DATA AND TELETYPE ASSOCIATION (INC)

The resignation of David Brownsey VK4AFA, as Secretary of the Queensland Amateur Radio Data and Teletype Association, was reluctantly accepted recently. His place has been taken by Don Thomson VK4YI.

—Contributed by Don Thomson VK4YI, Secretary

SUMMERLAND AMATEUR RADIO CLUB

During the North Coast Floods in April, members of the Summerland Amateur Radio Club responded to requests for help from the State Emergency Services.

Camberwell Grammar Radio Club Members from left: David VK3TDS, Chris VK3TIT, Harry VK3AXJ, Miles VK3TNT, Ron VK3TCF and Matthew VK3TAY.

Normally coastal floods are fairly quick to rise, have a sharp peak and subside quickly. The entire event usually lasts for about three or four days from an operational viewpoint.

This flood, however, lasted almost two weeks and extended both the natural and organisational resources available. Richmond-Tweed Division SES became operational on Sunday, April 3. Steady rain had been falling for some days, longer than usual in the build-up period.

As the rain increased the river rose steadily over two or three days creating a lower, but longer peak. Thus Lismore has a much less destructive peak but it held up for about two days. On the lower river as rates of flow decrease the huge volume of water catches up with itself and causes higher flood peaks then the nominal heights reached upstream would indicate.

Helicopters are an invaluable means of transport and rescue in a flood situation, especially once main roads become cut. They are not, however, without problems, particularly with radio in humid conditions. By Tuesday, both the local Cassino-SLSA Rescue helicopter and PolAir, which had come up from Sydney, were being grounded for periods by radio failure due to dampness.

There were also frequency non-compatibility problems between SES and PolAir. To overcome this Police hand-helds and pack radios were set-up at Division Headquarters in Lismore. This headquarters is not a good radio site so a portable UHF repeater had been set up on Wednesday.

At about 2330, the Division Communications Officer, Peter Mair VK2PF, contacted John Alcorn VK2JWA, on two metres with an early warning of a request for Thursday morning. Could the repeater be set up at the QTH of Leith Martin VK2EA, who lives on a high part of Goonellabah, a suburb east of Lismore with a good path to Divisional Headquarters?

Next morning, after confirming with Leith, John picked up the equipment and took it to Leith's home where, with Lance Ferris VK2NVF, they set it up. It was a very good outfit, based on the Philips 828, all built into a steel case about 600 millimetres cube. Either 12 volts or 240 volts powered it fed to either a UHF centre loaded mobile whip mounted on top, or by coaxial cable to a remote antenna. A vertical antenna and RG8 connecting cable were also part of the kit.

The repeater was set up in Leith's shack and the antenna put up on one of his pipe masts as high as the feeder allowed, about three metres above the roof. It was tested and running well by 0800 Thursday.

By Wednesday night, the SES signals staff were working very long and repeating shifts. We were asked if we could roster some of our members to the Communications Centre manning to ease the situation. We did this commencing on Thursday morning, and did eight hour around-the-clock shifts until 2200 hours Friday.

The work involved handling traffic on the Division Command Net and, when called on, the Local Command Net. Lesser traffic was also passed over the PolAir and Ambulance nets. Telex and Fax traffic was also processed, but unfortunately nearly all phone traffic went direct to the operations room where about 10 SES volunteers handled it.

By Friday, the rapid flowing upstream peaks moved downstream and slowed so that the urgency and need for 24 hour manning reduced. The helicopters could not work at night and food and fodder supply was not done at night. Thereafter, day shifts only were necessary. About 13 hours were worked Saturday and also on Sunday.

After this, SES reverted to its normal volunteers and work routine.

Nine members offered their services for this duty. They were: John VK2JWA, Leith VK2EA, Lance VK2NVF, Phil Evans VK2KEV, Jim Cunningham VK2ESI, Alex Chappie VK2BEV, Duncan Raymont VK2DLR, Ken Hore VK2YQB, Peter Richens VK2XHL. Others also offered, but were not called upon this time.

Meanwhile, another job had arisen. By Friday, the flood task had, in the main, moved to the lower river between Coraki-Woodburn and Wardell. During short flooding, of two to three days, cattle (and people) can survive on little or no food. This had gone longer and was likely to continue for several more days causing stock losses and difficulties for stranded residents. As well as the three helicopters, the Army was also supplying transport.

Seven trucks from 41 Bn RNSWR and a truck and eight landing craft from the 2/3rd Field Engineers, Brisbane, totalling 40 people were involved transporting food and fodder around the lower river. This needed a separate radio net to keep their traffic off the existing nets. The PolAir UHF net was suitable but, to cover the lower river, it was necessary to move the repeater further south.

Forewarned, on Friday morning Leith VK2EA, dismantled the repeater and Harold Wright VK2AWH, assisted by John VK2JWA, re-established it at the Telecom tower in Goonellabah. Using an existing feeder, the antenna was mounted at the B Level near the top of the tower. The move had degraded the path to Divisional Headquarters so Peter VK2PF and John VK2JWA, erected a vertical antenna, loaned by Harold VK2AWH, to improve the path.

On Sunday morning, reception through the repeater became difficult although the equipment tested out alright. Using a packset, John VK2JWA, assisted by Bill Parker VK2KDI, set up a manual relay at the King George V reservoir site. This is a high hill south of Lismore. This station operated for about two hours and was closed at 1136.

A VHF packset had been sent to the Fodder Base and, as traffic had eased on the Local Command Net, this was used. It was not until Sunday evening that it was discovered that the Fodder Base had moved its headquarters to new cover in a steel shed! Hence, the attenuation. Better radio location allowed the repeater to be used again.

Conditions were expected to ease on Monday but this was not to be. Another rain depression brought more heavy rain over the catchment causing rises during the afternoon with major flooding due for Lismore over Monday night. Again the club was asked to assist with signal staffing and around the clock rosters were began at 1600 hours Monday.

This rostered staffing continued until 1200 hours on Thursday when again the situation eased allowing SES to revert to its normal staffing procedures. As well as earlier members, Peter Cornelius VK2XHR/DG0BBT and Scott Watson VK2XGM, were involved. Harold VK2AWH, dismantled the repeater on Thursday as it was no longer required.

In total, 12 Summerland Club members were involved in various tasks during the operation and logged up over 151 hours worked. This does not include six other club members who are also regular SES members. They are: Peter VK2PF, Divisional Communications Officer, Duncan VK2DLR, Communications, Bill Cross VK2BCW, Lismore Floodboats, Gordon Campbell Officer, Graham Virtue VK2GJ, Communications Officer Byron Shire, Ray Williams VK2ARW, Gauge Reader Pimlico.

Some of these members logged up huge hours and unusual jobs. Bill VK2BCW, had to ferry firemen to an electrical fire in a flooded house! Peter VK2PF worked 161 hours over the two weeks.

This participation was considerable on the Club's part and showed again that skills kept up by amateurs are still available to the community when needed. This is one of the reasons often claimed by amateur organisations to justify the large spectrum space we use. This reason alone made the participation worthwhile.

It must, however, be kept in perspective as part of an operation in which over 500 SES volunteers put in over 18 000 hours in the first week in the Richmond-Tweed area. Over 26 000 hours in the Clarence area for the flood. The Army's 40 men put in over 3000 hours, plus countless hours by Police, Government, Local Government and many other voluntary organisations.

It was, nevertheless, a necessary link in the chain and a valuable service and learning exercise. We were all glad to see the sun. Thanks again to all concerned.

—Contributed by John Alcorn VK2JWA, Summerland Amateur Radio Club

ar

HORNSBY AND DISTRICTS AMATEUR RADIO CLUB INC

The following members have recently been elected to the Council for 1988/89.

President	John Jeffreys VK2CFJ
Vice-President	Ray Fry VK2FRY
Secretary	David Friday VK2CDZ
Treasurer	Karl Tomson VK2KKT
Publicity Officer	John Martin VK2JJM
WIA Emergency Communications	Barry White VK2AAB
Library	David Friday VK2CDZ
Morse Machine Repeater	Barry White VK2AAB
Education	Tony Lamacchia VK2BTL
QUA Publication	John Martin VK2JJM
Sports Club Liaison Officer	Ted Davis VK2ZED
Club Net Controller	Keith Alder VK2AXN

Club meetings are held on the fourth Tuesday of each month at the Asquith Sports Club, Old Berowra Road, Hornsby (next to Storey Park).

Committee meetings are held on the second Friday, after the general meeting at the Secretary's home. Visitors are welcome at these meetings.

The club net is held on Mondays. Club Station, VK2MA, and other stations are active from 8 pm on 28.370 MHz and 147.250 MHz. All amateurs are welcome to join the net.

The Hornsby and Districts Amateur Radio Club two metre repeater operates with the call sign VK2RNS on 147.250 MHz. The two metre packet digipeater VK2RPH operates on 147.575 MHz, and Morse Beacon VK2RCW operates on 3.699 and 144.950 MHz.

—Contributed by David Friday VK2CDZ, Secretary

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NEW RADIO CLUB IN VICTORIA

The Healesville Amateur Radio Group has been formed following a meeting of local radio amateurs and those studying for their amateur licence.

Inaugural Club President is Graham Tremellen VK3TGP, who says the club will provide licence study facilities, and encourage home-brew construction among its members.

Anyone interested in joining local theory and Morse classes or the club should write to Graham Tremellen, PO Box 285, Healesville, Vic. 3777.

ar

PORT ADELAIDE RADIO CLUB

A Year to Remember

There is a very good reason to remember 1988. The First Fleet Re-enactment was held from April 1 to 11. It was the Port of Adelaide Radio Club's first major involvement with an historic event.

On March 23, the club was asked by Alan Malabone VK5NNM, from the WIA, to help with the erection of antennas, etc. On Friday, March 25, Alan and a group of members arrived to check the site, situated in No 1 Shed, near where the *Yelta* and *Nelcebee* berthed. After some discussion it was decided to erect the antennas on the following Monday, under supervision.

On Monday, three club members arrived and waited for several hours. They were then notified that there were no antennas to erect!

From left: Ron, Jack, Rodney, John, Betty, Don (President), Alan, Rennie, Harry and Charles.

On Wednesday, a meeting was held at the clubrooms and it was again arranged for club members to assist the erection of the necessary antennas.

Club members arrived on Thursday, armed with a roll of wire, supplied by Alan VK5NNM, a trapped vertical from Charley Bonnici VK5DZ, and a ground plane supplied by Don VK5AS. The first task was to erect a long wire antenna. One end was attached to an old control tower, originally part of the Jervois Bridge which was built in the 1870s at a cost of £65 000. The other end was attached to a 40 feet high wharf shed, and then into the radio shack in the old Wharfinger's Office. (Originally, space had been allocated in the Maritime Museum, the cabin of the tug *Formost* but that was found to be too noisy and congested for radio use).

After testing the long wire, the trapped vertical was erected, attached to a maintenance ladder at the end of the building, 40 feet above ground. After sorting out where to run the ground radials, it was tested and found to be in working order. Next the two metre was installed and tested. All was operating well.

On Friday, April 1, Alan arrived with a TR-940S transceiver loaned by the WIA. The first contact was made by Harry Hillard VK5AHH, at 0002 UTC. This was with VK8NIP. Operators on the first day were VK5s NNM, ZN, and AHH. Many stations were contacted before the First Fleet arrived using the special call sign, VI88SA. The First Fleet, nine ships in all, was certainly a magnificent sight.

The radio shack was open to the public every day the Fleet was in port from 10 am to 10 pm. One special contact during the event was with the sailing ship *Eagle* KM1G, which was located off the coast of Mexico.

A welcome operator on the Wednesday was Jenny Warrington VK5ANW, President of the SA Division of the WIA.

During the 10 days of operation, there were 567 contacts made with VI88SA and many visitors were welcomed to the shack. Thank you to all members of the Port Adelaide Radio Club who made this event such a success.

Special thanks are extended to the following members for their specialised assistance: John VK5PTT, Grant VK5ZLY, Tom VK5NTJ, Graeme VK5PAF and Harry VK5AHH.

John VK5PTT penned the following verse especially for the occasion:

SPECIAL EVENT

—by John Mullins VK5PTT

"You what!" said the member
With such a retort,
"We're setting up a station
Down at the Port."

"Yes," said the Pres
"The First Fleet is here,
And I want all of you members
To set up the gear."

We have a vertical, a long wire,
And a 940S,
Though how long it runs
Is anyone's guess.

So the antennas were strung
High above the ground,
They were fastened with bolts
And were securely bound.

The coax was run
Into the set,
1:3 was the SWR
That's the best we could get.

100 watts was pushed up the spout.
"Huuuuloo, huuuuloo, are we getting out?"
For the *next* 10 days the call was sent
"This is VI88SA Special Event!"

Yes, it's Australia's birthday! That's why we're here,
To celebrate with humour, laughs and good cheer.
The operators were mostly, novice and full.

"SO"

There was nothing more pleasing
With the 10 days I spent,
Than to work with my "friends"
At the "Special Event".

—Contributed by Don Hobbs VK5AS, President

NERGS DO IT AGAIN

The North East Radio Group (NERG) of Melbourne retained its reputation as the premier foxhunting group by its showing at the Mount Gambier Convention.

A contingent of about 30 NERGs attended the convention, which was held over the Queen's Birthday Weekend.

Displaying their foxhunting skills to good effect, they won all but two of the foxhunts.

The convention's overall trophy contest saw a closely fought battle between the traditional NERG teams of Geoff VK3CGH and Paul VK3DIP.

Geoff's team finally came out on top by a small margin. His team included Ewen VK3BMV, Richard VK3CRH/VK7CG and Greg VK3VT.

They have won the overall trophy contest now for four years in a row.

TRAFFIC JAM COMPUTER

An on-board computer system which enables drivers to avoid traffic jams is to begin trails in Britain.

The system, known as Autoguide, will be used initially on the stretch of the M4 between Heathrow Airport and central London — Europe's most congested motorway.

Each computer will be programmed by the driver to pick up traffic information as the car passes roadside beacons.

The quickest route to any given destination will be plotted automatically and instructions on detours to take then appear on a dash-board console.

An infra-red beam will also give cars equipped with the system priority at traffic lights, enabling the light to be held on green or to switch from red to green as the vehicle approaches.

AR Showcase

A new AWA business sector, AWA Distribution, has emerged as a result of the combining of the Measurement and Control Division, AWA Rediffusion and Car Products, Audio and Hi-Fi and Land and Mobile Communications Groups from AWA Ashfield.

The new organisation will also have a new address:
Unit 14 and 15, Macquarie Park View Estate, 112-118 Talavera Road, North Ryde, NSW. 2113. Phone (02) 888 9000.

Bill Newcombe, Distribution's General Manager Sales, claims the new arrangements will allow for economies of scale in a number of shared facilities and result in improved customer service.

Distribution also intend to adopt a much more aggressive marketing approach.

Also streamlined are the interstate distribution operations which are available on the following telephone numbers:
Melbourne (03) 560 4533; Brisbane (07) 844 1631; Adelaide (08) 272 3588; Perth (09) 244 2884; Launceston (003) 44 5155.

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POWER CONVERTER

The power supply designers race toward higher frequency power conversion appears to be "hotting up".

Pulse Engineering have recently released technical information on their new 500 kHz Klipmount inductor and transformer range for Printed Circuit Board (PCB) mounting. Included in the range is a SMPS power unit capable of 350 watts output at 75 percent efficiency. The low profile magnetic structures are a key to the design, whilst remaining compatible with safety.

The Pulse range includes 500 kHz output transformers, gate drive transformers, current sense inductors and transformers, magnet amplifier transformers and more.

Full details of the 500 kHz SMPS power unit design and magnetics can be obtained from Clarke and Severn Electronics, PO Box 129, St Leonards, NSW. 2065.

ar

HEATSINKS

The Redpoint range of heatsinks has been extended to include three-pin, four-pin and eight-pin TO3 configurations.

The range provides for the conventional powerfin type offering up to 8.9 C/W to the shellsink type offering 9.5 C/W. The Redpoint PF range has been designed to clamp over the TO3 case without disturbing the device connections and using almost no additional board space.

All Redpoint heatsinks have a black anodised finish to maximise heat dissipation. Details of the Redpoint range of heatsinks is available from Clarke and Severn Electronics, PO Box 129, St Leonards, NSW. 2065.

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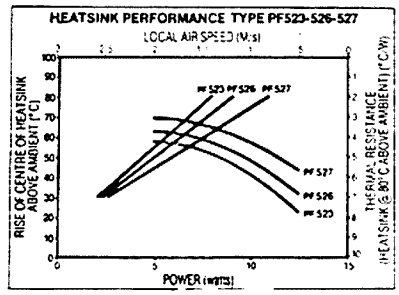
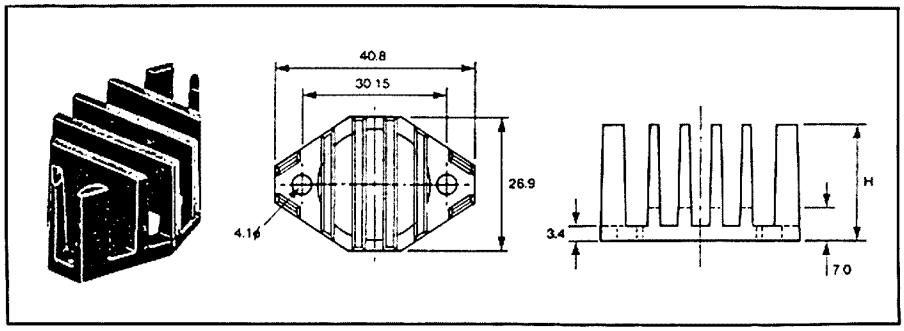


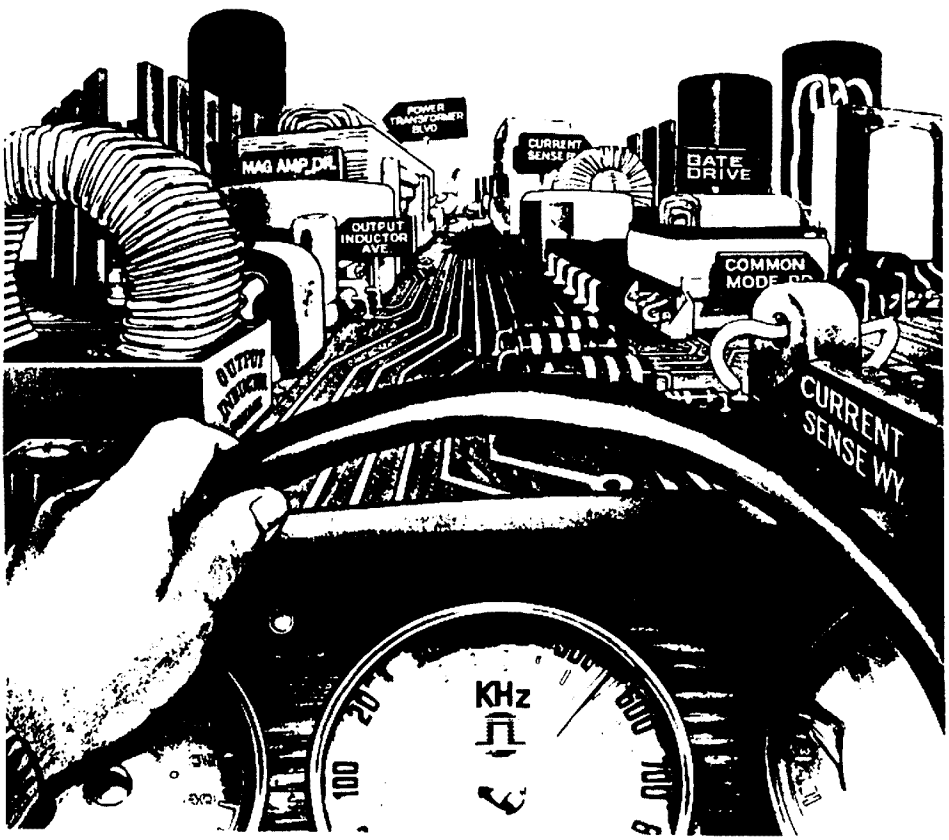


CELLULAR NET EXPANDS

Australia's high capacity cellular mobile telephone network has more than 20 000 users in its first 12 months of operation.

The system, which includes vehicle mounted, portable, and hand-held phones, now operates in Adelaide, Brisbane, Hobart, Melbourne and Sydney.

Telecom will expand the network in the coming year to Albury/Wodonga, Canberra, Darwin, Newcastle and Perth.



RADAR HISTORY PROJECT

Australian designed and built radar played a significant part during World War II in the south-west Pacific — but nothing appears to have been documented on the RAAF radar personnel.

That will change if a project to collect information on the operational side of RAAF ground based radar receives sufficient response.

Two ex-radar men are seeking information and hope to write a history and provide a valuable record for the War Memorial in Canberra.

The war effort required competent radar mechanics, and one source of easily trained personnel was the ranks of amateur radar.

Radio amateurs went straight to radar school being exempt from a six month radio school course undertaken by other recruits.

The daily diaries of all radar stations are being researched. But they do not give anecdotes, recollections, information and photographs of groups and installations.

All personnel who served on radar establishments, squadrons and stations, can contribute to the project.

Further information is available from Norm Smith, 93 Pacific Highway, Murillumbah, NSW. 2484, or Ed Simmonds, 8 Lytham Court, Nerang, Old. 4211.

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- **Monthly Project Buyers Guide**
  – each issue we detail where you can get the components featured in our projects as well as which firms are stocking kits of our projects.
- **Telephone technical enquiries**
  – yes, you can speak to the editorial team direct and have your queries answered. We don't live in an ivory tower!

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW 2150

DIVISIONAL OFFICE

The Division's administrative secretary will be on leave during the month of August. During this period there will be some changes in the opening hours. The broadcasts and the answering machine on (02) 689 2417 will advise the hours.

RETIREMENT

Cec Bardwell VK2IR, retired from the position of Correspondence Course Supervisor at the end of June 1988. Cec commenced his first lecture class for the division in 1959 which continued at Atchison Street until 1979. In the early 60s he also set up the Correspondence Course which has been used by thousands both within Australia as well as overseas. The new Supervisor will be advised in future notes. To Margaret and Cec, thank you.

RD CONTEST

Don't forget to set aside some time over the weekend August 13/14, to help VK2 try and regain the RD Contest. There is a space in the display cabinet at Parramatta for the trophy. The special RD broadcast will be conducted at 5.15 to 6 pm on Saturday afternoon. A repeat of the broadcast in the usual time slots.

BROADCAST ANNOUNCERS/ ENGINEERS

With a few dropping out of the roster there are positions vacant. If you would like to assist please contact the Broadcast Officer, Steve VK2KXX, via the office or call backs.

AWARDS — CONTESTS

The Postcode Contest for this month will be on Friday, August 26, from 9 to 11 pm. Details on the broadcasts. . .Don't forget to return your RD log as detailed in July AR. . .Several VK2 Awards have been issued. It is hoped to include a list and report in the next Mini-Bulletin. . .There will be a special one day award on September 22, to celebrate the 70th anniversary of the first wireless message from Australia to England. The call VI88WIA will be used on this day — details next month. . .During November there is the other special award for the Parramatta Bicentenary.

SLOW MORSE SESSIONS

This nightly session is conducted on 80 metres — 3.550 MHz — first from VK2 and then followed by VK5 operators. In recent times it has been suffering interference from both fishing boats as well as other amateurs. Please give the frequency a wide clearance to allow future amateurs every chance to learn the code. The same applied to the VK2RCW automatic transmission on 3.699 MHz.

CONFERENCE OF CLUBS

Illawarra Amateur Radio Society will be the host of the next Conference of Clubs to be held in early November. Agenda items should be submitted to the Divisional Office by early September.

VI88NSW

There are a few slots left for both clubs and individual amateurs. Clubs should check the recent club posting. There are one day slots available on August 8 to 12. Check with the office. There has been a steady stream of cards passing both ways through the VK2 Bureau.

NEW CALL BOOK

A reminder to ensure that your address details for the next call book are as you require them. Remind non-members that the entries that will appear are those appearing in the last edition unless they have advised both the Department and the call book editor of changes. Notification to the call book editor may be made through the Divisional Office. Would repeater and beacon groups also check their entries.

NEW MEMBERS

A warm welcome is extended to the following who were in the June intake.

J V Anderson VK2FLN	Silverdale
M J Brewer VK2FMB	Glen Innes
A N Cherry VK2BCA	Blaxland
E A Fogarty VK2MEF	Raymond Terrace
R F Hawksley Assoc	Newport
G Leszinsky Assoc	Cambridge Park
R Manieri VK2NAR	Greystanes
R W McDougall VK2BPA	Brighton le Sands
G W McLennan VK2FPA	Kurri Kurri
A W Mellis VK2MDO	Goulburn
T Nakamura Assoc	Sydney
B Nicholson VK2ABN	Gladesville
P H Norton Assoc	Coonabarabran
C J Nutt VK2DCT	Gladesville
R R Smith VK2DVT	Heathcote
G Soyusatici Assoc	Auburn
C G Stennett Assoc	Coffs Harbour Jetty
E Synstra VK2KEH/SCV	Faulconbridge
R Turner VK2COX	Hillsdale

ar

Forward Bias

Norm Gomm VK1GN
GPO Box 600, Canberra, ACT. 2601

DIVISIONAL PARTS BOX

The Division has established a Divisional Parts Box for those hard-to-get components such as variable capacitors. Neil VK1KNP, has offered to look after the box and is seeking suggestions for items to obtain.

COAXIAL CABLE

The VK1 Committee is arranging a bulk purchase of Mil Spec RG 213 cable as a very good price. A similar purchase of Mil Spec RG 58 was sold the very first night, so the price must be right! Alan VK1WX, is the contact for this cable.

ATV GROUP

After some careful consideration, the local ATV Group has decided to settle on an in-band (70 cm) repeater for the ACT area. Inquiries to Neil VK1KNP

MONTHLY MEETINGS

The May monthly meeting included a trash and treasure sale, and an introduction to repeater operation for novices. Due to the poor weather, attendance was down on the night, but those who attended had a great time transferring highly prized items from one owner to another.

The topic for July was a talk and demonstration of satellite broadcasting by Neil VK1KNP.

The proposed topic for the August meeting is a presentation on Project Raven, new communication equipment for the Army. This topic is subject to confirmation.

Hank VK1HZ, is always looking for new and innovative topics. So, any suggestions will be gratefully received.

Future meeting dates are:
August 22
September 26
October 24
November 28

PACKET ACTIVITIES

As well as two metre and 70 centimetre repeaters on Mount Ginini, the Division is installing a digipeater for the local packet enthusiasts.

Because of interaction problems with other equipment, the repeater will operate on 144.800 MHz. A major innovation is the use of a 4800 baud rate. The digipeater is base on a TNC2 and HAPEN modem, using direct FSK on a FM 828 transceiver. Subject to Canberra's weather and some minor technical problems, the new digipeater should be operational by the time this issue of AR is out.

The ACT Packet Group normally meets on the first Thursday of each month, but this is subject to variation. Details of venues and dates are beaconed by Richard VK1UE, about one week before a meeting.

Details on the ACT Packet Group activities can be obtained from Carl VK1KCM, by telephoning (062) 89 7819 (work) or (062) 58 3921 (home).

REPEATER NEWS

In the last issue of AR, we mentioned that the antenna on the Mount Ginini two metre repeater had expired and was to be replaced. At the time of writing, the new antenna has been in operation for a couple of weeks and reports coming in show a greatly increased range. Stations in south-west Sydney are able to reliably work the repeater. Along the Hume Highway it can be worked as far north as Mittagong, and below Jugiong to the south.

The people behind this effort were Paul VK1BX, Rob VK1KRM and Alan VK1WX. Congratulations on a top-job fellows.

Users of Channel 7 are reminded that this repeater is intended for mobile voice use only. However, the Division sees a need for experimentation and has approved the use of the Black Hill repeater (146.900 MHz) for experimental use subject to the technical provisions of the operators licence and normal operating courtesies. Other modes are acceptable, as long as FM modulation is used and the normal bandwidth for FM is not exceeded. Any inquiries should be directed to members of the VK1 Division Committee.

THEO VK1KV

Theo Vidler VK1KV, apparently under considerable pressure and with great reluctance, has left the mild climate of Canberra to move down to the harsh environment of the NSW South Coast.

Theo has been a stalwart of the VK1 Division for many years, not only serving on the Committee, but providing a positive contribution on other occasions. His main interests are in 80 metre chit-chat and VHF packet. He is looking forward to maintaining those activities and meeting new acquaintances on the South Coast.

Good luck from VK1-land, Theo.

ar

WA Bulletin

Fred Parsonage
VK6 HONORARY SECRETARY
PO Box 10, West Perth, WA. 6005

COUNCIL REPORT FOR THE YEAR APRIL 1987 TO MARCH 1988

MEMBERSHIP

In November 1987, we had 761 members as compared with 748 in December 1986. This is creditable at a time of falling real standards of living and also a time when there is a strong drift away from all kinds of voluntary associations. A hearty welcome to all new licencees and former members rejoining who made this possible.

MEETINGS

General Meetings continued to be held every third Tuesday night. Glyn VK6AJG, completed a full year as Program Organiser and provided us with an interesting and stimulating lecturer every second month. In July, we were advised by the Institute of Engineers that, in 1988, it would not be possible to book Science House for 12 months in advance and there may be nights when it would not be available to us. It was with some heart searching, not to say some hall searching, that we decided to transfer the meeting venue to the lecture theatre at the East Perth Westrail Centre.

At the 1987 AGM, the Secretary VK6PF indicated his intention to retire. Pleas, threats and personal approaches all failed to produce a replacement. In the end, Harry VK6WZ, a white stick operator, volunteered to take meeting minutes, while the President directed that Council members would have to handle their own correspondence and share dealing with general correspondence. That this should have happened is an indictment of the selfishness and lack if interest of Institute members. In July 1987, Fred VK6PF relented and took back the Secretaryship, enabling the Division to carry on.

During the year, visitors from the north-west, VK3, ZL1 and 9V1 attended meetings.

CHRISTMAS MEETING

In what seems to have become a tradition, a pleasant and successful Christmas meeting was organised by Cliff and Christine VK6LZ and VK6ZLZ, at the Westrail Centre. The newly created Department of Transport and Communications was well represented by our guests Trefor Jones, Glen Ogg and Barry Butler. There was no award of Amateur of the Year this year, but Outstanding Voluntary Service Certificates were presented to the Hills Amateur Radio Group and the Northern Corridors Radio Group for their high degree of enthusiasm and activity. To Ray VK6NRN, for his dedicated service to the QSL Bureau and to Eric Smith for his service to the history and preservation of amateur radio beyond his duty as Wireless Hill Museum Curator.

In addition, specially commissioned plaques were presented to all of the Practice Morse and News Broadcast operators and their respective co-ordinators, Malcolm VK6LC and Harry VK6WZ. Finally, Fred VK6PF was presented with a brassbound bulkhead clock as a token of gratitude to him for sacrificing most of his leisure time to the Wanneroo mast case. Incidentally, the Christmas Meeting was held on the second Tuesday so as not to be the week immediately before Christmas.

EXAMINATIONS

We were invited to nominate an Institute representative to attend the exams and view the question papers. The purpose of this was so that in the event that a candidate claimed that the paper or any question was unfair, the Department would have an independent body to call on for an opinion. We nominated Dave VK6WT, and in the event it proved more useful than the Department expected because his reports, which we forwarded to them, highlighted some ambiguous questions and unhelpful styles which were subsequently corrected.

The Department has implemented it's declared intention to devolve the conduct of examinations as an examiner and expects to conduct it's first exams by August 1988. The job that Dave was doing will be carried on with a committee from TAFE, DOTC and WIA.

SPECIAL EVENTS

JOTA this year, while being its normal success, was enhanced by the generous provision of an AUSSAT link between a repeater in VK6 and one in VK2.

Officers of the Ionospheric Prediction Service visiting Perth offered, at short notice, to give a lecture of interest to amateurs. This was arranged for July 27, and was enjoyed by those able to attend.

KARRATHA STUDY GROUP

Malcolm VK6LC, spending some time in Karratha in the course of his employment, decided to revive amateur radio and formed a study group. With some assistance from a local novice, Steve VK6NAK and Chris VK6AVX, a number of its members succeeded in obtaining licences.

PRACTICE MORSE

We note here that trial practice Morse sessions on Channel 2 VHF repeater have been going out for over 12 months.

FUTURE OF AMATEUR RADIO

Early in the year, a Future of Amateur Radio subcommittee conducted some deliberations but reached no firm conclusions excepting that we should be looking to the very young and very old in the community for recruits into the hobby. At this point it was eclipsed by a Federal Committee on the same subject.

PACKET RADIO

Harmful interference was experienced to the Travellers' Net from unmanned (mostly) packet radio stations operating above 14.100 MHz. We asked the Federal Executive to approach DOTC on the matter, sending them a submission drafted for us by Arthur VK6ART. There were also private letters to the Editor of AR noting the ungentlemanly behaviour of the packeteers. Many other letters followed, revealing a strong polarisation of opinion.

BROADCAST

The Council made some decisions with regard to the news broadcast, namely that there should be a deadline of 8 pm Friday for input and that we would adopt a policy of phased upgrading of equipment over a five year period.

RADIO MASTS

The unifying thread which runs through the whole year is the power struggle, or more correctly the struggle for justice, between the Institute and the Wanneroo City Council over radio masts in which we have made Peter Hackett VK6PK, our guinea pig. The case has been marked by much bitterness and anger and a great deal of deceit and capriciousness on the part of Wanneroo. At the Local Government election, the Mayor campaigned on a platform which included "ridding the City of unsightly radio masts". The City circulated an extraordinarily biased letter inviting objections from residents and someone anonymously circulated a provocatively false petition. Our appeal to the Minister for Local Government against the refusal of a building licence for a four metre mast was turned down without reason. The City was informed by the DOTC that interference was no business of theirs. On a further appeal to the Planning Appeals Tribunal, the City admitted that loss of amenity was not a valid ground for objection. They then rejected a further application on the grounds of interference and loss of amenity against the advice of their paid professional staff. Institute councillors attended at least three meetings with the Technical Services Committee, each time going away with bland assurances of goodwill. Words fail one to describe the duplicity of the Wanneroo Council. Another appeal is pending.

Some good which may yet come out of it is that the council staff arranged a meeting between the Institute and representatives of the Northern Zone of the Local Government Association to discuss model bylaws to permit a prescribed mast and antenna to be erected without requiring permission from neighbours. Unfortunately, progress from the LGA side has been slow.

FINALLY

On behalf of all the members, I would like to thank all Councillors for their dedicated work throughout a difficult year, but none more so than Fred VK6PF who has, literally often, borne the burden in the heat of the day.

Bruce Hedland-Thomas VK6OO
President

ar

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

Some of the VK5 Divisional Council — from left: Peter Maddern VK5PRM, Minutes Secretary; Don McDonald VK5ADD, President; Hans Van Der Zalm VK5KHZ, Secretary; Jenny Warrington VK5ANW, Immediate Past President; Alan Mallabone VK5NNM, Membership Secretary and Education Officer; and Bill Wardrop VK5AWM, Treasurer.
Not present were: Ken Westerman VK5AGW, Clubs and Country Members Representative and Membership Secretary; Bob Allan VK5BJA, PR, SATAC, DOTC Liaison and Vice President; Rowland Bruce VK5OU, Federal Councillor and Vice President and Graham Iles VK5AT, WICEN Director.

HELP

I have had the following two requests for over a month, but I ran out of space in last month's column.

The South Australian Historical Aviation Museum, in Mundy Street, Port Adelaide, is looking for anything appertaining to aircraft, that can be restored or used to restore any World War II aircraft or equipment. If you are going to clean up the shack and have anything that looks like ex-service equipment ***don't throw it out***, take it to the Museum, which is open on Wednesdays and weekends or contact Lloyd Jury VK5TP, on 43 7595.

George Lukacs collects anything to do with Antarctica, and in particular the Australian Bases. Post cards, letters, QSL cards and any philatelic material would all be greatly appreciated by George. You can ring him at home on 45 4800, or at work on 212 1141, or write direct to him at 23 Hurstfield Terrace, Findon, SA. 5023.

Also, we are still looking for volunteers to:
(a) form a Picnic Committee (here is the ideal opportunity for all those people on the northern side of town who complained that Bridgewater was too far to go!), and
(b) Ray Bennett VK5RM, is still looking for people to form an Historical Committee. You can contact Ray on 353 5119.

PHOTOGRAPHS OF PAST PRESIDENTS

I have received the first of those photographs of Past Presidents that I asked for. Tom Laidler VK5TL, who was Divisional President from 1968-70 has donated a nine by seven inch black and white photograph of himself taken around 1952, I believe. I suspect that our next request will be for someone who makes picture frames, as a hobby! (I hope that we are going to need lots more frames!).

I have also received, from Clarry Castle VK5KL, a photocopy of a couple of pages of AR for September 1, 1938. Clarry has pasted these onto a board so that they can be displayed in the Historian's Cabinet. It names members of the very first VK5 Divisional Council, (except that J W Hambly-Clark VK5AA, our first Divisional President, comes out as J W Handly-Black) circa 1918. It then goes on to show a photograph of the 1938 Council, and gives a thumbnail sketch of each member. At least three of these are still seen down at the BGB from time to time.

Clarry VK5KL and Frank Bourne VK5BU, attend the monthly meetings, and Bill VK5WW and Clarry are 160 metre operators for the Sunday Morning Broadcast. Not bad for a group who have all been around the WIA and licenced for over 50 years!

Perhaps, one of these days, when space permits, I'll give you some Thumbnail Sketches of the current Council. Meantime, you'll have to content yourselves with the accompanying photograph taken on the evening of the AGM in April.

DIARY DATES

August 23 — General Meeting (we are trying to get a speaker on Cellular Phones, but nothing definite yet). 7.45 pm.
August 30 — Buy and Sell. 7.30 pm.
September 27 — Display of Members Equipment, start getting your latest home-brew equipment ready to display, it could win you ESC Vouchers, the Millar Award (donated by Merv VK5MX, to the best newcomer) and including a $20 cheque, or the ICS Award donated by John Moffat VK5MG, for the best all-round winner, which also has a monetary value. We thank both Merv and John for their donations, and hope that there will be some stiff competition provided by the participants. 7.45 pm.

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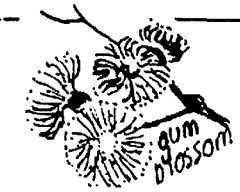

QRM from VK7

John Rogers VK7JK
VK7 BROADCAST OFFICER
1 Darville Court, Blackman's Bay, Hobart, Tas. 7052

BRANCH MEETINGS FOR AUGUST

The Northern Branch meets on August 12, at the Australian Maritime College at 7.30 pm. In response to recent discussions on the meeting format, there will be as short a business meeting as possible, to be followed by a practical session, details of which are given on the Sunday VK7WI broadcasts, via Leon VK7NHG.

The Northwestern Branch meets on August 9, at the Penguin High School, also at 7.30 pm. Information on the meeting agenda and activities are available via Greg VK7ZBT.

The Southern Branch meets on August 3, at the Activity Centre, 105 Newtown Road, Hobart, at 8.15 pm. It will be immediately preceded by an Executive Meeting, same venue, at 7.30 pm. Arrangements will be set out for a Gabfest, barbeque, and Mark II Monster Sale, for Saturday, August 6. The Mark II Monster is far more horrifying than the Mark I version, so should succeed in instilling such fear into members that they really will let go their purse strings and buy up everything in sight. Then the $1000 target for TARC will be reached and Rai VK7VV can breathe again, and so for that matter, can our TARC Organiser, Peter VK7ZPK.

Broadcasts for the Division are still developing with the repeat on 80 metres on Tuesday evenings receiving good reports. The method of presentation is showing signs of changing patterns, too, as new equipment at the Activity Centre in Hobart, comes into operation. Taped interviews are now possible and this means an increasing number of amateurs have access to the VK7WI broadcasts. Newsreading has also become possible for additional operators, with the broadcast console working at the Centre.

Repeater 2 has now been fitted with its new control unit, and Repeater 6 has improved characteristics, due to the work of several dedicated amateurs. That work is much appreciated by all repeater users, especially by those who, from June 1, have been experimenting on two metres for the first time.

We would remind readers of the ever-nearing date for TARC 1988 and the need for maximum support for this function.
John Rogers VK7JK

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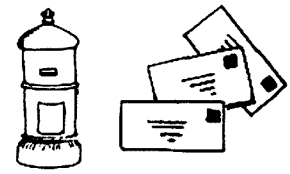
Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Over to You!



VNG — standard frequency and time signal service

As many know, our national frequency and time signal service, VNG, was closed down on October 1, 1987, for financial reasons.

Nearly 100 VNG users met on December 1, 1987 and resolved that this important service should be revived. The Precise Time Working Group of the National Standards Commission was asked to investigate ways of doing this and has identified another transmitter site for VNG near Sydney.

The group which operates this transmitter field is willing to run and maintain the VNG equipment. Preliminary estimates of costs for three transmitters are $30 000 for setting up and $40 000 per annum running expenses. Telecom has agreed to donate the VNG equipment (including four transmitters) to the National Standards commission. AUSLIG (the Australian Surveying and Land Information Group of the Department of Administrative Services) is paying the setting up costs.

A VNG Users Consortium has been formed as a subcommittee of the Precise Time Working Group of the National Standards Commission to provide funding to run VNG at the new site. Contributions are held in a trust account and used solely for VNG.

Readers are invited to join this Consortium and contribute to the running costs. Users have already pledged up to $2000 each and a limited VNG service will be commenced soon. The extent of the service, and the future prospects for long term continuation of VNG, will depend on the amount and reliability of continuing financial support from users.

The consortium has raised a total of $9537 as of May 1988.

Yours sincerely,
Dr Marion Leiba
Secretary
VNG Users Consortium
26 Fimister Circuit
Kambah, ACT. 2902

ar

WARC 1992 EXPENSES

With time moving on towards WARC 1992, it is time to consider how the WIA is going to finance its share of this very important conference. Incidentally, for those optimists who consider that the letters stand for World Amateur Radio Conference, let me disabuse your minds of that idea. They stand for World *Administrative* Radio Conference — a very big difference indeed.

Regardless of the fact that world amateurs will have no direct input to the Conference, it will be necessary for all amateur bodies world-wide to be represented as a lobby group. Without this representation the amateur service will be torn to shreds by default, if it is not indeed dismantled.

The costs of sending at least two delegates are going to be considerable and some way must be found to meet these expenses. Terry Carrell, President of the NZART estimates a cost of at least $30 per member to meet this expense. With a greater membership in the WIA, the cost per member will still be considerable.

We must be prepared to accept the costs as inevitable and non-members should be canvassed through electronic magazines, and direct, to make an equitable donation to their hobby.

Assuming the same cost per member here, I suggest a membership levy of $10 per member be made for the next three years and the levy to apply to each years' subscription. These monies to be placed in a separate account and earmarked specifically as WARC expenses. Any remaining monies after WARC can be reimbursed to members as a subsidy on their next membership fees.

I suggest that action be commenced *now* regarding the raising of WARC expenses as there will be less adverse criticism to a number of small levies than one heavy levy at the last minute.

If this letter generates some discussion and the Divisional Councils canvass opinion and advocate early Federal action, I think it will be in the best interests of the amateur community.

Yours sincerely,
Ted Roberts VK4QI
38 Bernard Street,
Rockhampton, Qld. 4701.

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DEVOLUTION — A FURTHER STEP

I think it is time the Amateur Radio Service gave some serious consideration to an obvious extension of one aspect of Devolution. This is the devolvement by DOTC of the issue of the AOCP and licences in their various grades.

I suggest that the licence examinations be held within the framework decided upon by DOTC and the successful candidates be issued their licences by the WIA. A capitation fee equal to the existing licence fee be paid by the WIA to DOTC for each successful applicant and the applicant be charged a combined fee to cover this licence and also the annual fee for membership of the WIA. Obviously, the WIA section of the fee to be charged pro rata for the amount of the current year's subscription to be applied when assessing the charge.

The question of not requiring or desiring membership of the WIA then raises a number of objections. In these enlightened (?) days, the principle of compulsory Union membership is a well-known fact of life, so that principle is not strange to our way of life. The WIA is the recognised voice of the Amateur Service from DOTC's viewpoint and is the collective voice of all amateurs when negotiations between the Administration and amateurs are under way. It is not, therefore, unreasonable to expect all amateurs to support these negotiations financially for their own benefit, as well as the other very real and tangible benefits that membership of the WIA confers on them.

In addition to the initial charges to the newly licenced amateur, the obvious thing would then be to issue all station renewal licences through the WIA on the same basis. Considering the reduction of workload for DOTC, it may prove possible to negotiate a reduction in the renewal fee. There is also the possibility of DOTC collecting both fees and reimbursing the WIA in turn but this would only add to their workload with a corresponding loss of administrative efficiency. Obviously, a DOTC overview of the operation would be necessary periodically to ensure no inequitable issue of licences occurred if this function was passed to the WIA.

This letter is only intended to raise a very valid discussion point amongst the amateur fraternity and administration. I freely admit that it is difficult to say to an amateur "You must join the WIA or else forfeit your licence", but the steady fall in membership of the WIA places an ever increasing financial and administrative burden on the dwindling membership. For the good of the Amateur Radio Service, I suggest we take a hard look at the Government policy of "Let the user pay" and consider this or a strong alternative policy while we still have a service where we can exercise and enjoy the privileges (and it is a privilege; not a right) that exist under our current licence structure.

Yours sincerely,
Ted Roberts VK4QI
38 Bernard Street,
Rockhampton, Qld. 4701.

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NOVICE PRIVILEGES

I would like to express my opinion on the recent addition to Novice privileges.

I sat for these examinations in 1985 after coming from the ranks of CB. I was asked to join a class to make up the numbers and see if I could obtain my NAOCP. After a long period of going to class and trying to fit it in with shift work, I sat for my first exam, which I failed.

I then increased my study for the next exam. Bear in mind that, until I first joined this class I had no experience whatever of radio procedures or exams. I sat for the next exam and improved two points over the first attempt. After a few more tries, I decided to try for the Full Call theory and to my surprise; I passed. The first hurdle over, I then had to sit for the CW. At first it got me down, but determination made me go on, and after three more tries I received my "K" call. That made me a little better, so then I had to increase the CW to 10 WPM. This was done after some great effort, and I passed after three attempts at 10 WPM.

To achieve my Full Call, all of this by now had taken me two and a half years, much study, and plenty of hard work!

This is a long way of saying I worked hard for my ticket to operate on the bands. And, I make good use of them too.

When it was announced that the Novice could use two metres, and that possibly Morse may be dropped, I thought of the time and effort that I put in — it makes things hard to understand. I don't know where this is going to end.

Just think if I had used the bands on K call until now, I wouldn't have had to worry about my Morse, it seems in the future.

The moral of this letter is, if you work hard for what you want, you will surely get it, and if I can do it so can a lot of others.

Yours with thanks,
Max Hardstaff VK7KY
8 Glenburn Crescent
Sulphur Creek, Tas. 7316

Permitting Novices to use two metre FM phone only, is quite unrelated to their Morse capability, Max. Although some Limited licensees would like Morse not to be needed for HF privileges, there is no intention by the WIA to move this direction. —Ed.

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NOVICES ON TWO METRES AND DEMOCRACY

Before making the final approach to DOTC on the issue of extension of Novice privileges to include a segment of two metres, the Federal Office had the benefit of various surveys carried out by the individual Divisions.

Their representatives came to the Convention in April 1988, and voted in accordance with their Divisional opinion. There were certain areas of clear agreement.

The preponderance of responses favoured the creation of a common band, and that that should be located within the two metre band. The reasons advanced for such views are important at Divisional level, but at the Federal level, the primary concern is the result brought about by Divisional votes.

Federal can only act on policy formulated by the majority of the Divisions. Despite such a show of votes, there are still some individuals who seem to think that they have the right to speak on behalf of some undefined, undocumented and inaudible majority, with whom they feel they have undisputed and intimate contact.

Federal acted after all opportunity was given for people to be consulted, and for numbers to be crunched.

It is time for all to realise that they are not alone in this world, and that acceptance by a minority of a majority decision is part of the democratic process. To keep defying the decision of the majority who chose to express themselves, is to defy democracy itself — a bit like anarchists fighting in the name of what they perceive to be democracy. Democracy does not mean that everyone's view must be accepted at all times. That is impossible. That is an obvious proposition, but it seems it must be said.

Those who write to the Minister expressing their objections to the Novice decision, are really undermining the status of the amateur body as a whole, and not that of the WIA. They must consider the possibility that some of the outbursts which have been expressed, particularly when they get the Minister's name wrong, really reflect poorly on themselves.

George Brzostowski VK1GB/VK4UZ
GPO Box 789
Canberra, ACT. 2601

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RIG WOES!

Prompted by the article in AR March 1988, by C H Castle VK5KL, regarding his troubles with a FT-101, I wonder if anyone has had a FT-901DM which would not tune-up with the "tune" button in the manner described in the handbook, and noticed a one amp diode tack soldered to the back of the tune unit PB-1720? I would be interested to hear of the reason and/or cure for this phenomenon. I suspect a relay/wiring board incompatibility on the rig here. Thanks.

Murray Kelly VK4AQK
29 Molonga Terrace
Graceville, Qld. 4075

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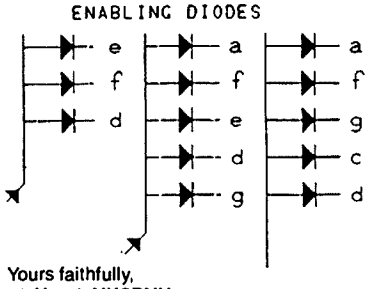
MULTIPLEX/PERPLEX

Thank you for publishing my article, To Multiplex or Perplex, in the May 1988 issue of AR.

I wish to point out a drawing error in Figures 6 and 7, the first two columns of the enabling diodes are the wrong way round.

The should be as follows:



Yours faithfully,
Jack Heath VK2DVH
2 Barclay Street
Quakers Hill, NSW. 2763

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PARCEL POST

With reference to the letter from Jim McPherson (AR, June 1988) — the Postal Guide, Section 10.56 includes "QSL cards, (amateur radio call cards)" among the articles not acceptable as Printed Papers, whilst Section 10.97.2 includes them in a list of "acceptable enclosures in small packets". Briefly, they may go as Small Packets but not as Printed Papers. Within Australia they are Non-standard Articles, the Small Packet classification only applying to Overseas.

The limit of five words only applies to greeting cards sent overseas at the Printed Paper rate, so does not apply to QSL cards.

Parcel Post rates apply over 500 grams within Australia. This is much more expensive but considerable savings can often be made by sending two packets. For instance, a parcel of 600 grams from Hobart to Brisbane surface mail costs $7.05, whereas one lot of 500 grams and one of 100 grams would only be $2.78!

Yours faithfully,
Chas Harrisson VK7CH
Manager
VK7 QSL Bureau
95 Wentworth Street
Bellerive, Tas. 7018

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REPLY TO BRUCE "GOOD TO KNOW"

(Amateur Radio, June 1988)

In reply to Bruce Jackson's letter, AR June 1988 issue, I am surprised to learn that Bruce did not know that we always used pigeons. We even had them at Point Cook. No doubt, as an old Radar chap, he is still "looking a lot", and having trouble with his VDU screen. However, it might be interesting to note that not many keyboards are used on the low end of 7 MHz and that most of the CW is hand-generated. The spacing at times with some operators does get a little tight, however as most have been around for a few years now, a CW "in the head" receiving capability of 40 to 50 WPM is general, there are no problems, as the trained human brain can automatically correct any anomalies. You seldom hear anyone asking for repeats even under poor reception conditions, this of course is an impossible situation for the VDU viewer, and Bruce being an old looker from way back would be aware of this.

Yes, the RAAF Signals Group met and marched again this April in Sydney, an excellent reunion resulted.

Good luck to you too Bruce, and I hope you may join us on CW sometime, you would be most welcome.

Peter Alexander VK2PA
Rollands Plains
Via Telegraph Point, NSW. 2441

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INTRODUCING MARKUP

(June 1988 Amateur Radio)

Unfortunately a few small errors have crept in. Most are relatively unimportant, however one may result in the demise of the oscillator transistor.

1. Page 6, column 2 should read "would give rise to a slight frequency"
2. Figure 2, the base bias resistor of Q1 should be 68 kohm
3. Page 11, column 2 should read "A calibrated CRO with time base "SAY" to about"
4. Page 11, column 2 — the 47 uF capacitors mentioned should be 0.47 uF

Best 73,
de
Ken Kimberley VK2PY
21 Nicoll Street
Roselands, NSW. 2196

ar

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YOU PROTEST — I'M DISGUSTED

With reference to the letter by Neil Penfold VK6NE in June AR. Not being much of a paper-chaser myself I have never really worried how much awards can cost until very recently when I applied and received an award from an Australian club — very nice too!

Knowing that there are quite a number of clubs within VK, I suddenly realised that it would cost me an arm and two legs to get all of these awards. Yes, before we go looking overseas, have a look at oneself — ***shocked*** — you should be. The average cost of printing awards is 15 cents, average postal charge is 60 cents, and an envelope will cost approximately 12 cents. Total cost — 87 cents.

Why do clubs persist in advertising their award when it can cost you up to $4.00.

Neil, you quoted 14 IRCs, some will cost you 20 IRCs — expensive! Some overseas countries don't seem to know the value of money — or don't seem to care. I sometimes think they feel that, if we want their awards then we will pay their "rip-off" price.

Finally, I wish all clubs world-wide the best of luck in *selling* their award. *Please be realistic!*

73
Bill Horner VK4MWZ
26 Iron Street
Gympie, Qld. 4570

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HAVE WE GOT IT ALL WRONG? NO!

The letter from David VK2PGE (AR, April 1988) may happily be applicable in the eastern states of Australia, but unfortunately Local Government is quite different in Western Australia.

1. Unified Building Regulations Board — It does not exist in Western Australia. There are Uniform General Building Regulations, but each council may set down its own set of bylaws and policies.
2. Mast construction is not the issue, so long as it is an "engineered structure" a building permit may be issued.
3. With the City of Wanneroo, the amateur VK6PK, having made his application, was told that *all* his neighbours must agree to its erection.
4. Neighbours said no, end of story, *almost.*
5. Appeals were lodged and dismissed, even after the mast height was reduced to 4.7 metres (which incidentally is 27 centimetres above my own single story roof-line).
6. Neighbours, even if only one objects, take precedent over the lawful licenced emission of amateur RF from an antenna mounted on a mast.
7. Latest council report of continuing with the refusal to issue a building permit, is that the *mast* will cause interference and loss of amenity.
8. Back to the amenity issue — council agreed that visual amenity was not an issue legally *but* was a policy of the council. A councillor is quoted as saying "Amenity is a major issue whether we like it or not".
9. Council decisions are contrary to advice received from its own solicitor and the City Building Surveyor.
10. The Supreme Court case of SA (WIA versus Nooralunga) which found in favour of the VK5 amateur, has no bearing in VK6.

Case proceeding!
Neil Penfold VK6NE
6 Moss Court
Kingsley, WA. 6026

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DUD CARDS — GLOWING DESCRIPTION

It is a little disturbing to find that there are apparently some operators who have passed the theory and regulations examinations for AOCP, but still don't know how to fill in a QSL card correctly. I have received cards from some VK stations with my call sign or signal report missing, and even more surprising, no mention of the other stations

location. I don't know how they expect to receive a return QSL, even if I felt like sending one after getting a useless card from them!

Almost invariably these "dud" cards contain a glowing description of the rig, antenna, shack and so on, which tends to suggest the missing information was not overlooked by writing the card in a hurry.

Surely the correct method of QSLing should be part of the knowledge required to get a licence, after all we have to know all the Q-codes, emission mode codes, etc. With the cost of postage these days, it is not very pleasing to spend money obtaining useless bits of cardboard. It would also be very disappointing for an overseas station to receive a card from VK which they could not use for an award such as WAVKCA, etc, because the sender omitted the essential information. They might tend to wonder whether getting a VK call sign was a bit too easy.

Incidentally, I don't think I have ever received an overseas QSL which was not completed correctly.

Yours faithfully,
R F Hancock VK5AFZ
PO Box 361
Port Elliot, SA. 5212

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NETS AND PACKET

Re the Packet/Travellers' Net saga, I feel I must rebut the letter written by VK4DFR, June AR, page 58. Pete makes quite a few interesting points, but the suggestion of moving packet to the top end of 20 metres is the most absurd of any of the proposals I have yet heard.

Nobody that I am aware of, apart from supporters of the Travellers' Net, has objected to the present location of the packet sub-band. The Travellers' Net is the only major net meeting daily between 14.100 and 14.125 MHz. In contrast, the top end of the band (assuming he means from 14.300 MHz up) includes the QRP calling frequency, Maritime Net, Brown Sugar Net, Maritime Emergency Net, Seafarers Pacific Net, SE Asia MM Net, SEANET, Skippers' Net, US Races frequency and, by "Gentlemens' Agreement" (I won't get into any correspondence over the use of this term) from 14.340 to 114.350 MHz reserved for emergency, and some EME work is also done around 14.345 MHz. Reference the HF net list in ARA Vol 10 No 10.

So if either party has to vacate the lower end of 20 metres, doesn't it sound ludicrous that *one* net insists that it "owns" that frequency by virtue of "being there first"? If packet is so detested by SSB operators then obviously the suggestion of "see packet up at the top end..." needs a bit of a rethink.

Sincerely,
Brian Field VK6BQN
PO Box 102
Wanneroo, WA. 6025

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INTERNATIONAL TRAVEL HOST EXCHANGE

SACKCLOTH AND ASHES!

Following is a letter to Ash VK3CIT, ITHE Co-ordinator.

Time passes so very quickly, and I can only apologise most sincerely for not writing you before now to thank you so much for putting me in touch with Casey Schreuder VK2CWS, the sole Sydney volunteer in the International Travel Host Exchange.

So here is my report — better late than never, but better never late, as they say...

Casey and his wife Mary, could not have been kinder to me than if they had known me all their lives, and I was very quickly made "one of the family". They took me everywhere with them, swimming at Bondi Beach, to the beautiful country parks, the awe-inspiring coast-line, surf clubs, radio clubs — so many things, it is hard to mention them all. But it was a wonderful experience, living with and taking part in the life of a real Australian radio amateur — not to mention, getting on the air every night with Casey and joining in the *Fishers Ghost* net, for which I had the honour of being presented with a fine certificate — how's that?

For my own part, I did my best to "fit-in" with their arrangements, and this is very important for "travellers".

I have now been host for the SERVAS organisation (very similar to ITHE) for 20 years, during which time I have had travellers stay with me from many parts of the world — a wonderful cultural exchange.

Wayne Green W2NSD (Never Say Die), of *73 Magazine* started a "Ham Hop Club" in the States in the early 70s, but unfortunately this did not last for many years — a great pity.

Once again, very many thanks, and please ask any of your members visiting England and wishing to visit the little Isle of Wight to write or ring me on 0983 67665, and I will do my best to accommodate them.

73,
Douglas Byrne G3KPO
52 West Hill Road
Ryde
Isle of Wight, England, PO33 1LN.

ar

Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

G — General
C — Constructional
P — Practical without Detailed Constructional Information
T — Theoretical
N — Of particular interest to the Novice
X — Computer Program

CQ — April 1988. RFI and the Novice. (G N). Meterless RF Bridge. (C N). Packet Picture Transfers. (A F). The Fleamarket Bandit. (G).

HAM RADIO — March 1988. 20th Anniversary issue. High Dynamic Range Mixing. (T). Yagi Antenna Gain. (P). Parametric Amplifiers. (T).

HAM RADIO — April 1988. Function Generator. (P N). UHF Frequency Systhesis. (P). Serial Data Latch. (P). Antenna Tuner. (N).

WORLDRADIO — April 1988. General information on amateur activities and products. Expeditions, propagation, etc. News about clubs and special events. (G).

RADIO COMMUNICATION — May 1988. Fitting Coaxial Connectors. (G N). RSGB Annual Meeting Minutes. (G). Wind Loading. (G).

QST — April 1988. Phase Noise. (T). VHF Sporadic E Propagation. (G). Safety on Towers. (G). Amateur Radio in Yugoslavia. (G).

BREAK IN — May 1988. Packet Radio special. (G).

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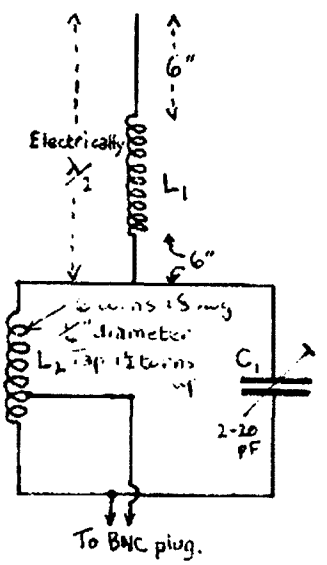
Improved Hand-Held Transceiver Antenna for Two Metres



—Reprinted from AR, UK and contributed by John Rogers VK7JK

QSP

THE QSL BUREAU DELIVERS

Ted Renouf VK2AWR, had a surprise among the QSL cards he received via the VK2 Bureau — no, it was not confirmation of a rare DX contact but a card for his first contact with a VE4.

So, what is so special, you ask? The QSL was for a contact on April 24, 1966, and has arrived 22 years later.

Ivan D Morin VE4IM, of Winnipeg, acknowledges having received VK2AWR's card for the 14 MHz SSB contact. The Canadian cards says "Ted, very happy to be your first VE4, Ivan."

Ted said he was pondering whether to write a nice letter of thanks to Ivan. Please do Ted, you must try and solve the mystery for all of us.

CLERICAL ERROR CAUSES A STIR

Pressure on the spectrum is uppermost in the minds of thinking radio amateurs and their national society in most countries.

Recently a beacon station appeared on 440 MHz (70 centimetre band) in Vancouver, Canada, identifying itself as being operated by the Customs and Excise Department.

It was conducting propagation tests prior to the setting-up of a permanent station on a mountain top.

After a flurry of activity parked by concerned radio amateurs, it was found that the beacon had been assigned 440 MHz in error.

DUTCH SIX METRES

Radio amateurs in the Netherlands have just been given permission to operate up to 30 watts CW on the 50.00-50.45 MHz portion of six metres. Previously the band had not been available in that country.

IONOSPHERIC SUMMARY

The IPS and Radio Space Services summary for April contained the following monthly average details:
10 cm flux — 123.4.
Sunspot number — 88.
A Index — 13.3.
I Index — 75.2.
Flares — 12

Solar activity was moderate to high during the period April 12 to 24. During this period there were 12 M or X class flares. Most of these came from a region which grew rapidly on the solar disc on April 11. The region rotated off the disc on April 25. The largest flare during the burst of activity was an X1.2/2B flare on April 14. M class flares occurred on April 12 — 1; April 15 — 2; April 16 — 1; April 17 — 1; April 18 — 2; April 20 — 1; April 21-22 — 1; and April 24 — 1.

The solar flux and the sunspot number rose dramatically during the middle part of the month to levels not seen since 1984. The solar flux peaked at 147 on April 16. By the end of the month, the flux has settled back to levels just barely in excess of 100.

The monthly averaged solar flux and sunspot number both reached new high points for this solar cycle. The 12-month averaged solar flux and sunspot number both reached new high points for this solar cycle. The 12-month smoothed sunspot number for October 1987 increased substantially over the previous month due to the recent burst of solar activity.

In the case of geomagnetic disturbances, from April 2 to 6, an extended period of disturbed conditions occurred during this period. The geomagnetic field became active during the period 0900 to 1400 UTC on April 2. However, a major storm started gradually on April 3 after 0700 UTC and the field was at major storm levels through April 4 until around 0400 UTC on April 5.

A further disturbance started after 0600 UTC on April 6 and the field was again at storm levels until late in the day. The field was at storm levels throughout April 22 and until the middle of the day of April 23. April was mostly quiet in terms of geomagnetic activity. The exceptions were the two intense geomagnetic storms during the periods April 2 to 6, and 22 to 23.

A graph showing cycles 19, 20, 21 and the progress of cycle 22 shows that cycle 22, up until now, increases much faster than cycle 19 so the indications are that cycle 22 could become an all time record. However, there is a long way to go as yet and other factors may be important. For example, it has been suggested that the rapid rise earlier in the cycle is due to a phase advance of the solar cycle, that is, the cycle coming earlier than would normally be expected. If this is the case, we can expect the cycle to reach a large, but not record, maximum earlier than anticipated. This would mean that solar maximum is likely to be reached somewhat earlier than late 1990, which is the expected time of the maximum if the cycle exhibits average behaviour.

—Contributed by Frank Hine VK2QL

ar

Silent Keys

It is with deep regret we record the passing of:

MR B R AUBREY	VK4AU
MR M G BURLEIGH	VK7JU
MR S C N (JOE) BYRNES	VK2FSB
MR R C G JACKSON	VK5DR
MR F C MELLON	L20469
MR N A R WILSON	VK5WA

Obituaries

S "JOE" BYRNES VK2FSB

It is with regret the Summerland Amateur Radio Club reports the passing of Joe VK2FSB, of Coraki, on May 10, 1988.

Joe began his radio life on the Citizen Band, moving on to attain the Novice call of VK2VQO in July 1979, before eventually taking out his full call. Joe was very adept in the field of radio, electronics, and antennas as well as making any machinery he required.

His tilt-over tower was made from a windmill to accommodate an HF beam, and wire antennas. He also made a very efficient two metre antenna with the assistance of his wife, Ivy.

He was often heard on Jimmies VK4HZ 80 metre net in the mornings and was frequently on other bands including the local two metre repeater.

Due to a medical condition in his later years, talking became difficult for Joe.

Joe's other interests aside from radio was the Coraki Bowling Club and beekeeping.

He is survived by his wife Ivy, sons and daughters and their families to whom we extend our deepest sympathy.

Bill Parker VK2KDI
Summerland Amateur Radio Club

ar

REGINALD GEOFFREY HASKARD VK5RH

It is with deep regret that I inform all amateurs of the passing of my uncle, Geoff VK5RH, on May 15, 1988, aged 81. He will be sadly missed.

He sparked my interest in radio when he presented our family with a crystal set in the early 1930s. Even in these early years of amateur radio, he had covered the walls of his wireless room with QSL cards, using all home-brew equipment for his contacts.

Geoff served with the RAAF in WWII as a Wireless Operator/Technician, surviving the bombing raids on Darwin and later was at the Nav/W Base at Mount Gambier.

I believe the nearest Geoff ever got to "black box" technology was when he purchased an AR7 from me intending to transistorise it — such was the calibre of this gentleman.

Sincere sympathies are extended to his wife, Margaret, daughter Marie, also Peter and grandchildren.

Rex Haskard VK5HO

ar

A PRECIS OF SOME HISTORICAL ORIENTATED HF PACKET RADIO TRAFFIC

The commemoration of the 60th Anniversary of the first Trans-Pacific air crossing, which originated in Oakland USA, on May 31, 1928 and concluded with a safe arrival in Brisbane, Australia on June 9, 1928, with Sir Charles Kingsford-Smith leading the crew was not forgotten, when a special dinner, attended by many dignitaries including Charles Kingsford-Smith, the son of the original leader were amongst those present, to mark this historic occasion which was sponsored by many notables including The Western Aerospace Museum, The Australian Consulate General, Oantas Airways and many others.

Our hobby contributed to the celebrations by forwarding messages from many well-known Australians via one of the newer modes of our hobby, Packet Radio, through the courtesy of the newly formed ASIANET operators and their American counterparts in Oakland.

Some excerpts from the originators messages will be of interest to all readers, such as from the Prime Minister of Australia, The (Right) Honourable R Hawke, M P, whose message contained excerpts such as "It is 60 years to the day, May 31, that Sir Charles Kingsford-Smith took off from Oakland to make the first Trans-Pacific flight. With him were Australian Co-Pilot Charles Ulm, an American Navigator, Harry Lyon, and an American Radio-Operator, James Warner, truly a fine example of early Australian-American co-operation.

"I congratulate you on your initiative in celebrating the 60th anniversary of this epic flight."

From the Premier of Queensland, The Honourable M J Ahern, M L A, who indicated in his message a warm welcome from the people of Queensland and stated "As Premier of Australia's most dynamic and progressive state, I'm delighted to be sending you a message over the airwaves.

"Today, in Brisbane, capital of Queensland, we are hosting the World Expo 88. It's only five weeks old and already more than two million people have passed through the gates.

"On behalf of the Government and the people of Queensland, I extend my wishes for a successful dinner, marking the historic occasion and commemorating those brave pioneers of aviation."

The Right Honourable the Lord Mayor of Brisbane, Alderman Sallyanne Atkinson, extended greetings to the people of Oakland and went on to say: "Sir Charles Kingsford-Smith is one of Queensland's favourite sons, and his airplane, the *Southern Cross* stands at the State's airport as a reminder to the thousands of air travellers who pass through daily, that although their flight may be delayed, their coffee cold, or their favourite magazine not available, things are better now than they were in Smithy's day.

". . . Many times I have flown between Australia and America, I have marvelled at the grit of Smithy and his crew. There is no doubt he helped create the strong bond which exists between our two countries, and which I hope grows stronger in the future."

—Precised by Ken McLachlan VK3AH, from information supplied by members of the ASIANET.

"HAM IN SPACE" RETIRES

Astronaut Tony England W0ORE, whose July 1985, shuttle flight on the shuttle *Challenger* brought the "Hams in Space" concept to new heights, has announced his retirement from NASA. He will take up a teaching position at the University of Michigan, Ann Arbour as a Professor of Electrical Engineering.

Tony is especially interested in working with AMSAT in future satellite projects and his work in Michigan will keep him very much involved in space technology as he will also be doing research in satellite technology as well as his teaching duties. Tony is a leading world authority on remote sensing.

With the departure of Tony from NASA, the next opportunity for continuing the amateurs in space program will fall to Doctor Ron Parise WA4SIR, of Silver Spring, Maryland, a visiting scientist to NASA. Ron's proposed inclusion of a packet radio experiment aboard the ASTRO-1 mission has been delayed while the shuttle program is reorganised following the Challenger accident in January 1986.

—Condensed and compiled from *Amateur Satellite Report*, Number 177, June 8, 1988

DEADLINE

All copy for inclusion in the **October 1988** issue of *Amateur Radio*, including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162,** at the latest, by 9 **am, August 22, 1988.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use*** scraps of ***paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words *minimum for non-members*
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable
Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 millimetre SASE to: **HJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No inquiries at office please . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — AUSTRALIA-WIDE

TRANSLATORS: The Federal Office receives a number of excellent reciprocal copies of amateur society magazines from sister societies in other countries. Assistance is required from amateurs who would be prepared to peruse several of the foreign language magazines with a view to keeping us informed of events in those countries, and of interesting technical articles. Are you fluent in Italian, German, Japanese, Dutch or Korean? Would you like to help, and get to keep the magazines? If so, please contact the Federal Office by writing to: Foreign Publications, WIA Federal Office, PO Box 300, Caulfield South, Vic. 3162.

WANTED — ACT

RADIO SERVICE MANUALS: Any year. Price and condition. Jock VK1LF, QTHR. Ph: (062) 86 6920.

WANTED — NSW

OIL FILLED CAPACITORS: Six oil filled capacitors 15-20 μF 440 VACW or 1500 DCVW. Also, Butternut vertical inc 160m coil is possible. Gordon VK2ALM, QTHR. Ph: (065) 52 4411 (BH) or (065) 53 5353 (AH).

USERS MANUAL: Can anyone help with a Users Manual for an Adler Alphatronic Computer Model P3. Will reimburse any out of pocket expenses. Details to Carl VK2EEC, QTHR. Ph: (02) 671 6595.

WANTED — VIC

TRAPS & BITS: Any traps & bits from Hy-Gain TH3JR. Have 2 traps from TH6 Thunderbird for swap or trade. No 878749 — 10m, No 878637 — 15m. Doug VK3AQL, QTHR. Ph: (03) 857 8475.

WANTED — QLD

HANDBOOK & CIRCUIT FOR SWAN VHF 150: all mode amplifier. Will pay cost of postage, etc. Fred. Ph: (07) 396 3521.

TH3 HF BEAM: or similar to set up the official Girl Guides JOTA station in Qld. Must be in good condition & reasonably priced. Also, 250 watt 2m & 70 cm, plug in modules for Bird Thru-line Mod 43 watt meter. Contact David VK4ATE, QTHR. Ph: (07) 378 9868 (AH).

WANTED — SA

SYNCHRO TORQUE TRANSMITTER OR INDICATOR (SELSYNS): wanted either transmitter, indicator (receiver) or both. Prefer 50V/50 cycle units 3" ideal with X, Y, 1, 2, 3 markings on the base plate. GEC or Muirhead Magslips are ideal units. Please contact Dean Probert VK5LB, Hope Forest, SA. Ph: (08) 56 7354.

FOR SALE — ACT

VALVES: 200 new boxed valves. $5 each, plus $1 P&P Also many used good valves $3 each plus $1 P&P SASE please with inquiries. Jock VK1LF, QTHR. Ph: (062) 86 6920.

YAESU FT-757GX RX/TX: VG cond C/W YM-38 mic, manual & tech supplmt. $1300. Yaesu FC-102 antenna tuner. $250. Qty used 5933WA valves C/W bases, plate caps & leads. Best offer. Hank VK1HZ, QTHR. Ph: (062) 54 3315 (AH) or (062) 65 5304 (BH).

FOR SALE — NSW

ANTENNA FARM: Big towers, 1000' long wires, etc on 26 acres 3000' alt. A nice home, a nice place to live. 2½ hours easy drive to Sydney; 1½ to Canberra. $145 000. Details VK2UH. Ph:(048) 4011, Ask for Smithy on Bannaby 28.

ANTENNA TUNER: 1 kW key down, bal & unbal outlets. Inbuilt *dummy. Made in England.* With manual. $250. Gordon VK2ALM, QTHR. Ph: (065) 52 4411 (BH) or (065) 53 5353 (AH).

BEAM: 5-element Hy-gain No 411 10 metre. 1 Crown rotator Model CAR24. Both with manual. Perfect condition. $300. Norm. Ph: (065) 68 2544.

DSE COMMANDER 2-METRE TRANSCEIVER: 15 watts, repeater offsets, mic & manual. Excellent condition. Recently aligned. $175. Kirt VK2DOJ. Ph: (02) 436 2618.

KENWOOD TR-2500 FM 2 METRE TRANSCEIVER: 2.5 watt output hand-held. Kenwood MS-1 quick charger. Mobile stand; SMC-25 speaker/microphone; PB-25 batteries (2); SC-4 vinyl case; owners manuals, excellent condition. Offers invited for quick sale. Also, Hidaka VS-33 triband Yagi. $525 new, Emotator 5025AX Antenna Rotator. $450 new. Hidaka VS-41 10-40 metre vertical. $225 new. Manfred VK2RV, PO Box 120, Vaucluse, NSW. 2030. Ph: (02) 371 8854.

KENWOOD TR-9500 70 CM ALL—MODE TRANSCEIVER: with extras. Mint condition. $850 ONO. ATN 420-440-11 70 cm Yagi. New, unused. $100 ONO. Kenwood R-820 HF receiver. Covers amateur bands & some shortwave bands. Excellent condition. $450 ONO. Paul VK2ATR, QTHR. Ph: (049) 59 3748.

FOR SALE — VIC

ANTENNA TUNER: Kenwood AT-230 160-10m, inc WARC bands. Built-in PWR/SWR meter, antenna selection switch, coax & single wire outlets. As new, only used once, in original carton, unmarked. $230. Bruce Kendall VK3WL. PH: (03) 741 7654 (AH), (03) 544 4888 (BH) or (03) 543 4553 (BH — FAX).

MODEL 15 TELEPRINTER: Good working order. $30 ONO. Darryl VK3AJS, QTHR. Ph: (03) 640 9294 (BH) or (03) 435 0951 (AH).

KENWOOD TS-670 QUADBANDER: 7, 21, 28, 50 MHz bands. Gen coverage rx. AM, FM, SSB, CW. In original carton c/w mic manual. Unmarked, no mods. $900. Steven VK3TK. Ph: (03) 741 0594 (AH).

SONY 2001D PORTABLE HF/VHF RX: AM/SSB 150 kHz to 29.9 MHz. FM 76 to 108 MHz. Air FM 116 to 136 MHz. Keypad or dial tune. LCD freq readout to 100 Hz. 12/24 hour clock. Scan & time functions. VGC. $600 ONO. Price includes P&P. Ph: (058) 21 0846 (AH).

FOR SALE — QLD

AOR MODEL AR2001 RECEIVER: 25-550 MHz continuous scanner with Arista 12V DC power supply. Willis extension speaker & "lair dinkum" Australian translated instruction manual. Perfect condition. $550. L40101, QTHR. Ph: Ray (07) 398 2440.

KENWOOD 2600A 2M FM: plus 35W Linear Amp (Daiwa), keypad, 10 memories, scan, etc. Included is AC ST2 stand/quick charger for base use, DC-DC converter, SMC30 spkr/mic, soft carry case. All mint cond. $500. Ken VK4TR, 8 Reel Court, Mermaid Waters, Qld. 4218. Ph: (075) 52 9090.

KENWOOD R-1000: 100 kHz to 30 MHz General Coverage Receiver. 12V/240V, as new $480. Yaesu FLDX 2000 1 kW-HF linear. $650. Kenwood Trio TX-599 & JR-599 tcvr, X-mode, & X-band operation, incl 2m conv. $650. High performance Datong RF Speech Clipper/Processor. $120. 12 VDC to 240 VAC Converter. 130 watts. $85. E/A 200 MHz Frequency Counter. $90. Ask for Jeff VK4ABJ. Ph: (079) 28 1105.

FOR SALE — SA

FL-2100Z LINEAR AMPLIFIER: Little used, as new. $800. Murray VK5BVJ, QTHR. Ph: (087) 38 0000.

Advertiser's Index

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INCLUDING SOUND INSIGHTS

AUGUST

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★ **ETI-1418: Build Your Own 4-Track Expandable Recording Mixer.**

★ **A Spike On The Line**
Protection from power line disturbances.

★ **Where to buy RF Kits Overseas**

FREE! Sound Insights
Australia's Highest Circulation
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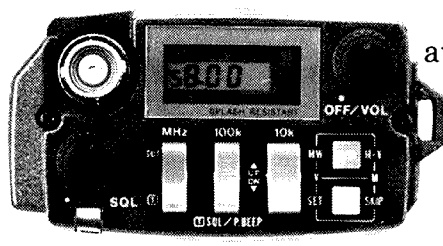
ICOM PUTS POWER IN THE PALM OF YOUR HAND.

Seven watts of power is a respectable output for any transceiver. Now imagine the possibilities of that much power packed into a multi-functional handheld.



That's what you get when you attach the optional IC-BP7 battery pack to the new IC-2GAT from ICOM. And even the IC-4GAT pumps out 6 watts with the same battery pack.

Plus you also get plenty of advanced features in the one simple-to-use package.

There are twenty memory channels and one call channel. With programmed scan and memory scan built in. A pocket beep function lets you know if particular subaudible tones are being transmitted.

The top panel digital touchstep switches and readout make frequency entry simple, especially when the unit is belt mounted. And the squelch monitor unit makes squelch control easier too.

After dark operations are no problem because the LCD backlight shows all displays. Then the light turns itself off when you're not using the unit.

In fact, all models have a power saver function built in.

So we don't just give you more power in the palm of your hand. We help you keep it there as well.

Call (008) 33 8915 or (03) 529 7582 for your nearest ICOM stockist.

They'll give you all the power you ever wanted.

ICOM

The Ball Partnership ICO 0015

Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

VOL. 56, No 9, SEPTEMBER 1988

OPERATION OF PACKET BULLETIN BOARDS
INTRODUCTION TO FOX HUNTING
A LOOK AT THE LEGALITIES OF RFI
COMPUTER PROGRAMS
CLUB PORTRAIT
GUEST EDITORIAL

Amateur Radio

Australia 1788 1988 ©

Special Features

Technical Features

The 1988 RD Contest was opened by Senator The Honourable Gareth Evans Q.C., Minister for Transport and Communications. (See page 7 for Address).
—Photograph courtesy George Brzostowski VK1GB

Regular Features

DEADLINE

All copy for inclusion in the November 1988 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, September 16, 1988.

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EDITOR
BILL RICE* VK3ABP

NEWS EDITOR
JIM LINTON VK3PC

TECHNICAL EDITORING CO-ORDINATOR
PETER GIBSON* VK3AZL

TECHNICAL EDITORS
EVAN JARMAN* VK3ANI
DOUG MCARTHUR* VK3UM
GIL SONES* VK3AUI

MARKETING
BRUCE KENDALL* VK3WL

CONTRIBUTING EDITORS
Frank Beech VK7BC
Joy Collis VK2EBX
Brenda Edmonds VK3KT
Ron Fisher* VK3OM
Gilbert Griffith VK3CO
Ken Hall VK5AKH
Roy Hartkopf* VK3AOH
Robin Harwood VK7RH
Ron Henderson VK1RH
Colin Hurst VK5HI
Eric Jamieson VK5LP
Bill Martin VK2COP
Hans Ruckert VK2AOU

COMPUTER DRAFTING
Liz Kline
Ken Kline

*Members of Publications Committee

MEMBERSHIP AND CIRCULATION MANAGER
Helen Wageningen

ACCOUNTS AND ADVERTISING MANAGER
June Fox

Inquiries and material to:
The Editor,
PO Box 300,
Caulfield South, Vic. 3162.

Material should be sent direct to PO Box 300, Caulfield South, Vic. 3162, by the 20th day of the second month preceding publication. Note: Some months are a few days earlier due to the way the days fall. Check page 1 for deadline dates. Phone: (03) 528 5962. HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with strictly.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

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Opinions expressed by individuals are not necessarily those of the Wireless Institute of Australia.

News Editor's Guest Editorial

What is the role of Amateur Radio *magazine?* It is not until you really think about that question do you come to realise the multi-faceted role served by the WIA journal.

From the first edition in 1933 it has been primarily the medium for dissemination of information to radio amateurs and shortwave listeners.

Being the official journal of Australia's national radio society, it also becomes the voice of the WIA.

The Macquarie Dictionary defines "journal" as being any periodical or magazine, especially one published by a learned society.

The first editor, Harry Kinnear, and the inaugural WIA Victorian Division based magazine committee saw the need for the Institute to have a journal and set the foundations still being followed today.

The magazine provides a venue for the interchange of ideas between members and feedback on developments affecting our hobby.

The devolvement of amateur examinations is a current issue on which members views can be aired through the pages of AR magazine.

There are others, like restructuring of the licence system and future directions of our hobby.

The advertisers in AR magazine are effectively showing their market what they have to offer, and get a worthwhile response for their advertising dollar.

Reviews of equipment and other products keep readers up with the latest available.

The ever-popular Hamads service helps recycle used equipment. Members can also call for help when they need a particular component or circuit diagram. It really works!

Clubs and groups have always had a slot in the magazine for news on their activities.

The WIA Divisions are able to effectively communicate with their members via monthly columns.

But the Divisions are also news-gatherers for the journal. They look for, and encourage, their members to submit general interest or technical articles.

Being a technical or scientific hobby, the magazine is an ideal place for WIA members to publish technical papers on their experimentation or discoveries.

An innovation which began two years ago, Technical Mailbox, is giving members the opportunity to seek authoritative solutions or answers to their technical problems.

The journal promotes both the technical side and hobby communicator aspects of amateur radio.

The community service provided through WICEN and Third Party Traffic handling is also part of the editorial menu.

It aims to cater for both the newcomer and old hand in the hobby.

While it is not always possible to satisfy everyone, the WIA Publications Committee and the regular columnists try to cover the various activities within the hobby.

Awards, CW operating, Shortwave Listening, DX, VHF, Contests and Satellites are examples of the broad range of interests covered.

There are plans to publish articles on Foxhunting and Packet Radio, (see elsewhere in this issue) and other possibilities are under review.

AR magazine is read more widely than just by the WIA membership, which receives a copy mailed each month. Many non-members see the magazine through members who pass it on, or at club meetings.

These potential members will be targetted in the magazine with frequent recruitment material including details of services available to members.

Influential people including cabinet ministers and government department heads get the WIA journal, giving it an important public relations role.

Our hobby is an international one, and global decisions ultimately affect the Amateur Radio Service in Australia.

The WIA is an active member of the International Amateur Radio Union (IARU), and regular reports on the international events appear in this magazine.

Our monthly publication is admired by the WIA's sister national radio societies who often praise its content.

The RSGB, ARRL, and the doyen of 73 magazine, Wayne Green W2NSD, have been among those who have offered unsolicited congratulations.

AR magazine is often directly quoted by overseas publications, and occasionally articles written by WIA members are re-printed with full credit in other magazines.

A less obvious role for this long-running publication is that it is an historical record. Collections of every edition published are available as a history resource.

You now have in your hands a publication which is more than a mere magazine.

Jim Linton VK3PC
News Editor
ar

WIA QSPs TO MEMBERS

Federal Office Staff

I would like to tell you something about the staff in the Federal Office. Many of you will know by now that Ann McCurdy is back with us, but in a part-time capacity after her serious operation. Ann provides secretarial assistance to the General Manager. There are three other part-time workers — June Fox, who is responsible for the accounts and advertising for *Amateur Radio* magazine, Helen Wageningen, who is responsible for the membership records and AR circulation, and Earl Russell VK3BER, who looks after the membership computer system.

The other worker in the Federal Office is Bill Roper VK3ARZ, whose voice is well-known to you. Bill joined the Federal Executive in April 1987 and took over as acting-treasurer last November. During the December to April period, he spent a considerable amount of time reviewing certain aspects of the operation of the Federal Office, particularly those associated with the financial side of things. As a result of this review, Bill has commenced setting up a number of new office systems, which include a new accounting system.

Since May this year, Bill has been working in a temporary capacity as the General Manager and Secretary of the Institute. He is currently on long term leave from his current employer and because of this arrangement, very little publicity has been given to his employment through WIA channels at Bill's specific request. This temporary employment arrangement will conclude sometime during September, by which time the Federal Executive hopes to be in a position to make a full time appointment to this position.

Peter Gamble VK3YRP
Federal President
ar

Survey of Amateur Radio Readers and Members of Your Society

The Wireless Institute of Australia is basically a service organisation and, in keeping with most similar organisations in our community, is currently examining its reasons for existence with a view to deciding its future direction.

As with most other leisure-time activity groups in our society today, the WIA is experiencing some difficulty in keeping pace with the rapidly changing perceptions and expectations of its members.

Amongst other things, it is experiencing problems caused by members finding increasing difficulty, due to the increasing demands on their leisure time, in performing the many voluntary tasks needed to keep the Institute functioning. And the difficulties caused because these same members, more affluent now then when they had time to spare, are reluctant to pay higher membership dues to enable professionals to take their place and perform these necessary duties.

Like most service organisations, in the past the WIA has tended to be a systems driven organisation, delivering established services because that was what was available, and being rather slow to respond to the members changing needs.

Following modern commercial practice, we are now turning around and changing to a customer driven organisation. An organisation that provides what its members want.

As we gear up to produce a new corporate plan, a blueprint for the future, we need your help to ensure that we plan wisely for the future. We want you to tell us what you want and expect from your Institute.

A survey of members will be included in the October 1988 issue of *Amateur Radio* magazine. Among other things it will give you the opportunity to tell us what you think we do well, what we do poorly, and where we should be placing the emphasis in the future.

Another part of the survey is going to gather data to enable the Institute to produce a statistical model of the readership of *Amateur Radio* magazine. This will enable us to demonstrate to advertisers the worth of advertising in our magazine.

And yet another part of the survey will help the Editor and the Publications Committee to better tailor *Amateur Radio* magazine to its readers requirements.

To encourage a maximum response from members there will be a number of valuable prizes available to be won by those who return the completed survey.

Full details will appear in next month's *Amateur Radio*.

ar

OH NO, NOT ANOTHER LOG KEEPING PROGRAM!

Kevin Feltham VK3ANY
109 Mary Street, Morwell, Vic. 3840

This article discusses computer programming principles, using a log keeping program to illustrate some of the principles discussed. Home-brewing is all but extinct in amateur radio. Computer applications can provide an outlet for the creativity and ingenuity of amateurs and help fill a void left by the demise of home-brewing.

There has been a plethora of amateur station log keeping programs in the amateur literature since personal computers first appeared in amateur shacks. In the July 1987 issue of *Amateur Radio* there were no less that three log keeping programs, two written in BASIC and one in PASCAL. Once amateurs acquire a new computer they usually like to try their hand at programming. Most go through the stage of writing relatively simple number crunching programs to compute aerial parameters, satellite predictions and so forth. A log keeping program is a natural progression into a more ambitious programming effort in the field of data handling as opposed to simple calculation.

Personally, there seems little need for a log program, except possibly for contest applications or for the dedicated DXer. In any case, a log application can usually be quickly developed using one of the database systems such as dBASE 3®. However, using a procedural language such as BASIC or PASCAL to write a log program from scratch provides good programming experience in data manipulation, data structures and input methods.

CHOICE OF PROGRAMMING LANGUAGE

Most beginning programmers give no thought to which computer language to use. BASIC is the natural choice as it is easy to learn and is provided with virtually every personal computer. It has many features and can accomplish most tasks. In the *Hewlett Packard* implementations it is particularly good for technical applications. However, while it is possible to write good readable programs in BASIC, it is also possible to write hopelessly unreadable ones!

Languages such as PASCAL and MODULA 2 offer many advantages over primitive languages such as BASIC and FORTRAN. They offer a variety of data structures which are not available in BASIC and FORTRAN and encourage, indeed almost force upon the programmer, good program design. Because of the strong data typing, declaration of variables prior to use and the use of global and local variables, it is easier to write programs that are free of subtle bugs that show up some time after the program has been placed in service. Bugs usually show up early in the testing phase.

The author's language of choice is now PASCAL, or more particularly TURBO PASCAL, for microcomputer applications. TURBO PASCAL, under MS-DOS, is used on a PC/XT clone. It is also available for CP/M machines and, I believe, 68000 based machines. TURBO PASCAL has many extensions over the standard PASCAL in the areas of file handling, bit manipulation and string handling. The MS-DOS implementation also gives access to system interrupts and BIOS routines. As such it is far from a standard implementation of PASCAL although on microcomputers, it is almost a standard in its own right. TURBO PASCAL also comes with an efficient text editor which makes writing the source code easy.

Changing from BASIC to PASCAL is roughly equivalent to the change which was made from AM to SSB. It seems difficult at first, but once the change is made there is no going back. (The author is looking forward to trying MODULA 2, a language which is a development of PASCAL).

DATA STRUCTURES

The advantage of using PASCAL is the great variety of data structures that it is possible to use. In BASIC or FORTRAN the most complex data structure available is the multi-dimensioned array. PASCAL offers standard data types such as the record, set and the pointer as well as those found in other language. Also, the programmer can define his own data types using the standard data types. This allows the building of complex data structures which are ideally suited to data manipulation applications. For example, each element of an array may itself be another array. Records may contain fields which are themselves records, or arrays, or arrays of records. This article does not intend to be a tutorial on data structures, very large books are available on this subject alone, but rather to point out their availability and to encourage the reader to explore their use.

A particularly powerful feature of PASCAL is the availability of pointer variables. When combined with records these permit the building of dynamic data structures which are the secret to rapid data retrieval and database applications such as a log program.

A disadvantage of arrays when using compiled programs such as FORTRAN or PASCAL is that their size must be known at compile time. Therefore enough memory must be allocated to the array to cater for the largest size likely to be used. In many cases the array is seldom completely filled and the unused memory is unavailable for other use. Dynamic data structures overcome this by allocating memory only as it is required, and freeing this memory for reuse when it is no longer needed. The reader who is at all interested in programming is encouraged to study the use of pointer variables and dynamic data structures.

AND NOW, THE LOG PROGRAM

The three log programs previously mentioned all kept the entire log in memory. This may be alright for a contest, but is not of much use to the keen DXer who wishes to have instant retrieval from a log containing thousands of contacts too large to fit into the computer memory. Also, a glitch on the power lines can wipe out the entire log. This means that the log must be frequently saved to disk which can be a nuisance during a contest, and in any case, is not the complete answer. The size of the log is also limited by the computer memory. What is needed is a log which is kept on disk at all times with some means of instantly finding the correct record on the disk, and retrieving just that record.

The author has written a log program which is a development of an earlier program written in BASIC. In both programs the logs are resident on disk. As a new contact is entered, it is written immediately to disc. Both programs work well and, as far as the user is concerned, they function identically. The difference is in the speed of retrieval of a particular contact. The PASCAL version retrieves the correct record virtually instantaneously, the only delay being the time it takes to read a disk sector into the buffer. The BASIC version is virtually unusable with a large log because of the time taken to retrieve the disk record.

The only difference between the two programs is the method used to find the disk record containing the desired contact. The BASIC version uses a sequential search, the PASCAL version uses a dynamic data structure known as a B-Tree kept in memory to reference directly the required disk record.

The three log programs previously referred to all keep the contact data in string arrays. The author of the program written in PASCAL mentioned that a record type data structure would have been preferable. This is indeed true as it makes the program much more readable, and reading and writing to disk more efficient.

The fact that the log is kept on disk means that a computer with a relatively small memory can handle a large database. The only limit is disk capacity and any limitations on the number of disk records that can be accessed imposed by the language being used. With TURBO PASCAL, 64K records can be addressed if integer record numbers are being used. It is possible to use real numbers to address records which overcomes this limitation.

The program I have written is a general purpose program, ie it is suitable for the DXer. It can be used for contests as is, but it could be optimised for contest use by removing some of the options and reducing the depth of menus. Provision could also be made for automatically entering the time and date from the system clock, which has not been included in the

present program but is easily implemented. These modifications will speed up data entry during contests.

The program has been designed to be as foolproof as possible. All data entered is checked for validity, and the entry of incorrect data should not crash the program. The operation of the program should be clear from the menus and screen prompts without any supporting documentation. Various methods of searching the log are possible. A search can be initiated for a call sign, prefix or partial call sign. A search can be for all contacts in the log, or on a particular band, before a certain date, after a certain date or between dates. A search can also be made for all contacts on a particular band. The entire log can also be printed out. Output can be to the screen or printer.

The program was written as an exercise in database handling and program design rather than because I desperately wanted a log program. Much has been learned from writing it and there has been great satisfaction gained from the way in which it works. The fast disk access depends upon having a tree structure in memory which indexes the database on disk. This tree structure is a B-Tree, based on the binary tree, but with modifications to maintain a better balance. To learn more about tree structures it will be necessary to attain a good book on data structures. The index is also stored on disk and read into memory when the program is started. It is updated as modifications are made to the database.

PROGRAM DESIGN

First, it is necessary to write down what functions the program is required to accomplish. In this case, a menu driven program to carry out the following functions was required:

- Enter new contacts into the databases
- Search for a call sign
- Search for a prefix
- Search for a particular band
- Print the entire file

This leads to the following PASCAL program.

```
begin {Main program}
  Initialise;
  repeat
    Menu (Option);
    case Option of
      '1' : Enter—New—Contact;
      '2' : Search—For—Call sign (Option);
      '3' : Search—For—Call sign (Option);
      '4' : Search—Band;
      '5' :Print—Entire—File
    end; {case}
  until Option = '6';
  CloseFile (QSO—File);
  CloseIndex (QSO—Index);
  clrscr;
  writeln ('AMATEUR STATION LOG PROGRAM TERMINATED!')
end. {Amateur—Station—Log}
```

That's it! The entire main program! The first step in program development is to type the program in as above using the text editor. As can be seen, the program calls eight procedures — Initialise, Menu, Enter—New—Contact, Search—For—Call sign, Search—Band, Print—Entire—File, CloseFile, CloseIndex.

These procedures are placed ahead of the main program, easily accomplished with the TURBO PASCAL text editor. A procedure is similar to a subroutine in BASIC, except that they are called by name, not line number, and it is possible to pass parameters to procedures. Of course, it is still necessary to write the procedures to do the actual work, but these can be written exactly the same way as the main program. That is, write down what they are to accomplish, write the procedure in outline as above, and if necessary use other procedures to accomplish specific tasks. Procedures can be nested within other procedures. In this way the writing of the program is gradually broken down into small parts, which taken individually, are easy to code.

After the main program is finished, dummy procedures can be written to test the program. In the case of the procedure Initialise, this would be:

```
procedure Initialise;
begin
end;
```

At this stage the procedure does nothing. Similar to a subroutine in BASIC consisting only of a RETURN statement.

The procedure Menu returns a parameter to the main program so it would be written as

```
procedure Menu (var Option : char);

begin
  Option := '6';
end;
```

Notice that Option is a character variable, not numeric. In the main program the variable Option is used, so at the beginning of the program include the variable declaration:

```
var
  Option ; char;
```

Now compile the program. It should compile and run. The program will do nothing at this stage except print the closing message on the screen. This proves that the logic of the program is correct and it now only remains to fill in the details in the individual procedures. As this process proceeds it is usually found that there are further global types and variables that need to be included. This is simple to do as program development proceeds.

You will find that local variables are also needed in most of the procedures. These may have the same names as in other procedures or the main program, but no confusion will result because PASCAL keeps all these variables separate from each other. This is one of the reasons it is easy to write bug-free programs in PASCAL. Procedures used frequently in various programs can be written and included in programs without modification, without fear of variable names clashing. Try that in BASIC and see what happens?

INDEXING THE DATABASE

At this stage, I must confess, I cheated. Although I have programmed binary trees before, Borland, the creators of TURBO PASCAL have made it easy. They produce a series of routines on disk called *Turbo Database Toolbox*. This contains all the procedures necessary to implement B-Tree indexing and to write quite sophisticated database applications. The necessary procedures are supplied in source code form and are included in the program at compile time. The routines are very easy to use and well explained in the documentation.

It will be necessary to include several constant declarations at the beginning of the program which are used by the indexing routines. These vary depending upon the nature of the records in the database and require a little bit of thought to achieve optimum results.

It is possible to have more than one index file in each database, and to have several data files. In the log program there is only one index file and one data file. It is necessary to decide on the structure of the records in the database. In my case, I made the following type declaration to store contact information.

```
type
  QSO = record
    Call sign : string (10);
    Date : string (8);
    Time : string (5);
    Band,
    High—Band,
    Low-Band : real;
    Mode : string (6);
    Report : string (3);
    Remarks : string (40)
  end; {record}
```

This creates a user defined data type called QSO. In the variable declarations it is now necessary to include a variable of type QSO, eg

```
var
  Contact : QSO;
```

The variable Contact can then be manipulated as any other single variable, ie equated with other variables of the same type, read or write from disk, etc. This is even though it consists of several fields which can be accessed individually. Note that all fields are strings, except three which are real numbers. The reason for this will be explained later.

As in any other database, one of the fields of the record must be a key. In this case it is the Call sign field. But, there is no reason why there can not be more than one index file using say the Band or Date fields as keys. This provides more options and greater versatility for searching but did not seem warranted in the present application.

INPUT VALIDATION

This is an important consideration in a program. In PASCAL, as in most languages, if the program pauses waiting for input from the keyboard, it will crash if a non-numeric character is entered when a numeric value is expected. This sort of thing should be guarded against by inputting all data as character strings, and converting to numeric values after checking the input. If non-numeric characters are included, then the program should prompt for re-entry of the data before proceeding.

If a date is being entered, the validity of the date should be checked. For example, the day field is entered first. If the day is not in the range 1 to 31 then the program will not proceed until a valid number is entered. The month field is entered next. If the month is valid, that is in the range 1 to 12, then the day is checked again to see if it is valid for that month. Again, the program will not proceed until the date is valid to this point. When the year is entered it is checked to see if it is a leap year. This determines the number of valid days acceptable for February. With all this checking, it is not surprising that the procedure for date entry is one of the longest single procedures in the program. But this is an indication of the sort of input validation that should be undertaken. A similar process is used for entry of the time.

In a contest log, date and time would be taken from the system and entered automatically to save time. However, in a general purpose program it is better to enter them manually. The program can then be used to enter previous log information into the database at any time.

Incidentally, this means that the program can be put into use immediately to enter current contacts, and old contacts entered at any convenient time to bring the database up to date. Contacts do not have to be entered in chronological order.

The Contact record has three fields for the frequency, Band, High—Band and Low—Band. This is to cater for the many ways in which the frequency of operation is likely to be entered and to make the program as foolproof as possible. For example, in some cases the actual frequency of operation may be entered. In other cases the frequency of the bottom end of the band may be entered. Some people enter 146 when working on the FM portion of two metres or 144 when working on the gentleman's end of the band. With this program it does not matter. The frequency is entered as a string of characters, and then converted to a number. If an error occurs the program loops until a valid number is entered. This number is used to compute two further numbers, one above and one below the number entered. These numbers are chosen so as to include the whole of the band being worked, plus something to spare at each end.

The reason for the above is that when searching for contacts in a particular band, any frequency within the band can be entered as a search parameter. The contact will then be found so long as the search frequency is within the limits of the high and low frequencies previously computed. This gives the operator freedom to enter the frequency of operation in the form preferred, and it is not necessary to remember how it was originally entered to be able to retrieve the information.

As can be seen, input validation is an extremely important part of program development, more important than at first seems. Most programmers spend much time getting the logic flow of the program right, and pay only passing attention to data input routines. It is extremely frustrating to have a program halt with an error message when a wrong key is pressed entering data. A little attention to detail can avoid this and you conclude with a virtually crashproof program.

DATA OUTPUT

Attention should also be given to the data output routines. The log program offers a choice of output to screen or printer. In general, the same procedures are used for both outputs, with different branches being taken at different points in the procedure according to which output option was selected. For example, when printing to the screen, the display pauses when the screen is full. When a key is pressed, the next screen of information is displayed. When outputting to the printer, printing is continuous, but the perforations between pages are skipped.

When printing the entire log, the log is printed in alphabetical order of call sign. This suits me and is an automatic result of the B-Tree indexing. If output is required in chronological order, then a second index would have to be set up where the date was the key field instead of the call sign. When selecting the output option another menu option would then be required to specify chronological or alphabetical order.

CONCLUSIONS

The log program discussed in this article was written mainly to try out certain programming and database principles. The project was a success in that the resulting program performs very well and achieved all of the initial aims. It has proven the viability of having a disk based rather than a memory based log program which allows rapid retrieval while not being constrained by the memory size of the computer. If a hard disk system is used, retrieval is virtually instantaneous and still very quick with a floppy based system.

The importance of foolproof input routines was amply demonstrated during the development phase of the program. Even after the logic of the program was well and truly sorted out, unexpected effects still sometimes occurred when entering data. It is important that the user be given a chance to review and alter the data before it is committed to disk.

The advantage of using a language such as PASCAL was very obvious during the development stage. Each function of the program can be developed and tested independently. Once a procedure is developed and running correctly, you can then work on developing the next stage of the program knowing that it will not upset anything that has already been done. By developing and debugging the program in small stages, the final program worked with a minimum of testing and debugging being necessary.

The author can recommend that any amateur seriously wishing to develop their programming skills consider using TURBO PASCAL or MODULA 2. as a programming language. The limitations of BASIC and FORTRAN are too inhibiting and slow down programming development. The use of PASCAL greatly reduces program development and debugging time. Remember what the B in BASIC stands for! Of course, there are some projects for which PASCAL is not suitable, such as a program to turn the computer into a TNC for packet radio. Only assembler can cope with that sort of project, but if you are that far into computers, this article will be of little use to you!

The listing of the program is not given here because of its length. It does not include the Turbo Access routines because they are copyright and cannot be freely reproduced. If you wish to type in this program yourself it will be necessary to purchase the Turbo Database Toolbox, as well as obtain the listing from me. Alternatively, I can send anyone interested in the program an MS-DOS formatted disk with the compiled program and the source code (less the Turbo Access routines) for a cost of $20 which includes the cost of the disk, postage and packaging. I would need to know the disk drive on which you intend to store the data.

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QSP

1988 SEOUL SUMMER OLYMPICS

Some of the special event stations that will be active from September 17, are 6K24SO, 6K88SO and 6K88BYC. Stations may be operated by visiting licenced amateurs and there will be special QSL cards and awards for these and other stations which will be operating unique prefixes and suffixes.

—Condensed from *CRRL News* by Ken McLachlan VK3AH

ar

FRAUD

Eleven amateurs in Puerto Rico face possible revocation of their amateur privileges, as the US Federal Communications Commission (FCC) charges that they were involved in fraud by using their roles of Volunteer Amateur Radio Examiners.

The FCC became suspicious when the licence growth of amateurs in Puerto Rico exceeded 50 percent. The average growth in the United States of America over the same period was only three and a half percent!

—Condensed from *CRRL News* by Ken McLachlan VK3AH

ar

HAVE YOU GOT THE TIME?

In America, the National Bureau of Standards has established a "time-by-modem" for the computer buff. The service is generated in 300 or 1200 baud. Dial the allocated number and hit the ? key and the correct time is generated on the screen to set your computer's clock. Quite an innovation and money spinner. Telecom please take note.

—Condensed from *The ARRL Letter* by Ken McLachlan VK3AH

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UK CONSIDERS NOVICE LICENCE

RSGB Secretary, David Evans G3OUF, says the encouragement of more newcomers is essential for the well-being of amateur radio.

Writing in the RSGB journal *Radio Communication* he says one key to the future is to develop a new type of licence to give beginners practical "hands-on" experience.

Work is underway to develop a beginners licence grade giving access to a few amateur bands, with mode, power and possibly antenna restrictions.

Those in the 11 to 16 age group perceive the typical one year training period which might involve 150 hours of classes needed to pass the current radio amateur examination is too long.

The RSGB is developing a new licence designed around a 30 hour course plus the time for Morse code training at six words-per-minute.

WRIST WATCH PAGERS

A wrist watch-pager is being test marketed in the United States by San Francisco based AT and E Corporation.

To send a message to the pager a caller rings a special number and punches in a message using the buttons on a conventional touch phone. The message is then transmitted by a sub-audible carrier on an FM broadcast station.

The pager alerts the wearer with a beep, and then displays the message on its watch face.

According to AT and E, some 500 000 subscribers can be carried by a sub-carrier. It was negotiating to lease sub-carriers from FM broadcast stations.

Called the Receptor, the wrist watch-pager is being made by Seiko of Japan.

—Adapted from *Westlink*

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WIA 1988 REMEMBRANCE DAY CONTEST OPENING ADDRESS

by

SENATOR THE HON. GARETH EVANS Q.C.

Following is the open address of the 1988 Remembrance Day Contest which was delivered by the Minister for Transport and Communications, Senator The Honourable Gareth Evans Q.C.

I am very pleased to have been given this opportunity to speak to you at the opening of your Remembrance Day Contest.

The Wireless Telegraphy Act was enacted in 1905, and experimentation in the exciting world of wireless was given the government's stamp of approval. No one could have seen the developments to come. The word 'wireless' may have long since been replaced by 'radio', but the skills and enthusiasm of these early experimenters has not in any way been dampened.

Amateur radio as we know it today, is a hobby where data packet transmissions, moonbounce, and satellite communications between amateurs the world over, are everyday activities.

A far cry indeed from the days when spark gap transmitters, and decoherers captured our attention. Since those early days Australian radio amateurs have played an important part in the development of the Australian communications industry as we know it today. I have not the slightest doubt that they will continue to be at the forefront in developing new ways of utilising the radio spectrum.

The Hawke Labour Government has, as one of its major objectives, the promotion and the competitive, innovative and efficient economy, that will see Australia continue to take a place among the major nations of the world in the 21st century.

It is my responsibility as Minister for Transport and Communications to ensure that the communications sector, in all its facets, plays its part in the development of the nation. To foster the necessary climate for such developmental activity my Department has, as one measure, recently introduced revised regulations and licence conditions that remove many of the past limitations governing modes of amateur operations.

The fact that we were able to remove some of the restrictions is in recognition that amateurs generally are using the spectrum in a most responsible manner.

To return to the purpose of your contest today, although specifically the contest commemorates the sacrifices made by 26 Australian amateurs during World War II, it is also an opportunity to reflect more widely on the contributions that thousands of other amateurs have made to the Australian community.

Since becoming the Minister of Transport and Communications, I have become aware of the many occasions on which amateurs have unselfishly established efficient and effective communication networks during times of local and international emergencies. I also know that, throughout Australia, there are many people whose lives have been enriched by being able to participate in this technological and diverse hobby. Our thanks must go to those who are giving their time and skills to the many hours of training involved.

Before closing I would like you to know that Australia's image as a multi-cultural society is promoted by the communication links you are able to establish both locally and world - wide. Finally, I would like to take this opportunity, not only to wish the participants well in the forthcoming contest, but also to wish you well in your experiments for Australia.

REPORT ON OPERATION OF PACKET RADIO BULLETIN BOARDS IN THE AMATEUR RADIO SERVICE

Barry White VK2AAB
28 Redgrave Road, Normanhurst, NSW. 2076

Resolution 87.09.06 from the 1987 WIA Federal Convention recommended that a policy paper be prepared on the operation of bulletin boards. Barry White VK2AAB, offered to co-ordinate the preparation of this paper. A paper entitled* A Report on the Operation of Packet Radio Bulletin Boards in the Amateur Radio Service *from the Australian Amateur Packet Radio Association and dated January 25, 1988, was circulated at the 1988 WIA Federal Convention. Please note that this paper was not a WIA policy paper, but is published in full for the information of all amateurs in view of the considerable interest and concern about packet radio operation.

This paper has been produced by the Australian Amateur Packet Radio Association at the request of the Federal Technical Advisory Committee (FTAC) of the Wireless Institute of Australia and discusses the band planning, and operational requirements of packet radio bulletin board services for the use of radio amateurs in Australia. The effect of these bulletin board services (BBS) on the VHF and HF bands is also considered.

DISCUSSION
The advent of computer oriented communications on the amateur bands, first with RTTY and then AMTOR, led to the introduction of mailboxes for those modes. With the introduction of packet radio, bulletin boards with more facilities than just mailboxes appeared. These extra facilities, such as text file up and down loading, program files, satellite data, etc, placed very much heavier loadings on the frequencies in use than had been experienced by RTTY and AMTOR mailboxes.

The effect of "Networking" will be a major consideration.

CONCLUSIONS
The Australian Amateur Packet Radio Association recommends that only one BBS shall use the main two metre network frequency in each major amateur population centre. Additional BBSs for special applications should use the other frequencies available for packet radio.

Originators of messages for users of BBSs in other Local Area Networks (LAN) should not attempt to lodge their messages directly, but use the message forwarding facilities of the local BBS.

The WIA should consider methods of controlling the numbers of BBSs on network frequencies.

1. INTRODUCTION
Following the discussion on Packet Radio Bulletin Board Systems at the 1987 Federal Convention of the Wireless Institute of Australia (WIA), the Australian Amateur Packet Radio Association was asked to prepare a paper on the operation of these BBS.

2. BACKGROUND INFORMATION
Requests were made to interested groups to comment on the need for a plan to improve the throughput of the packet radio network and on how to organise the operation of the BBS.

Experience in Sydney, where the greatest amount of packet activity is to be found in Australia, has led to complaints by operators about the difficulty experienced in attempting to communicate with stations while BBSs are operating. The great number of collisions occurring when remote stations are involved in downloading files is a major cause of frustration.

3. DISCUSSION
3.1 The Environment of a Packet Bulletin Board
The local network first developed with a small group of stations communicating with each other on a single frequency. In Sydney and Melbourne a Bulletin Board was established to provide a message and file service to the users. While the number of operators remained small, there were no significant problems associated with sharing the frequency with the BBS.

However, during 1986 in Sydney the number of stations using AX-25 grew quite fast and BBSs of the WORLI type were installed in Sydney, Newcastle and Gosford. With the installation of digipeaters in Newcastle and Sydney, the operators in these centres were now using the BBSs in Sydney, Newcastle and Gosford regularly.

With file downloading from two or three BBSs occurring simultaneously as well as several contacts taking place between stations in the area from Newcastle to Wollongong, the number of re-tries needed by the BBSs increased considerably. It has become apparent that this situation will develop in other centres in the near future and planning is needed to improve the existing situation and provide a model for other centres.

In Sydney and Newcastle, the experimental installation of the level three software NET-ROM in VK2RPH and VK2RPN improved the throughput of the BBSs that use 147.575 MHz. Further improvement is expected when UHF "backbone" frequencies are used for communication between the various repeaters.

3.1.1. The HF BBS
The Region Three Bandplan allocates 14.070 to 14.100 MHz to narrow band modes. However, the HF BBSs have been operating on 14.103, 14.105, 14.107 and 14.111 MHz, all of which are in the phone section of the band as determined by the WIA Bandplan. An examination of the activity between 14.070 and 14.100 MHz shows that there are a great number of RTTY and AMTOR stations operating in that segment. These stations also include a number of mailbox stations. It has felt by the packet BBS operators that there would have been much friction generated if they had operated in that segment, so the packet operation started above 14.100 MHz.

However, this has generated considerable complaint from SSB operators who have run regular nets in that area above 14.100 MHz. These operators complain of the packet stations transmitting when the phone operators have occupied the frequency and they claim prior occupation of the frequency on a long term basis.

A similar situation has arisen in Sydney with the change to 144.800 MHz by the Divisional BBS, VK2AWI.

The problem has been alleviated to some extent by the move of Australian BBSs to 10.147 MHz for much of their local operations.

BBSs are at present in operation in Japan, the Philippines, Hong Kong, New Zealand, Hawaii and the USA, as well as Australia. HF BBSs are presently operating in Brisbane, Sydney, Melbourne, Adelaide and Perth.

There have been discussions between Australian phone net operators and the operators of HF BBSs in the Pacific area but no satisfactory solution has been found. The operators in Region Two were particularly unsympathetic to the complaints of the West Australian phone operators of the Travellers' Net. They did not consider Region Three agreements to be relevant to them.

This problem is not a consideration for the Department of Transport and Communications, but as it concerns bandplanning, it is a concern for the Institute.

3.1.2. The VHF BBS
The facilities of the WORLI auto-forwarding BBSs with their ability to provide files for programs, newsletters, satellite tracking data, messages to "ALL" items, and the person to person messages has satisfied what was previously an unrealised need.

The time on frequency by BBSs on a weekly evening is an indication of their widespread acceptance by the majority of amateurs. In Sydney, the main frequency of 147.575 MHz has two BBSs operational. The first is the WORLI/WA7MBL auto-forwarding BBS, VK2XY. The second is the Commodore 64 BBS operated by VK2OP. This letter BBS specialises in providing program services for C64 users. Because of the popularity of the C64 packet radio package which does not use a terminal node controller (TNC), there is a considerable group for whom this BBS is very useful. This is an example of the specialised BBS which can be considered suitable for operation on the main network frequency.

The WIA NSW Division operates a packet BBS, VK2AWI, on 144.850 MHz, to provide news, coming events and a method of sending broadcast items to the Division for the Sunday broadcasts. This BBS automatically changes frequency to the main network frequency of 147.575 MHz, so that messages to and from amateurs in other areas can be received and sent.

3.2 THE EFFECT OF BBS ON THE PRESENT NETWORK
Many files on the BBSs are long files, perhaps up to 32 000 characters long. These take a considerable time to download and occupy a large proportion of the available time. By the correct setting of the parameters of the Terminal Node Controllers, it is always possible to give other users a better opportunity to transmit. This, of course, means that the transfer of the file takes longer.

With a test last year of the NET-ROM software in VK2RPH and VK2RPN, there was a marked reduction in the number of repeats. This allowed more activity between other station to proceed with less holdups. It is expected that further improvement will occur when the UHF "backbone" connections are available.

3.3 AUTO MESSAGE FORWARDING
One of the most useful features of the WORLI type of BBS is its ability to automatically forward messages to stations who access another BBS in another remote area. Forwarding is operational between Sydney and Newcastle on VHF and to other States including Western Australia, via HF.

This forwarding ideally takes place at times of least activity. At present forwarding to HF and between Sydney and Newcastle occurs in late

afternoon and early morning from 0300 hours EAST. The times are set up by the operator to suit his local conditions and at the appointed times the BBS connects to the required BBS via the network without intervention of the operator. If the remote BBS has messages for the local BBS it will forward them while the connection is available.

In Sydney the BBS VK2AWI which operates on 144.850 MHz automatically changes frequency at a predetermined time to the main network frequency of 147.575 MHz, connects to VK2XY or the Newcastle BBS VK2CZZ and forwards and receives any messages awaiting forwarding.

The format to request a message to be forwarded is shown below:

(S)END VK2AAA @ VK2CZZ

This addressing will indicate to the BBS that this is a message that needs to be forwarded to the Newcastle BBS VK2CZZ.

On HF there is a more difficult situation; as no standard addressing protocol has yet been determined messages are being partially hand sorted by the operators concerned. Discussions are taking place but no "favourite" system has yet emerged.

Messages have been sent and received from Australia to many overseas countries to date including Equador, Britain, New Zealand, Japan, Germany and USA.

The automatic forwarding of messages addressed to "ALL" has resulted in many long news items arriving on local bulletin boards, such as messages from the ARRL to all amateurs. Many of these are of little interest to local amateurs but some are of great interest especially those concerning satellite users.

An addressing system to keep at home those not needing world-wide distribution is urgently needed.

3.4 SPECIAL INTEREST BBSs

There should be provision made for special interest BBSs. Some examples of special interest are, satellite tracking and operational information for groups such as AMSAT Australia. WIA Divisions should perhaps consider their own BBSs such as the operation of VK2AWI in Sydney.

3.5 CHANNEL AVAILABILITY

The subject of bandplanning is fraught with all the traditional "I was here first" problems. At present five two-metre channels, 144.800 to 144.900 MHz are allocated for packet radio digital systems. At present these five frequencies are sufficient for network, simplex and BBS activity. The frequencies 147.575 and 147.600 MHz, which were allocated some time ago, are still in use for the majority of activity. This will continue until UHF connection between Local Area Networks is implemented. At that time it is expected that those areas not having Channel 5A television will move to the lower part of the band.

3.6 PROPOSED BANDPLAN FOR BBS

144.800 MHz Network BBS
144.825 MHz Simplex No BBS
144.850 MHz Divisional BBS, WICEN and third network?
144.875 MHz All other BBS; no restriction on numbers
144.900 MHz Network BBS

However, there is a major problem with this arrangement; where it is desirable to have adjacent Local Area Networks on different frequencies only two are available. In the Newcastle-Sydney-Wollongong area three will be needed (assuming no Channel 5A television).

The reservation of 144.850 MHz for WICEN and Divisional BBSs seems to be impractical. It is suggested that the frequencies of 144.775 and 144.925 MHz be considered for future expansion and not allocated for particular use at this time.

Despite the above, we do not recommend a particular rigid bandplan for BBSs. BBSs other than the main network BBSs should be placed on frequencies decided by local arrangement.

A problem has arisen with the proliferation of BBSs. In the Sydney area there were seven BBSs operating on 147.575 MHz for a period in 1987. At present the number has declined to two 24-hour and two intermittent operations.

3.7 MESSAGE HEADERS

There is much discussion at present on what method should be used for addressing messages. They form into three main camps:

i. The Postcode — in this system, messages would be addressed to an amateur in the following format;

S VK2WI @ 2150

This is the postcode for Parramatta and the message would be forwarded to the BBS that served that (and many other) postcodes.

Advantages:

The Call Book gives the postcode of each amateur, so that it becomes easy to obtain the BBS address of any amateur.

Disadvantages:

Not all countries have postcode systems and there is no country designation in the postcode.
There is no standard format for postcodes.
Someone will have to enter all the postcodes into the forwarding files of the BBSs versus the BBSs that serve them.
There may be *more* than *one* BBS *in a* postcode area.

ii. The STD Code:

The discussion taking place in the USA on the use of the STD and exchange telephone prefixes does not seem to have given much thought to combining the ISD and STD exchange codes.

Advantages:

In all countries numbers only are used so that it would be possible to route a messages to any part of the world.
The numeric address could be found for any amateur via the Call Book and the telephone service if the telephone was connected.

Disadvantages:

A considerable amount of work may still be needed to set up the forwarding files of the BBSs.
If the addressee does not have the telephone connected or has a silent number it would not be possible to obtain the ISDSTDEXC code. It does not solve the multiple BBSs for one code problem.

iii. Call Signs:

Each of us has a unique identifier.

Advantages:

No allocation organisation needed.
Contains country information.
Frequently contains state, province, or district information.

Disadvantages:

Some countries allocate call signs within their boundaries in a random manner. In some countries amateurs may move large distances and not change call signs.
The BBS system or the network will have to build a file of where all users are located and which BBS they use.

3.8 THIRD PARTY TRAFFIC

Recently, the Department of Transport and Communications has made statements regarding third party traffic which appear to suggest that long time practices may not be legal. I refer to the passing of messages from licensed radio amateurs in countries which do not have third party agreements with Australia.

It has been the practice for at least 85 years to pass on messages from another amateur to a third amateur and this has never been considered to be third party traffic, if it meets the rule that it is of a nature that would not usually cause recourse to the public communications systems. In fact, New Zealand has stated that their amateurs may pass on messages to other amateurs overseas even though they have no third party agreements.

The situation is now that New Zealand amateurs may send messages to us but we cannot receive them because we have no third party agreement with New Zealand!

The packet working group of the Radio Society of Great Britain (RSGB) in its report on the packet repeater experiment has reported that the Department of Trade and Industry has agreed that third party traffic will be interpreted to mean traffic originated by, or destined for, non-amateur stations (persons?).

4. CONCLUSIONS

The development of Bulletin Board Services is occurring so fast that most parts of this report has been rewritten several times, but it is clear that the teething problems we are now experiencing are solvable with better technology and better co-operation between packet radio groups and between packet radio operators and other amateur operators.

Particularly in regard to the amateur community generally the WIA will have to play a significant role.

Operations of BBSs has been satisfactory to date given the inexperience of a large percentage of users. More tolerance of others and more consideration in the times at which files are downloaded will pay great dividends.

Frequencies available to packet radio BBSs on VHF are adequate at present and no further requests are envisaged.

5. RECOMMENDATIONS

The Institute should address the means of introducing a gentlemen's agreement on the operation of BBSs. We do not consider that licensing be a reasonable solution as, from time to time, the Sysops will tire of providing the function and pass the burden to another amateur. The Australian Packet Radio Association does not feel that it is in any position to say who should or should not operate a BBS on what frequency. We feel that the best body for this function is the WIA. Even the WIA will run into problems with non-members taking umbrage, but the WIA repeater committee system may provide a model for the required function.

Congestion problems with the existing packet radio system will be considerably reduced when Level Three networking is introduced. How much improvement there will be is difficult to foresee at present.

We recommend that only one BBS operate on the network frequency. An exception to this general principle could be to provide a special purpose BBS such as an AMSAT BBS.

Consideration of the provision of a separate network for BBS forwarding in areas of high traffic density.

Consideration of HF bandplans for bulletin board services is becoming urgent.

The WIA should negotiate with the DOTC with a view to aligning their policy with the long established practices of the definition of third party traffic.

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AN INTRODUCTION TO FOX HUNTING

Greg Williams VK3VT
1 Noorabil Court, Greensborough, Vic. 3088

This article is an introduction to the art of fox hunting as it is practiced in the south-eastern region of Australia.

The author has hunted these elusive creatures in Melbourne, Mount Gambier, Ballarat and Wagga Wagga. The information presented has been gathered first hand from these expeditions and is therefore based on practical experience as well as a theoretical perspective.

What is a fox and why would anyone want to hunt it? At this point let me assure all those who are beginning to compose letters to the editor about violence and protection of animals, the type of foxes are not those cute little fury ones. No, these foxes are amateur radio transmitters in various shapes and sizes. They range from a normal 100 watt HF transceiver in a vehicle to a tiny two transistor affair buried under a tuft of grass. There are a number of definitions used by different groups of fox hunters, in Melbourne the term *FOX HUNT* is used to define any form of organised transmitter hunt. In Mount Gambier the South East Radio Group (SERG) use *FOX HUNT* when the transmitter is manned and being modulated by the operator and refer to *HIDDEN TRANSMITTER HUNT* when an unmanned transmitter is hidden in some devious spot. The differentiation gives some idea of what is expected of the participants but the techniques are almost the same for both type of events. We will be looking at the details of hunting in various locations later. Throughout this article the term *Fox Hunting* will be used to describe the activity of chasing and locating a transmitter of any sort.

The question of why anyone would want to hunt these foxes is easily answered — it's fun! There are some real thrills in amateur radio such as your first QSO, working a rare country, winning a contest, building something that works, and finding a well hidden fox transmitter. Fox hunting is also a method for allowing adults to play hide and seek without too much ridicule, although spouses have been known to complain on odd occasions! The ability to locate signal sources can be of great value in tracking down a source of interference. The author has used fox hunting techniques to track down powerline interference which was wiping out six-metres and to locate some other forms of interference.

A TYPICAL FOX HUNT

A typical hunt begins by having the teams of hunters, usually called hounds, meeting in their vehicles at a prearranged location. Each vehicle is considered a *team* and all the equipment to be used for the hunt must be in the vehicle. This equipment consists of a directional antenna which can be rotated while mobile and a receiver covering the fox's transmit frequency. Other items such as maps, attenuators, and lights, are not necessities but can prove useful, but more of that later.

A team must consist of at least two people, one to drive the car and the other, called the *beam swinger*, to operate the equipment; we have found that another person to navigate can be of great benefit. It must be stressed the driver must drive and do nothing else, he can listen to what is going on in the vehicle but that old saying of "Keep you eyes on the road" cannot be over emphasised. On more than one occasion we have experienced some very close calls due to the driver looking at equipment and making comments such as "turn the noise blanker off" instead of watching the road.

With the hound teams waiting at the start, the fox (the hidden transmitter and the person are both called the fox) then calls on the hounds to come and find him. The hounds then break ranks forming a loose pack and head off in what they believe to be the direction of the fox.

At conventions the hound vehicles all line up head to tail with much jockeying for position and one-up-man-ship to gain the best position. The call from the fox causes much frantic beam swinging to get the right direction. (Be careful of following another hound for we have found they can be just as confused as you are; and are only going in that particular direction to keep ahead of you!).

The fox's transmissions may be just a carrier with the odd identification, or consist of short bursts of transmission usually becoming less frequent as you get nearer. Oftan the fox will give helpful hints such as "I can see clouds" or "there are cars near by". While the fox is transmitting the beam swinger rotates the antenna and determines the signal direction. Using the directions from the beam swinger and information off maps, the fox is tracked down to a small area. This is where the hounds need to use their eyes and brains as well as their radio equipment. The author has bad memories of driving past the fox's white four wheel drive vehicle several times without seeing it! Once you are close to the fox it may be necessary to get out of the vehicle and hunt on foot. That's when a 'sniffer' comes into play. A sniffer is a small portable outfit which has a directional antenna and some form of signal detector. This detector is usually much less sensitive than a complete receiver as it is only used when you are close to the fox. An article on a two metre sniffer is planned to be published in a later edition of *Amateur Radio*.

Finding the fox may not be easy, it could be buried, hidden in a hollow road side post or telephone book, Father Christmas may have it in his toy sack, or it may be inside the fake rock in the middle of the stream; all these hiding spots have been encountered over the years. Eventually you will locate the transmitter and there will be some way of informing the fox personnel that you have found it, you are then *IN*, a fox hunters term for being recorded as locating the fox. So that is how a fox is caught.

There are various scoring systems in use depending on the competition. At conventions there is usually just first, second and third, whereas the regular Melbourne hunts have a points system tied to the time of arrival.

Most fox hunts are conducted on two metres with occasional hunts on other bands, usually 80 metres, 10 metres and 70 centimetres. Two metres is used for a number of reasons with the main ones being the availability of equipment and the relative small size of antenna required.

BASIC TWO METRE EQUIPMENT

For two metre hunting the basic equipment required is a receiver and an antenna. The receiver can be almost any type but it should have an S-meter, capable of covering the whole two metre band, and be multimode although this is not essential. Most convention two metre hunts use FM and operate above 146 MHz. On the other hand the Melbourne group use AM around 144.250 MHz.

The mode used does not make too much difference as most foxes don't give valuable information over the air, thus if you are listening to an FM fox on an AM receiver you won't miss any useful information. It has been found that swapping receive modes can be helpful, especially if the signal is weak SSB or CW modes provide an edge over FM or AM.

In Melbourne the IC-202 has been a popular choice as it covers the frequency of interest and the receiver gain can be controlled by a pot in the PTT line, see Reference 1. Another popular choice is a converter into an HF receiver. With the modern general coverage transceivers this will give all modes and complete band coverage. A suitable converter can be found in Reference 2. If using a converter with a general coverage receiver it is advisable to use a 118 MHz crystal to give complete coverage of the two metre band.

The antenna is a most important part of the equipment, if it gives ambiguous directions it can lead a hound, that is **YOU**, in a totally false direction. Thus an antenna should give an unambiguous indication of direction and be small enough to be easily rotated at highway speeds. The peaks or nulls of an antenna can be used for determining the direction to the transmitter, a peak will give the best results especially when the signal is weak. On two metres a peak is easily achieved with a Yagi or Quad antenna. The three element Yagi described separately is a good all round antenna. It does not provide the maximum gain that can be achieved but has a clean pattern with a good front to back ratio.

When driving along a road the antenna should be rotatable from inside the vehicle. There are a number of methods of achieving this, ranging from having a broom stick resting on the floor or arm rest, through to a complicated series of gear boxes and support bearings with the antenna centred on the roof of the vehicle. Most hounds use a piece of pipe attached to a roof bar as a bearing; see photograph. This gives an indication of one simple method of supporting the antenna.

It is possible to make the vertical support from wood or metal however, most use wood as this allows the antenna to be mounted vertically and will break if it comes in contact with overhanging obstacles such as trees. Teams may have a preference for one polarisation but most usually adhere to what the fox is using.

Many hounds use an attenuator to reduce the signal strength into the receiver as they approach the fox. A variety of attenuators have been described in amateur radio literature over the years. The one described in the *ARRL Handbook* would be quite suitable. While an attenuator is a handy addition to the hounds equipment it is not mandatory, as there are a number of ways of determining a bearing when you get closer to the fox. The simplest method is to tune off the frequency a little and hunt on the skirts of the signal. Don't forget to tune back for the next hunt or you may wonder why everyone else but you can hear the fox.

Just where the beam swinger should sit is a matter of team preference — some navigators like to sit in the front and observe the passing landscape, while some beam swingers suffer from motion sickness and prefer to sit in the front. The beam swinger of our team usually sits in the front because all the equipment won't fit in the back. Also, there is often two navigators who can argue in the back with minimum disruption to the driver!

That covers the equipment and methodology. Any readers requiring assistance in running hunts for a local club or in becoming a fox hunter

please contact the author with a SASE. Further articles on sniffer building and HF hunting are planned. There is only one way to find out if you will enjoy the thrill of chasing transmitters around and that is to get out there and try it. Next time you are planning to attend a convention, pack some fox hunt gear and have a go. Most hounds will offer advice and encouragement to new teams as they will help to improve the level of competition and keep the sport alive.

WHERE TO TEST YOUR SKILLS AND THE RULES THAT APPLY

WIA Victorian Division Melbourne two metre group

This group hold hunts on the second Friday of the month, including January. Frequency is 144.250 MHz AM, with a liaison frequency of 145.675 MHz FM. Five hunts are usually held during the evening commencing at 8:00 pm in the car park adjacent to the roundabout at the corner of Swanston Street and Cemetery Road, in Parkville. Scoring is zero points for the first to find the fox then one point per minute for coming after the first hound, after 10 minutes, 'time' is up and the meeting point is announced over the fox and on the liaison frequency. The lowest total score for the night wins and runs the hunt next month. At the end of the evening a supper is provided at a modest cost. There are no limits on equipment except it must be in a single vehicle and outside assistance, such as bearings from other stations, is not permitted. New teams are always welcome. For further information, contact the author on (03) 435 7870 (AH) or Geoff VK3CGH on (03) 288 6019 (AH).

South East Radio Group (SERG) Mount Gambier Convention

Is conducted on the Queen's Birthday weekend (June). This convention has hunts on two metres (146.450, 146.500 and 146.550 MHz), 70 centimetres (439 MHz), 80 (3.580 MHz) and 10 metres (28.450 MHz). A two metre sniffer hunt is also included. Only one set of equipment per car is allowed and they provide a ticket which has to be obtained at the start and given to the fox when you find him. Prizes are awarded for first and second with points for the overall trophy for up to third place. The convention also has a large flea market, good food, a home brew competition and scrambles on a number of bands. Contact the SERG Inc (VK5SR) at PO Box 1103 Mount Gambier SA 5290 for further information.

Wagga Wagga Amateur Radio Club Convention

This is convention conducted during October each year which has a number of two metre hunts with multiple transmitters on the same frequency — find one, turn it off, then look for the next one and so on. Prizes are awarded for places which are determined from a number pegged to the transmitter. When we last visited this convention there was a interesting display of working vintage engines and farm equipment along with a flea market and displays. Contact the Wagga Wagga Amateur Radio Club (VK2WG) at PO Box 294 Wagga Wagga NSW 2650.

Ballarat Amateur Radio Group Convention

Held on the Sunday before the first Tuesday in November, this convention has fox hunts on two metres, 70 centimetres, 80 and 10 metres with similar rules and scoring as the SERG convention. This is another chance to pick up some preloved gear and put a face to the voices you know so well. Contact the Ballarat Amateur Radio Group (VK3BML) at PO Box 216E Ballarat East Vic 3350.

North East Radio Group (NERG) Inc Quarterly Fox Hunts

The NERG run these as a family fun event and hold hunts on two, 80 and 10 metres once a quarter on a Sunday afternoon. The meeting point is the north-west corner of the car park at Doncaster Shopping Town, at 1:00 pm. The action ends at one of the many barbeque venues in the area for a BYO tea and chat. The dates for these hunts are advertised on the Victorian Division broadcasts through VK3BWI. Contact the NERG at PO Box 270 Greensborough Vic 3088, or contact the author.

Victorian Fox Hunt Championships

Held in February each year with hunts on 80, 10 and two metres as well as 70 centimetres and 2 metre sniffer hunts. Prizes are awarded for each event and an overall trophy for the best team. This event will be co-ordinated by Richard Hinsley VK3CRH/VK7CG in 1989 and he can be contacted through PO Box 270 Greensborough Vic 3088 or once again contact the author.

REFERENCES

1. *MANUAL GAIN CONTROL FOR THE IC202* — GIL SONES VK3AUI, *AMATEUR RADIO* MARCH 1979 P11.
2. *A TWO METRE RECEIVING CONVERTER* — HAROLD HEPBURN VK3AFQ, *AMATEUR RADIO* OCTOBER 1984 P12.

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DID YOU RECEIVE YOUR AR FOR AUGUST?

It is believed that some copies of August *Amateur Radio* became separated from their plastic envelopes in the post.

If you did not receive August AR please advise the Federal Office in writing (PO Box 300, Caulfield South, Vic. 3162) of your name, call sign and address.

The mailing house will arrange for a replacement magazine to be forwarded to you as soon as practicable.

JAMBOREE ON THE AIR (JOTA)

Bob Demkiw VK2ENU
18 Ettalong Place, Woodbine, NSW. 2560

Although throughout the year there are many activities which contribute to the public awareness of amateur radio, there is perhaps one event which has a better potential for attracting new members to our hobby. This event is the annual Jamboree on the Air (JOTA) which exposes amateur radio to our future adults.

JOTA is an important activity in that it allows boys and girls to have first hand experience in the operation of radio communications. It provides them with an insight into one of the aspects of every day life, which can be expanded through experience in the use or knowledge of the various components of the hobby that operators are willing to demonstrate to the Scouts and Guides. All are familiar with radio, television, video recorders and computers which are common in most homes and schools. It is commonly accepted that these items are used to convey information, whether it be music, pictures, news, stories or other data, but beyond this little is known or understood how communications are achieved. JOTA is an opportunity of expanding the concept, especially when the ages of the young people are taken into consideration.

The Jamboree on the Air is as the name implies — a large gathering of both Scouts and Girl Guides on the air.

It gives the youngsters an opportunity to make contact with other members of the movement, to exchange ideas and to develop friendship while at the same time educating and preparing them for adulthood. Both organisations have survived many upheavals, sweeping social events and challenges from rival youth movements because they put the needs of young people first. "Since its inception, Scouting has been dedicated to the ideal that young people will make better citizens and be happier individuals if their natural enthusiasm and desire for structured activity are allied to a sense of purpose and achievement . . . As well as teaching practical skills, group dynamics, self-realisation and expanded perceptions of the world . . . The methods and activities of Scouting must satisfy each succeeding generation of children and now offer a wealth of up-to-date challenges such as electronics and air activities." (Introducing Scouting: 1986:11).

Similarly, the aim of the Girl Guide Association "is to provide a program embracing a wide range of leisure time activities and interests which, while enjoyable in themselves, have an underlying educational purpose, namely to develop individual character based on the values expressed in the Promise and the Law as laid down by the Founder, Lord Baden-Powel, and to foster a love of country and to promote a full sense of citizenship and to encourage international goodwill." (Girl Guides Association: 1986:3).

Lord Baden-Powel of Gilwell, founded Scouting for boys in 1908 and the Girl Guides movement was founded in 1910. Today Scouts and Guides can be found in over 150 countries and territories. The movement has a membership in excess of 16 million.

GETTING STARTED

As most people are naturally shy, it is often difficult to "get the ball rolling". The main difficulty is that not all amateur radio operators are aware of JOTA and likewise, not all Scout and Guide Leaders are aware of amateur radio. Therefore, the first approach should be made to the State headquarters of the respective organisations; ie the Girl Guide Association or the Scouting Association. On establishing contact you will be asked to make further inquiries with the JOTA co-ordinator who may be an amateur operator or a leader who knows something about the activity.

At local level, the District Commissioner, or Group Leader may be approached about running a station at pack, group or district level. The levels will give you some idea of the numbers involved; eg a pack usually has 24 cubs or brownies, a group may have a cub pack and a scout troup (48) while a district may comprise two or three groups; ie approximately 100 youth members. The level of participation can be selected to suit the operator.

DURATION

The duration of a JOTA station can be varied to suit the operator/s. It can be conducted for any period of time during the Jamboree whether it be one hour or 24, it is totally up to the operator. However, the overall time will depend on the numbers that the station will be catering for, the type of programs to be run and the location of the station. The programs will vary with the type of youth members involved. For instances, if it is a cub or brownie pack then the activities can be of a simple nature as the ages will range between say seven years and 11 years, while in the case of scouts and guides the program will require some variation to suit the needs of youth members in the ranges of say 11 and 18 years.

PROGRAM

The types of programs to be conducted during a Jamboree are dependent on the resources of the operators, leaders and the physical location of the JOTA station. If it is to be conducted at the operator's home, then only a small group of youth members can be catered for and the program may simply consist of a tour of the shack and perhaps a demonstration of operations.

Other programs may consist of stations being set up in Guide or Scout Halls while still others maybe a camping site under canvas. Similarly, if you are willing and only have two metres FM and a whip on the car, but you are willing to set up shop in a hall, then that is all you can use. On the other hand, groups of one or two, or clubs might run a whole variety of equipment including HF, RTTY, Packet, Slow Scan Television, etc/ No matter what resources are available to you, the main thing is that you have done your best to allow some youth members to participate in the event. For example, I have set up shop on a number of occasions with the intention of using both VHF and HF only to find that propagation on HF is so poor that only VHF could be used and only after waiting several hours for a turn on one of the repeaters. Still we have had fun and that is all that counts.

Perhaps the most difficult part of the whole exercise is finding ways in which to explain what amateur radio is about, why people have it as a hobby, what QSL cards are and why they are collected. Its like asking youth members why they collect an infinite number of objects when testing them for their collection badges and receiving an infinite number of answers back, we all have our own reasons. It is however, helpful to put together some static displays of material which can provide some insight, whether it be copies of *Amateur Radio,* QSL cards or components. Again there is an endless variety of material which can be used to help your explanation and for the youth members to understand a little more than they know beforehand.

Leaders should be able to develop a program of activities to keep those youth members not occupied with talking on the radio/s or awaiting their turn with either games or set tasks. These activities could include:

Making walkie-talkies from milk cartons
Making Morse keys with wire, batteries and torch batteries
Making telephones with tin cans and string
Making crystal radios
Running a guessing game — naming electronic components
Running lessons or testing for interest badges

RADIO PROCEDURES

Although you as an operator may not have second thoughts about picking up a microphone and talking to someone at the other end, some consideration must be given to the youth members who may not have done it before. Many will be shy, hesitant, some will not try and all will be lost for words. Of those who will want to have a turn many will think it is either like that seen on television where both parties are almost seen at once or like the telephone where a button does not need to be pushed and the other party will reply at once, and that it will all clear and audible. Many will hang there and try to collect their thoughts while the other party will try to work out what is causing the hold-up. Then you may strike the youth member who knows it all because they have a Citizen's Band radio and think that the whole show is exactly the same. One other problem that could be encountered is the case of the 14 or 15 year old Guide who is chatting up the 18 year old Venturer, or vice versa.

It is considered a good idea to meet with the youth members prior to the Jamboree and give a talk on amateur radio and demonstrate procedures. Alternatively, arrangements could be made with the leaders to coach the members on some of the things which could be said and the procedures. Examples could include:

1. My name is . . . . . and I am from the . . . . . Guide/Scouts. My age is . . . What is your name and what is the name of your group?
2. Where are you located . . . . . ? What are your hobbies/what interest badges do you have?

I consider it important to state that operators are responsible for their equipment and therefore

the only item that youth members should be taught to operate is the microphone. The operator should be in attendance at all times to supervise the proceedings and carry out station identification.

On a similar note it should be noted that the possession and consumption of alcohol at Scouting/Guiding activities is totally prohibited.

SPECIAL CALL SIGNS

Applications for the issue of special call signs are to be directed to the Department of Transport and Communications, either through the Group Leader in the case of Scouts and the relevant District Commissioner in the case of the Girl Guides.

DOTC has a block of call signs in which the first letter of the suffix denotes the type of organisation involved; ie the letter "S" stands for Scouts and the letter "G" stands for Girl Guides. Whichever organisation is making the application it will need to nominate a custodian for the licence, I understand that this person should hold a full call. DOTC charges the annual licence fee applicable for the call. Further information about obtaining a special call should be sought from the Department in your State.

CONCLUSION

In conclusion, I hope that the information supplied is of some benefit to those who have either participated in previous Jamborees or those who maybe contemplating in offering their services to either of the organisations involved. I have participated in a number of these activities and although I have enjoyed the challenges, I have wondered how the other groups have coped with the situations.

References:

1. Introducing Scouting, 1986. The Scout Association of Australia, 3rd Edition.
2. Helpful Hints for Local Associations and Commissioners, 1986. Girl Guides Association (New South Wales).

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RFI = NUISANCE? A Look at Legalities

The Ravenscroft court case in Canada has sent shock waves through national radio societies and radio amateurs throughout the world.

Jack Ravenscroft VE3SR, was found guilty of being a "nuisance" when his amateur operation interfered with a neighbour's domestic appliance operation.

The radio frequency interference (RFI) problem was not attributed to Jack's equipment, but due to the susceptibility of electronic and electrical consumer equipment to interference from amateur radio signals.

He was found guilty of being a nuisance and put off the air.

Jack lodged an appeal in the Court of Appeals, which ruled that both Canadian radio amateurs and those affected by RFI must work together to remove the problem.

This means that Canadian radio amateurs must arrange for neighbourhood radio frequency interference suppression to a standard approved by the Canadian Department of Communications. Those affected by RFI must accept the modifications, and if they do not, then they have no further recourse.

But, whilst that court ruling only applies in Canada, it raises questions which could have application in Australia. *Amateur Radio* magazine sought a legal opinion on the case from George Brzostowski VK1GB, WIA Federal Executive member, and Lawyer. The following reviews the Canadian landmark RFI ruling:

RADIO INTERFERENCE AND THE LAW OF NUISANCE

I have been asked to explain the ramifications of the Canadian Appeal Decision in the Ravenscroft case for the Australian radio amateur. What follows is intended to be for information only. The variety of circumstances in which nuisance may be held to happen is so vast, that I do not assume responsibility to write something which has universal application.

WHAT IS "NUISANCE"?

An accepted definition of nuisance is: "An **unreasonable** and **substantial interference** with the **use and enjoyment of property**".

The key words are in **bold**. Clearly, RFI may constitute interference with the enjoyment of television, videos, stereo units, etc. Whether nuisance has been committed depends on whether the extent of interference is unreasonable and substantial.

WHAT IF I DO ALL I CAN TO AVOID RFI?

If you have, then you may prove that you are a responsible and considerate citizen, but you may still be guilty of nuisance. A good way of looking at it is to draw analogy with the growing of a tree. That is something which normally is quite inoffensive, but once its roots start to cause damage to a house on the neighbour's land, a nuisance has been committed by the person on whose land the tree grows, regardless of what steps were taken to confine its root system, and regardless of who planted it.

Nuisance is a strict liability tort (ie a wrong done to someone else).

Using a transmitter under terms of a licence, is perfectly legal in itself. However it is the interference with the neighbour's use of his equipment which must be found to be unreasonable and substantial, not the actual use of the transmitter.

However, while the reasonableness in the use of a transmitter is not directly relevant in itself, the conduct of the person causing the RFI may have an indirect bearing on the question of whether the interference was "substantial and unreasonable".

For instance, somebody transmitting only on Saturday afternoons on the 14.220 net for a few minutes, is unlikely to be found guilty of RFI interference. Someone talking every evening for a few hours, during prime viewing time, is exposed to the risk of a different finding.

The law is not perfect, and I even venture to say that a few minutes each week of splatter and unsuppressed harmonics may be found not to constitute nuisance, (on the ground it is not substantial enough to have become "unreasonable") but several hours each day of perfectly clean signals, may be a nuisance!

WHAT IS MEANT BY "UNREASONABLE AND SUBSTANTIAL"?

A related question is, "What about the quality of the susceptible equipment"?

The judgment in the Ravenscroft appeal is not much help in making this issue clearer. What it does do, is look at the practicalities of how can a neighbourhood dispute be resolved. As you may know, Jack Ravenscroft lost at the first instance, and was not only ordered to pay damages to the neighbour, but he was also prevented by injunction from using his equipment.

The Appeal Court ordered Jack to compensate the neighbour for inconvenience, but lifted the injunction conditionally, and ordered the neighbour to co-operate, and make his equipment available for modification which should prevent further susceptibility to RFI. If the neighbour failed to co-operate, the injunction was lifted permanently. If the modifications failed to eliminate the problem, then the injunction was to be reinstated.

It emphasised the need for reasonable give-and-take in a suburban dispute.

The case is interesting for two other reasons. It paid little heed to the question of whether the neighbour's equipment was unusually sensitive to RFI, but such sensitivity may have been the subject of argument in the lower court, and simply omitted from the text of the appeal judgment.

The issue of unusual sensitivity may be important in deciding whether the interference was unreasonable in the first place. There is no suggestion that the neighbour's equipment was defective, but there is a strong suggestion that it had scope for further improvement.

Therefore, if Jack wanted to use his radio, and if the neighbour had reasonable equipment in the first place, it was up to Jack to arrange for that equipment to be made compatible with his transmissions.

I am of the view that where the neighbour's equipment is defective, ie as failing below reasonably accepted standards, a radio amateur would have a strong argument that he is not guilty of nuisance on the ground that the interference was not unreasonable in the first place. The argument could be that the neighbour brought it upon himself, and that in such cases, there ought not to be any obligation to improve the neighbour's equipment.

What is comforting, is the affirmation of the need for reasonableness on the part of the neighbour.

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RF IMPEDANCE MATCHING USING FERRITE TOROIDAL CORES

Stephen Bushell VK3HK
74 King Parade, Knoxfield, Vic. 3180

Part 2: Auto-Transformers.

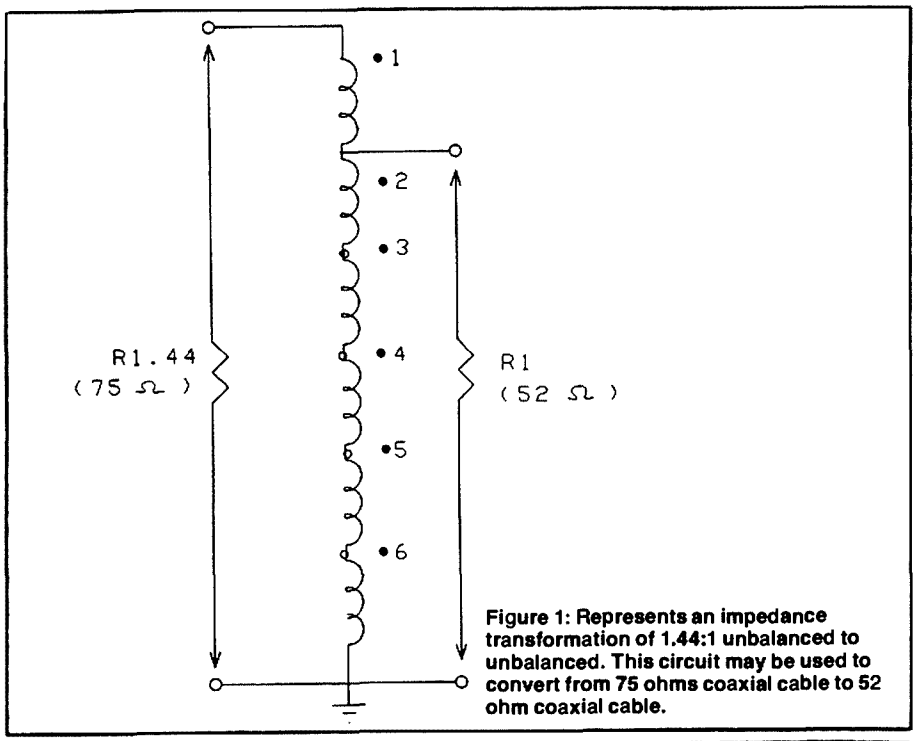


Figure 1: Represents an impedance transformation of 1.44:1 unbalanced to unbalanced. This circuit may be used to convert from 75 ohms coaxial cable to 52 ohm coaxial cable.

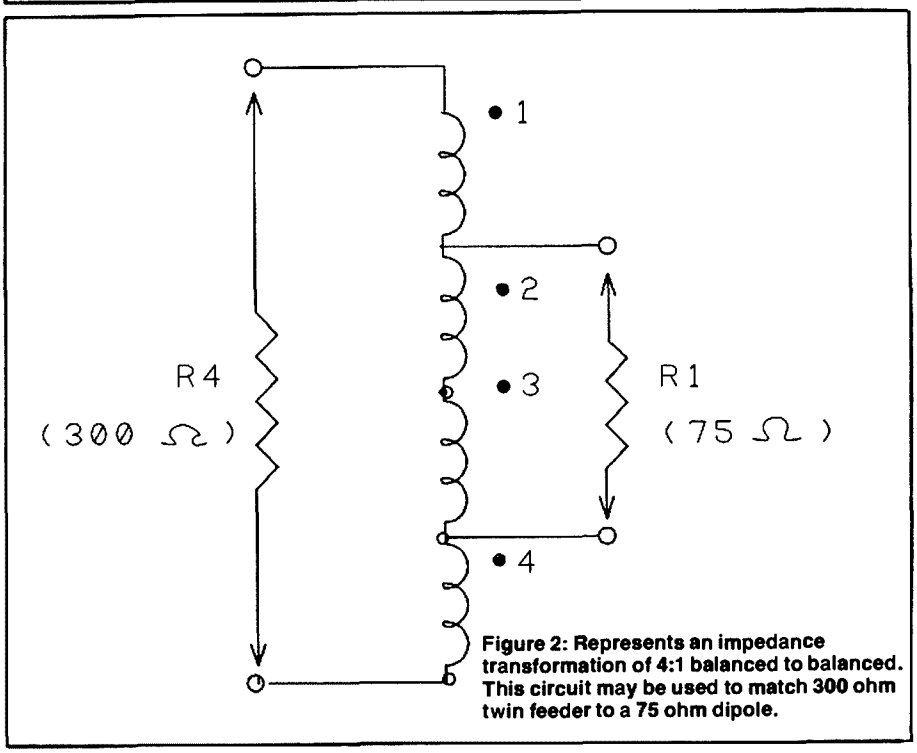


Figure 2: Represents an impedance transformation of 4:1 balanced to balanced. This circuit may be used to match 300 ohm twin feeder to a 75 ohm dipole.

In Part 1 we dealt with transmission line transformers. We used transformation ratios which were related to a whole number greater than one squared. We were able to achieve ratios 4:1, 9:1 and 16:1 in balanced to unbalanced and unbalanced to unbalanced current formats. However, ratios and balances different from these are often required for more general application.

The auto-transformer differs from the transmission line transformer in that the transformation ratio and current balance depends on the number of windings and the particular placement of tappings along them. This arrangement is convenient in that the taps may be placed at the junction of the windings which are readily accessible when wound onto a toroidal core. (See Figure 1).

Determination of the number of windings and the tap positions is easy especially if you have either a calculator to provide square roots or a slide rule. I find the slide rule is easier to use in that only one operation is required to provide the number of windings and the tap position, whereas the calculator method can be rather tedious.

Now is the time to try to find your old slide rule which you thought you would never use again. (Note — the batteries will not be flat!).

PROBLEM: To convert 75 ohm coaxial cable (unbalanced to 52 ohm coaxial cable (unbalanced).

SLIDE RULE METHOD:
Align 75 on the A scale with 52 on the B scale.
Scan the C and D scales for integers which are aligned.
5 on the C scale is aligned with 6 on the D scale.

SOLUTION: We require a Hexifilar (6) winding which is tapped at the junction of windings 5 and 6. See Figure 1.

CALCULATOR METHOD:
52:75
= 52 ÷ 75
= .693
.693
= .83

The tedious part is in converting the decimal back to a fraction to obtain the solution which is 5/6.

UNBALANCED TO UNBALANCED

It should be noted that the problem just dealt

with entailed an unbalanced to unbalanced format. The windings (Figure 1) share a common grounded point at the bottom of the transformer and have an uneven turns ratio, 5:6. Consequently, current is unbalanced with respect to each winding and to ground.

BALANCED TO BALANCED

To achieve this arrangement we must have a winding configuration wherein each impedance looks into a separate but equal number of windings which, as we are dealing with an autotransformer, will all be in series.

At this point, operation on the calculator really becomes a bore so, if you haven't found your slide rule, you should try a little harder to remember where you last saw it.

What we have to achieve is a winding/tapping ratio which is separated by an even number. If we want to match 300 ohm balanced to 75 ohm balanced we see from the C and D scales after aligning the 300 and 75 with the A,B scales that the smallest ratio separated by an even number is 2:4 — we therefore require a quadrifilar (4) winding tapped one winding either side of centre. (See Figure 2).

Unfortunately, life was not meant to be easy!

All ratios do not provide a tapping point at the junction of windings and one must decide if an imbalance (VSWR) is acceptable or if a tapping should be placed part way along a winding. In the case of the 300 ohm feedline and the split dipole driven element of Figure 1, Part 1, where the impedance at the element centre was measured at 35 ohms, we find upon aligning A and B scales, 300/35 that the closest aligned evenly spaced integers are 2/6. They are not, however, exactly aligned. Bringing the C and D scales (2/6) into alignment causes the B scale (33.3) to move into alignment with 300 on the A scale. A resultant shift from 35 to 33.3 which gives a ratio 35:33.3 or 1.05:1 which is in fact the VSWR resulting from the impedance change. This is of no consequence as it represents a virtually imperceptible loss.

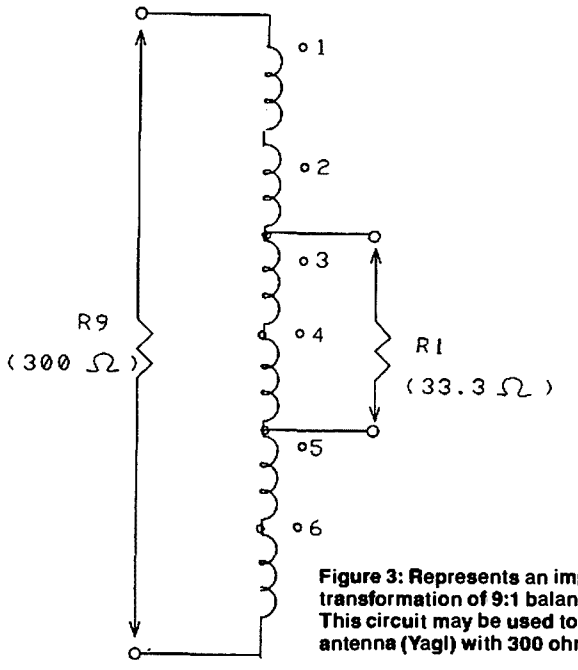


Figure 3: Represents an impedance transformation of 9:1 balanced to balanced. This circuit may be used to match a beam antenna (Yagi) with 300 ohm twin line.

To match the beam to the 300 ohm twin feeder therefore will require a hexifilar (6) winding transformer tapped one turn wither side of centre. (See Figure 3).

Net time we will look at conventional transformers and see how they compliment and expand the variety of impedance transformations and current balance formats dealt with so far.

VK6 MORSE WORKSHOP A BIG HIT . . . AGAIN!

Andrew Baumanis VK6WB
35 Ormaston Road, Carine, WA. 6020

Following the success of two Morse Workshops in 1987, it was decided to have another this year.

The aim of the program is to build confidence in both sending and receiving at Amateur Operator's Certificates of Proficiency (AOCP) examinations with practical experience in an environment similar to the examination itself. The VK6 Practice Morse Co-ordinator, Malcolm Johnson VK6LC, spent many weeks compiling a program and, following on from last year's successes, he excelled in producing a thoroughly interesting and enjoyable Saturday morning.

In all, 42 operators and hopefuls attended the session, consisting of 24 candidates and 28 staff. Of the candidates there was a keen interest shown by non-licensed persons — 17 of these attended, leaving one N-call, three K and J calls and three Z calls. Three of the staff who came to help were present at the 1987 Workshops as candidates without call signs.

The new Western Australian Divisional President, Christine Bastin VK6ZLZ, opened the morning's activities, and was immediately followed by Glen Ogg VK6KY, a DOTC Examiner, who spent 10 minutes discussing DOTC Receiving Examination requirements, and what was expected of candidates. He placed strong emphasis on the role of the examiner, not to fail candidates, but to give them the best opportunity to demonstrate their competence. Following this, it was straight into five and 10 words per minute practice. This was done under examination conditions, but without the pressure of an examination. Ample time was available at the end of each practice for discussion.

Malcolm VK6LC transmitting practice text.

All heads down under examination conditions.

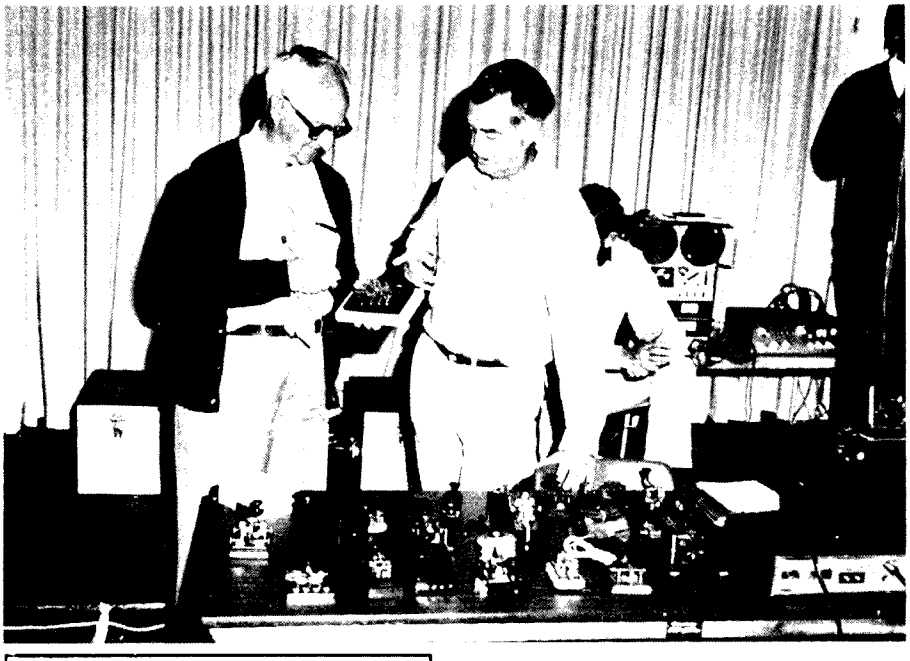
Barrie VK6AF, DOTC Examiner, demonstrating correct key manipulation.

Barrie Butler VK6AF, a DOTC Examiner, with 45 years experience in telegraphy, followed with a talk and practical demonstration on code sending and examination requirements, including key manipulation, correct characterisation and spacing, correct erasing and, most importantly, how to face the examine. It was good to see the DOTC examiners prepared to come and give help and advice to candidates. It was thoroughly appreciated, especially meeting the examiners in a casual atmosphere. Barrie took time to demonstrate correct and comfortable ways to handle a key. He also explained that, as long as the CW was good, he was quite happy to accept sending using any part of the anatomy, eg nose or little toe.

The morning included other items of interest. Details about WIA membership and activities were presented by Peter Hackett VK6PK, the VK6 WIA Membership Secretary. Christine and Cliff Bastin VK6ZLZ and VK6LZ, detailed WIA education, book and Morse tape facilities. Dave Couch VK6WT, presented an enthralling Morse

Above:
Practice Morse Operators, Alan VK6AR and Doug VK6AUL, check the sending technique of Larry VK6ZLW.

Below:
Dave VK6WT and Tom VK6TO, looking at some historical Morse keys.



code key demonstration showing a large variety of keys, old and new, and all shapes and sizes. Some of these were old military keys, some were used while strapped to one's leg, whilst another clipped onto the steering wheel of a car!

The session concluded with receiving stations being set up. Candidates were able to practice sending in an examination environment and receive helpful comments after the practice texts were sent.

The three hour morning passed quickly and went into "overtime" as nobody was interested in leaving. However, the effort put in by Malcolm VK6LC, in preparing the morning's program, the VK6 Morse operators for their time and patience, DOTC examiners, Pam, Malcolm's wife, who ensured that no one was thirsty or hungry, and all other staff, was greatly appreciated by those who attended. These workshops have now been a great success for the past two years and look set to be a regular feature on the VK6 Calendar.

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MORE ASTRO-AMATEURS?

The ARRL and AMSAT have made a joint proposal to NASA on amateur radio participation in the US space station to be built in the 1990s.

The submission points out that the hobby could help promote favourable public awareness of the space station and the US space program.

The ARRL and AMSAT envisage experiments using voice, data and video communications techniques, providing a means of recreation for crew members and, as a back-up means of communications.

The proposal highlights the ability, through amateur radio, the space station would have of holding two-way communications in real time with selected school classrooms and civic gatherings, with ground facilities manned by local volunteer radio amateurs.

The ARRL and AMSAT emphasised that a key element to the proposal's success will be the planned AMSAT Phase 4 Geostationary Satellite due for launch in 1992, with tremendous digital data capabilities.

—From the *ARRL Newsletter* and *Gateway*

ABBREVIATED CALL SIGNS

The use of abbreviated call signs, such as dropping the VK prefix and using only the call sign suffix is not permitted.

The WIA Victorian Division sought clarification on abbreviated call signs after a radio amateur queried their use on a repeater, and requested the WIA seek a definitive answer why they could not be used.

The Department of Transport and Communications (DOTC) said: "The use of abbreviated call signs is not approved because they are often call signs in their own right and their use could lead to confusion."

If you use only part of an amateur station call sign it could in fact be the entire call sign of another station in another radio service.

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PLASTICS BREAKTHROUGH

A class of plastic when doped with certain impurities has been found to conduct electricity efficiently, and in some cases, equal or better than copper.

One prospect of this development will be rechargeable batteries with double or triple the capacity of current batteries.

A full report entitled *Plastics that conduct electricity* was published in the February edition of *Scientific American* magazine.

—Adapted from *Westlink*

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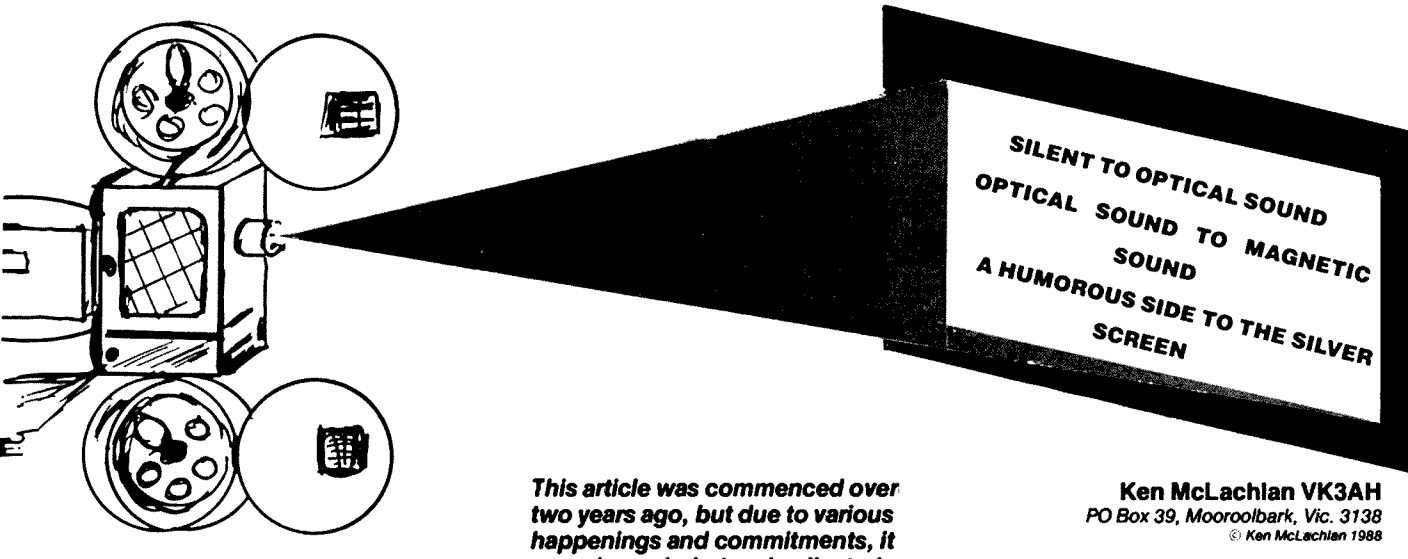
HAMADS

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.*** Please remember your STD code with telephone numbers

DEADLINE FOR NOVEMBER IS SEPTEMBER 16, 1988



Ken McLachlan VK3AH
PO Box 39, Mooroolbark, Vic. 3138

This article was commenced over two years ago, but due to various happenings and commitments, it was pigeon holed and collected dust. Alas, it has been resurrected and is dedicated to the many amateurs who were and are still engaged in the commercial theatre industry.

I personally have been officially involved with the industry since 1948, being privileged to enjoy every facet of screening to the magical silver screen in most States of Australia either, as a projectionist or service engineer. In Victoria, the writer has held positions from spool boy to circuit manager of a theatre group. Many times these positions were moonlighting to my main profession.

Many amateurs, have been commercial projectionists over the years, some now are unfortunately Silent Keys and it is sad that they cannot reminisce the earlier 'silent' days and the latter days of 'the talkies' or the 'flicks', depending in which area you were at the time. It was a different sort of occupation, as no one in the industry ever enjoyed a normal social life, because they were providing entertainment to, in those days, the multitudes. Many WIA members will read this and it is trusted it will bring back many happy memories.

It was not realised, until the research and note making stage for the creation of this article, of how much 'water had gone under the bridge' in four decades and the progress the industry had made in those years. Front shutter, open geared and even converted hand-cranked mechanisms that would never have got past any Inspector, whose duty it was to uphold Legislation and numerous other oddities that have occurred since the inception of the movies would fill a book, not just an article in *Amateur Radio*. Such marvellous innovations as 3D, Cinerama and other inventions that dramatically increased the sales of remedies for analgesia, to the operator or service personnel have been neglected.

Unfortunately regulations were different throughout the Commonwealth, as in the State of Victoria, the legislation covering Public Buildings and places of entertainment was controlled by the Department of Health and even to be in a 'Biograph Operating Room', one had to licensed as a Trainee or be a fully qualified Projectionist, obtained by examination which encompassed Regulations, DC Theory, AC Theory, Sound, Optics and a frightening practical examination (where some examiners were quite practical jokers), where you had to present a part performance. This was all after a three year, then later two year apprenticeship and one had reached the magical age of twenty one years (this also has been dropped to a lower age), attendance at a recognised course and be a responsible person of sound character. As this was a second job, the school was out, but as soon as practicable during my training, the thought of being the Manager/Projectionist of 'my own theatre' at the tender age of 18 lured me to become a member of the defense forces, joining after initial training, an entertainments unit. An experience, which trained me in all facets of the industry before sitting for my Victorian License on discharge, strangely, a license that is still current, which was never actually used for a number of years. Whilst in the forces, the opportunity of becoming a technician and travelling to different areas, was too good to pass by, also it gave the opportunity to see Australia whilst learning the installation and commissioning techniques which were to become a way of life on discharge, with two major equipment suppliers, Western Electric (later Westrex) and Radio Corporation of America (RCA).

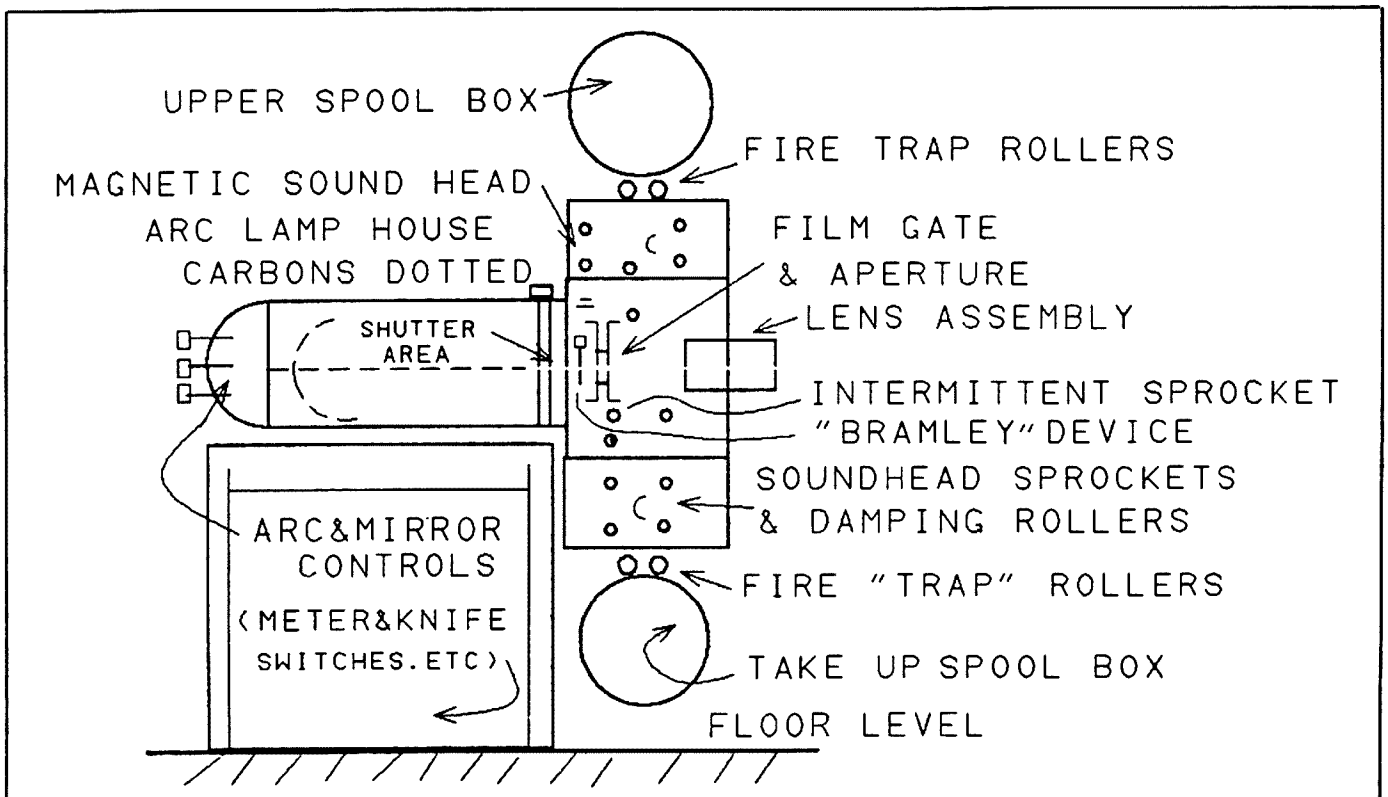
At the conclusion of this article, all projectionists who are known to have been engaged in the commercial projection of film, as the Victorian Act defines 'for gain or reward', will be listed. Many will be missed, some will have sadly become Silent Keys, therefore it is trusted that those whose knowledge is more accurate and up to date than mine will contact me, so an addendum may be placed in a later edition of *Amateur Radio*.

My first contact with the industry, commenced in a Victorian country town where the 'Movies' were screened each Saturday from a travelling circuit. The equipment was really quite simple, comprising two modular portable (well worn) Pyrox projectors with a 1000 watt incandescent lamp, shocking 'Top of the shelf' lenses which had ingressed a considerable amount of oil during their use, an unusual optical sound head (which also suffered the oil syndrome), a 10 watt amplifier using two trusty 2A3s in the final and a very portable, probably more aptly described as flimsy, screen and supply of at least 20 ten minute reels of film, as being of a portable nature it saved time in doubling them up and splitting them again after the screening, the maximum footage allowed in the spool box was 2000 feet (700 metres). The modules were assembled and held together by 'thumb-screws' allowing ease of erection and dismantling.

I became involved through curiosity for something to do on a Saturday night was the only entertainment for the week after working six days as a trainee draftsman at a milk processing factory. At that time, the older nitrate base 35 mm stock was still existent, and was even widely used for many years to come. As it was so volatile many safety precautions were introduced, including a device probably only used in Victoria which was known as the 'Bramley Device', named after its inventor. Many operators had various unprintable names for this device. The theory was excellent, but in practice, at times, it was activated by a faulty join, a strained sprocket hole or for any other strange reason. This device actually was a solenoid energised by voltage from the arc or light source that magnetically held up a metal plate allowing the light to pass through to the lens. In series with the circuit was a form of micro-switch which was in the closed position when two rotating spacers which were held apart by the film, in its path through the projector. A film break, caused the circuit to open, de-energising the solenoid, allowing the plate to drop (if it was not jammed in the open position by devious means) and the light with its intense heat was removed from the film, alleviating the chance of a potential fire.

Whether it was Murphy's law or the thoughts of an astute public servant who wrote the act, projection boxes for the exception of one or two, were elevated above the audience, and constructed to a fire-proof rating of a certain number of hours. Nevertheless, one learnt quite early in the business that film was heavy and quite a haul, to its holding area for the screening.

After a considerable period of initiation, a family move to the city led me to joining a large city 'circuit' as an assistant projectionist on a full time basis, of course this was to be my second job. Six nights of screening, a Saturday morning 'Cartoon Carnival', the usual matinee, an inter-



Layout of a Typical "Old Style" Projector.

mediate screening and of course the evening screening on the Saturday night. Sunday was a day of sleep and the cycle recommenced again.

Presentation was always uppermost in the thoughts of the projection staff, managers, usherettes and ushers, even to the 'lolly' boys who were all dressed and groomed immaculately. Every theatre was controlled by a circuit manager and superiors, that would grace the theatre at the most inopportune times, as did the Health Department Inspectors. Avid smokers were the Health Inspector's joy, even more so than those that did not have their licenses displayed. Each projection box had to be equipped with at least two large buckets of sand, a small shovel, highly polished brass fire extinguishers containing carbon tetrachloride (a fluid with a boiling point of about 77 degrees Celsius) which is now known to produce phosgene gas when placed on hot metal, a toxic gas that would exacerbate respiratory problems and direct contact through the skin of the fluid may cause hallucinations and incoherent problems as well as mental disorders, (always wondered and still do, why people shun me) and at least two asbestos or woollen fire blankets.

Each of these articles had specific purposes which they were not designed for, the sand buckets were a magnificent ash tray and particularly one well-known inspector would scratch away until he found a butt. Nevertheless it was a lever, as it was hard to prove that it was actually placed there whilst the theatre was open to the public, unless of course he burnt his fingers. Regardless, it would be written into the report. (Any self respecting projectionist who was a smoker, carried a tobacco tin in their pocket, which was the ash tray). The fire extinguishers were really never full as they contained fluid which was an excellent dry cleaning agent that assisted the usherettes to remove ice-cream stains from their skirts after interval, and there were some very clumsy employees. This was a chore that no self respecting projection staff member would allow the fair lady to do herself.

During those years, it was mandatory that a licensed operator, a registered assistant or another operator be in attendance at all times and at times another trainee may be assigned, to learn the ropes. With three, within very small confines, various ways were found to break the monotony. Generally each projection box had two 35 mm projectors, a slide machine, preamplifiers and the main amplifier. Using DC arcs from a motor generator or selenium rectifier with just enough capacity to run two arcs, meant that a switching device was needed to allow the load from the unused projector to be directed by knife switches to the slide machine, conveniently situated and within easy reach of all. Though a neat but frowned on trick by many operators was to 'snatch' the arc from the outgoing projector to the slide machine, which, when perfected, gave a film fade out and a fade in of the Interval slide.

In one certain suburban projection box located at ground level, the switches were located by the main amplifier. The amplifier being of an original 41, 42 and 43A Western Electric design, was rack mounted and at least two metres high, with the power supply comprising four 'huge' rectifiers which were about 75 mm in diameter glass tubes and about 250 mm high, glowing at full capacity that emanated heat excelling a couple of kilowatts, located about 150 mm from the floor level. These rectifiers were at times in the summer a little much, with the arcs running, nevertheless they did have their uses in the winter, as the usherettes came in to warm up before interval.

A couple of common tricks used to check a new employees calibre was to wind some heavy resin core solder around the unused lines to the slide machine or strategically place four small crackers that would harmlessly explode after the arc was struck! Of course it was prudent to check that the machine was lined up before the interval slides and no better person to do this chore, than the new recruit. This following experience and the subsequent look of horror, will live with me until I die. The command was issued, but what was not realised was that one of us had set the crackers and the other had set the solder. The order was carried out, but the rest is almost indescribable. The person saw smoke rising and sparks, which he handled quite well until the crackers went off. The face of the 16-year-old emanated that of Herman Munster, a quick look at the glowing rectifiers, out through the fireproof door into the foyer, one foot into the cleaners bucket and a slide across the foyer to the street. He eventually returned, very shaken and proved to be a very competent projectionist, service engineer and a well respected amateur. It is hoped he forgives the perpetrators of his initiation, when he reads this in print.

This particular theatre must have been staffed with renegades, as the manager, a massive man that completely filled a doorway, was also moonlighting and his days work was selling American cash registers, where all the sales staff started a chant before commencing work each day 'that they would produce better figures than their previous days work'. Over a weekend, for various reasons his world collapsed around him, and on the Monday morning, he went to the bank and converted all the takings into threepenny and sixpenny bits, placed them in a wheat bag and proceeded to the Victorian

Manager's Office. On entering, with celerity, he upturned the open bag on the Manager's table combined it is believed with some quite unprintable but very apt words. He has not been personally sighted since! The manager with a very cluttered office full of coins was it is believed, speechless, an attribute which was not consistent with the man's character.

On another occasion, the same theatre was screening a film called the 'Wooden Horse' and one of the sequences had at least a three minute period of silence. The first time it was encountered it was 'panic stations'. Amplifiers were hastily checked, the volume control was placed in the 'flat' out position, the 'port hole' window was removed to see that it was not the monitor amplifier, which had given up, the film track was checked for a sign of reproducable area (at a speed of 90 feet per minute this was not an easy task and meant a lot of film on the floor, which would all go back on the spool, if no one moved their feet). Then it occurred, a sound above all sounds and no member of the audience stayed on their seat. Later the manager, said it was a spectacular part of the film. I personally have shown that film a considerable number of times and have at times nearly placed the 'woofers' from the speakers, amongst the audience.

If one was in a city theatre, one learnt due to screening a film for a lengthy period, that the change from machine to machine was done by intuition, and there was also the competition of burning the carbons to the minimal length on a reel. As the carbon usage was proportional to the voltage and current, many tricks were played upon the unsuspecting opposite shift and at times there was no consideration to the audience to save a carbon holder.

It is interesting to note that most of the Western Electric equipment was used initially in the 'silent days', where the projector speed control was variable from the 16 frames per second to sound speed of 24 frames and above. In many locations the first sound facilities of a synchronised record player were in place but disabled.

Of course the 'Annual Movie Ball' was the event of the year and as the normal finishing time of the feature was 11 pm, half the fun and ones money, had been used by others. By soldering a 'bridge', across a 'solder tag', the variable speed was reintroduced to the projector. It was and still is, it is believed, to give the time of intermission and the end of the screening in the foyers of some theatres. Of course, unbeknown staff, sped-up the equipment, not too fast, but fast enough to allow us to leave about 40 minutes earlier than was expected. Many people came out into the foyer and checked their watches that evening, shaking their heads in disbelief, with the time shown on the clocks. Nevertheless it was better than dropping a reel or two out and really losing the continuity of all the program. (Incidentally the 'bridges' were removed before departing for the Movie Ball.). We would have been the first evening projection staff to arrive at the grand event and took great pleasure in greeting other staff as they arrived, consoling with them of the events of what they had missed.

Another incident, at the same theatre was a Mannequin Parade. It was well publicised, even to the extent of a senior evening newspaper photographer (still an active amateur and first class photographer) gaining the front page with one lass, that was decoratively decked out in a costume of the latest material. Such publicity, ensured a full house, and it was suggested that the resurrection of the 'arc-spot', from the generator room, below, would be appropriate. The spot worked magnificently with a pink coloured gel, the crowded theatre was stunned with the beauty beholding them — some of the mannequins with the new material which became transparent from the arc's rays, gave true X Ray vision and one arc-lamp was very quickly doused!

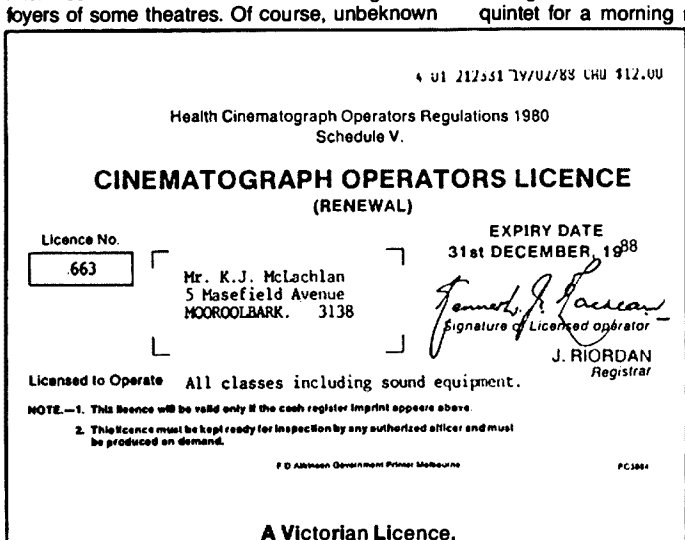
The projectionist and technical theatre staff, apart from these supervisors were also responsible to the Chief Projectionist Manager, an impeccably dressed man, who always wore a 'bow-tie'. When one was summoned to appear at his office in the city Head Office, they went with trepidation and the atmosphere created by a huge office and no offer of taking a seat, did not enhance the aura of goodwill. His charming personal secretary Marge, looking over her horn-rimmed glasses was the only gesture of friendship, with her warm smile and knowledge of every employee by their first name.

This gentleman had the habit of taking a constitutional walk around the city stores during his lunch break. On one of his tours he graced the premises of a well known hardware chain-store, to be served by one of his nightly staff. Then during a further tour of the store he found four more of his staff, filling in during the lunch hour rush. That evening the word was sent through the chains of command to the unhappy quintet for a morning meeting, next day. Word has it, that the whole of the city's main street were privy to the gentleman's remarks. Needless to say the hardware store was quite short of staff for that day and the days to come. He was the driving force behind the first Drive In Theatre in Australia, later leaving the organisation, constructing and running a successful Drive In Theatre for many years, which is one of the few presently left in the Melbourne metropolitan area. Its early success, was due to impeccably presented staff and a screening that was technically flawless and perhaps the 'bow tie'. I was lucky, as he never suspected my moonlighting before joining the forces and even on my return to the company at a later date, and any of my many other misdemeanors, during my employment with the circuit.

Service life was a breeze, selection of the most up to date first film releases at the cheapest of hiring fees, your own staff and the service and upkeep of the equipment under ones care. Virtually one wore the 'coats' of exhibitor, manager, projectionist, service engineer, generally being only responsible to the Entertainments Officer, who was generally the Education Officer, (a great help to me as I was doing technical correspondence studies), except at one location where the Padre was the responsible Officer. One exceedingly hot Christmas Eve, this gentleman acquired adequate refrigerated refreshments and other 'goodies' for the whole staff from the Mess, a gesture that was typical of this Officer's rapport with all that met him.

My newly acquired position with my own theatre at different postings, was quickly lost due to promotion as a Service and Installation Engineer. Quite an exciting challenge, to fault find and install newer and much better equipment than the old Westrex, Cummings and Wilson, Kalee and other assorted equipment that was 'tied' together with what was at hand, in a typical amateur fashion.

At one base, located beside a lake, I had a 'ball', fishing and removing oysters from the pier and supports that the Sunderland Flying Boats in all their glory, were tethered too, during my off duty hours. Coincidently, a well known amateur from VK6, now a Federal Councillor, was doing his National Service at the same time. We never met, but through a chance remark in discussion, we have had many long discussions on the funnier side of life at that time, as it was an Officer Training establishment, everything on this establishment was done by the 'book', including morning parades. This is the only



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Health Cinematograph Operators Regulations 1980
Schedule V.

CINEMATOGRAPH OPERATORS LICENCE
(RENEWAL)

Licence No. 663

EXPIRY DATE
31st DECEMBER, 1988

Mr. K.J. McLachlan
5 Masefield Avenue
MOOROOLBARK. 3138

Signature of Licensed operator

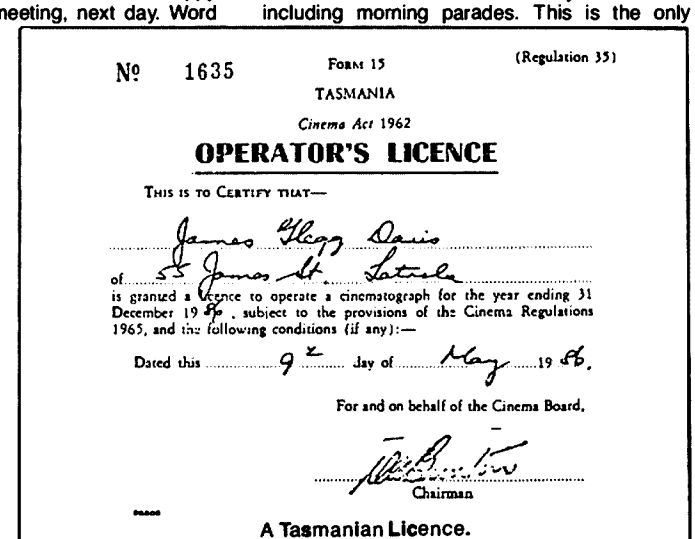
J. RIORDAN
Registrar

Licensed to Operate All classes including sound equipment.

NOTE.—1. This licence will be valid only if the cash register imprint appears above.
2. This licence must be kept ready for inspection by any authorized officer and must be produced on demand.

F D Atkinson Government Printer Melbourne PC3864

A Victorian Licence.



No 1635 FORM 15 (Regulation 35)

TASMANIA

Cinema Act 1962

OPERATOR'S LICENCE

THIS IS TO CERTIFY THAT—

James Clegg Davis

of 55 James St. Latrobe

is granted a licence to operate a cinematograph for the year ending 31 December 19 88, subject to the provisions of the Cinema Regulations 1965, and the following conditions (if any):—

Dated this 9th day of May 19 88.

For and on behalf of the Cinema Board,

Chairman

A Tasmanian Licence.

'pastime', I was exonerated from being on the morning Roll Call and parade, it didn't worry me a bit as I rolled over in bed, for another half hours sleep, no longer though, as one may miss out on breakfast!

Another posting to a northern area theatre, was a comedy in itself, as I at times wondered if I was keeping the local theatre named 'The Star' running or the defense establishment's open air facility. Many friends were made, and everyone helped everyone else in that area, even to doubling as a Taxi Driver for a couple of hours, which taught me a lesson that would never be attempted again.

After a number of other postings, I was discharged and joined Western Electric as a service engineer in New South Wales where the installation of Widescreen formats was closely followed by the introduction of Cinemascope to the larger theatres in Newcastle and Sydney. It was a situation where one learnt as they went, (particularly not to place ones foot through the proscenium of one of Sydney's finest theatres, as I did), generally eating on the run and working 18 hours per day, seven days per week on installation, fault finding, commissioning and service to the existing clients that were waiting in the 'wings', with cheque book in hand, to see how magnificent these attributes would be to the Box Office, before purchasing. The equipment manufacturers just kept with the pace of the increasing demand, nevertheless the quality control suffered, placing a greater strain on the installation procedures and maintenance staffs workload. At times the installation staff, were still filing the apertures for the format being used, as the National Anthem was being played, and no one can get closer to panic than that, as in many types of machines, the aperture plate couldn't be removed whilst the film was in the projection gate. Many operators became nervous wrecks because of this small problem, as if during a changeover in format the correct aperture plate wasn't selected it meant stopping the projector completely and correcting the fault. Nicer brands of projectors allowed dowsing of the light, sliding the offending plate out and replacing the correct aspect ratio plate, five seconds to the experienced and hardened operator.

Some projectionists were frightened to death about the new 'black box' technique, quite often called other unprintable names, others took it in their stride. The former group couldn't come to grips with magnetic sound tracks replacing the variable density or variable area optical track that was synchronised in advance of the projected film, whereas the magnetic track was lagging behind the projected picture and there were four tracks which contained audio for three backstage reproducers, left, centre and right plus the side theatre audience participation speakers. This meant four preamplifiers and four main amplifiers with generally 807s, being used as the final audio amplifiers in the larger installations. It was too much, and the 807s were not the consumable type. The latter group assumed that when it didn't work it was the problem of those that put it there and they were thought to be as close as the telephone was. No way would they touch anything but the main switch and that was done with reluctance.

Work in the harbour city was very exciting, though hectic at times, particularly as the suburban layout was quite unfamiliar. An opposition company in Melbourne made a lucrative offer, which was accepted, as that is where the Drive In boom started and they were manufacturing most of the driver and final amplifying systems in modular form for rack mounting, which was quite a challenge.

Country maintenance duties was a not a new aspect and the chance of using that much valued privilege of the license that cost five shillings per annum, may be able to be used. It was never realised how much the law was flouted by some exhibitors on the country circuit due to sheer economics. An assistant operator was unheard of, however they were covered by the head usher, with a trainee assistants permit, who knew all the locals. Visitors to the area were treated with the respect of the usher making haste to and remaining in the projection box if there were any unusual sightings, though in Victoria the exhibitor had the Exhibitors Tax to contend with, and their inspections were quite regular, so at many times the projectionist had 'unneeded' assistance.

One country tour was never meant to be. Transport was by the trusty railway and bus system, not conducive to the carrying of a heavy tool box, spares and appropriate clothing for the planned weeks or on occasions, fortnights trip. Arriving in a distant town in the middle of a screening, depositing the necessary tools of trade, finding which 'flea-house' one was domiciled at, finding a meal and then the room that the 'know all/fix all' was booked into, was quite an art. Of course I was told a certain room number, no locks on the doors and, upon switching on the light. was greeted by a screaming lady, hiding under the bedclothes. A hasty retreat, finding the management and it was her mistake. That is my story and I am sticking to it.

This was my first and last trip in that direction, as it was catastrophic. The previous evening en route to this destination was the second time I had seen amateur radio, since I was 'knee high' to a grasshopper and had at many times admired Keith VK3SSs equipment located in the far left corner of his workshop/shop, which was close to my home town. It was then decided that one day I would follow in his footsteps and become a amateur radio operator. That previous evening, I had arrived in on the train and after finding a cafe to have a meal, I dropped into the theatre, to unload. The screening had commenced and all I could hear above the auditorium noise as I climbed the stairs was a repetitive 'clickety-clack'. The thought of a usual half hearted thump on the fireproof door with the comical announcement of 'Health Department', was dismissed from my mind as that was not a consistent projector noise. On juggling myself through the door, I was confronted by one of the most comical projection boxes I had yet seen at that time. It was conventional, except it had numerous additions of cotton reels used as pulleys, connected with different coloured strings running in all directions. This was my first and not the last initiation of a 'one' operator controlled projection box. In addition additional unfamiliar equipment, earphones and a strange device that was making the 'clickety-clack' noise, later I was to learn that it was some device that has always horrified me, a Morse key. Yes, it was an amateur, enjoying a QSO, whilst also enjoying his work.

Fronting at the theatre after an early breakfast, I was encountered by the 'cotton-reel' syndrome. Oblivious to all the extras, the projector, arcs, amplifier and other necessary equipment was thoroughly tested, the report written up, and I ventured on to a circuit of four theatres that I was later destined to manage. Believe you me, it was nice to be in conventional company, though the operators of the previous theatres initiative must be praised, for their ingenuity, that gave their patronage, a precisionally perfected performance, year in and year out for decades.

The Drive In and Wide Screen/Cinemascope boom had hit, long hours and deadlines (things haven't changed) became a nightmare. The company that I was employed by, were the leaders in the field and the workload was intensive. The first Drive In was 'put together' in record time. It was built on a creek bed, as the land was cheap. Opening night, after a heavy rain-storm was spent 'paddling', with many mutterings 'of hope the earths are connected properly' from the largest 'crew and onlookers', ever seen in one place at anyone time. Oh, such was Show Business.

Installations and commissioning tests were traumatic and at times very dramatic. At one installation as the workers left, the local children came over the hill, out of the sunset like a lot of Apache Indians. Heavy duty diesel rollers were drained of the oil which was replaced with the untamped stones. Unterminated speaker posts, if still standing, had the wires cut at the already covered conduits, supporting guys terminated by riggers before 'strutting the mighty screen', were appropriately cut and the mass of screen was caught by the wind, the damage couldn't be described but again the theatre opened on the scheduled date.

At one inner suburban theatre situated on a main suburban road, selected for the change over to Cinemascope over a weekend, conversion was completed on the usual death knock and had survived all the usual tests. The opening line of the prelude to The Robe, was "Now we present Cinemascope . . ." with curtains dramatically opening to a new screen ratio, accenting the new format. This procedure was well embedded in every Theatre Engineer's mind. On this occasion, whilst standing outside the projection box at the top of the aisle, the curtains opened and 'Car ? to Car ?. We are going in to see this new finagled picture'. Definitely my first case of RFI (and unfortunately not my last) from no one else than a police vehicle and on all the four amplifiers. It brought the 'house' down with laughter, but the very red faced including mine, technicians, laboured for one week to rid these pestacious varmints noises from occurring again.

Strangely another unusual incident occurred in the same area whilst leaving an installation of a dreaded Perspecta Sound system, for an opposition company. This system would have been a delight to Lloyd VK5BR, an expert in his own right on filters. It was a purely optical (el cheapo) system based on controlling the left, centre and right speakers (no audience participation speakers) by a 30, 35 and 40 Hz cycle control signal being imposed on the sound track. It never worked as it was intended, for more than half an hours duration and if that, one's luck was in. It was doomed to be a disaster from its inception and the first picture on this system was a musical concerning the Canadian Mounties. Nelson Eddy moved from the left side of the screen with his voice emanating from the right. This was typical of the installation as another technician and the writer were leaving the theatre at about three o'clock in the morning, of course with a small oxygen bottle to be refilled before returning later that day, when we were greeted by two very large gentlemen in blue uniforms. We got home for breakfast but the intervening hours events are left to the readers imagination, as the onus was on us to prove our

innocence and the reason for being on the premises, particularly with such equipment.

Earlier in the article, mention was made of a Health Inspector, who is now unfortunately deceased. This gentleman was one of the fairest, honest and most helpful gentlemen I ever had contact with. I forgave him for the 'trick' he played on me with an accomplice during my practical Licence examination, which was replacing the copper coated arc carbon with a suitably painted piece of wooden dowel, after a very nervous tour of my explanation of various equipment in the Motor Room. The transposed 'carbon' was detected prior to the crucial moment. He also did eventually pass a candidate, who repeatedly answered the standard Regulation Paper question 'Note in sequence the steps you would take in the case of a fire'. The answer of 'Very fast ones ...' and similar answers was not very appropriate at each exam he presented himself for.

During my active time in the industry, I was conned into being the relieving 'sparks' at a vaudeville type show in the well renowned Tivoli Theatre, since closed and well demolished, as most of the old theatres have become in this State. I had spent a fair amount of time amongst the numerous lighting circuits, dimmers and all the knick knacks that go up to make a performance. At times one had to be very dexterous to operate a number of dimmers, spotlights and effects that were used to make the dancing girls appear more beautiful. Originally it commenced as a three performance stint, ending up in virtually about fifty, due to the electricians sickness. It was a different scene to the pictures, but it was 'Show Biz'.

Another variation, was one of the original Film Festivals that was held at the theatre in the Melbourne University where an incident occurred between the very artistic director and yours truly. The audience and staff, including one amateur (now interstate) who was working in the projection box during the festival whilst studying on campus, were all involved. The festival screened films virtually from 9 am to 11 pm for 15 consecutive days. Everyone was tired and tempers flared at many times, nevertheless this particular evening was too much for us all and it commenced quietly and ended in a very verbal altercation in the foyer, which attracted a larger audience than the sub-titled film that was being screened in the auditorium. Many years later we met, and had quite a laugh about our difference of opinion. After the completion of the festival, I stayed on with the theatre in the capacity of projectionist and the 'sparks' for the live shows that were presented. Incidentally the world premiere of John Sumner's world acclaimed production 'Summer of the Seventeenth Doll', was inaugurated from this location, which had many and varied audio enhancements anywhere from backstage to the projection box and most of the final amplifiers used the trusty and much loved 2A3s.

No article would be complete, without the Health Inspector's remark regarding an incident that occurred to him *before* his retirement and subsequent untimely death. He was making a routine visit to a suburban cinema and noticed a person in white overalls working under the bonnet of his car, beneath the street lighting outside the foyer. As of his nature and thinking he may be able to be of assistance, he placed his head under the bonnet for a chat with the 'mechanic', who was happily working away as this cinema now used extended reels, Xenon lamps and no 'paid' assistant. The operator instantly recognised his unsolicited helper, with

—Examination Papers courtesy John Riordan, Registrar, Victorian Cinematograph Operators Board

CINEMATOGRAPH OPERATORS EXAMINATION

GENERAL PAPER

1. (a) Describe the Department of Health Public Building Regulations governing Cinemas during public occupation, concerning the prevention and/or isolation of fire.

   (b) Name two other areas in a Theatre, where other fire prevention measures are required to ensure public safety under these Regulations.

2. Having a projector lens of 4" (102 mm) focal length, a projector throw of 100' (30.48 metres) and an aperture plate of .472" (11.9 mm) in height, what will the height of the picture be on the screen? (Show all calculations).

3. (a) Describe the effect of travel ghost has on a projected picture?
   (b) What causes travel ghost?
   (c) How would you remedy the problem?

4. (a) Describe in detail the procedure you would adopt as normal maintenance to either a Xenon Lamphouse or a Carbon Arc Lamphouse?
   (b) What precautions should be taken while handling a Xenon Lamphouse?
   (c) Why must care be taken while handling a Xenon bulb?

DC PAPER

1. (a) Define OHMS law.
   (b) Give three formulae for voltage.
   (c) Give three formulae for wattage (power).

2. Direct currents:-
   (a) Define direct current.
   (b) What is pulsating direct current?
   (c) Which of the above (a) or (b) will pass through a transformer and why? (Brief answer).

3. Xenon lamps:-
   (a) What are types of currents used to ignite and run Xenon lamps?
   (b) How are the electrodes shaped in a Xenon lamp?
      Draw and mark their polarity, also show a horizontal lamp in place with mirror.
   (c) What is the expected voltage and current rating for a small Cinema.

ALTERNATING CURRENT

1. (a) Describe with diagrams:-
      (1) Auto transformer.
      (2) Step up transformer.
      (3) Step down transformer.
      Clearly indicate their construction and give an example where each would be used.
   (b) Explain two main losses, which affect the efficiency of transformers and methods used to reduce these losses to a minimum.
   (c) Does a transformer take any current when the secondary circuit is open? If so, why?

2. (a) State which instruments where current and pressure (potential) transformers, respectively are used. Draw a diagram showing circuit connections of either instrument. fully describe all components and the principle of operation.

(b) If a step-down transformer with a 2 to 1 ratio has an efficiency of 90 per cent, what would be the secondary voltage and amperage when the primary is supplied with 100 amps at 100 volts.

SOUND

1. (a) How is amplification in a transistor achieved?
   (b) Draw an NPN transistor showing polarity of connections.
   (c) Why is the term "common collector" used to describe a certain transistor circuit.
2. (a) An exciter blows and is replaced - you have time to make adjustments if needed - briefly describe your method of checking and adjustments if absolutely necessary.
   (b) What is the azimuth adjustment.
3. (a) What precautions must be taken by you and/or serviceman when working on solid state amplifiers (including the use of soldering irons)?
   (b) Using meters?
   (c) Working in a newly carpeted area?

Some typical Victorian Licence questions.

panic. They amiably discussed and fixed the problem. They parted amicably and the operator made a hasty return to the equipment by the emergency exit and awaited in fear and trepidation for the Inspector via the conventional access through the theatre. On entering the projection box he produced his credentials, shook hands, made the remark that the face was familiar. On completion of the inspection, he succinctly wished the operator all the best with his car and a safe trip home. For the second time in his life, the operator was speechless. The first was when he was my assistant in a city theatre, whilst unbeknown to me, between 20-minute reels he decided to discover what the interstices were like in an Anamorphic Lens, which is a complicated assortment of lenses and prisms that create a compressed image from the film into a legible screened Cinemascope picture. No audience member knew, unless they overheard the conversation through the soundproof walls, nevertheless it took a complete shift to line the lens up correctly and that was more by sheer good luck than management.

Strangely, earlier at this theatre I had been the operator, and due to surgery, it was not prudent to lift or move around too much. My wife Bett was registered as a trainee, and carried on the work whilst I minded our four children in an Audio Control Booth adjacent to the projection room. During this period, there was a special screening for the non-working projectionists on a Sunday afternoon. Bett did the lot without a hitch, including suffering the indignity of a take-up reel drive failure, necessitating the film to be hand wound for the period of the reel's screening. Against all regulations, I learnt at an early stage of my career to leave all doors of the equipment open when running. With a film break, the celluloid always had somewhere to go, instead of packing itself into the projector, necessitating virtually a hacksaw to free it all. Apart from the bent shafts and loss of film, that was left in the wake of such a catastrophe. I had seen many, but luckily it never happened to me.

Another incident at this theatre, was that the late Arthur VK3AM, who had agreed to assist by doing some relief for me, during a telephone conversation. Arthur came along to see the workings as I was changing over a three phase motor on which the wiring was still alive. Arthur, delicately suggested that another operator would be more suitable as he was not used to Xenons, complicated audio equipment, the risk of electrocution or the joys of dressing up in 'protective clothing', looking like the man from Mars, in the unlikely occurrence of having to change or adjust a lamp, because of its impulsion characteristics which could wreck a lamphouse on ignition. One learnt quite quickly, when once lit, they stayed that way until the end of the screening, though the output was reduced whilst not in use.

The scene and role of the projectionist has changed dramatically over the years with the advent of modern technology and most modern cinemas have the whole program on one flat platter of film and the projection equipment is programmed for the opening and closing of curtains, control of the lighting and music. In other words, find a good book or magazine (*Amateur Radio*), press a button, sit down and relax. Nevertheless, a thought should be given to the pioneers of an industry that has been adequately staffed and nurtured to the stage it is by technology and radio amateurs from all countries that have made a significant contribution to the 'Silver Screen', which has provided millions of hours of enjoyment to so many since the 'silent days', where the music was supplied by a pianist.

As previously mentioned the opportunity of managing a country theatre complex in four towns, being manager/projectionist of one, was too good a position to pass up. Comical as it may seem now, the first week in this position was quite traumatic. Part of the countryside was a high intensive fruit growing area, that was well renowned at times for being a riotous behavior area even to the extent of the constabulary being dramatically increased. This influx was a bonanza for any form of entertainment and the local theatre had no competition. The 'Full House' sign, meant nothing to one character on the first night of my new duties as he was determined to see the film, and he brought his rifle along to assist him gaining a 'seat, through the side exit door. For his trouble he received a seat and a bed in the 'cooler' until the next sitting of the court.

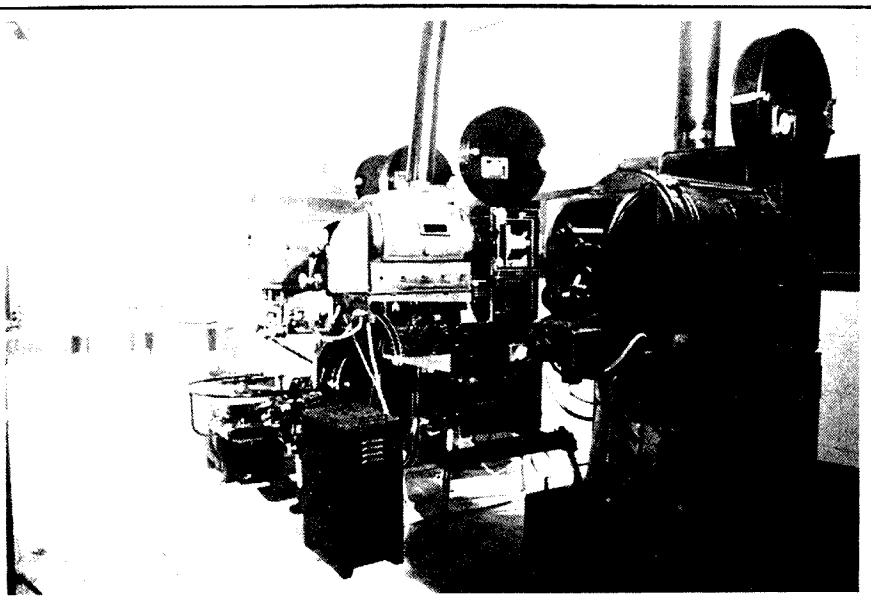
That was the start of the week, on the Saturday evening the local publican had his usual block of seats booked. After interval he advised the usher, that he was going home with his family and locking the hotel up. On checking, the patron in the next seat had deceased and the Innkeepers Act had a clause that if a morgue was not available, the nearest hotel must accept the body of a deceased person until an autopsy can be conducted or arranged by a Coroner. Yes, we did see the hotelier that evening, and into the early hours of the next morning. It was an unusual way of getting to know the local constabulary over a convivial drink from the top shelf, at the hoteliers expense and quite out of hours. No one was complaining at the publican's hospitality.

Whilst in this area, one of the Theatre Managers rang about midday on a Sunday to advise that he had lost the majority of the weekend's takings. After the initial shock, and some questioning, it was found that he had come home from the theatre and placed the money in the oven. His wife lit the stove to cook the Sunday roast and when he awoke he discovered a charred mess. A fairly lengthy trip and after a lot of piecing together only one or two pounds were lost. He found other areas for future safekeeping, of the 'weekend' loot. His wife, was so upset that she required medical treatment. Neither of the couple spoke about it for months, but it was one of those things which just happened out of the blue, and like most other misfortunes, can be laughed about for years to come. Anyway it was only money!

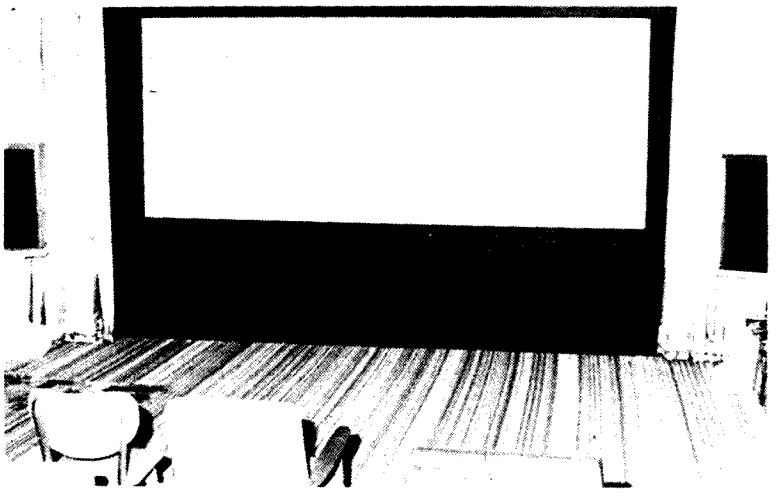
By chance, I joined another country circuit, which was moonlighting an electrical and radio service position, doing the theatre work at night. It was here I met Rex VK3VL, who connived me into sitting for the Amateur Examination, in which I was successful and I express my sincere thanks to Rex, for his persistence in 'twisting my arm' of sitting for the examination and giving me the privilege of holding a license which has given me great pleasure for in excess of three decades.

Back to the city, to my profession, however the magic of the theatre and the money attracted more moonlighting, in Drive Ins and Hard Top Theatres. The Drive Ins had numerous hazards such as cars driving off with the speaker still attached, cars with flat car batteries and on many occasions the decision of how to delicately and unobtrusively find a way to wake couples, asleep in cars who were of course quite oblivious to the fact that the screening had ended. This was generally done whilst checking all the speakers in readiness for the next evening's screening, commonly being termed the 'ramp tramp'.

Many other operators have varied stories to tell, one I know was probably at one of the first open air cinemas, as I was in Darwin, for a short time. Another operator, who was only qualified to



Some of Jim VK7OW's collection of projectors that grace his Biobox. Included are a 1927 'Synch-Sound' projector which screened the first 'talking picture' in Tasmania.



Jim VK7OW's Cinemascope screen with the tabs open. Each of the two speakers shown contain a 12 inch Low Frequency Woofer, a 13 inch by six inch mid-range horn and two 'tweeters'. Behind the screen is a 1927 vintage Western Electric multi-cellular HF Horn with a 555 driver, a Huee 17A Midrange Horn with a 555 driver and two 18 inch Electro-dynamic LF units with the original cross-over network.

16 mm standards, went to an island's defense station. He didn't like the position of the open air screen and had it shifted, however the 100 mm x 100 mm wooden stanchion supporting the home of the projector was 'smack' in the centre of the projected beam. A saw soon removed this obstruction and the consequences were the loss of the shelter and the demolition of the projection equipment. The prudent Commanding Officer had him on the next transport headed south, accompanied with a strong referral for discharge, negating an undue load on the taxpayer. This person has and is still trying to gain a seat in politics, maybe for retribution.

One amateur is known to have operated in England in a various number of theatres, nevertheless he did some prestigious performances, however he was not enthralled of a future of looking out of, as he describes 'little holes in the wall' for the rest of his life, as he would end up as crazy as the people on the screen. Other operators I have received information from vary from descriptions of the equipment that they use or have used and one operator Jim VK7OW, has created a private collection and has his own private theatre at home. Jim designed the home he lives in and of course he incorporated his theatre which is about 20 metres long and eight metres wide. Seating is for an audience of about 50 people who are treated to the ultimate in excellence. Acoustically corrected and balanced auditorium characteristics, motorised curtains and masking when changing formats, dimming lights and controlled background music from either reel, cassette or disc which is fed to — wait for it — an American Bogun Cinema amplifier complete with a five stage equaliser fed to a Raycophone 100A amplifier using 2A3s as finals. The screening of an eight metre Cinemascope picture, sound which is presented by six speakers at the screen and three audience participation speakers on each side of the auditorium. The Biobox is equipped with five restored and compatible machines that have been acquired from around the State. The arcs are AC, drawing 45 amperes at 25 volts with an eight inch mirror. As this article with the magazine will be distributed to the major film tradehouses, be prepared for a take over option, Jim.

Incidentally, there is a lot of the very vulnerable nitrate film still in lofts, garages and supporting floors of houses. Titles of these films include many Cinesound releases as Newsreels and features such as 'The Ghosts of Port Arthur' which includes some of the original footage of the Australian classic 'For the Term of his Natural Life', where the renowned names of Ken Hall, Bert Cross, Arthur Smith and Bert Bailey and others made their mark on an industry which received very little recognition from entrepreneurs, or subsidies from the government of the day. Really, the technological advances from recording to presentation have been dramatic, so why has the present talent of directors, cast and crew been forced to use their talents in other countries and exporting their product back to where they were born, educated and strived for an existence?

It is recommended than any nitrate film held by any reader should be documented and the information forwarded to the National Film Archives at the National Museum in Canberra. This film may be just the missing link to combining and restoring a full length feature for transferral to another and much safer base. Also, one's comprehensive building and householders insurer would be quite happier at lessening the chance of a mishap. A quantity of this volatile material, which whilst stored in particular circumstances may even nullify some insurance contracts.

I personally have no desire to re-enter the industry, or even a theatre for that matter and probably the managements of many theatres have the same feelings about me, nevertheless my contribution to the government coffers will benefit from the renewal of my license each year, which commenced with the 'Princely' sum of five shillings per year and is now $12 per year.

The saying 'There is no Business like Show Business' is so true and no matter what, the 'show always went on' and personally it is believed this will continue for many years to come.

Like the familiar Bugs Bunny cartoon ending, 'That's all Folks'.

Some of the amateur operators and individuals who are known to be or have been commercial exhibitors, projectionists or persons with a genuine interest in preserving some of our heritage which was documented on film and assisted with this article are:
Betty Cooper, Chris Long, Ken Burns, Rick Wynne-York, Roy Ramsey, Peter VK3KAU, John VK5ZFO, Jim VK7OW, Syd VK7SF, Norm VK3EQ, Gordon VK3AGE, Rick VK3RC, Ken VK3AH, Stan VK3AGT, *Arthur Forecast VK3AM, *Ken Rankin VK3KR, Jack VK3AJY, Geoff VK3AC, Gil VK3CQ, Ron VK4BUR, John VK2ZHM, Bren VK2BJC, Athol VK7LR, Harry VK3XI, Paul VK6OF, Rupert VK3BJN, Bill VK3EG, Keith VK4KH and Leo VK3DX.
*Denotes known to be a Silent Key.

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STOIC WIRELESS OPERATOR CONTINUES TO TAP OUT MESSAGES

On Wednesday, April 10, 1912, the SS *Titanic* left Southampton on her maiden voyage. Five days later, she lay a useless mass of twisted and torn steel on the bed of the ocean, for on April 14, 1912, at about 11.40 pm, she struck an Iceberg whilst on her maiden voyage to New York.

The blow to the starboard side of the ship ripped a hole 300 feet long and within three hours she foundered in water two miles deep.

The wireless was working perfectly at the time and the captain ordered Mr Jack G Phillips, Chief Marconi Operator, to send "the regulation international call for help. . .". Mr Phillips then began to send the signal CQD and later SOS.

The *Titanic's* CQDs and SOSs were first heard by the German steamer, *Frankfurt* which was 153 miles away. Almost at the same time, the *Carpathia's* wireless operator reported the emergency to his captain and was able to give the stricken liner's position as 41 46N 50 14W. Immediately, the *Carpathia*, which was 58 miles away, altered course to the rescue. The first message the *Carpathia* picked up was, "COME AT ONCE, WE'VE STRUCK A BERG. IT'S CQD. OM CQD." (CQD meant Come Quick, Danger and was rather tricky to tap out in Morse code. For this reason, the now universal distress SOS was also used and this was the first occasion it had really been broadcast in earnest). Soon, at least six ships were steaming to the disaster zone.

Two long hours elapsed before the *Carpathia* arrived and began to pick up survivors. Among over 1 500 people lost on that fateful night was Jack Phillips, the *Titanic's* senior wireless operator, who remained at his post as the decks were awash. Mr Harold S Bride, second wireless operator, showed equal devotion to duty and was eventually rescued after nearly two hours in the sea.

As the decks were awash, Mr Phillips was standing in the wireless room sending details of how the *Titanic* was faring to the *Carpathia*. As Phillips was sending, Harold Bride strapped his lifebelt to the wireless operator's back. He had already put on his overcoat and was wondering if he could get Phillips' boots on him while he was still sending.

The Captain released all men from their duties but Phillips continued to send. He continued sending for about 15 minutes after being released by the Captain — water washing the floor of the wireless cabin.

Jack G Phillips, Chief Marconi Operator on board the *Titanic*.

Eventually, Jack Phillips ran aft and made his way to the deck. He swam to a life-raft but lay there exhausted until his last breath failed. Harold Bride later said of Jack Phillips. "He was a brave man and stuck to his key until the very end. If he had had a chance to go to his room and get warmer clothing, as I did, he would probably be alive today. But duty was first with him."

PMG COMMENTS

The Right Honourable Herbert Samuel, MP, Postmaster-General, referring to the disaster at the dinner of the London Chamber of Commerce on April 18, 1912, said:

"Those who had been saved had been saved through one man, Mr Marconi, whose wonderful invention was proving not only of infinite social and commercial value, but of the highest humanitarian values as well."

Parliament had given the Postmaster-General complete control over the use of wireless telegraphy, and no one could operate or establish a station without the Postmaster-General's licence, which was only very sparingly given, and for purposes of experimentation and research and under such conditions which precluded disturbance of commercial or humanitarian messages. Round the coast, in charge of his department, there was a girdle of wireless stations which were in constant communication with the telegraphic services of the country and with life-saving stations. No fewer than 400 liners had been equipped with wireless apparatus, including some cargo vessels. All the operators on these ships were required to hold a Post Office Certificate of Efficiency, and to answer immediately any signals of distress, and under conditions which, as far as possible, precluded interference with one another.

DAVID SARNOFF

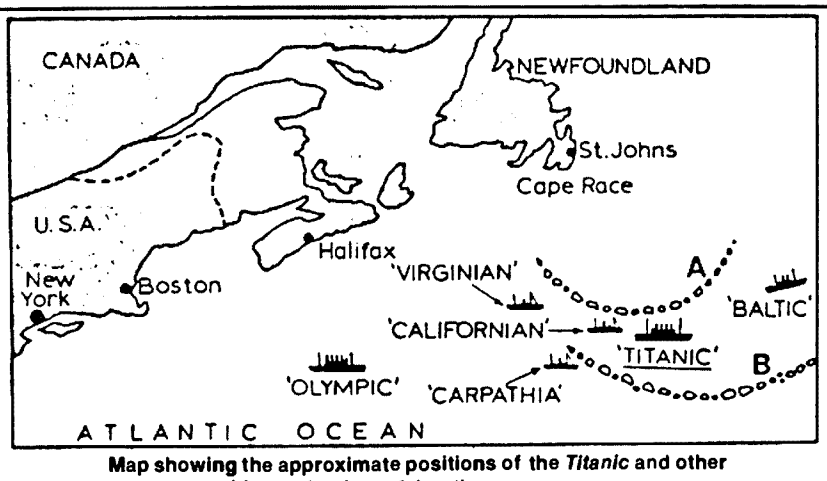
David Sarnoff was on duty at the Marconi Wireless Telegraph Company of America station at Saisconset on Nantucket Island on April 14, 1912. He stayed on duty continuously for 72 hours so that he could relay message from the rescue ship to the rest of the world. (Brigadier General David Sarnoff, was born is a small village near Minsk, Russia, in 1891. He was a former Chairman of the Board of RCA and passed away on December 12, 1971.).

TITANIC EQUIPMENT

Radio equipment on the *Titanic* was the most powerful possessed by any vessel of the mercantile marine at the time. It's generating plant consisted of a 5 kW motor-generator which yielded current at 300 volts 60 cycles. The motor of the set was fed at 110 volts DC from the ship's lighting circuit. Also, an independent oil-engine set was installed on the top deck, and a battery of accumulators was also provided as a stand-by. The alternator of the motor-generator set was connected to the primary of an air-core transformer, and the condenser consisted of oil-immersed glass plates. To eliminate spark-gap and its consequent resistance as much as possible, a Marconi rotary disc discharger was used. This was driven off the shaft of the motor-generator.

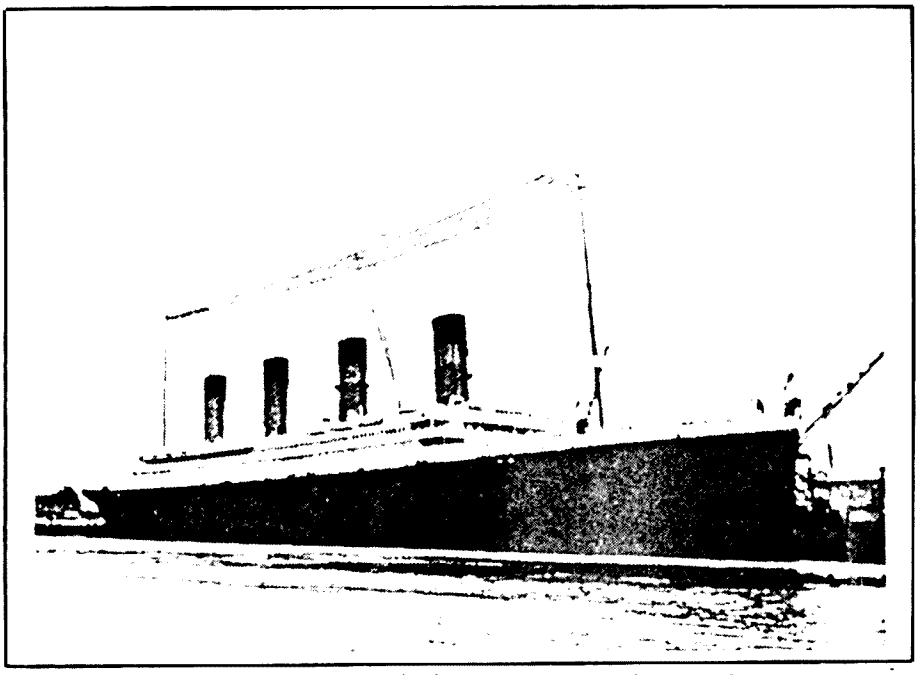
The guaranteed working range of the equipment was 250 miles under any atmospheric conditions, but 400 miles was not uncommon, while night-time range frequently increased to 2 000 miles. The aerial was supported by two masts, 200 feet high, stepped 600 feet apart, with a mean height of 170 feet. It was used in the dual role of transmitting and receiving. The earth connection was made by insulated cable to convenient points on the hull of the vessel.

The receiver was a Marconi magnetic travelling band detector used in conjunction with a multiple tuner, providing reception of all frequencies between 100 and 2 500 metres. The multiple tuner was calibrated to permit instruments to be set at



Map showing the approximate positions of the *Titanic* and other ships at the time of the disaster.

Maiden Voyage of the *Titanic* advertisement.



The *Titanic* leaving Southampton. The wireless aerial can be clearly seen.

any prearranged wavelength and was provided with a change switch to permit instantaneous change of the circuit from a highly-syntonised tuned condition to an untuned condition (for stand-by) especially devised for picking up incoming signals of widely different wavelengths. Due to robust nature of the magnetic detector it could be employed permanently connected to the transmitting aerial, thus dispensing with all mechanical change over switching arrangements.

MARCONI'S COMMENTS

Mr Marconi was called to give evidence at the Board of Trade inquiry into the sinking of the *Titanic*. He stated that there were two possibilities whereby a continuous watch could be kept in the wireless room to listen for SOS signals. The first was to give a member of the crew sufficient training to be able to recognise distress signals and place him on listening watch whenever the wireless operators were not on duty. The second was for the development of a device which would sound an alarm bell whenever an emergency call was received. (This auto-alarm apparatus was eventually proved in experiments and came into use after World War I).

Although the survivors of the *Titanic* disaster marched *en masse* to honour Marconi at his hotel in New York, he always felt that his invention should have done more. He realised too many ships had wireless equipment far too weak and that certain wavelengths must be set aside exclusively for different kinds of wireless messages.

The Marconi Company made its first commercial installation on a merchant ship in 1900. In 1910, over 100 new installations were made, bringing the total number of Marconi-equipped ships to 250. Communication was exclusively by Morse.

Transmitting equipment was mostly housed in a "silence cabin". Considerable noise came from the spark and the rotary converter that powered it. A wavelength of 600 metres was used almost exclusively, though by law the equipment had to be capable of operating at 300 metres.

During ocean voyages, ships were at time out of reach of shore stations and messages had to be relayed by other ships. To facilitate this, Marconi Company issued monthly "Communications Charts" for the main transoceanic routes, showing the passages schedules for Marconi equipped ships.

—The above article has been compiled and condensed from articles in remembrance of the *Titanic* disaster, which originally appeared in *Practical Wireless* May, June and July 1972, written by Colin Riches and Arthur Dow. These articles were forwarded to AR by Robert Dew VK1DE

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—Compiled by Bell McLachlan

A REMOTE CONTROL ANTENNA SWITCHING SYSTEM

Bill Duke VK2WD
44 Avian Crescent, Lane Cove, NSW. 2066

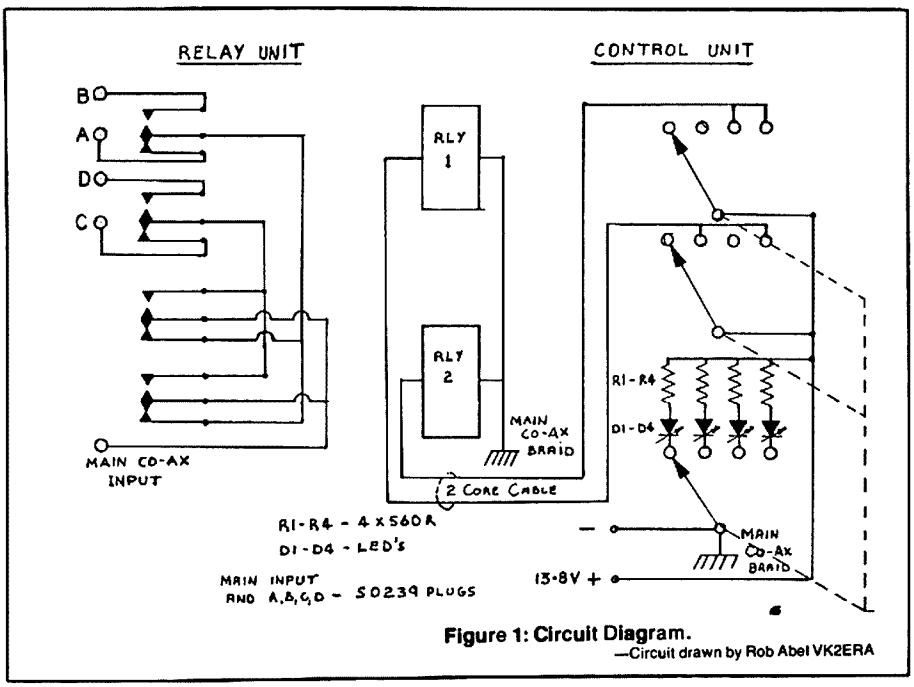

Figure 1: Circuit Diagram.
—Circuit drawn by Rob Abel VK2ERA

With up to four HF antennas in use, it was decided to remotely control each antenna by feeding them to a relay box, by a single coaxial line, to the operating position.

The relay box contains two DPDT relays and five SO239 sockets. At the operating position there is a box with a three-pole four-position wafer switch and four LEDs to indicate the antenna in use. A two conductor cable, in conjunction with the shielded outer braid of the main coax, feeds 13.8 volts, taken from the transceiver power supply, to the relays. This should be made clear by reference to the circuit diagram.

OPERATION DETAILS

Switch position 1 — both relays are passive connecting antenna A.
Switch position 2 — relay No 1 energised connecting antenna B.
Switch position 3 — relay No 2 energised connecting antenna C.
Switch position 4 — both relays energised connecting antenna D.

The relays are Archer catalogue No 275-2188.

The system has been in use for over 12 months on frequencies from 28 to 3.7 MHz with entirely satisfactory results.

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DISCUSSION ON OPEN WIRE FEEDERS AND BALANCED OUTPUT ANTENNA MATCHERS

Dean Probert VK5LB
RMD Verrall Road, Hope Forest, SA. 5172

There are still amateurs who use balanced feeders for a variety of reasons!

AFTER READING THE excellent article by Lloyd Butler VK5BR, in June 1987 AR, it occurred to the author that the majority of the text deals with coaxial (unbalanced) output matching units. Unbalanced output matchers, ie transmatches enjoy almost exclusive popularity due to the widespread use of coaxial line as a feeder from the transmitter, or the matching unit, to the antenna. However, there are still amateurs who use balanced feeders for a variety of reasons. There are probably many more who would use them if they were better understood.

Lloyd provided detail on balanced tuning which used a balun in the input circuitry. Limitations on the use of baluns prompted Lloyd to recommend a suitable toroid selected for the frequency range and with sufficient core cross section area to prevent core saturation. The use of a balun in the *output* of an *unbalanced* matching unit drew the following comment which is worth re-printing:

> "The problem here is that the transformer would not only have to be designed for a wide range of frequencies, but it would also have to be made to operate over the wide range of output impedances, a somewhat difficult proposition."
>
> (Butler L. AR, June 1987)

This timely warning reminds us baluns must be used with care. There are literally dozens of authorities to support this statement including M Walter Maxwell in *QST*. See Bibliography and, in particular, *QST* April 1973, page 39, "Another Look at Reflections." This series of articles are valuable reading and are strongly recommended.

Just to reinforce the point a little more, most antenna matching units provide a *direct* electrical coupling for a 50 ohm load. For example, a transmatch provides an unbalanced output unless a balun is used. A toroidal balun is generally employed but care should be taken in the selection of the core material, to prevent core saturation and damage due to non-linearities at high flux densities. (Sevick *QST* 1976, page 23). Also attention must be paid to wire size and insulation to prevent voltage breakdown. Remember, under severe mismatch conditions, high voltages may be present. Also, ohmic losses can be high. Toroidal baluns should only be used within their power ratings and not in the presence of *high SWR* especially over a wide range of frequencies. (Maxwell *QST* 1973, page 39). As long as these limitations are appreciated a toroidal balun is an excellent broadband coupler for balanced to unbalanced loads, or as an impedance transformer for stepping Zo levels up or down.

The question is, do we need to use a balun at all? This depends on individual installations. When using a multiband antenna, a matching unit will be able to present the transmitter with a "perfect match". It also will, when set to the correct values, attenuate harmonics from the transmitter. (ARRL Handbook 1982, page 19-10). Matching networks have a passband response for the frequency to which it is set. However, there may be several settings of capacitance and inductance which will give a 50 ohm "match". A transmatch may degenerate in it's harmonic attenuation, die to the way it is adjusted in part, and exhibit a high pass response. (ARRL Handbook 1982, page 19-11). By the way, the use of maximum capacitance and minimum inductance provides the best attenuation. (De Maw, *QST* February 1976, page 27). Is there an alternative then to using coaxial cable and a transmatch? There is always the balanced feeder. Open wire line has fallen out of favour and is, to some extent, misunderstood. It is thought to be prone to line radiation due to high SWR figures generally thought to be a characteristic of open wire line feeder. This aspect is more thoroughly dealt with later in this article. The author proposes that the use of a balanced output antenna matcher and balanced line feeder is still a very good option open to operators using modern equipment. The reasons are given in the following text. Let us look at line losses, effect of SWR and conjugate matching.

TRANSMISSION LINE LOSSES

Losses in transmission lines depend on several factors; ie the size of conductors, the spacings between the conductors, the dielectric material used in the construction of the feedline and the frequency at which the line is to be used.

Coaxial lines can be considered to be lossy when compared to open wire feeders. Because losses increase as the mismatch on the line termination increase, mainly in heating losses, the type of line chosen to feed the antenna is very important to us. Also, the frequency at which the antenna is perfectly matched (if it is matched at all) will be in your favourite portion of the band in use. However, if other parts of the band are to be used an increase in mismatch, proportional to the deviation from design frequency, must be expected. If a multiband antenna is used without being carefully matched for each band used, then the mismatch on the various bands will be substantial. This is pretty obvious.

If the transmission line has *very low loss characteristics* then high standing wave ratios can be tolerated with no practical loss of power in the antenna system.

> "A wire antenna, fed at the centre with open wire line is the most efficient multiband antenna devised to date. For all practical purposes the feedline is loss-less so extremely high SWRs can be tolerated. This does not mean that coaxial cable cannot be used, because of high SWR, but only the very best and expensive types are really suitable in this application."
>
> (*ARRL Handbook* 1978, page 584)

The feedpoint mismatch, although affected to some degree by the immediate environment of the antenna, does not effect the gain or radiation characteristics of the antenna. High SWR in an open wire line at HF caused by a severe mismatch will not produce antenna currents on the line, nor cause the line to radiate, if the feedline currents in each wire are balanced and if the spacing between wires making up the feeder are small at the wavelength of operation. (Maxwell, *QST* June 1973, page 22).

By comparison, coaxial line has higher RF losses than open wire line at HF chiefly because of its lower impedance causing higher current flow at lower voltage for the same power. For a given coaxial cable feeder the shorter it is, the less loss is to be added for a given SWR. (Maxwell, *QST* June 1973, page 21). The author is not attempting to advocate the use of open wire line coaxial line per se. At HF, for moderate lengths of low loss coaxial (low attenuation) cable loss is negligible even with an SWR of 5:1. So, even with high SWR figures, there need be no loss of any power if the antenna system is carefully thought out. That is, what length of feeder run do you need, what SWR figures can you reasonably expect, what range of frequencies is the antenna likely to be exposed to, and what type of feeder (balanced or unbalanced) does the antenna require? In many cases, the open wire feeder has a lot of advantages when compared to coaxial cable.

CONJUGATE MATCHING

Is the power re-reflected from the antenna because of high SWR lost? In a transmitting antenna the reflected power can be re-radiated, together with the forward power, by use of a transmatch or other antenna matching unit. This process is known as conjugate matching. Maxwell described this process extensively in *QST* October 1973. The Bibliography lists all articles in this series and they also are strongly recommended reading. Conjugate matching is the result of precise and total re-reflection of the

arriving reflected wave to the antenna from the antenna matching unit. This means that reflected power is not lost when an antenna matching unit is used. It is reflected, with the forward power, to be re-transmitted as full power, by the antenna. (Maxwell, *QST* October 1973).

So, even with high SWR figures, there need be no loss of any power if the antenna system is tuned to the impedance required by the transmitter with the use of an antenna matching unit. Further, there is no reason why open wire line cannot be used if long feeder runs or cost, etc, precludes the use of coaxial cable. In fact, it is preferable to coaxial cable under these circumstances. But to feed the unbalanced transmitter (50 ohm) to balanced open wire, ladder line or television ribbon (600, 450, 300 ohm) line to the antenna, a balanced antenna matching unit is best utilised for the reasons discussed.

Now, looking at some more aspects of antenna systems amateurs consider; not everyone can, nor needs to have, a huge tower with directional arrays. It is not practical, nor necessary in many cases. It is entirely economical, efficient and sensible to use a dipole doublet, on bands from 3.5 to 28 MHz, where the individual amateur's circumstances dictate. The question is, of course, how to feed it to operate most effectively over this range of frequencies because of the varying impedances. For many amateurs, a G5RV doublet with 300 ohm ribbon and then coaxial cable to the transmitter is one solution. The author's G5RV uses ladder line from the centre insulator right down inside the shack to a balanced output antenna matcher; a 'Z' matcher in fact.

If the amateur does use beams then problems arise in choosing feeder types. In some cases, including the author's, the antenna tower may be 500 feet or more from the transmitter. Beams on rotatable masts are more conveniently fed with coaxial cable for obvious reasons. However, coaxial cable can have some horrible attenuation figures over a 500 feet run, not to mention horrible dollar figures too. The author found it convenient to use open wire feeder from the shack to the antennas. Experience has shown that, in the case of the G5RV antenna used at VK5LB, open wire line in the shack, coupled to a balanced antenna matching unit used by the author, there is no RF floating around in the shack. There is no TVI or BCI caused by the use of open wire line. The author also has a computer and television monitor in the shack. Tests reveal that the only interference occurs when the open wire line is physically touching the television coaxial line and in no other circumstances. If the television coax from either the computer or the television antenna is moved a foot away from the open wire line then any trace of interference to the television ceases completely. Open wire line in a shack will cause no problems if correct construction practices and line layout are followed.

The open wire line at VK5LB is simply laid out in the same way as coaxial cable.

COAXIAL BALUNS

For open wire line to be used to feed rotatable beams a halfwave section of coaxial cable may be used. (Remember it repeats the impedance of the antenna at the end of the section. *ARRL Antenna Book*, page 127). A coaxial balun will convert the line to a balanced feed of either 1:1 or 4:1 ratio depending on the construction of the balun.

Advantage of coaxial baluns are that they are capable of handling the specified voltage of the cable from which they are constructed and they are frequency sensitive. They respond only to the frequency for which they are cut and attenuate others. So, as well as feeding a multiband dipole open wire line is simple and easily used to feed baluns as well.

Debate as to whether construction of open wire line is simple or easy is an entirely different manner. Personal experience has shown no special difficulties but there are many who disagree. The point is that there is no real bar to using open wire line and it is much cheaper over long feeder runs. It is a practical alternative to coaxial cable where the coaxial cable use poses problems of one sort or another.

The author has mentioned balanced antenna matching units and, in particular, the 'Z' matcher used at VK5LB. There are differing types of balanced matching units suitable for use with open wire feeder described in most text books. Almost all of them either are directly coupled electrically between the input and output, or require coils to be changed or taps switched with a change in frequency. In most cases, the coils require taps on the outputs as, with many antennas of differing impedances, the amount of inductance required differs. The coils must be kept symmetrical and so care must be used in the positioning of the taps. (*ARRL Antenna Book* 1977, page 101). This also applies to switched tap coils. (*ARRL Handbook 1982, page 19-13).*

The 'Z' matcher, by contrast, has no tapped or switched coils. It utilises two coils, one within the other but not electrically connected. One set of coils is for 10 to 20 metres and another is for 40 and 80 metres. The outputs are taken directly from the ends of one of each of the coils. There is no problems therefore with line balance or unequal currents in the feeder line legs. Also, the 'Z' matcher has only two controls (capacitors) for impedance matching and so is very simple to construct and adjust.

The author intends to write an article in the near future describing the 'Z' matcher in detail with photographs and a circuit diagram. Many amateurs may wish to construct a similar unit.

The author has attempted to point out a few pertinent facts, as opposed to fallacies and misconceptions, concerning the use of equipment other than the usual coaxial cable and transmatch which are readily available commercially.

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RAYNET WANTS PHONE PATCH

The Raynet organisation in Britain says it is quite jealous and envious of the third party and phone patch privileges available in the USA.

Raynet If the British equivalent to the Wireless Institute Civil Emergency Network (WICEN).

Raynet chairman, Geoff Griffiths G3STG, said that until recently it had been difficult to get third party traffic defined in the UK. "Up until the Mexico earthquake disaster, the government in Britain really tolerated the radio amateur and didn't understand the tremendous value of the communication resource the radio amateur was able to offer," Geoff said.

He made those comments in an interview broadcast in the United States by the Radio Amateur Information Network (RAIN).

The turning point was the Mexico City disaster in September 1985, Geoff said.

The British Government had apparently been put off the prospect of the Amateur Radio Service providing worthwhile communications because it had lumped the radio amateur along with the worst of the CB operators.

"But, when Mexico happened they discovered that radio amateurs were able to help our own Foreign Office so much by providing a link through the International Amateur Radio Network (IARN) with communications to Mexico City.

"They suddenly woke to the fact that radio communications provided by the volunteer agencies could be of tremendous help to them.

"Their attitude, their co-operation level has been increased by leaps and bounds ever since then," Geoff said.

The Australian Traffic Net (ATN) also used the IARN during the Mexico disaster to pass third party traffic messages. The IARN is managed by Glenn Baxter K1MAN, in Maine, USA.

Raynet chairman, Geoff Griffiths said he would like to see phone patch in the UK. But, he would only be in favour of phone patch for emergency communications, and for it to be available under very controlled conditions.

The British radio amateur faced the same opposition experienced in Australia with a government-owned communications monopoly (Telecom) opposing phone patch. It took years of careful and consistent approaches to Telecom Australia to gain phone patch for the Amateur Radio Service.

Raynet however, wants to see phone patch only available for its members. Geoff said he believed that, to give all radio amateurs phone patch in Britain could bring disrupt to the Amateur Radio Service in that country.

"What I would like to see is a whole range of special privileges or licence conditions granted to Raynet members," he said.

But, the British Government was reluctant to give Raynet special conditions.

"So, winning privileges (phone patch) which are regarded (in the US) as an every day tool for emergency communications is really quite difficult," Geoff told RAIN.

YOUTH OF YESTERYEAR

The youngster of today has a new toy. He begins with the crudest of materials, and at very little cost, builds himself a radio set.

He explains what he is doing in fluent jargon, which makes his father think desperately of a dictionary.

A walk around the great wireless show in the Exhibition Building is sufficient to show that the greater number of radio enthusiasts are boys — or were not so long ago.

—From the *Sun News-pictorial*, Special Radio Supplement, March 9, 1927.

How's DX?

THE WILGA TREE

An embroidered account of a DXpedition. Fictitious names have been used to protect the guilty, however the main points are true.

. . . calling CQ CQ CQ QRZ. Yes well cheers Des, nice to catch with you again.

Yes, wasn't a bad trip, we got a few contacts in ZL-land, but most were around VK4 and VK2.

How many? Well, I suppose about 15 or 20. I'll tell you how we did it, if you want to try it yourself sometime.

First Des, you have to make sure that your car battery is about three years old. You can't trust a new one these days. Now get one of those beaut noise filters from the shop down the road, you know, the ones with the little choke in them rated about three amps. You know the ones?

They work a treat on sideband. Put it somewhere in the car, and arrange your mobile rig to plug into it. Hook the filter up to the battery. Some wire from an old three-core flex will do.

If the car is fairly small, you won't have to spend too much money on petrol. It's nice if it's got a parcel shelf under the dashboard too, and a good high console between the front seats. There is no point in hanging the HF rig from the dashboard anyway, you'll only bump your leg on it, or your head when the fuses start blowing. If you put the rig on the back seat, it will be out of the way, and it can have a good long power lead from the filter to it.

What did you say about mobile aerials? Well, if you've got a fairly small car you won't have to carry one of those five metre long whips because it won't fit. They clutter things up too much anyway. We got out on a re-wound 11 metre one. It was about two metres long. Really compact. It had a telescopic whip at the tip to adjust the SWR, and it was good for nearly 15 kHz without adjusting.

I thought you meant mobile antennas. Well, we took a dipole as well. You should have seen the coax. Ours had at least three joins in it with PL-259 plugs and joiners, we didn't bother about a balun. We did the right thing and set it up by daylight. There's no point in testing the thing before you go away because with all the other houses and antennas around you can't get the same results in the bush.

We used a tree to throw the halyard over. We picked the highest one around for three or four kilometres, it must have been nearly four metres tall, and if you stood on the ant hill near the bottom you could get about 10 centimetres start on your throw. The ants weren't too keen on the idea though.

Yes, the swelling has just about gone down and I can put shoes on now. I threw the halyard over the top with a spanner tied to it. If I tugged the rope gently I could get the spanner back without bringing down too much of the top branches. When I'd had a bit of a try at this I picked a lower branch with fewer leaves on it. After the third try it went over without getting the line caught in the bark.

Oh, by the way, don't believe all those stories about how good "Rid-o-gard" is. I tell you what, there were still flies in the car the next morning. Bill's sandy blight is just about gone now. You should have heard him the other day when he thought he'd gone blind overnight!

Well by then things were beginning to look alright. Bill plugged the coax into the antenna and rig and took a reading on the meter. The SWR was hard over in the red. We, he reckoned that was a bit funny *so* he tuned *down to* the bottom *of the* band, and then the top. Got the same thing again. Both times! He had a bit of a panic, and I said to get the multimeter out of the boot. We dug around a bit, and came up with it about as good as new, considering. We checked the whole system and, you guessed it — about one ohm resistance.

I tell you mate. I sat down in the car to reflect on matters. Bill went on a bit about life and the universe in general, and PL-259s in particular. After a while we decided to pull the antenna down and put the multimeter on it. Guess what? The coax was okay but the antenna was no good.

You're telling me Des. Bill had a 259 on the antenna and he reckoned that the heat when he soldered it up the other day must have melted through the *inner insulation. I got a pair of wire* cutters and cut it off. We cut the other one off as well and separated out the coax core and braid for about 50 millimetres. Bill had a 12 volt soldering iron in the boot so we plugged it in, dragged the antenna over and soldered the braid and core on. The iron would have been about big enough to put an IC into a circuit board. Well, we eventually got enough solder on it. Dragged the antenna back to the tree, put it up and got the rig going.

Oh well, when we tuned up this time, we couldn't even get enough power out of the rig to get a reading on the built-in meter. "Start the motor," says Bill; "a few more volts might help." Well, the SWR was 8:1/ We tried both ends of the band and it looked better at the top end. "Too *long*," I said, so we cut a good 300 millimetres off each end. Tried again, still the same! "Still too long," said Bill, so we cut a bit more off. It wasn't hard to do. The actual problem was to keep the ends from dragging on the ground. One end was tied to a rock, and propped up with a piece of PVC pipe Bill had found on the side of the road. The other was on the barbed wire fence beside the tree.

No, not directly. There was a couple of metres of nylon rope on it. By this time we were sick of cutting the antenna, so we just bent some of it back, and wrapped it around itself. The SWR was still 8:1 across the band, but a little better at the high end.

Well, nothing we did made any difference to it, Des. I got hold of the multimeter and checked the coax at the rig end. It was open circuit, like it should have been, even with the meter on the high resistance setting. I got Bill to put his finger across the coax inner and braid at the rig end and we got about 2 Mohms like you'd expect. By this time Bill had had about enough. So had I. If there was a chaff cutter handy the whole lot would have gone through!

At least the flies were beginning to pack it in by then. Actually the sun was going down so we reckoned we'd knock off too. We pulled the whole lot down, rolled it up, and went back to town.

Next *time Des*? I'll tell you what, next time. It's going to be an end fed wire with a great big ATU on it. No dipoles. They just don't work on wilga bushes.

—Contributed by Ken England VK4JPE

The Saharan Arab Democratic Republic or RASD — formerly Spanish Western Sahara — was formally proclaimed on February 27, 1976, in Bir Lehlou. To date, the RASD has been recognised by 70 countries and is the 51st member of the Organization of African Unity (OAU). The country is bordered by Morocco, Mauritania and Algeria. The physical character of the area ranges from vast stretches of desert to green oasis, from worthless sand to valuable phosphate deposits.

The first Saharaui operator, Naama Zeine-Eddine S01A, is now fully trained and will be further developing the Union de Radioaficionados Saharauis, S0RASD. QSL manager for the club station is EA2JG, Arseli Etxeguren, 81 Las Vegas 01479 Luyando-Alava.

—Contributed by George Cranby VK3GI

SPECIAL EVENT STATION

A special event station, GB2LNM, will be operating between September 24, 1988 and October 24, 1988, on all amateur bands.

The station letters stand for Great Britain Loch Ness Monster.

—Contributed by Danny GM4LDU via Lee Noonan VK2LEE

QSL card from Rio de Oro, S0RASD.

FROM WOODBINE

June was a rather poor month for activity from Woodbine due to absences and preoccupation with family matters. On June 19, conditions were excellent on 20 metres to the USA with strong signals being reported.

Bob W3MIE/K3HWL was worked operating a special station from Meadville, Pennsylvania, in celebration of Meadville's 200th birthday. It is believed an attractive QSL card has been struck for this occasion and is available from the QSL Manager, N3EWP, either direct or via the bureau.

WA5MOA, in Texas was a very strong station, but no contact was made.

A very enjoyable QSO with Charles KA2WHU, lasted about 30 minutes.

Another interesting QSO was on 20 metres with Paulo PY1FB/MM, June 9, near Norfolk Island. Reports were 5 and 9 both ways. QSL via bureau.

Other contacts were as follows. All are on 20 metres unless stated otherwise.

June 6 WY5L/KH3 (QSL via N5DAS)
June 10 RB0GG (QSL via bureau)
June 19 KA2WHU (QSL via bureau)
June 25 FK8KAB/P (QSL via K8 bureau); VE2BYR; FD1NCK/F0 (heard only); NL7MY; NL7NF; VK6APW
June 26 VK2NNK (on 10 metres); FO4NP (heard only)

—Contributed by Bob Demkiw VK2ENU

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MALYJ VYSOTSKIJ ISLAND 4J1FS (Finnish/Soviet)

Yes, the joint Finnish/Soviet DXpeditlon, by all reports, was a complete success. It appears that they only operated on the 20-metre band, but reports at the time of going to press are rather sketchy. It is unfortunate that such an operation from what was heard in VK, that the out of band stations, remarks, the self appointed 'policemen' and general behaviour of some amateurs was inexcusable and not good for amateur relations between any countries.

Nevertheless, the question still remains, will this island become a new DXCC Country and Bob Winn W5KVE in his magnificent weekly newsletter quotes the following 'statement' which is reprinted from the ARRL Letter.

In what has been probably the hottest DX news since Peter 1 Island and the Western Sahara, along comes Malyj Vysotskij Island claimed to be a new DXCC country.

MV Island is located in the bay of Vyborg in the Western USSR at 60 degrees 17 minutes North latitude and 28 degrees 34 minutes East longitude. This uninhabited island is about one and a half kilometres long with its location of some strategic importance. It is apparently leased to Finland by the Soviet Union and is separated from Finland by intervening Soviet Islands and continental land mass.

It seems that the potential DXCC status of this island was proclaimed some 17 years ago by the Assistant Communications Manager R L White, acting at the direction of the ARRL Awards Committee: 'At such time as operation takes place. . .we will make an official announcement of its addition to our Countries List. This long forgotten action has been sitting untapped for all these years, since permission to activate the island could not be secured from the authorities.

Martii OH2BH, a genius at diplomacy, dedicated DXer and a valued assistant to amateurs In countries that want to share our hobby, has forwarded copies of the original documentation, dated November 17, 1970.

It is highly technical and has created immense precedents that we will have to live with in the future, so please it is a positive action that deserves positive thinking and there is no one more capable to handle it than John Parrot W4FRU, Chairman of the ARRL DX Advisory Committee, his Committee and Don Search, Manager of the DXCC ARRL Awards.

Congratulations Martii and all your helpers, with a big thank you, from DXers world-wide for your approach, that may allow us a new DXCC Country. If so, It will add another to my score and many other VKs too.

—Adapted from *QRZ DX* by Ken McLachlan VK3AH

ONE VALVE REGENERATIVE RECEIVER

This receiver was based on one published in* Electronics Australia, *March 1966. It is very sensitive and much superior in all aspects to the receiver described by the author in January 1988 AR.

Peter Parker VK6BWI
C/- Witchcliffe Post Office, WA. 6286

WITH GOOD SIGNALS it will provide good speaker reception in a very quiet room, if you are using a reasonable outdoor aerial, such as a G5RV. Aerial coupling has been kept low so that aerials can be changed without a large change in the tuned frequency.

The receiver can be bumped and turned off with very little detuning. This was due to the fact that the prototype was built in a diecast box with a ceramic valve socket, all of which were salvaged from an old valve FM broadcast receiver. Such over-designing is not necessary for good results, but a metal enclosure helps.

A mistake sometimes made is to connect pin five to earth and pin four to 6.3 volts. This is correct for nine pin valves with a number beginning with six, but not with these valves. Simply connect pins four and five together to 6.3 volts and pin nine to earth.

The 50 pF variable capacitor could be increased to 100 pF with no ill effects and a 100 pF unit will be more convenient. A 50 pF unit can be bought for about $8. For the tuning capacitor, any one from an old valve receiver will work but the tuning ranges will vary.

The unit uses 1.5 mA of HT.

After winding the coil, test it and turn the 50 pF variable capacitor to maximum capacity. If nothing is heard, put a 47 to 100 pF styroseal or ceramic (note voltage ratings) in parallel with the regeneration capacitor. Always turn off the HT and wait before working on equipment. I always disconnect the HT.

If there is still no oscillation or noise, reverse the regeneration coil and repeat the above steps.

Construction was with tag strips. Remember to keep 6.3 volts low tension hum from interfering with reception.

To give you an idea of this set's sensitivity, 80 metres SSB signals were just audible with 20 centimetres of wire as an antenna. With the normal aerial, many coastal stations from interstate provided strong reception. This receiver, like all regenerative sets, has a shortcoming of poor strong signal handling due to a non-linear detector.

(For a list of coastal stations, see AR, June 1986).

As for the choice of valves, a 12AX7 is markedly superior to the 12AU7, but the 12AU7 is still a satisfactory performer. I expect the 12AT7 should work, but I have not tried one. The original 1966 article used a 6SL7 which is claimed to be as good as the 12AX7.

(Much more output could be obtained if the 100 k resistor to the output plate, pin 1, were reduced to 10 k. Better still, connect the output transformer primary from HT+ to plate, deleting the 0.022 capacitor. Of course, the set will then draw much more HT current, about 10 mA with the 12AU7. The 12AX7 will need a lower cathode resistor, say 270 ohms. —Technical Editor)

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See page 31 for Figure 1.

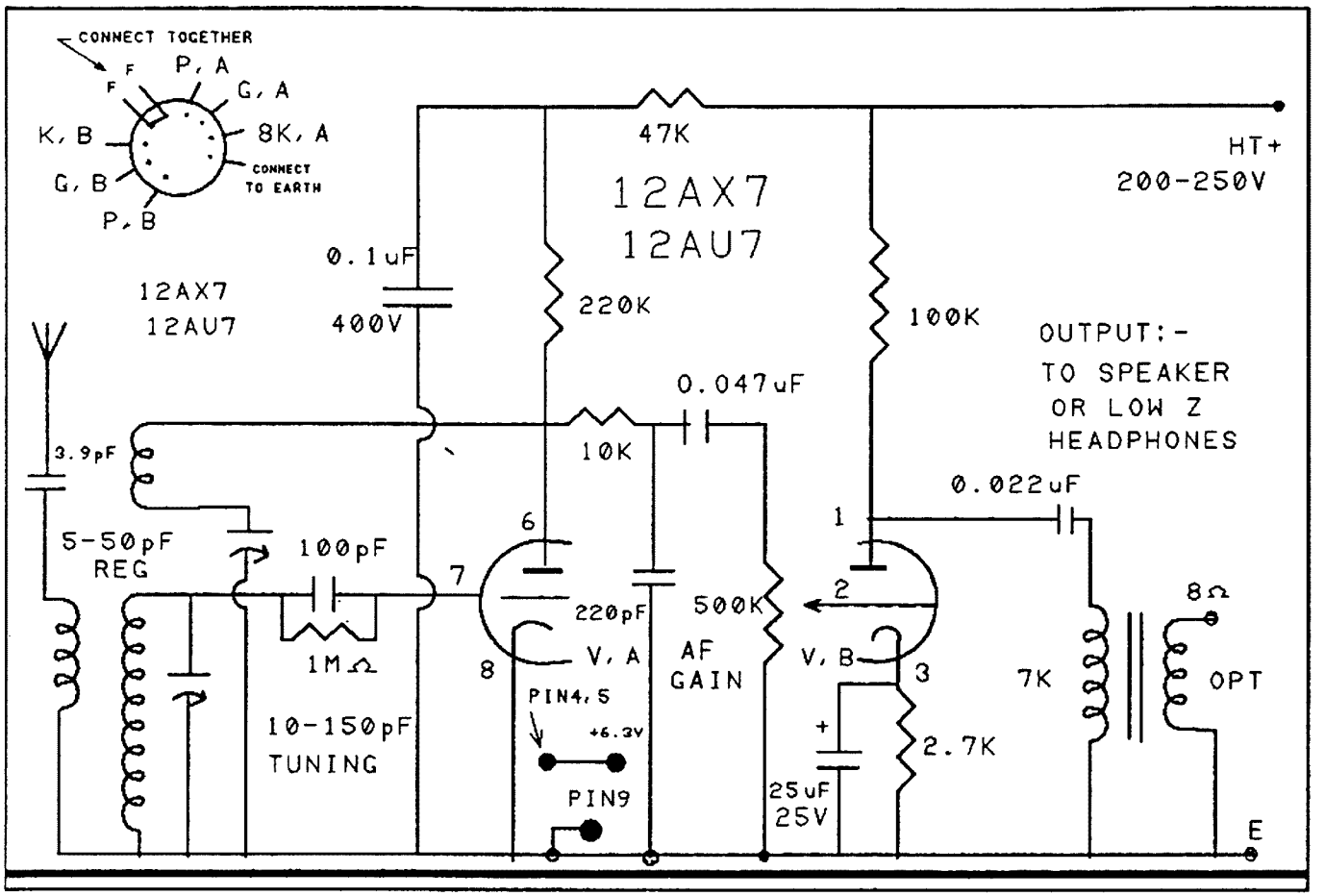

Figure 1: Circuit Diagram.
Coil for 3 to 5 MHz.
Former ebout 35 milllmetres in diameter
Wire Gauge approximately 0.8 millimetres

Coils are wound over each other and separeted by tape. Order is probably unimportant

Aerial Coupling — 9 turns
Regeneration — 12 turns
Tuning Coll — 29 turns

Eric Jamieson VK5LP
8 West Terrace, Meningie, SA. 5264

VHF UHF — an expanding world

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.005	H44HIR	*Honiara*
50.005	ZS2SIX	*South Africa*
50.011	JA2IGY	*Mie*
50.020	JE6ZIH	*Japan*
50.028	JA7ZMA	*Fukushima City*
50.066	VK6RPH	*Perth*[1]
50.075	VS6SIX	*Hong Kong*
50.080	KH6JJK	*Hawaii*
50.110	BY4AA	*China*[2]
51.020	ZL1UHF	*Auckland*
52.013	P29BPL	*Port Moresby*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*
52.345	VK4ABP	*Longreach*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.445	VK4RIK	*Cairns*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
52.510	ZL2MHF	*Mount Climie*
144.022	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.445	VK4RIK	*Cairns*
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
144.950	VK3RCW	*Melbourne*
145.000	VK6RPH	*Perth*
432.066	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK1RBC	*Canberra*
432.420	VK2RSY	*Sydney*
432.440	VK4RSD	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*Macleod*
432.540	VK4RAR	*Rockhampton*
1296.198	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.440	VK4RSD	*Brisbane*
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
2304.445	VK4RIK	*Cairns*
2306.440	VK4RSD	*Brisbane*
10445.000	VK4RIK	*Cairns*

1. Approval has been given for this new beacon, VK6RPH on 50.066 MHz, to commence operating from Perth as from September 1988. For the first time in Australia we will have an opportunity to compare the relative propagation properties between 50 and 52 MHz. For this reason, I hope the planning has been such that the two signals will be comparable when they leave the antenna, otherwise the exercise will not be nearly as valuable. The message came from VK6KXW via VK5NY.
2. BY4AA has been active on 50.110 MHz beaming towards Australia between 0300 and 0900 UTC.

The June 1988 issue of *The Western Australian VHF Group Bulletin* gives a new and full listing of beacons in Western Australia. In this it is stated that VK6RTU on 52.350 MHz is temporarily out of service and no mention is made of VK6RPB, on 144.565 MHz at Port Hedland. Both of these have now been removed from the above list.

Other beacon news included in the Bulletin is that of BY4AA mentioned above, also SZ2DH has been active on 50.015 MHz from Athens, Greece. It is operated by SV1DH.

Also, 9N88ITU in Nepal, has been operating a beacon on 52.125 MHz and listening on 52.145 MHz for any calls.

I notice that the Hamilton six metre beacon, VK3HMV, has been missing for the last few days. As it is always audible at Meningie I am hoping the interruption is temporary.

With the receipt of the above information from Western Australia, I feel reasonably safe in saying the beacon list is now accurate except for VK5RSE at Mount Gambier, which has been giving some temporary trouble but should be cured by the time you read these notes. My thanks to those operators who have forwarded information regarding the status of the beacons in which they are interested. Those other publications which use this list are assured of its general accuracy and are requested to please acknowledge the source when reprinting!

TWO METRES

I was pleased to receive a letter from David Tanner VK3AUU, with an update of his recent two metre activity. With an extremely good equipment set-up and antenna farm, he is currently to the forefront of activity in Victoria.

David reports: "The EME log is starting to get a few entries now. I have worked 22 stations in 12 countries including a two-way SSB contact with HB9CRQ on June 11. I have worked W5UN a total of 15 times with the best contact back in January, when I was using 60 watts to a single 19 element Yagi. I am pleased to note my article on the DL6WU Yagi has prompted the construction of quite a few of these around the country with most being very happy with the results.

"W5UN now has 48 Yagis with a calculated gain of 30 dBd so anyone with 100 watts and one long Yagi should be able to work him.

"The station here now consists of four DL6WU 19 element Yagis stacked 15 feet wide and 13.5 feet high. I estimate the antenna gain at close to 21 dBd less feedline loss. The phasing lines are heavy 300 ohm ribbon and the rest of the feedline is a mixture of half-inch heliax and 10DFB with total loss of about 1.5 dB. My 8877 amplifier is capable of putting out 1800 watts on CW so the ERP is about 160 kW. (I do have a high power permit). The preamplifier is a MGF1302 with noise figure of 0.5 dB. On moon-set to the south-west I can detect echoes with 50 watts leaving the shack, while up in the air the best I can hear is about 400 watts of CW and full bore SSB. Plans are afoot to increase the antenna to a maximum of eight Yagis in the next couple of years. Anyone who is contemplating such a structure should be made aware of the potential wind loading of around 400 kilograms at wind speed of 140 km/h and design the supporting structure accordingly!

"On the terrestrial scene I seem to be able to work VK2ZAB any time on SSB with his signals eight to 10 dB above the noise. This is a distance of 680 kilometres across the highest mountains in Australia, not exactly line-of-site.

"The following interstate stations were worked in May and June. VK1s BG, BUC, GL, VP, RK, VK2s MQ, DVZ, KWA, KYP, ZAB, ZRE, VK5s ACY, OH, LP, DK, NY, KCX, ZMK, ZDR, VK7s JG, AV. Of these the most difficult was VK2MQ, at Tumut.

"Good tropospheric conditions were noted on the following days:
May 10, 11, 12, 29, 30, 31. June 2, 3, 4, 24, 25, 26."

Thanks for the letter David. I hope your location is not subject to some of the winds we have here in South Australia. Roger VK5NY, suffered a bent mast recently with two eight-element six-metre Yagis. When living at Forreston, I too, suffered the same fate with the same antenna system in a 140 km/h gust. Here at Meningie I worry about my antenna installations at times, although I have less up-top these days and the 25-foot boom six-metre Yagi is mounted just above the top of the tower which is some help in reducing final top-loading.

The *West Australian VHF Group Bulletin* for June said that "Bob VK6ZFY and Bob VK6KRC, both located in Perth, heard FM signals recently just below 144.100 MHz. The speech and accents indicated the source could be Indonesian fishing boats operating off the West Australian coast or even in Indonesian waters. The signals were heard around 0700 local time on an exceptionally warm morning."

Given that the distance to Indonesian waters is around 3000 kilometres from Perth and much of it over the Indian Ocean, the signals may have been coming from anywhere in between or the full distance under favourable conditions. As amateur SSB and FM equipment is cheaper than commercial or marine equipment, it is more than likely many boats in a fishing fleet would have such equipment and possibly using it illegally. Most times we would not hear it. The way amateur equipment is used by fishing fleets on the HF bands is well-known, it is inevitable that it will be used on VHF

While we are still on two metres, a letter has arrived from ,my long term friend Ross VK2ZRU, in Sydney, with a comment on my recent reference to Phillip FK1TS, hoping to work back to Australia on two-metres.

Ross says: "Two-metre contacts to New Caledonia have been achieved quite often from eastern Australia but only with very solid Es propagation. Unfortunately, Noumea is too far north from us to get into ducting from very strong and slow moving highs across the Tasman. Such signals are a summer time phenomenon, not getting very far north in the winter months, as they do in VK5 on a line roughly through VK7.

"Some of the openings to FK have brought some interesting contacts. Copies of QSLs enclosed show one from FK1RF who was in a car using a five-eighth wave vertical and 25 watts. Also, FK8EM. I was his sixth VK contact that day!

"We can thank OSCAR-10 for this activity. Up until that satellite came on the scene Noumea had really only been working on six-metres and didn't need two-metre and 70 centimetre equipment before that time."

Thank you Ross. I am sure Phillip will be encouraged to read that information. I was aware such contacts had been made and it should have been mentioned at the time.

Other contacts made by Ross include FKs 8CR, 8AH and 1SB, the latter running 150 watts to two 10-element Yagis. Most contacts seem to have been made during the morning from around 0000 to 0300 UTC, although the contact with FK1SB was at 1205.

FROM SOUTH AFRICA

The June 1988 issue of *VHF News* from Hal Lund ZS6WB, reports further TEP contacts on six-metres between ZS3AT and 9H1FL (Malta) at 1540 on 4/5, and on 8/5 between 1630 and 1645 UTC, QSOs with FC1GTU, FC1GXV (Corsica) and CT4KQ (Portugal) with the latter peaking to S9 for more than an hour.

In the same issue is a reprint from JA1VOK in *Five Nine* of DX conditions in Japan. From 4/4 to 3/5, six-metres was open every day. Countries QSOed on six from JA during this period included 3D2, 5W1, FK, FO0, FW, H44, HL9, KG6, KH0, P29, T20, T5, VK2, 4, 6, 8, VK9N, VS6, YC, XX, ZL1, 2, 3. The VK8VF two-metre beacon was heard in JA on April 9, 13, 15, 16, 17, 19, 24, and May 2. Contacts were made between JA and VK8 on April 15, 16, 17, 19 and May 2 on two-metres.

Hal ZS6WB, makes the comment in regard to the above that the JA to northern Australia TEP path is similar to their path from Windhoek to southern Europe, the main difference being in the number of station active at both ends. Those further south in South Africa therefore have much in common with VK1, 3, 5 and 7 who missed our on the openings.

What should be of considerable interest to VK operators from the list of contacts is the wide field over which six metre activity is currently spread. Whereas for the last cycle, in some cases, operators had to finally get moving and start operating part way through the cycle, this time they are ready and waiting. With suitable vigilance on our part, many exotic contacts will become available over the next five years or so, particularly as more countries are now aware of some of out operating restrictions and the need for attention to the 52 MHz segment.

THE BIRCHIP STORY

Ray Naughton VK3ATN, from Birchip, well-known for his early exploits into EME from a very large antenna farm, is now looking to attempt something different. Information received mentions the construction of a huge rhombic antenna system suitable for use on 28, 50, 144 and 432 MHz. The antennas will be mounted on aluminium towers 108 feet high and each leg of the antennas will be 440 feet long.

Two rhombics at 108 and 82 feet can have their parameters physically changed to provide operation on either 28 or 50 MHz with a gain of 28.5 and 31.9 dBi respectively. Four other rhombics will be mounted at 60, 54, 48 and 42 feet to provide a gain of 38.6 dBi on 144 MHz. Four others will be mounted at 36, 34, 32 and 30 feet to provide a gain of 43.3 dBi for 432 MHz. By suitable adjustment it is considered the system could be used on 14 MHz with a gain of 25.5 dBi and on 7 MHz with 22.5 dBi. All the vertical angles, declination and Greenwich Hour Angles have been calculated, together with the width and length requirements.

The main lobe will be centred on 68 degrees true north and this beam heading centres approximately on Kansas, USA. Maybe a warning should be sent to Gordon VK2ZAB, that this direction will be very close to directly over him. The many kilowatts of ERP will surely have an effect on his sensitive equipment! VK5LP, for one, will be very interested, eventually, to see how Gordon does receive the signals on the four bands nominated. The rear of the system will be pointing fairly close to Naracoorte in the south-east of South Australia, so VHF operators there may hear some strong signals.

Ray says he has hopes that, in time, the system could be made available to mobile or portable operators, who could drive up to the antennas, connect their equipment and sample EME operating. There will be no charges for connecting to the system, but any donations towards the project, at the time will be accepted. It is hoped to have the 26 and 50 MHz systems operational by the end of 1988, with 100 watts being fed into the antennas.

The whole thing is a huge project. For the time and money already spent we can only hope the idea works and is therefore worthwhile. We also hope Ray will not be climbing any of his towers when the wind is blowing strongly! Good luck.

GEELONG AMATEUR RADIO CLUB

The Geelong Amateur Radio Club Newsletter told me the Club celebrated its 40th birthday with an anniversary dinner held at the East Geelong Golf Club on June 18. Together with my readers, I offer the Club congratulations for achieving such a milestone and hope it will continue to prosper and be of value to the amateur fraternity.

I am sure that much of the reminiscing which took place centred around the technological advances which have been made since the Club was formed in 1948.

As an historian dating back many years, now with six history books to my credit, the last being launched on July 7 and another to be launched next year, I can only urge the Geelong Club and any other organisations with an historical background, to try and have that information recorded in written form. It is so easy to leave it till later, but later is often too late. Do it now!

WINTER-TIME SPORADIC E

Throughout June there were spasmodic openings on 144 and 432 MHz from VK5 to VK3 in the lead-up to what could be seen as the annual winter Es openings. These commenced on 24/6 when a large rather stationary high pressure system produced excellent signals into Melbourne and some Victorian country districts. Roger VK5NY, from Mount Wilson was having a ball with very strong signals on both bands to Melbourne and also from VK3PM, in Mildura. None of the signals were nearly as strong at Meningie although they were workable. Peter VK3PM, was using a vertically polarised antenna which was not helping, but Roger was receiving him better by up to three points than was VK5LR The unusual circumstances also prevailed on 432 where signals to me from Melbourne were poor.

The next day, 25/6, the signals were certainly better. At 0015 UTC, VK5LP worked VK3AMZ 5x6, 0019 VK3NM 5x6, later at 1126 VK3DHW 5x8 and 1129 VK3ZJC 5x7. However, there was still no joy on 432 MHz. Roger VK5NY, continued to work all and sundry with great signals and caused much frustration by working VK2YEZ at Griffith at 1237 UTC 5x9 on 144 and 5x5 on 432! The good conditions continued through 26/6.

On 28/6 six-metres opened to VK2 when VK5NY worked VK2XJ.

The band quietened down somewhat until the next high pressure system came along on 11/7. Of course, this had to be the time when VK5LP was absent for a week at a conference in the old hometown! The following is a report of the activity as passed on by Roger VK5NY.

11/7: VK2YEZ at 1123 on 144 and 432. Also VK2KAW and VK2ZMP at Wagga. VK3KUB and many other VKs. Heard the Canberra beacon VK1RCC on 144.410 MHz at 1227 very strongly but no other signals from that direction.

12/7: VK1RCC beacon in most of the day around S2. At 0452, on six-metres worked VK7ZIF at 5x9, soon after worked VK6JXX at Esperance. His signals were reasonable considering the use of a quarter wave whip at his end! Then worked Peter VK6KXW, in Perth and was advised of the new beacon to come on 50.066 MHz. Peter said he had been monitoring a lot of television stations from the east during the day. He had also been hearing a number of signals around 48 and 49 MHz from Asia.

13/7: The day dawned with good signals still prevailing, particularly on two-metres. VK2BY at Broken Hill was working via the Mount William repeater. Roger asked him to QSY to the low end and promptly worked him at 0017. At 0101 heard VK1RCC and again at 0123, also for some time thereafter. At 0210 the Melbourne beacons VK3RTG and VK3RCW were both copied with QSB. The band appeared to be wide open to Wagga and on through to the Blue Mountains but there were no signals to work! On checking with Roger around 1100 the conditions had disappeared with the high pressure system dissipating. No beacons were audible at Meningie and the Mount William repeater was inaudible. The Mount Gambier beacon was still missing.

Roger VK5NY, summed up this burst of winter Es and tropo by saying that he had never before experienced the reception of VK1RCC for three days in succession. In addition, VK2XJ had been worked again at 0528 on 13/7 which made him available each day for a week on six-metres. Roger had also noted hearing the ZL beacon on 28 MHz an hour or two before the VK2 beacon and this was a pointer to the approach of some possible good six metre conditions.

SOAP-BOX

For some time now I have been wanting to write a few paragraphs relating to VHF propagation, in response to requests I receive from time to time, mostly from new operators, who are not sure how to get the best from the three most populated bands, 52, 144 and 432 MHz. In particular, 50 to 52 MHz because of its capabilities of supporting fairly regular long distance communications.

Until this month, my columns seem to have been very full, but for some reason, this time there is a reduction in news. As it is September and the month when it is possible there may be an increase in six metre DX activity, the time to say something seems appropriate.

I am not going to make what I say seem like a primer for working other stations with extended reasons why some happenings occur. There are many good publications by recognised authors dealing with the subject in detail. It will be more useful to say what can occur and when may be the best time to observe the phenomena — the question most asked is — *what must I do to work a DX station and when do I start?*

THE SYSTEM

For the moment we will deal with the six metre band, the other two being referred to as necessary. Without seeming to say the obvious, there are some minimum requirements in regard to equipment. One does not need a transceiver but it helps! All operating today is by the two stations involved being on the same frequency, except in certain split frequency operations which can be deferred for the moment. In the former days of AM operating it was not uncommon to transmit on one frequency and receive on another. Today, a transceiver or transverter will allow single frequency operation. Equally as important is a reasonable antenna, say four elements or more fed with the best feedline you can afford. Coaxial cable may help you to keep out of your neighbour's television set, particularly if you can't get your antenna up very high. A rotator which can be operated from the shack will make life easier when it comes to peaking up the signal of the distant station.

OPERATING

One prime requirement is to transmit! Not many contacts eventuate if everyone is listening. There are certain designated call frequencies for SSB,

52.050, 144.100 and 432.100 MHz. A world-wide DX calling frequency exists on 50.110, but this is subject to certain restrictions in Australia, depending in which State you live. Normal operating is permitted in VK6 and VK8, all other areas have power restrictions and those with Channel 0 stations, time restrictions as well. Refer to the DOTC Operating Manual or former issues of AR for details.

When using the call frequencies and a contact is made, unless the contact is of a very brief nature, it is courteous to move off the call frequency to continue the contact. When calling, announce your call sign frequently. Many operators will call "CQ DX" up to 10 times before announcing their call sign, perhaps twice! The operator at the other end having heard you say "CQ DX" once is more interested in your call sign which may not be so readily decipherable. Use recognised phonetics as laid down in international standards. The Japanese are notorious for using all manner of strange phonetics which slows down recognition and thus the contact rate. There are some Australian operators who have used odd phonetics for many years. Because the chosen phonetics are easily recognised, this presents no problem, but do steer away from strange sounding words.

THE PROPAGATION OF SIGNALS

The ionosphere is created by the bombardment of the upper atmosphere by the ultra-violet radiation from the sun. Without the ionosphere there would be no long distance radio communications. The various layers of the ionosphere have varying effects on radio signals and the highest frequency at which a vertically projected signal would return to earth is called the Maximum Usable Frequency (or MUF) for a zero length path between two adjacent earth points. This MUF will be the factor which determines what you may eventually hear and on what frequency. Towards the peak of the last 11-year cycle of sunspot activity, by using receivers which could tune from about 25 MHz upwards, I found it very interesting to observe the gradually rising MUF on certain days. At times there would be signals on 28 MHz but nothing around 40 MHz. Later, signals from the USA would be heard at 40 MHz and as the MUF climbed higher, television signals from Asia would be observed around 48 MHz heralding a possible 50 or 52 MHz opening before long. Sometimes the MUF would go on climbing, to over 100 MHz to provide extended distance signals on the 144 MHz band, and so on. The commercial FM band between 88 and 108 MHz is a good pointer to a high MUF eg if you live in Alice Springs and can hear Adelaide FM stations, then you would certainly be hoping for some two metre contacts eventually.

SPORADIC E PROPAGATION

This is probably the most widely observed phenomena and appears to be supported by highly ionised patches in the ionosphere around 100 kilometres above the earth. Sporadic E (or Es) propagation is highly unpredictable thus its name "sporadic E". Es most often occurs during the late spring and the summer months with a minor peak around mid-winter. However, so sporadic is its nature it is quite capable of appearing at any time, day or night. Whenever it appears, it can be observed for many hours, or even days, before disappearing, or it may last a few seconds giving you time for one quick contact before it goes. Any length of time between those limits is possible! Signals can vary from extremely strong to very weak, with heavy or light QSB or fairly steady.

If the MUF is relatively high, the signals can be very strong over short distances, say 600 kilometres. This is known as short skip. Normally, a distance of around 1600 kilometres is considered about optimum for one hop transmissions. Double and triple hop transmissions allow contact to places like New Zealand and other areas of the Pacific, depending on where you live, of course. Multiple hop transmissions may be somewhat weaker, but many contacts between VK5 and ZL have been at S9 plus.

Short skip transmissions on 28 MHz are pointers to a possible 52 MHz opening in due course, while short skip on 52 MHz could indicate a possible two metre opening. It used to be considered that two metre Es openings occurred about one thirtieth of the times that six metres opened. In the light of events in recent years, in Australia anyway, those predictions would seem to be rather conservative. A word of advice — if you are fortunate enough to be involved in a two metre opening, don't waste words on unnecessary chatter, exchange signal reports and names, sign off and get on with the next contact. The opening may only last a minute or two and you will deprive yourself and others of contacts by blabbing too much! Should the band stay open for an hour or so, as it can at times, then by all means go back and have some longer contacts, but still let late-comers break in if they let their presence be known.

Another factor which should be considered is that there is a tendency for Es to "follow the sun". I say tendency, because Es is sporadic, but there have been many occasions when it has been possible to work stations where the sun has already been for some hours, before you can work other areas, eg eastern coast stations might expect to work FK and ZL earlier than stations in VK5. As the sun moves over from the east (actually the earth rotating), VK5 would expect to hear stations in, say, VK2. FK and ZL stations may then be mixed in with the Australian stations.

The statement is open to challenge, but has not been totally disproved, that during periods of low sunspot activity there appears to be an increase in the openings due to Es, with a consequent rise in possible Es contacts on two-metres. Whether such statements are accepted or not, what is true is that Es appear each year to provide a whole series of interesting contacts for many people.

One proviso did arrive last year when a large solar flare around December 18, disrupted the usual pattern of six metre operating and reduced the normally hundreds of contacts to a mere handful for many operators, those suffering the most appear to have been in Western Australia, who, at the best of times, do not experience the range of contacts available to the eastern States.

BACKSCATTER

Backscatter is an unusual form of propagation which can support communications over considerable distances, but often the stations involved will be perhaps 300 to 400 kilometres apart, or less. The received signal is characterised by a somewhat hollow fluttery sound, at times difficult to decipher. However, I have known instances when the signals have been quite clear.

A backscatter contact takes place when two stations point their antennas at a common spot in the ionosphere and work by the reflection from that spot. At the moment, contact by any other means is not usually possible. Signals are often weak, but again, can be unusually strong! To prove whether the received signal is in fact backscatter, point your antenna on the direct path to the other station. If he cannot be heard then it will be backscatter.

Backscatter is not uncommon on 10 and six metres. There have been reports of it occurring on two metres.

TRANS-EQUATORIAL PROPAGATION

Around 1947, amateurs first observed this form of propagation, commonly referred to as TEP, and occurs in the F2 region of the ionosphere. Contacts occur more commonly in areas centred about 4000 kilometres either side of the geomagnetic equator and amateurs as far apart as 1500 kilometres situated in these belts are able to contact amateurs similarly situated on the other side of the equator. Hence the contacts between Japan and Australia. TEP occurs mostly in the late afternoon or early evening and opportunities appear to exist more often during spring and autumn and peaking for perhaps a month after the equinox, but again, wide variations do exist.

The signals can be extremely strong and tend to fade rapidly up and down, but still leaving communication possible. When propagation is good, it is no trouble to work Japanese stations with 10 watts or less on six metres.

The occurrence of TEP is tied to the sunspot cycle, occurring more often during periods of high sunspot activity, but there are many recorded instances when TEP has occurred spasmodically. Stations in the northern half of Australia are more favourably situated to use this phenomenon than those in southern latitudes, contacts being made on a fairly regular basis for several months of the year.

F2 PROPAGATION

Another interesting form of propagation is commonly known as F2 propagation and is also supported by the F2 ionosphere, that portion situated about 400 kilometres above the earth. Like all other modes, it too can be spasmodic, but again, appears to be linked to the sunspot cycle. This mode is capable of supporting very long distance communication in almost any direction. In the past, discussions have occurred as to what form of propagation may have supported a particular contact, F2, TEP or what?

From the Australian viewpoint, one could expect that the contacts made in the past between Australia and such places as Hawaii, USA, Alaska, Mexico, Canada and the more distant points in between, would have been via F2. Contacts to other places more to our north, such as India, Nepal, Indonesia, etc, may have been F2 or TEP, or a mixture of both, or either or both, supported by a Es content, who knows? Then, there were the "nearly made it" contacts to South Africa, crossband 10 metres to six metres.

At the peak of the sunspot cycle, when such contacts were more common, it seemed most contacts were being made either during the morning before 0000 UTC and in the case of places like Mexico, as early as 2200. Late afternoon contacts are also possible. It is all based upon being vigilant and being there at the right time.

THE SUMMARY

Most of the above has been orientated towards six metres which, in the first instance, will probably receive a high degree of attention by a newcomer. Two metres Es has been mentioned. Evidence seems to be unfolding that, under certain conditions Es may be possible on 432 MHz. Roger VK5NY get very close to establishing that fact in 1986 when he almost made it to Brisbane on that band under conditions which were certainly not tropospheric!

To deal with 144 and 432 and above adequately, will involve more time and space. This will be the subject of further discussions on another occasion. Subjects involved include coastal ducting, inversions, scatter contacts, aircraft enhancement contacts, etc.

It is hoped what has been said will help some on the way to sharing DX contacts. I use the word sharing purposely, because it is necessary to share a DX station with others. You will not be popular by hogging a contact with a rare station to the exclusion of others.

What has been written is couched in terms the layman can understand. Maybe someone will want to pull apart what I have said, if so, so be it! What has been written is essentially factual and should be capable of helping most who feel a need to be helped. If someone, as a result, is able to improve their DX operating skills, then that is all the satisfaction I seek!

CLOSURE

In closing may I again urge all VHF operators who wish to participate in possible DX operating, particularly on six metres, that their equipment should be ready and operating at peak efficiency by now. From this time onwards the unexpected can happen at any time — what a pity to miss out on a contact, say, to the USA because you antenna was on the ground being repaired!

Closing with two thoughts for the month: "People who have what they want are fond of telling people who haven't what they want that they really don't want it." And: "The world is moving so fast these days that the man who says it can't be done is apt to be interrupted by someone doing it!" 73. The Voice by the Lake.

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CONTEST CERTIFICATES

During the current review and re-organisation of the Federal Office of the Wireless Institute of Australia it has come to my attention that several amateurs believe they have not received certificates for contests they have won.

Institute records show that all certificates were prepared and forwarded to the winners. However, if you have won a contest in the past few years, and have not received your certificate, please advise the Federal Office by writing to:

Contest Certificates
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic. 3162

On receipt of the details of valid claims, a duplicate certificate will be issued promptly.

Bill Roper VK3ARZ
General Manager and Secretary
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QSP

CHIP TRACKS KILLER BEES

A tiny computer chip has been developed to track killer bees. Engineers for major US defence contractor Martin Marietta, known for producing MX missiles and laser-guided artillery shells, developed the chip.

About the size of a half-carat diamond and weighing about as much as a grain of salt, it was part of an integrated circuit that would be attached to captured bees' mid-sections.

The device, powered by nine solar cells, can transmit an infrared signal that can be picked up by a ground station up to a mile away.

A killer bee transmitter is expected to be in the field by next year.

Killer bees, although aggressive but generally not deadly, are descendants of African queen bees.

Since escaping from a Brazilian laboratory in 1957, they have migrated as far as southern Mexico, and are expected to cross into Texas as early as next year.

Scientists hope that, by being able to track the insects, they can control the migration without using large quantities of pesticides.

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TOPICAL TECHNICALITIES

Lindsay Lawless VK3ANJ
PO Box 112, Lakes Entrance, Vic. 3909

Telecommunications is the exchange or dissemination of information at a distance by means of signals in the presence of noise. The signals must be more powerful than the noise or capable of separation from the noise.

The apparatus used to amplify and detect signals generates internal electrical noise and it is important to reduce the internal noise to an acceptable minimum. How do we measure the success of our efforts?

One method is to connect a signal to the apparatus input and measure the signal to noise (S/N) ratio at the output. The acceptable S/N ratio depends on the application. A 6 dB S/N ratio was considered suitable for communications receivers and I recall many happy (?) hours spent trying to persuade Kingsley AR7 receivers to produce one watt output with a S/N of 6 dB from an RF input of one microvolt. That measurement was actually a signal plus noise to noise ratio because signal and noise could not be separated. Better methods have since been devised to assess apparatus noise performance, based on comparing the total noise output with an ideal device with no internal noise. The specifications for modern devices however, continue to quote performance in terms of S/N ratio.

The modern receivers in my shack claim sensitivities and S/N ratios not much better than the ancient AR7; for example:
0.25 uV for 10 dB S/N on J3E HF
1 uV for 10 dB S/N on A3E HF
0.5 uV for 20 dB S/N on J3E VHF

My store-bought microphone amplifier claims a S/N of 60 dB, but fails to specify an input. How accurate are those claims and are they suitable for our purpose?

Electrical noise generated by electrons absorbing heat energy is the minimum noise level attainable in apparatus; it is predictable however, and serves as a standard for comparison with noise generated by other means. The available noise power from thermal generated sources is -174 dBm per Hertz of bandwidth at a temperature of 17 degrees Celsius (290 degrees K). The only factors which will alter that power are temperature and bandwidth:

P_n = KTB watts ..... (1)
P_n = KTB x 10^3 milliwatts ..... (2)
P_n = 10log.(KTB x 10^3)dBm ..... (3)
K = 1.38 x 10^{-23} Joules per degree.
T = temperature in degrees absolute.
B = bandwidth in Hertz.
dBm is power level referred to one milliwatt.

A temperature of 290 degrees is accepted as the most likely operating temperature of Telecom apparatus and the following thermal noise power levels at that temperature are worth noting:

P_n = -174 dBm per Hertz.
P_n = -139 dBm when B = 3 kHz.
P_n = -134 dBm when B = 10 kHz.
P_n = (-174 + 10log.B) dBm.

My desk microphone produces an open circuit output of 40 uV with a 'Sound Pressure Level' (SPL) of 70 dB reference the threshold of audibility (2.04 x 10^{-5} Pascal); that is approximately the SPL of ordinary conversation at a distance of one metre. The matching impedance is 600 ohms therefore the conversation level to the microphone amplifier is -92 dBm and the maximum possible S/N ratio if B = 3 kHz is 47 dB and 42 dB if B is 10 kHz. The claimed 60 dB S/N at a bandwidth of 15 kHz is impossible at conversation levels; maybe it is intended for use with a rock band!

Suggestion: when buying an amplifier, be sure you know the expected output level of your microphone and ask for performance specifications at that level.

My VHF receiver bandwidth on SSB should be about 3 kHz and the minimum noise power referred to the input -139 dBm. The specification sensitivity of 0.5 uV at the 50 ohm input is a power of -113 dBm, therefore the maximum possible S/N ratio is 26 dB. Apparently the internal receiver noise degrades the S/N ratio to 20 dB therefore the 'Noise Figure' is 6 dB. Disappointing and not suitable for EME or other low noise applications.

To complete the discussion, we present an explanatory diagram — Figure 1. R is the matched source resistance of a receiver or amplifier and:

$P_s = E_i^2/R$ or $E_s^2/4R$ ..... (4)
$P_n = E_n^2/4R$ = KTB + Pni ..... (5)
Pni = Appliance internal noise referred to the input.
E_n^2 = 4KTBR ..... (6)

If the S/N ratio is 20 dB as specified for the VHF receiver, and E_i is 0.5 uV then E_s = 1 uV and the receiver equivalent noise input is 0.05 uV and

E_s/E_n = 1/0.1 = 20 dB.

if the receiver has no internal noise the ideal S/N is

E_s/E_n = 1/0.05 = 26 dB.

For further information about the above, the excellent *Technical Mailbox* discussion in AR, August 1987, is recommended.

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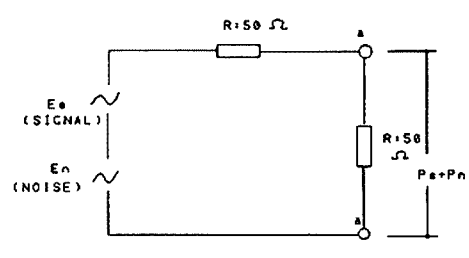

Figure 1.
P_s = $E_s^2/4R$ = E_i^2/R
Pn = $En^2/4R$ = KTB + Pni
Ei = signal volts at appliance input a-a
Es = open circuit signal volts at a-a
En = open circuit noise volts at a-a
Ps = signal power
Pn = Noise power (total)
Pni = equivalent appliance noise power

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

During 1988 we have seen an increase in YL activity on all bands due to the proliferation of YL awards available this year, plus improving propagation.

In my case this means much leafing through logs and counting of contacts; meeting friends on the air that I have not heard in years, and many YLs I have never spoken to before. Some I have met, some I will never meet. It is still good to exchange a friendly greeting!

As one DX ALARA member said; "It's a pity politicians aren't radio amateurs — we all seem to be able to get along together."

Not entirely true, perhaps, but due to the nature of our hobby perhaps we "get along together" better than most.

The following was written by Inge Tobias de Agular PY2JY, and sums it up very well.

MEDITATION OF A YL RADIO AMATEUR

My Lord, if I should die now, I would go happily for I know the meaning of friendship, affection, co-operation and unselfishness.

Since my first day as a radio amateur and till today nobody has let me down.

From south to north, from east to west, I have friends whom when they hear me are happy to meet me again.

I will never come across many of these friends except through QSLs and letters but in their voices I perceive the happiness of our re-encounter.

Some of them I met personally somewhere in this world, received me as if I were their sister, and we enjoyed ourselves like true brothers and sisters.

I never was alone in emergencies, in which I helped out,

I always had friends that helped me, and there you can see that radio amateurs always work together.

This is Friendship!

To be a radio amateur is to live with happiness; happiness of having so many friends which one can depend upon, happiness to be able to help somebody in need, sadness when giving bad news, happiness in meeting others, happiness in meeting again, happiness in unselfish help, happiness of having accomplished a mission.

X X X (From May/June *YL Harmonics*)

YLRL CONVENTION 50TH ANNIVERSARY — HAWAII — JUNE 27-30, 1989

Proposed Schedule:

Tuesday June 27	Arrive Honolulu
Wednesday June 28	Tour Bishop Museum in Honolulu Fly to the Garden Island of Kauai in the afternoon Board meeting in the evening
Thursday June 29	YLRL Forum in the morning Island tour in the afternoon
Friday June 20	Board meeting, tours If the attendance is as high as indicated so far, the final banquet this evening will be a LUAU (on chairs — not the floor)

(From May/June *YL Harmonics*)

YL RADIO CLUB OF ITALY

Helen Grosso I7KAX, is DX Chairman of the YL Radio Club of Italy. She is hoping that, with propagation opening up it will once more be possible to make contact with YLs in the Pacific area. Concerning the Italian YL Club, she says;

"Our club consists of about 100 members, more or less. We meet every Monday on 7.050 MHz at 1230 UTC. We hold a general meeting annually, and elections bi annually. Our President is Olga Scolari, Via Conte Verde 50, 00185 Rome. Our Secretary, Santina Lanza, Via F Todaro Is, 206n 7, 98100, Messina. Three or four times a year we publish a newsletter in Italian and English."

VK4 STATE REPRESENTATIVE

For personal reasons Josie VK4VG, has found it necessary to resign from the position of VK4 State Representative. The new VK4 State Representative is Cathy VK4CEK. Our thanks to Josie for her contribution to ALARA as her State's Representative.

BIT AND PIECES

Gwen VK3DYL, is safely back in chilly Melbourne, and wishing she could have brought back some of the hot weather encountered in the USA after a wonderful trip and warm hospitality.

With improving propagation, North American YLs are staying up late and burning the midnight oil to come on the 222 YL Net each Monday at 0600 UTC. It is great to catch up with so many we have not heard for a long time.

A nice surprise early in July when Val VK4VON/ ZL3GW, came on the ALARA Net, during a holiday in Queensland. Val lives in a remote area of New Zealand, and finds amateur radio a great way to "keep in touch".

Congratulations to Christine VK5ZCQ, now VK5KTY.

Congratulations also to Geoff VK3AZI and Patricia VK3PRV, on the arrival of little harmonic, Suzanne Abigayle on May 20. A sister for Tiffany.

Angie G0CCI and Nigel G4IJF, were married in March. Our sincere wishes for their future happiness.

NEW MEMBERS

A warm welcome to Pat VK4PT, Marlene VK3FML, and sponsored members Masayo JR5MVX, Gwen ZL2NAD and Rita G0EIX.

Until next month, 73/33.

ar

THE BRICK COOLER

David Barneveld VK4BGB
PO Box 275, Booval, Old. 4304

Heat generation a problem in solid-state VHF amplifiers?

If you have ever used one of those solid-state VHF amplifiers, you will be only too aware of the problem of heat generation after extended periods of operation. A simple remedy for this would be to place the amplifier in the refrigerator and drill holes in the side of the cabinet to take the coaxial cable, etc. The only drawback now is that the heat has been transferred over to your spouse who will probably blow a "safety valve".

A simpler method is outlined in this article! As the bulk of the heatsink is situated on the top of that amplifier, a small muffin fan can be attached easily to the top to blow air downwards onto the heatsink, and greatly increase the heatsink-to-air thermal transfer. This method was tried quite successfully with a 130 watt amplifier. The heatsink temperature dropped from unbearable to moderately warm.

For those not wishing to drill holes in the side of the heatsink, the bracket could be held on reasonably well with double-sided tape, provided the unit was not moved too much.

A mesh grill across the top of the fan will stop "sticky-fingers" being amputated!

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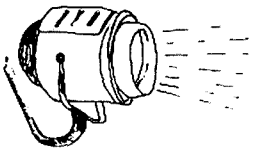


Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Yet another exchange agreement between two international broadcasters has come into effect. This time, Radio France Internationale and Radio Japan have commenced broadcasts via their transmitting facilities as from early August. Radio Japan will be using the French relay base in Montsinery, French Guiana, with 500 kW senders to reach South America. Broadcasts will be in Portuguese and Spanish as well as Japanese. It is a little known fact that there are over one million Japanese emigres in Brazil alone. Broadcasts reportedly will be on either the 25 or 31 metre band at around 0300 UTC.

Conversely, Radio France Internationale from Paris will be heard via the NHK senders at Yamata, Japan, with a relay of French programming, beamed to western and south-eastern Asia. The 19 metre channels are reportedly being used between 0930 and 1130 UTC. At compilation time, the frequencies were unclear, so if you do hear strong French programming on the 19 metre band it very well could be Paris via Yamata.

Incidentally, Radio Japan via "Africa No 1" is coming in well here on 15.235 MHz in either English, French, German or Japanese around 0600 UTC. The target area is Europe and signals are excellent. Interestingly, Tokyo is also scheduled to use the same channel to Australasia at the same time from Yamata with their General Service. But the signals are well down under "Africa No 1". So much that I believe that they have stopped using Yamata until after the signals from Gabon go off, than Yamata comes in excellently. I also note that occasionally the satellite feed from Tokyo drops out on the Gabon signal, and the station reverts to pre-programmed musical interludes with bilingual identification announcements. It must be a frequent occurrence because "Radio Prague" commented that the tape filler was better audio-wise than the satellite feed.

Radio Beijing and Radio Canada International have also been negotiating an exchange agreement over sharing senders. Montreal is reportedly wanting to improve their signal over Japan, although they have been utilising the Yamata site for nine months for their Japanese programming. Apparently signals are skipping over Japan, hence RCI's interest in using a northern Chinese site to reach mainland-Japan. The Chinese also wish to improve their signal level and presence in to eastern North America, despite using the Canary Islands site of Spanish Foreign Radio and Mali. The latter reportedly has been disappointing, yet not surprisingly as the African senders in Bamako are only 50 kW.

The Seychelle Relay of the BBC will have commenced testing by now. The actual channels are not known but will be long-established channels serving eastern Africa. Programming will be shared equally with World Service and the African Service.

The Olympic Games will be commencing this month and many international stations are scheduling live broadcasts. The BBC World Service is one that has decided to split the World Service and several channels will reportedly carry live descriptions. Most stations will have regular updates.

The *International Listening Guide* arrived unexpectedly in the mail box in late June, some seven weeks late. In view of adverse publicity, I had expected that it would fold, but it has bounced back. They have made some alterations to the editions, dividing it up with four editions of the External Services broadcasting in French and English throughout the year and a frequency summary of usage each May and November. It has become a very tall order to publish a frequency summary four times a year plus English and French language broadcasts.

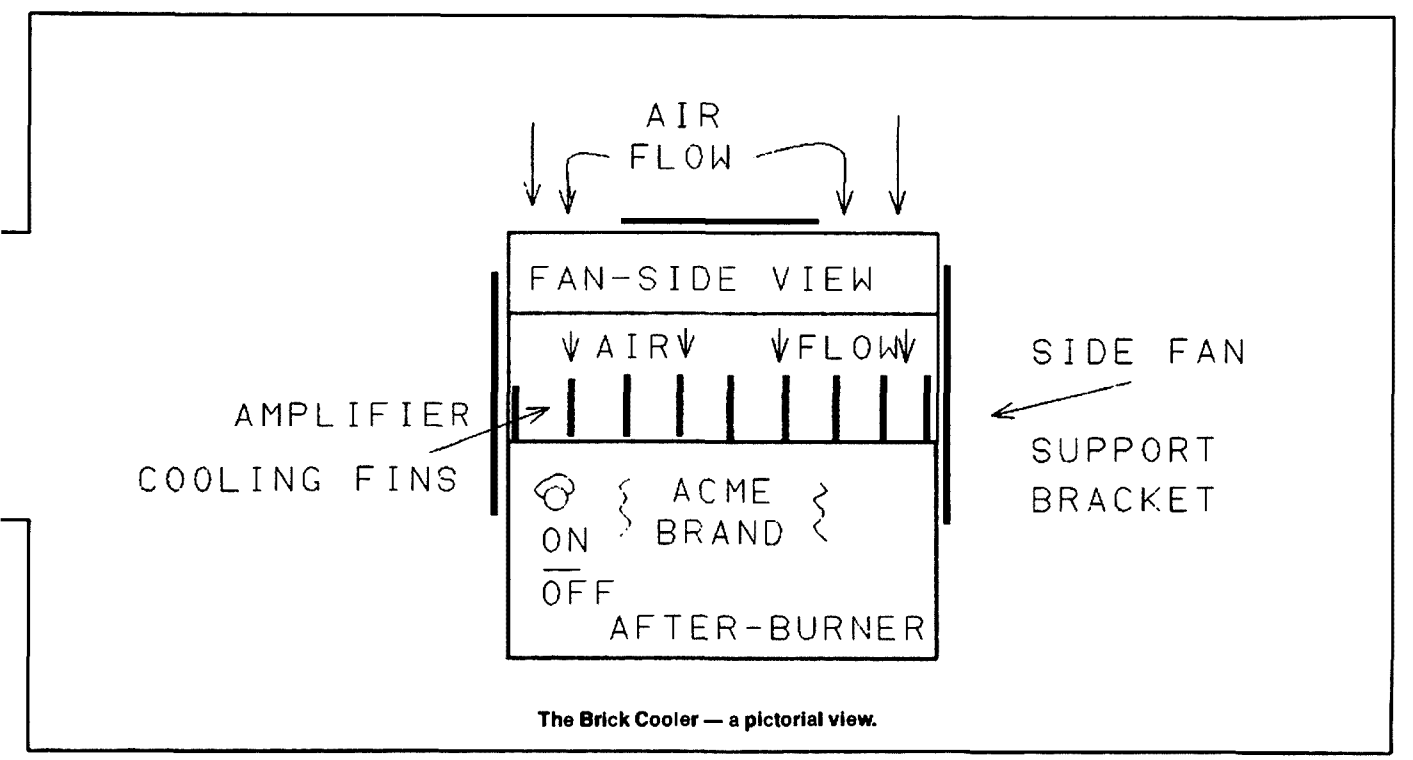
The current issue is again excellent, if not indispensable to the serious monitor. Those interested might find the abbreviations and symbols a little bewildering at first, but it is easily mastered. The price has increased to $A30 per annum and may be ordered via their Australian agent, Howard R Moore, 33 Brooklyn Avenue, Salisbury, SA. 5108. The Australian Radio DX Club were agents as well but I note that they are not listed as such in the current edition.

As for the much-publicised *International Broadcasting Handbook* — there is no word! Many people, I believe, in good faith ordered it in advance, being unaware of the difficulties the individual had in getting it published. Some have asked for their money back and even have turned very nasty. I believe that the publication of the handbook has been postponed and, as mentioned several months ago, it would be wise to wait and see if it is published and reviewed before ordering.

Do not forget that the S-88 period commences on Sunday, September 4, at 0100 UTC, yet major changes can be expected on Sunday, September 25, when Europe goes off Summer Time.

In conclusion, I must apologise to those who have been writing to my old address, that has been inadvertently listed at the *masthead of* this *column*. Sorry it has taken so long to reply, but if they had arrived at the correct address I could have replied sooner! The correct address is 52 Connaught Crescent, West Launceston, Tas. 7250. Until next time, the very best of 73 and good listening!

ar



The Brick Cooler — a pictorial view.

Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7277

CONTEST CALENDAR

SEPTEMBER 1988

10 — 11 European DX Contest SSB Section (Rules July issue)
10 — 11 IARU ATV International FSTV Contest (Rules this issue)
17 — 18 Scandinavian CW Contest (Rules this issue)
24 — 25 Scandinavian SSB Contest (Rules this issue)

OCTOBER 1988

1 — 2 VK-ZL-Oceania DX Contest (Rules August issue) SSB Section
8 — 9 VK-ZL-Oceania DX Contest CW Section
8 — 9 IRSA Radiosporting Contest
— 9 RSGB 21/28 MHz Phone Contest
— 21 RSGB 21 MHz CW Contest
29 — 30 CQ WW DX SSB Contest

NOVEMBER 1988

11 — 13 Japan International DX Contest
12 — 13 European RTTY Contest
12 — 13 OK DX Contest Phone and CW (Rules this issue)
— 12 ALARA YL/YL Contest (Unconfirmed date)
— 13 BATC SSTV/FSTV All Bands Contest
26 — 27 CQ WW DX CW Contest

29TH SCANDINAVIAN ACTIVITY CONTEST RESULTS

The 29th Scandinavian Activity Contest results have now been announced and I will list the VK participants and the scores obtained.

1. VK2BQQ 4840 points
2. VK4TT 840 points
3. VK4XW 630 points
4. VK4XA 357 points
5. VK5AGX 300 points

The continental plaque winners in the CW section are:
Africa JG1FVZ/5N0
Asia UA9SA
Europe YU4AU
North America VO1SA
Oceania YB2FEA
South America PK2KT

And in the Phone section are:
Africa EA9IE
Asia UA9TS
Europe UT5DK
North America VO1SA
Oceania YC2CTW
South America CX8BBH

DXers will note how familiar most of the listed call signs are and how they can be heard in most of the big pile-ups generated by DXpeditions.

29TH SCANDINAVIAN ACTIVITY CONTEST — 1988 RULES

CW — September 17, 1500 UTC to September 18, 1800 UTC.
Phone — September 24, 1500 UTC to September 25, 1800 UTC.
Logs to be forwarded to the SSA Contest Manager, Jan Eric Rehn SM3CER, Lisataet 18 86300, Sundsbruk, Sweden.
General rules for non-Scandinavians are as follows:
1. Aim of Contest — to promote communications skills between amateur stations world-wide. Non-Scandinavians will try to work as many Scandinavian stations as possible.
Scandinavian stations are defined by prefixes as follows:
LA, LB, LG, LJ (Norway), JW (Svalbard and Bear Island), JX (Jan Mayen), OF, OG, OH, OI (Finland), OH0 (Aland Island), OJ0 (Market Reef), OX (Greenland), OY (Faroe Islands, OZ (Denmark), SJ, SK, SL, SM (Sweden), TF (Iceland).
2. Eligible entrants: radio amateurs as well as SWLs world-wide.
3. Periods: CW third full weekend in September — Phone fourth full weekend 4. Sections—
a) Single operator single transmitter, all bands only. Single operator single transmitter, all bands QRP. Single operator: one person performs all operating logging and spotting functions. only. Multi-operator must remain on the same band for at least 10 minutes. QRP operators may use stations with a maximum input of 10 watts.
b) Multi operator single transmitter, all bands only. Only *one* signal allowed at any *time on any* band. The station must remain on the band at least 10 minutes after first QSO on that band after band change.
c) SWL. Only single operator, all bands. Log must contain: Date/Time UTC, band, station heard, message sent by Scandinavian station, SWLs own report, station worked by Scandinavian station, multiplier, points. Only Scandinavian stations may be logged for points. Scoring as for transmitting sections.
All Sections:
The use of multiplier spotting assistance from other persons than the station operator/s is not allowed.
5. BANDS — 3.5, 7, 14, 21, and 28 MHz according to IARU band plans.
3.560-3.600, 3.650-3.700, 14.060-14.125 MHz should be kept free of contest activity.
6. EXCHANGES — Consist of RS/T plus a serial number starting with 001. QSO after 999 are numbered 1000, 1001, etc. The same station may be worked once on each band. Only CW/CW and phone/phone QSOs are valid.
7. SCORING — Two way QSO with sent and received exchange counts for QSO points. Non-Europeans score one point for every complete Scandinavian QSO *on 14, 21 and 28 MHz* and with three points for such QSO on 3.5 and 7 MHz.
8. MULTIPLIER — Worked all call number areas (0 to 9) are valid on every band in each Scandinavian country.
Portable stations without district number counts for the 10th area; eg G3XYL/LA counts for LA0.
OH0 and OJ0 OH0M are separate call areas. SJ9 counts for the ninth call area in SM. (eg SM3, SK3, SL3 count as one multiplier, not three multipliers on each band).
9. FINAL SCORE — Multiply the sum of QSO points from all bands with the sum of multipliers worked on all bands.
10. LOGS — Signed original logs (or copies of original logs) must be submitted separately for CW and phone. Logs to be filled out in the following order; Date and time in UTC, Station worked, sent and received exchange, band, multipliers (eg OZ4, SM4, OH0, etc) and points.
SWL logs must contain; Date and time in UTC, band, Scandinavian station heard, message sent by Scandinavian station, SWLs own report, station worked by Scandinavian station, multipliers, points.
SUMMARY SHEET — All entrants must be followed by a summary sheet showing station call sign, category, *name* of operator/s and address. Indicate number of QSOs per band less duplications, number of duplicates per band, multipliers per band, QSO points per band and final score.
MULTIPLIER SHEET — All entrants must submit a multiplier sheet for each band with more than 200 QSOs.
DUPLICATE QSO SHEET — Possible duplicate QSOs must be shown in the log and counted for zero points. Each entrant shall submit a duplicate QSO sheet for each band with more than 200 QSOs. Duplicate sheet to contain worked stations lists, eg DXCC countries and call areas.
11. DECLARATION — By his/her signature on the summary sheet the participant declares, that all rules are observed and that the station was operated in accordance with the rules and regulations for amateur radio stations in the country of the participant.
12. ADDRESS FOR LOGS — The arrangements alternate *between* SRAL, SSA, NRRL *and EDR*. See above for this year's address.
13. CLOSING DATE: Logs and sheets, addressed to the organising league shall be mailed not later that October 30, 1988.
14. AWARDS — Top scorers in each country, in each category, additional awards depends on the number of entries received.

Thanks to Eric OH4NR/OH8RC/OH6DX/OH7RS for these rules. Please note that the 31st SAC in 1989 will be arranged by NRRL Norway.

The whole book of results and rules, etc, contains 49 pages and for obvious reasons I have only used the relevant sections of interest to VK amateurs. Good luck to you and I hope to be able to list a couple of VK call signs as winning the Oceania plaques after this next contest.

VK2BQQ has kindly sent a copy of the rules for the OK DX Contest. These, like the SAC and BERU remain virtually the same each year so it would be a good idea to take a photocopy of them.

OK DX CONTEST 1988 RULES

The Czechoslovakian Central Radio Club has the honour to invite amateurs world-wide to participate in the annual OK DX Contest.
1. CONTEST PERIOD — Every second full weekend *in November*.
1988 November 12/13.
1989 November 11/12.
24 hours, 1200 UTC Saturday to 1200 UTC Sunday.
2. MODE — CW and Phone.
3. BANDS — 1.8, 3.5, 7, 14, 21, 28 MHz.
4. CATEGORIES
a) Single operator all bands.
b) Single operator single band.
c) Multi operator all bands (club station).
d) SWL.

Any station operated by a single person obtaining assistance such as keeping the log, monitoring other bands, tuning the transmitter, etc, is considered to be a multiple operator station. Club stations my compete in Category C only. Only one transmitter and one band is permitted during the same time period (defined as the 10 minute rule). That means a station can change bands after 10 minutes operation on it.
5. CONTEST EXCHANGE — Signal report (RS or RS/T) and number of ITU zone.
6. SCORING — A station may be worked once per band regardless of the mode. Cross-mode and cross-band contacts are not valid.
One point for a complete contact with anther DXCC *country*.
Three points for a complete contact with OK/OL station (OK4/MM counts one point for everyone).
Zero points for complete contact with own DXCC country (counts only as a multiplier).

7. MULTIPLIERS — Sum of different ITU zones worked on each band.
8. FINAL SCORE — Total QSO points from all bands times the sum of the multipliers.
9. LOG INSTRUCTIONS
1. All times must be in UTC.
2. Indicate zone multiplier only for first time it is worked on each band.
3. Logs must be checked for duplicate contacts, correct QSO points and multipliers.
4. For each duplicate contact or multiplier that will be removed from the log by the committee, a penalty of three additional contacts of the same points will be exacted.
5. Use separate sheet for each band.
6. Each entry must be accompanied by a summary sheet showing all scoring information, category, contestants name and address and a signed declaration that all contest rules and regulations have been observed.
7. All entrants are encouraged to submit cross-check sheets for each band on which 200 or more QSOs were made.
10.AWARDS — First place certificate will be awarded in each category for top scoring station in each DXCC country, all scores will be published.
THe "100 OK", "OK SSB" and "SLOVENSKO" awards may be issued upon a separate application (No QSL cards are required for contacts made during the OK DX Contest).
11. DISQUALIFICATION — Violation of amateur radio regulations in the country of contestant or the rules of the contest, operation in an unsportsman-like manner, manipulating scores or times to achieve a score advantage, unverifiable contacts and multipliers are grounds for disqualification. Decisions of the contest committee are final.
12. DEADLINE — All entries must be postmarked no later than December 15, and should be mailed to: The Central Radio Club, PO Box 69, 11327 Parha 1, Czechoslovakia.

Any photographs from the contestants will be appreciated . . . OK2FD, OK Contest Manager.

A letter from the BATC Contest Manager, Mike Wooding, 5 Ware Orchard, Barby, Nr Rugby, Warks, CV23 8UF, UK, informs us that the contest to be held this month is now an official IARU contest, and that the European societies have agreed that the contest will be run by a different member country each year. This next contest will be run by Belgium and the BATC will run the 1989 contest. Mike did not send a copy of the rules so it will be up to you slow scan operators to find out as best you can for this year's event and I will try to get a copy in time to publish for the 1989 contest.

IARU ATV (International) Saturday, September 10, 1800 UTC Saturday to 1200 UTC Sunday FSTV. Operation is on all bands.

In the July issue of *Amateur Radio* the list of those amateurs who lost their lives when on active service during the second world war contained an error that had appeared some years ago and had not been corrected.

Don Shaw VK3PV/VK2BDS, has kindly put the record straight and I would like you to amend the list under VK3PV to read:
VK3PV R P Veall, Australian Merchant Navy.

VK/ZL/OCEANIA SAMPLE LOG

After all the many and varied logs that came in for the 1987 contest, and as I felt some stations were perhaps "missing out", in order to help future contest managers it would be appreciated if entrants use summaries similar to the following:

SUMMARY SHEET
VK/ZL/OCEANIA CONTEST 19XX
SSB SECTION ON XX XX 19XX
VK4AHD

Brian Beamish VK4AHD
35 Chester Road
Eight Mile Plains, Qld. 4123

BAND	QSOs	POINTS	MULTI-PLIERS	SCORES
		(For individual bands)		
160	16	320	6	1920
80	46	460	15	6900
40	155	775	110	85250
20	166	166	93	15438
15	111	222	73	16206
10	25	75	23	1725
TOTAL	519	2018X	320 =	545760 points

All rules and regulations have been observed to the best of my knowledge and checked for any duplicates, etc.

Signed: Brian Beamish VK4AHD
XX XX 19XX

VK/ZL/O CONTEST 1987 RESULTS

ASIA CW

HL1LW	1160	HL1XP	1968
JA1AAT	84	JA1BNW	3472
JA1BUN	1260	JA1JGP	704
JA1OP	24	JA1YAD	3080
JA2DN	3248	JA2KPV	312
JA3UWB	1924	JA4AQR	40
JA6BWH	1700	JA6SHL	1584
JA7ASD	2340	JA7YFB	2968
JA8CJY	320	JA9CWJ	60
JA9FT	39	**JA0DAI***	14884
JE1AER	3432	JE1CKA	9400
JE2IEQ	3024	JF2VDY	5070
JH3JYS	280	JH6WHN	72
JH8GEU	3596	JI6DMN	96
JO1QZI	570	JR3BOT	5668
JR4ISK	8		

ASIA SSB

HL1LW	4864	HL1XP	6084
JA1BUN	578	JA3SSB	40
JA3YBF	10530	JA4CUU	6960
JA6QDU	154	JA7AQR	4234
JA7YFB*	**16800**	JA8YBY	15744
JA9YBA	4032	JA0UMV	3036
JE1AER	4028	JE2IEQ	3060
JF1XOO	18	JG3QCW	3848
JH2SGC	126	JH6WHN	40
JI6BJQ	378	JK3QZU	9912
JL3WSL	1040	JO3DWD	8
JS1WOZ	72	JR1ZTT	630
JR2TRC	50	JR3BOT	7514
JR3KAH	264	JR4ISK	18
JR5EPR	25	JR7OMD/2	510

ASIA SWL

JA8-5871	242	JA8-3769	648

USSR CW

RA0JJ	720	RA0YB	CHECK
RA1QE	CHECK	RA3DX	2784
RB5IA	320	RB5MA	650
RB5UX	CHECK	RB5WA	616
RB5WR	162	RW4LYL	1510
UA0BCK	306	UA0LCZ	3888
UA0QO	4144	UA0SAU	10620
UA1OIZ	CHECK	UA1OT	48
UA1QCC	32	UA3EAY	CHECK
UA3PB	CHECK	UA3PNN	24
UA4HNP	4270	UB4JZV	320
UA4NBH	CHECK	UA6AF	1232
UA6LCT	396	UA9NN	312
UA9SAW	CHECK	UA9UZC	476
UA9XCI	40	UA9XR	216
UA9YI	5772	UB0YW	442
UB3IWA	9800	UB4MZL	3038
UB4ZWB	4216	UB5EF	CHECK
UB5IKN	380	UB5INN	546
UB5IRM	594	UB5NQ	240
UB5QGD	CHECK	UC1AWZ	57
UC1WWF	736	UC2ACZ	504
UC2AS	CHECK	UD67DZ	65
UD6DKW	6	UI9AWX	INCOMPLETE
UJ8JA	2976	UL7CAC	16
UL8CWW	198	UM8MAA	32
UM9MWO	468	UO5OAL	398
UO5WU	200	UP1BWW	3060
UP1BYL	504	UP1BZA	3456
UQ1GWW	11220	UT5DK	1480
UT5RY	80	UW3TU	286
UW6AU	CHECK	UW9AO	390
UZ0AXX	11550	**UZ0CWA**	15444
UZ0CWW	1122	UZ0JWA	7360
UZ0QWA	12100	UZ1AWT	6808
UZ1CXF	CHECK	UZ1NWO	50
UZ1OWZ	144	UZ1ZZZ	506
UZ4WWB	152	UZ6LWZ	2378
UZ6YWB	992	UZ9CWA	7380
UZ9OXI	598	UZ9XXM	18

USSR SSB

RA0JB	CHECK	UA0FF	1035
UA0LCZ	260	UA0SAU	8970
UW0ZF	3776	UZ0QWT	1872
UW0ZF	CHECK	UZ0CWA	16324
UW0JWA	3776	UZ0QWT	1872
UW0WWA	144	UA1DZ	6528
UC1WWF	560	UQ1GWW	17670
UZ1CXF	756	RR2RR	1386
UC2AI	176	UP2BR	816
RA3DJA	CHECK	RA3DX	950
RZ3DX	1054	UA3ASL	CHECK
UA3TN	40	UV3DF	CHECK
UV3DN	CHECK	UA4HNP	2050
UA4NC	CHECK	UB4QWW	3000
UB4XWB	7140	UZ4FWA	196
RW4LYL	3038	RB5EX	CHECK
RB5DX	240	RB5LL	1508
RB5IA	392	RT5UO	CHECK
UO5OQ	28	UB5MNO	175
UT5RY	1088	UT5DK	2952
UA6LQ	6272	UF6DG	35
UD6DR	30	UZ6LWM	552
UL8LWA	2070	UL8CWW	3
UL8LWZ	1394	UM8MIG	72
UA9YI	3220	UI9BWE	2968
UZ9CWA	4896	UZ9OXI	992
UZ9XWH	176	UB4IZA	72
UB5IAK	1160	UB5WE	603
UI9AWH	352	UL8LYA	8692
UP1BZA	13224	**UZ0AXX***	**21172**
UZ0OWO	CHECK	UZ4WWB	224
RB5MF	6540	RL7JA	CHECK
RM8MA	432		

USSR SWL

UR2-083-200	1840	UA2-125-217	58
UP2-038-1751	264	UP2-038-1580	
			24 HOUR
UP2-038-1220	2016	UP3-170-565	32
UA3-170-372	328	**UB5-073-2589***	**8820**
UB5-073-3135	418	UB5-073-1610	1368
UD6-001-220	340	UM8-036-101	468
UA9-145-30	6996	UA9-161-264	572
UA9-154-2105	252	UA9-161-298	1620
UA9-167-837	752		

NORTH AMERICA CW

KF1Z*	**1674**	N6ADI	1102
NL7DU	140	W8UVZ	850

NORTH AMERICA SSB

K6SVL*	**4450**	VE3BXY	2

SOUTH AMERICA CW

YV1OB*	**768**		

SOUTH AMERICA SSB

LU1LDL*	**46**		

OCEANIA CW

K1BAZ/DV1	11472	YB2FEA	5304
C21XX	**48372**	YB4FN	1620
YC0TMZ	726	YC5PD	5876

EUROPE CW

DJ4SO	1428	DL1SV	588
DL3RD	208	EA1AUI	160
EA2CR	60	EA5CLO	140
G5MY	704	HA4XX	CHECK
HA5KHC/8	39	HA6KVB	884
HB9DX	396	HB9IK	1600
HB9MM	792	LA2EG	162

LA7MFA	264	LZ1KVF	18	**DL8FM***	7956	EA3AAY	924	Y36SG	CHECK	Y46IF	CHECK
LZ1KSP	672	LZ1LZ	1176	EA3ELM	CHECK	HB9DX	144	Y24NG	176		
LZ2TU	CHECK	OE7TKW	24	HB9IK	450	I1VXJ	484				
OF4RH	390	OH2PM	126	I8RS	2686	LA9REA	CHECK	EUROPE SWL			
OK1KZ	32	OK1OND	126	LZ1KSP	132	LZ2RS	CHECK	HA2-013	2160	LZ1C187	1490
OK1US	CHECK	OK1VD	1020	OE1TKW	32	OE3PSA	1064	LZ1E229	6836	OK2-3947	246
OK2BGR	32	OK2PDT	24	OF1ZAA	2100	OH1AD	3528	YO9-17412/TR	25	Y32-10-F	2522
OK3TAY	50	SM3CVM	CHECK	OH2BUU	182	OH2PM	1886	Y45-09-B	5028		
YO8CDQ	2	YO9BVG	18	OH6PA	160	OF3GD	8				
YO9CYD	36	YO9DAF	44	OK1KZ	72	OK3CSR	120				
Y33VL*	2520	Y35VM	850	OK1LNZ	2	OZ2X	80				
Y21KF	176	Y44PF	144	SM6OOI	108	SP6FAF	64				
Y22UB	60	Y22HF	50	YO3DCO	80	YO3YC	98				
Y36SG	8	Y31CB	40	YO8CDQ	2	YU1KQ	3002				
Y21CL	CHECK	Y21PE	CHECK	Y54VA	7564	Y78SL	780				
Y24XJ	CHECK	Y31JA	CHECK	Y44PF	418	Y24XJ	216				
Y43VL	CHECK			Y36TG	198	Y23DG	196				
				Y57ED	18	Y41ZA/Y36RG	32				
EUROPE SSB											
CT1BOP	574	DJ9ZB	360								

PLEASE NOTE: Changes have been made to the total scores in the Oceania sections due to incorrect interpretation of the rules. This applies to both the CW and SSB sections.

OCEANIA SSB			
C21XX*	144592	K1BAZ/DV1	13800
YC5ODQ	5302	9M6AE	7680
ZK1XG	6160		
AFRICA SSB			
CT3BM*	448		

VK/ZL RESULTS
CW SECTION

CALL	OPEN	10m	15m	20m	40m	80m	160m
VK2BQQ	188739						
VK2PS	116740	507	1932	1750	8550	5100	960
VK2APK*	645760	1725	16206	15438	85250	6900	1920
VK2KM	108362						
VK2AIC	13132						
VK2AOF	99684		2160	8307	5550	3900	20
VK2AYD	487039	75	15360	13206	104940	5890	
VK2DID	92070		2352	13800	3640	1980	
VK2SU	3424						
VK3XF	1888			288		1600	
VK3CQ*	167425	3	13860	10287	1615	2610	1400
VK3XB	142807						
VK3AMD	3040						
VK4SF					64175		
VK4TT*				40020			
VK4XA*	535040	5928	15708	15561	49610	11280	360
VK4XW	15708						
VK5GZ	20658						
VK5AGX	84189						
VK5ADX*	260984						
VK6AJ*	258156		50430	13083			
					12455		
VK7RY*	4219						
ZL1AIH						31820	
ZL1AIZ*	451200		216	4902	106200	33000	1120
ZL1BN	37638	1440	1296	792	2900	770	
ZL1BSG	60016						
ZL1IM	23030						
ZL1HV	93891						
ZL2AGY*	492407	1716	532	7070	169200	9600	
ZL2IN	26550			504	980	1200	1540
ZL3AGI*	13885						
							SSB SECTION
VK1RJ*	29900						
VK1ZF	5720						
VK1RH	3564						
VK2PWI			15042				
VK2VZB	Check	Log					
VK2ABC				1715			
VK2BQS	1632						
VK2AYK				13860			
VK2KA				49			
VK2PS	69015		144	8774		2160	2240
VK2APK*	300118		476	10502	40825	8700	1200
VK2MCF	1008						
VK2CXX	59976						
VK2HS/P	9532						
VK2AIC	4350						
VK2WA				1015			
VK3IO*							12300
VK3XF			1110				
VK3AKK*	289883		32	1731	188330		
						40760	
VK3YH	18054						
VK4OH*	216784		19706	71659	400	150	
VK4OD	Check	Log					
VK4NCM	Check	Log					
VK4NEF	53692		7008			10080	
VK4BJD						18270	
VK4XJ	Check	Log					
VK4PJ				35568			
VK4AQD*	172596			78792	1360	3080	
VK5QK*	172596			78792	1360	3080	
VK5RK			144				
VK6ANG*	28733						
VK6AFW	9367						
ZL1AAS*	392739						
ZL1AXB*			206485				
ZL1BVK						36600	
ZL1AIZ*				47175			
ZL1MQ	54780		1804	5074	1440	1260	400
ZL1AF*	12320			1628	3600		
ZL2AFY						40280	
ZL3TX*	13002						

Open winners in each call area marked *.
Winners on each band marked *.
Both are high-lighted in bold type.

—Contributed by Brian Beamish VK4AHD
ar

PROFESSIONAL ANTENNAS NOW AVAILABLE FOR THE SERIOUS AMATEUR!

Scalar brand antennas are well known in the government, military and commercial communications markets and are exported to many countries around the globe. Scalar has been in business since 1973 making it the oldest Australian-owned major antenna manufacturer. Early this year the Scalar Group of companies were acquired by Vicom International Pty Limited who are substantially expanding Scalar's activities. The new antenna company is now called Vicom Scalar Pty Limited. We are now able to offer amateurs some of the extensive range of antennas previously only available on the commercial market. Please note that sales are mail order only, cheque or bankcard with order. All prices include P&P for delivery anywhere in Australia. Regards, Michael Goode, VK3BDL, General Manager.

2 METRE ANTENNAS

M12T Stainless Steel ¼ wave, unity gain	**$7.33**
M22T Fibreglass ¼ wave unity gain	**$11.53**
M23TL Stainless Steel wave 3dB gain	**$36.91**
M25T Fibreglass wave 3dB gain	**$28.52**
M26T Fibreglass helical 30" 3dB gain	**$27.36**
GRH/T Ground independent 3dB S/Steel whip	**$51.82**

70 CM ANTENNAS

M31 Stainless Steel ¼ wave unity gain	**$8.74**
M45 Flexible PVC covered ¼ wave unity gain	**$8.23**
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OW450 "On-Glass" 3dB kit	**$160.48**

6 METRES

M60T Fibreglass ¼ wave unity gain	**$29.00**

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HA610T 10 metre helical	**$77.11**

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KW10 resonant freq 28.475	**$81.00**
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W2AU 1:1 balun 2Kw 1.8 to 54 MHz	**$81.73**
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MS Medium duty spring for VHF whips	**$23.38**
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IS Heavy duty spring for HF whips	**$56.75**

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Model OW 150

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Frequency	140-174 MHz
Nominal Impedance	50 Ohms
Maximum Power	150 Watts
Bandwidth (1.5:1)	10 MHz

— MECHANICAL SPECIFICATIONS —

Radiators	17-7 Stainless Steel - Copper Clad with Black Chrome Plating
Radiator Lengths	20 inches (50.8 cm)
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Connector	Miniature UHF
Cable	RG 58 U, 15½ feet (4.7 M) long with Antenna Connector installed Radio Connector Supplied Loose

- **No Hole**
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- **Small Size**
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Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

VK2 AWARDS

Commencing on January 1, 1988, the VK2 Division introduced a range of awards. It was not long before the first applications were being received. Below is a report on those received by early July.

Bicentenary of Australia Awards 1788-1988: Requirement is to work 200 stations during 1988. For those outside VK2, they have to work 200 VK2 stations. VK2s work any 200 stations.

Alick Pickford VK2EF
April 5 — 200 stations
May 7 — 200 VK stations
June 22 — 200 VK2 stations

John Buxton VK2XJB
June 3 — 200 stations on two metres

Fred Baker VK2YZU
June 3 — 200 stations on six and two metres

Jim Swan VK2BQS
July 11 — 200 stations mostly made in RTTY mode.

National Parks Award
Within VK2 there are at present 66 National Parks, 21 State Recreation Areas and 13 Historic Sites. The award can be worked either from or to the various locations. No time limit. Minimum of 25 locations required.

Peter O'Connell VK2EMU
April 26 — Worked from 25 locations all on 80 metres

David Folkes VK2KHZ
May 27 — Worked to 25 locations

NSW CITIES, MUNICIPALITIES AND SHIRES AWARD
In VK2 there are 30 cities, 32 municipalities and 113 shires. Minimum 25 locations to be worked with no time limit.

Allck Pickford VK2EF
March 25 — 25 mixed locations
April 8 — 25 shires
May 3 — 50 shires

John Buxton VK2XJB
April 20 — 25 mixed locations
David Folkes VK2KHZ
May 7 — 25 shires plus 25s award

Details of the various VK2 awards is available in a printed form. Copies are available from the VK2 Divisional Office. If required to be posted, please include two stamps to cover production and postage. All clubs have a copy of the awards so check with them.

In addition to these awards there are two special series in VK2 during the latter part of this year. The first is the one day award on September 22, using the call sign VI88WIA, for the 70th *anniversary of* the first radio message between Australia and England.

See the article elsewhere this issue for details.

The other special award is the Bicentenary of Parramatta award, using VI88NSW, for the month of November. Requirements are to work the station at 10 locations in Parramatta.

There will be an article on this in the October issue of *Amateur Radio.*

—Contributed by Tim Mills VK2ZTM

FISK AWARD

An *important* and historical event in the development of world-wide communications by wireless occurred on September 22, 1918, when the first closing years of the last century, I had striven to direct wireless messages from England to Australia were received at Wahroonga, 20 kilometres north of Sydney, New South Wales.

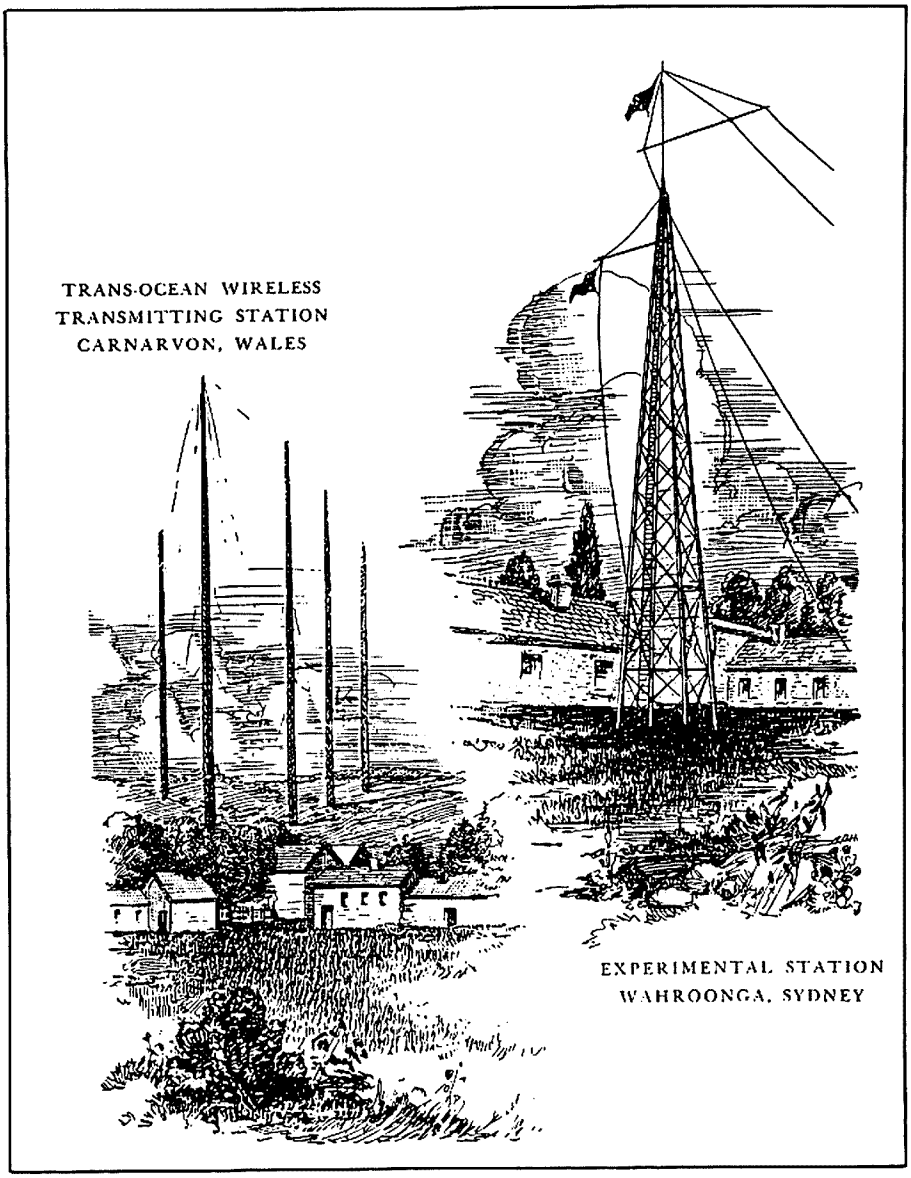
This achievement marked both the culminating point in a long period of research and the foundation of those long-distance wireless telegraph, wireless telephone and broadcasting services which today link Australia so efficiently with the rest of the world.

A monument has been erected to establish a suitable lasting memorial at Ernest Fisk's home, "Lucania" 1 Stuart Street, where the messages were received. During the unveiling ceremony, which took place on December 14, 1935, His Excellency The Marchese Marconi addressed the assembly by wireless from Paris.

"Although it is nearly 20 years ago since I directed the transmissions from the high-powered station at Carnarvon, which resulted in the conveyance of the first direct telegraph message to reach Australia from this country, it gives me immense pleasure to be able to take part in your ceremony today.

"Over a considerable period, in fact, since the

Draft Copy of the Fisk Certificate.



give to the world generally and to the British Empire in particular, improved and cheaper means of communication. Not a little of this time had been devoted to the development of systems which would afford mariners a surer and safer aid to navigation and thereby a larger measure of safety and security for the passengers who travelled with them. My work in the cause of navigation on sea and i air is not yet finished.

"It is natural, perhaps, that I should also have devoted considerable time and research to methods which would bring Great Britain into closer and more intimate touch with its Dominions and Colonies across the seas.

"There were many people, some, I am afraid, of high technical achievement, who discounted my ambitions, but encouraged by the results of my earlier experiments and happily by so many who had followed and appreciated my work, I could not be satisfied until my theories and ideas had been put to the practical test.

"Simultaneously in Australia, my friend Fisk, who is with you today, was conducting experiments with a very similar object in view. In the Autumn of 1918, when I decided to make my first series of tests in an endeavour to reach Australia without the assistance of intermediate stations, I found Fisk in readiness to bring to the experiment the wealth of knowledge and experience that he had accumulated.

"On your monument today is recorded the text of the first radiogram to reach Australia direct, as the result of those first experiments. In shorter time than it takes to read the message, it had covered those 12000 miles or more in its travel from the homeland. Thus was laid the foundation of the speedy and highly efficient system of wireless communication, which today connects you with the capital of your Empire and which has done so much in the interests of commerce.

"Australia is indeed to be congratulated for having still at its disposal the services of so distinguished an engineer as E T Fisk. His skill and research have been of inestimable value in giving Australia and the Western Pacific a system of wireless communication, both telegraphic and telephonic, which is able to take its part on equal terms with other high speed and modern systems in operation the world over.

"In conclusion, may I say that it has given me genuine pleasure to be associated with the unveiling today of the Wahroonga monument to mark the now historic spot which had so important a part in my earlier experiments.

"It is indeed gratifying to me to know that the people of Australia appreciate the extent to which wireless has figured in their commercial prosperity, for without inexpensive and efficient communications no country can make headway."

At the unveiling ceremony The Right Honorable W M Hughes, PC, KC, Prime Minister of Australia, 1915-1923, said that "wireless was a miracle which had opened up a new world far more spacious than that discovered by Columbus. Nothing would do so much to promote international peace as that modern miracle. They should honour men like Marconi and Fisk, who had done so much to perfect that wonderful means of communication."

Ernest Fisk said the ceremony was an indication that his fellow citizens recognised the work he and his assistants did, as being of benefit to the world, and especially to Australia.

In 1901, Marconi sent the first signals across the Atlantic Ocean, without any physical conductor. In 1917, the station at Carnarvon in Wales was opened by Marconi for the purpose of communication between Great Britain and North America. At this time, Fisk and Marconi discussed the possibility of communication with Australia. Scientific men said this was impossible. Experiments lasting many months were conducted at Wahroonga. These resulted, first, in hearing indistinct signals from Carnarvon, and finally, after much research, in the recording of clear and lengthy messages.

The result of those experiments appealed to Mr Hughes, who fought single-handed at the next Empire Conference for direct wireless communication between various parts of the Empire and Australia. He succeeded in ultimately overcoming opposition, and thus enabled wireless to make its great contribution to the social, political and general welfare of the Empire.

Marconi was a great international figure who had taken his wonderful discovery to Great Britain, which was the first country to adopt and develop Marconi's great inventions. In Australia, Fisk was assisted in his experiments by a large number of AWA engineers.

The monument is constructed mostly of Australian trachyte, and comprises a base, die and column surmounted by a globe of the same material. On each of the four corners of the base is a bronze lion to symbolise Great Britain; the globe shows outline maps of the two countries connected by a lightning flash. The whole is surmounted by a bronze figure of Mercury, the messenger of the Gods. The design was conceived and executed by the architect, James Vicars F R A I A.

On three faces of the base of the monument a bronze tablet tells the story.

I.

THE FIRST DIRECT WIRELESS MESSAGE FROM ENGLAND TO AUSTRALIA SENT UNDER THE DIRECTION OF THE MARCHESE MARCONI, FROM THE MARCONI WIRELESS STATION, CARNARVON, WALES, WAS RECEIVED BY E.T.FISK, ESQUIRE, FINST.R.E., A.M.I.E.(AUST.), IN THE EXPERIMENTAL WIRELESS STATION ATTACHED TO HIS RESIDENCE, "LUCANIA", HERE ON 22ND SEPTEMBER, 1918

II.

THE FIRST DIRECT WIRELESS MESSAGE SENT FROM WALES BY THE RIGHT HON. W.M.HUGHES. P.C.K.C. PRIME MINISTER OF AUSTRALIA:
"I HAVE JUST RETURNED FROM A VISIT TO THE BATTLEFIELDS WHERE THE GLORIOUS VALOUR AND DASH OF THE AUSTRALIAN TROOPS SAVED AMIENS AND FORCED BACK THE LEGIONS OF THE ENEMY. FILLED WITH GREATER ADMIRATION THAN EVER FOR THESE GLORIOUS MEN, AND MORE CONVINCED THAN EVER THAT IT IS THE DUTY OF THEIR FELLOW-CITIZENS TO KEEP THESE MAGNIFICENT

BATTALIONS UP TO THEIR FULL STRENGTH."

The third tablet is dedicated to the people who erected the monument.

On September 22, 1988, to commemorate the 70th anniversary of this great event, an award may be gained by contacting the Special Station, VI88WIA at Wahroonga. The station will be operating for 24 hours only, working UTC time, on 3.570, 7.070, 14.170, 21.170. 28.570 MHz, plus or minus depending on QRM and propagation. Locally the call may be heard on two metres, 70 centimetres and two metres packet (147.575 MHz).

The award may be obtained from one two-way contact. Such a contact is to be confirmed by the applicant's QSL card and a $3 fee within Australia to cover production and postage costs. Overseas costs $A5 or equivalent in US funds. Shortwave listeners will be eligible to receive the award on receipt of hearing one reported contact with VI88WIA plus the appropriate fee.

Applications should be addressed to: VI88WIA, PO Box 600, Wahroonga, NSW. 2076.

—Contributed by Jo Harris VK2KAA, NSW Divisional Historian

HMAS SYDNEY AWARD CERTIFICATE

The Royal Naval Amateur Radio Society, NSW Chapter is introducing an HMAS Sydney Award Certificate 1988 on the occasion of the visits to Sydney by a Royal Naval Fleet, including HMS Ark Royal, with supporting RN ships and a Dutch Task Force led by HNLMS Witte de With. There will be about 40 ships in all in honour of our Bicentennial Year.

The award will feature four HMAS Sydneys of the RAN, commissioned from 1913 to 1988, their histories and battle honours.

Validity: QSOs or SWL reports made, with members of the NSW Chapter of RNARS after September 26, 1988 until December 1, 1989. Member's numbers are required for the award; eg 8888/88 on log sheets or SWL reports.

Two points for a club station and one point for each member.

VK amateurs and SWLs require 10 points, DX stations require six points.

QSOs are to be direct simplex, any amateur mode or band. Endorsements for CW, SSB, etc are available as appropriate.

The award will be of a high quality. Costs: $4.50 for award certificate or five IRCs. Include a self-addressed and stamped 26 x 20 cm envelope for the award which will be protected by the club station for return to the applicant.

Members of RNARS NSW Chapter may be heard on the following frequencies and times (UTC):

3.615 MHz from 1000 to 1130 approximately, Mondays.

3.621 MHz from 0930 to 1030, Tuesdays.

7.020 MHz, 0200 Sundays — plus other times on Saturdays and Sundays.

14.052 MHz daily when the DX bands are open.

Please use standard log sheet format plus members name, numbers and OTH. SWLs standard SWL identified card including both stations worked. Please, do not forget to sign the submission and include your call sign.

Chapter committee decisions on validity and endorsements are final.

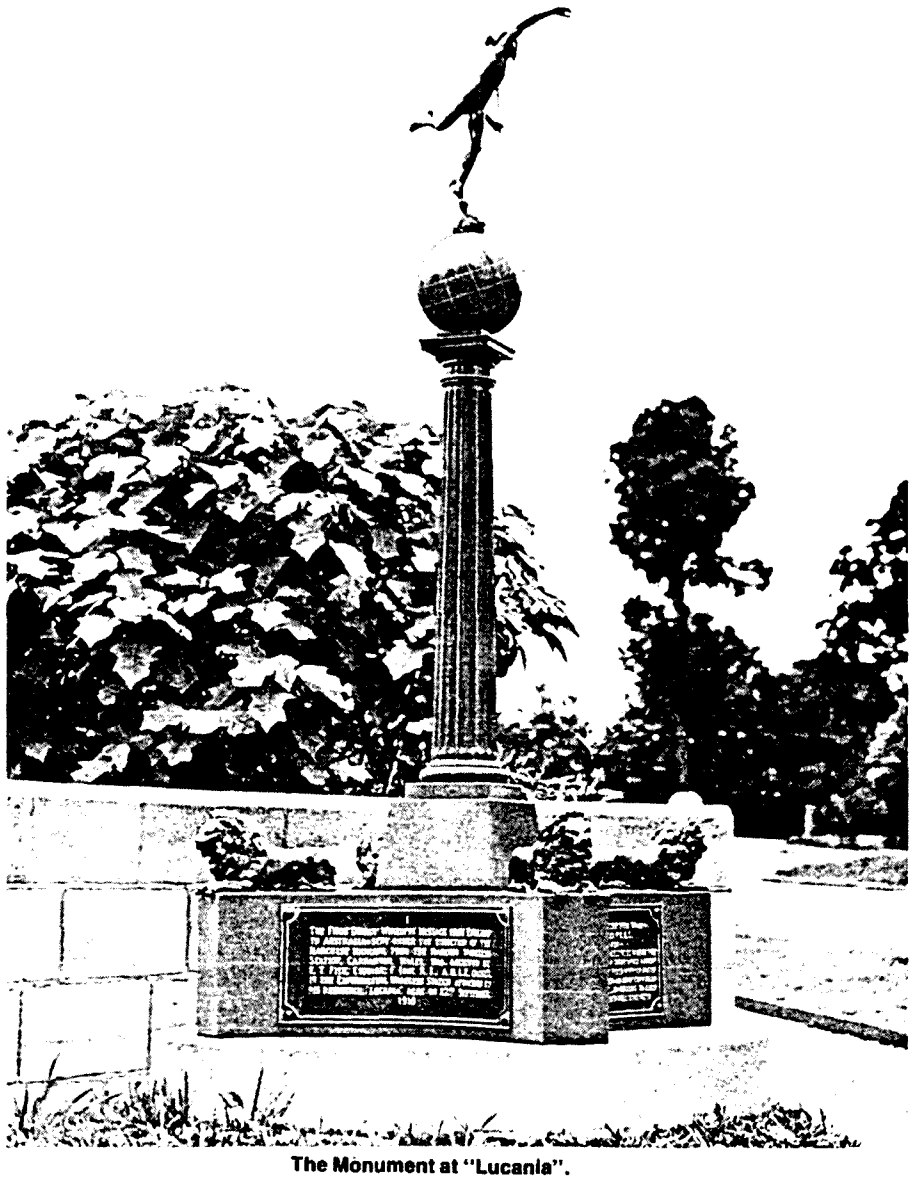
—Contributed by Gerry Aubert VK2CGA, Acting Honorary Secretary, RNARS, NSW Chapter

TEN-TEN INTERNATIONAL NET INC "TWENTY EIGHT" CHAPTER

Formed in January 1987, the Chapter announces an addition to the original series of awards offered.

This will be a series of 10 pennants, featuring nine towns of the south-west region and the "Twenty Eight" parrot, the towns featured being:

Augusta, Collie, Margaret River, Bunbury, Mandurah, Pemberton, Busselton, Manjimup and Yallingup.



The Monument at "Lucania".

This will be called "The Southwest Home of the Twenty Eight Parrot".

The basic idea of the awards is to help increase awareness and interest in the south-west region. Although the Chapter has only one member from the south-west at present, there are other members of "Ten-Ten" there and many others who regularly work on 10 metres.

Intended as a fun-event, rules specify that *both* members and non-members of "Ten-Ten" can be *worked in order to qualify for the pennants.*

However, only members of Ten-Ten may apply for the pennants! (Non-members can use QSOs to qualify for membership and there onward, for Chapter and Awards.

Pennants can be gained in any order, however "The Southwest-Home of the Twenty Eight Parrot must *include* at least one member of the "Twenty Eight" chapter in VK6.

If you live in or are operating from one of the designated towns, you become an "instant qualifier" for any member of 10X worked for that pennant (whether or not you belong to 10X).

Similarly, if you work a station in a designated town (as a member) you will also qualify for that pennant.

Otherwise, by working stations anywhere in the world collect the letters from each QSO to form the names of each town.

You can use up to three consecutive letters from each QSO.

QSOs from June 1, 1988 will be accepted for this ongoing award.

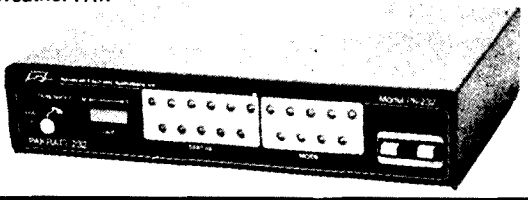
Cost of each pennant is $3 within Australia or US$3 for DX stations. This includes postage which may be adjusted for multiple applications.

For more information, join the weekly net each Sunday after the VK6 WIA broadcast, 0210 UTC on 28.560 MHz, or write to Dave Handscomb VK6ATE, PO Box 1073, Sublaco, WA. 6008.

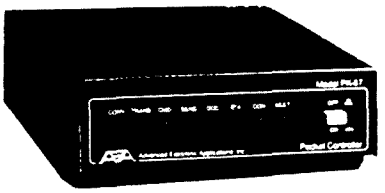
JOIN THE PACKET REVOLUTION!

New PK-232 Breakthrough

A new software enhancement makes the AEA PK-232 the only amateur data controller to offer six transmit/receive modes in a single unit.
★ Morse Code ★ BAUDOT (RTTY) ★ ASCII ★ AMTOR ★ Packet ★ Weather FAX



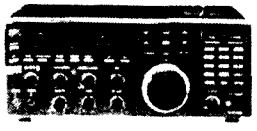
PRICE $649 WITH FAX



PK-87tm PACKET CONTROLLER $379

The PK-87 is not just another copy, it is much more. With all the packet program features of the Multi mode PK-232, the PK-87 is an economical new TNC designed to bring you enhanced completely compatible packet software plus new hardware features for improved packet operation.

COMM. RECEIVERS & SCANNERS



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Features — • Wide freq range — HF 90 kHz to 39 MHz and optional VHF/UHF band • 200 channels memory • Scan reception • Teletype reception (optional) • JDirect access tuning • Wide dynamic range • Clock timer • Interface with PC

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- KR 065 stay bearing
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This unique scanner covers 25 to 550 MHz and 800 to 1300 MHz range 20CH memories

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HF Transceiver specially designed for high performance, enhanced capabilities and ease of operation — features unique to JRC. With general coverage receiver, automatic antenna tuner (optional), two VFO systems, channel scanning, priority check 72 channel memory capacity, digital RIT, several interference rejection circuits and PC remote control capabilities makes the JST-125 one of the three top transceivers on the market.

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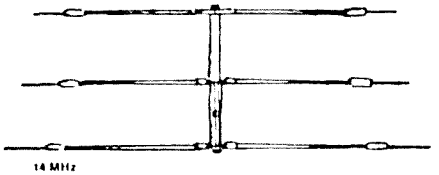
TET-EMTRON ANTENNAS

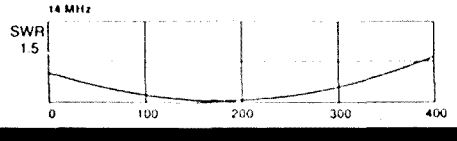
Dr. MAC TANIGUCHI of TET Japan has now joined EMTRON INDUSTRIES and improved his already famous "phase-feed" matching system based on the "HB9CV" concept. This new matching system provides an increase in gain, roughly comparable to adding another element to the antenna, while significantly improving the front to back ratio. The performance exceeds even conventional YAGI-UDA design and these new TET-EMTRON multiband beams exhibit extremely flat VSWR over a wide frequency range.

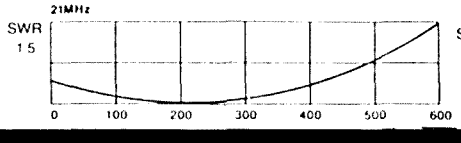
Our new antenna factory "TET-EMTRON" a division of EMONA ELECTRONICS is now producing a range of antennas aiming specially at the export markets of Japan, U.S.A. and Europe.

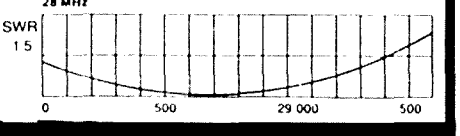


SPECIFICATIONS:

	HB33DX	HB43DX
Frequency	14/21/26 MHz	14/21/28
No of Elements	3/3/3	4/4/4
Gain (dBd)	8.5/8.7/8.3	9.4/9.5/9.8
F/B Ratio (dB)	22/24/21.5	24/24.7/22
VSWR	1.5 or better	1.5 or better
Power Rating	2 kW	2 kW
Impedance (ohm)	50	50
Element Length (metre)	8.25m	8.25m
Boom Length (metre)	4.0m	6.0m
Turning Radius (metre)	4.54m	5.1m
Wind Surface Area (m^2)	0.58m^2	0.74m^2
Wind Load (EIA STD 80 MPH)	56.7 kg	72.7 kg
Weight (kg)	15 kg	19.2 kg
Price	$580	$480







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FAX: (03) 670 0671

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416 Logan Road, Stones Corner
Qld. 4120
Ph: (07) 394 2555
FAX: (07) 394 4316

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

Part 2 — Trouble with HiFi, TV and Video Equipment?
by Arno Weldemann DL7AH

Electronic Disturbances
"The legal position, when disturbances occur — tips to overcome disagreements!"

The legal position was explained in Part 1, which should be read first, and the types of disturbances were described. The methods to overcome disturbances were described. The methods to overcome disturbances are now shown, using radio amateur means.

One can make UHF coupling capacitors by using double-sided epoxy printed circuit board (PCB). The typical double-sided 1.5 millimetre thick PCB has 3 pF capacitance per one square-centimetre area. These coupling capacitors introduce only a very small antenna power loss at the second and third television program (UHF IV and V). The insertion loss at program 1 (VHF) amounts to 7-10 dB. Usually the high field strength of the VHF transmissions will permit this order of loss. These conducted current blocking capacitors represent 7 kohm reactance on the 80 metre band. Their high pass effect also results in an improvement of the front end immunity. It is now possible to deal with any other equipment which suffers from insufficient immunity against conducted current disturbances, by further application of the same techniques. The mains plugs of Hi Fi systems (tuner, amplifier, turntable, tape recorder, etc) are all grouped together and plugged into a multi-position mains socket strip. A mains choke as described earlier is placed between the socket strip and the wall socket. The loud speaker cables have RF blocking chokes near the amplifier speaker terminals. Otherwise the cables would act like a dipole antenna (Figure 10). The RF blocking chokes do not affect the Hi Fi sound reproduction quality. The same methods can be used on organs and public address systems.

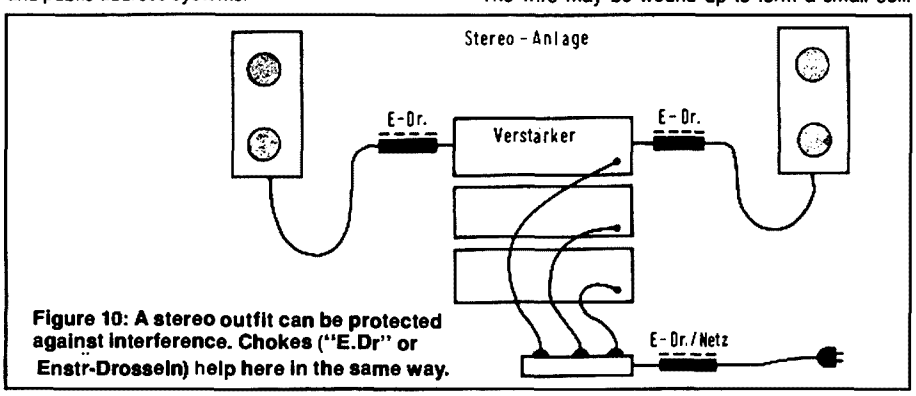

Figure 10: A stereo outfit can be protected against interference. Chokes ("E.Dr" or Enstr-Drosseln) help here in the same way.

Telephone answering recorders are treated by opening the large plug, unsoldering white and brown wire, and inserting two 100-200 uH chokes. These chokes are the size of quarter-watt resistors and cost about DM 1.20. A RF current blocking choke may have to be inserted at the mains cable, if the first measure was not completely successful (see Figure 11).

Older telephones may suffer from disturbance usually caused by demodulation of the unwanted signal by the microphone (a carbon microphone acts like a semiconductor). A ceramic capacitor of 2-5 nF, placed parallel to the microphone (soldered across the fork contacts), usually produces good results.

Inadequate selectivity usually causes inadequate front end immunity. It is always advisable in a collision case to check whether the disturbance is caused by conducted RF current along attached cables, but there are some devices in which insufficient front end selectivity causes disturbance. Insufficient front end immunity is probable if there is insufficient antenna signal selectivity. An especially sad chapter is represented by the army of cheap wideband masthead antenna preamplifiers, which were installed for decades in large numbers. One could not talk about selectivity because of the wideband design! Even the smallest unwanted signals cause overdriving of the receiver and so disturbance is created. There is a simple possibility to overcome the major part of the difficulty. A 10 centimetre long piece of hookup wire (0.1 uH) is placed across the input terminal of the preamplifier — like a short circuit from the coaxial centre to the braid. This wire may be placed like a loop along the coaxial cable (Figure 12). This loop represents a R-L high pass compared with the 60 ohm input impedance of the coaxial cable. Unwanted signals of below 150 MHz are, in fact, progressively "shorted" out. The impedance becomes so high above this frequency that television signals on bands III, IV and V are not attenuated.

Other limit (high pass) frequencies and required inductances can be calculated under the assumption that one metre of free standing wire has 1 uH inductance:

$$f_{gr} = R/2\pi L \,,\; L = R/2\pi f_{gr}$$

(Gr = Grenze = limit or cutoff). The same method is used on television sets and VCRs. The combination of this high pass wire loop and the conducted current blocking capacitors represents a valuable improvement of the inadequate front end immunity. The wire may be wound up to form a small coil.

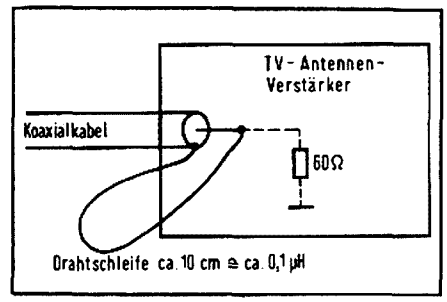

Figure 12: A piece of wire as a high pass filter. A suppression possibility for wide band antennas or receivers.

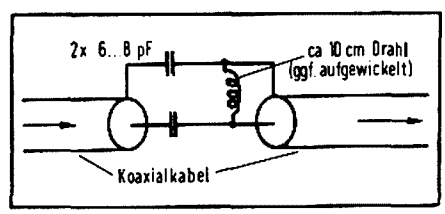

Figure 13: The cutoff frequency of this suppression circuit may be adjusted as necessary. Appropriate for television sets and video recorders.

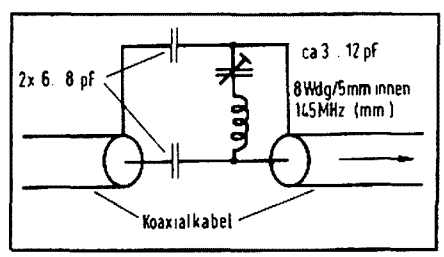

Figure 14: This "suck-out" circuit may be quickly adjusted to the appropriate frequency. Most useful for the two-metre amateur band.

The blocking capacitors also act against conducted unwanted signals (see Figure 13).

The resulting reduction of the antenna signal, at lower frequencies (VHF band III), is especially useful in the case of VCRs, because the built-in wideband antenna signal preamplifier often has too much gain, bringing the connected television receiver too lose to the point of being over-driven.

A series tuned L-C circuit is most effective to overcome a two metre (144-146 MHz) transmission disturbance. A coil of eight turns (5 mm id) and a series connected trimmer capacitor of 3-12 pF (Figure 14) is placed behind the blocking capacitors. The photograph, number 15, shows this east t make arrangement. The tuning up is done with the help of a two metre receiver. The wave trap is placed between the antenna and the receiver, a steady two metre signal is tuned in (repeater etc)

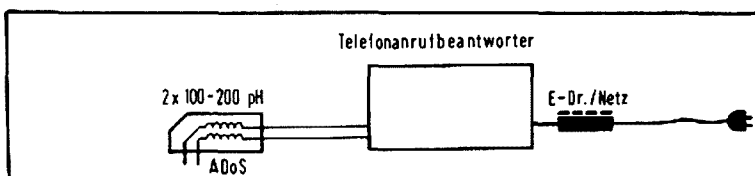

Figure 11: A telephone answering machine can also be suppressed by opening the line connecting plug. It may be necessary to obtain permission.

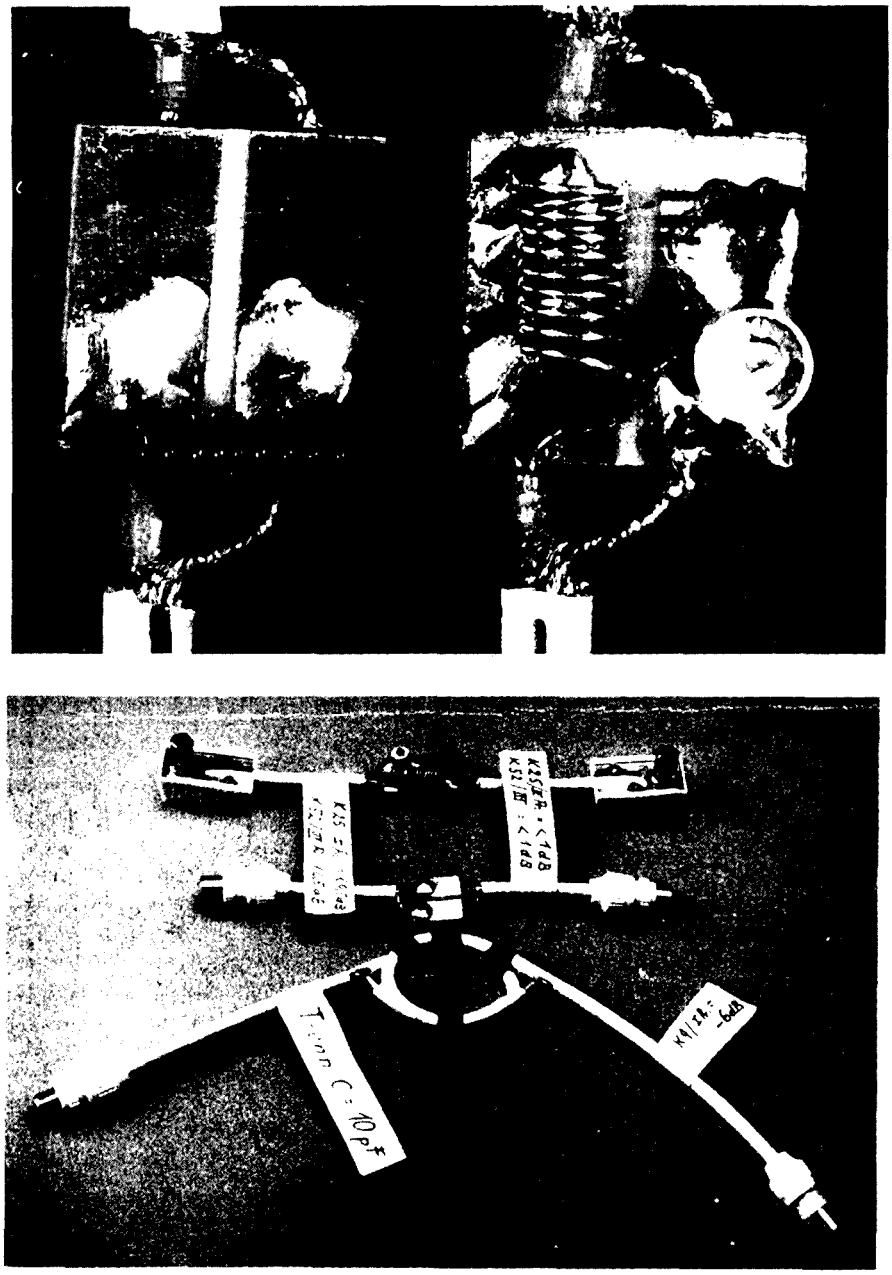

Figure 15: Construction of "suck-out" filters using amateur facilities. Copper-coated board for capacitors. When fitted with plugs and connectors this group of filters permits problem-free experimentation.

and the trimmer is tuned for minimum signal strength. The attenuation amounts to over 40 dB at adequate bandwidth.

Bad shielding — insufficient radiation immunity: Inadequate radiation immunity is an increasing problem as far as disturbances to electronic entertainment equipment are concerned (and not only these). The cost cutting pressures on Far East producers of cheap electronic products (Japan, Taiwan, Korea, etc) even cause the most necessary shielding of circuit groups to be left out. It is therefore not surprising that even small unwanted electro-magnetic fields are enough to result in a disturbance penetrating the non-metallic unearthed cabinet. A disturbance is "pre-programmed" if a correctly operated (legal) transmitter is in the neighbourhood of a VCR for example, which uses the frequency range of 0 to about 8 MHz, and if the equipment function requires a very high gain amplifier (Figure 16).

More than 90 percent of all VCR disturbances are not caused by amateur radio transmitters, but by local high power radio stations operating on long, medium or shortwaves. Only well designed or later improved video recorders can be used within an area of up to several thousand square kilometres around a medium wave transmitter. The other VCRs suffer from conducted current effects, and direct radiation pickup by the rotating video head components, and/or by other front end elements, causing substantial distortion on play back. The colour reproduction is mainly affected, according to the frequency distribution, by transmitters working below 1 MHz (for example long and medium wave radio transmitters), whilst transmitters near 1.5 MHz or shortwaves affect mainly the black/white (luminance) signal. The input circuit of the play back amplifier in most VCRs is tuned to about 5 MHz, to compensate for the otherwise falling response. The resulting resonance increase, combined with the necessarily high amplification of the play back channel, makes good shielding necessary. VCRs on the market from Philips, Grundig, Akai and Sharp, prove that this can be done at low cost. Even amateur radio transmitters, operating on 80 and 40 metres close to the 5 MHz input resonance of the VCRs, do not affect these recorders in spite of close proximity. More and more customers understand the term "Electro-Magnetic Compatibility", which results in the well-designed recorders catching the larger share of the business.

How can one overcome the picking up of unwanted radiation by a badly designed VCR? We have come back to the earlier explained Xray look at a house, to understand the direct radiation pick up correctly (see previous instalment). The metal cables and pipes not only carry the received antenna current, but depending on the length, resonance effects may cause a voltage increase also, as occurs with transmitter antennas. A VCR with inadequate shielding is affected by unwanted RF which is re-radiated from a mains cable installed inside the wall. The same can happen from central heating and water pipes, telephone cables, etc. This is the only way to explain why a VCR is affected (disturbed), when connected to one power point, and not if connected to another power point, perhaps closer to a transmitter antenna.

A simple test demonstrates the possibilities. The VCR is pulled forward as far as the cables allow, while operating in play back mode. Do not hold the equipment in the hands. One could turn the VCR around by 90 degrees, to see if the disturbance can be even more reduced. A different place in the room for the recorder could also be tried. Only complete shielding of the VCR remains, if results so far are still unsatisfactory. A correctly made and good looking metal shielding box is the only alternative. The size must permit adequate cooling. The VCR, including RF blocking chokes and separation capacitors, is installed in the shielding box, and the disturbance is overcome with near absolute certainty. The costs are a matter for the owner of such a bad VCR. The radio amateur is advised to provide at his own expense at least the demonstration. The radio amateur could use such a case as proof of not being at fault, should similar disturbances occur in his neighbourhood. It would

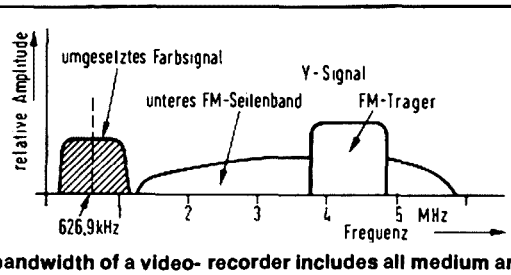

Figure 16: The bandwidth of a video- recorder includes all medium and long wave transmitter frequencies. The only effective solution is screening with a metal case.

help, if the industry could offer such universally useful shielding boxes. Besides the difficulty with amateur transmitters, the disturbance from other correctly operated radio transmitters (over 90 percent) would be eliminated as well. The industry is blamed for selling equipment with "hidden faults" and claims as excuse, that "special local conditions may cause problems". The court cases of the past re "hidden faults" versus inadequate passive immunity have nearly always decided against the manufacturers.

The means shown here of overcoming disturbances were deliberately limited to those which radio amateurs can handle.

The success rate is very good, as experience shows, if it is tackled systematically. There is still the possibility of involving the manufacturer, in a single case where no adequate success was achieved. It is up to the complainant (neighbour) whether he uses this possibility, purchases better equipment or decides to live with the problem. One should advise him, if he intends to purchase a new VCR, to obtain the specific statement on the invoice "has correct immunity" (DIN and VDE Norm: 3V.m). This is also the recommendation of the West German Post Office.

—Paper prepared by Arno Weidermann DL9AH and Klaus Roggenkamp DK3HA

LITERATURE:

1. Professor Karl Tetzner: Radio Amateurs also in Manager Positions, *Funkschau* 13/1984, p 35.
2. Clear picture and clear sound. Information sheet of the Federal German Post Office. 8/1979.
3. Reception disturbances treated at the root. *Funkschau* 11/1986, p 44.

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DEADLINE FOR NOVEMBER IS SEPTEMBER 16, 1988

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

I have recently had letters from a couple of amateurs charged with setting up the examination systems in their States. It is good to hear that the organisation is beginning to develop. I fear we are all still feeling our way in this matter, so I am making another of my regular pleas for information and input.

I estimate that there are probably between 10 and 30 groups or individuals who are hard at work preparing papers for approval, establishing examination protocol, finding suitable locations, applying for accreditation and completing vast amounts of paperwork.

Since I am a naturally lazy person, all this duplication or multiplication of effort seems to me to be unnecessary. Of course some of the arrangements will be specific to a particular group, but there must be room for sharing of information, ideas, and worries.

If your first examination runs like clockwork, please let the rest of us know how you did it. If it is a complete shambles, please let us learn from your mistakes when you have worked out what went wrong.

I expect that the examiners will fall into two groups — those who are setting up to run regular examinations or provide materials for a number of venues, and those who wish to run a "once-off" to suit a particular group of candidates.

Those working on the larger scale, of course, have more opportunity to polish up their techniques as time goes by. The 'occasional' examiner may need more help and advice.

If we are serious about encouraging new recruits into the hobby, we must be sure that they can enter, ie examinations must be available and the availability should not be less than it was under the DOTC system. This means that provision has to be made for examination in remote areas as well as in the main population centres, in areas with no resident amateurs, as well as in those with active clubs.

It would be pleasing to think that each Division will be in a *position* to look after all applicants *in* their area by March 1989, but I cannot be confident that they will. There a much to do, and limited time and resources. In most cases, there will be heavy reliance on volunteers.

I would like to see the development of a strong network among those involved in examinations. The Department accepts that once an examiner has five papers approved they may be re-cycled on a random basis. Can we take this a stage further and provide a 'pool' of approved papers to be shared among all Divisions as required?

I have asked previously for collection of statistics relating to individual papers and examiners. I am prepared to act as a central register for these, also for information about times and locations of examinations so that inquiries can be directed appropriately. Once you decide to arrange an examination, you are obliged to notify DOTC of the arrangements. Please also notify your Division and the Federal Office of the WIA.

Another point that arises is the question of fees for examinations. While few of us see the examinations as a source of revenue, most agree that the Institute should not be required to absorb the costs involved. It would be preferable to establish a rate that is fairly uniform, at least for examinations run under the auspices of the Institute. I see a set scale for papers, tapes, etc produced for the examinations, with the need in some situations for a fee to cover the cost of local supervisors or hire of rooms or facilities.

Most remote candidates will be prepared to make this type of arrangement if it means they avoid a trip to a major centre.

We investigated costs in some detail when the devolvement proposals were being discussed. The estimates produced are available in the 'package' presented to the 1987 Convention. Divisions and Divisional Councillors should have copies which could be used as a starting point.

To conclude, please find time to let me know what you are planning. Unless you specifically ask me not to, I will circulate this information to the others involved in the hope that we can all save ourselves some effort and time, and can work *together* to build an efficient, time effective system. I look forward to hearing from you all.

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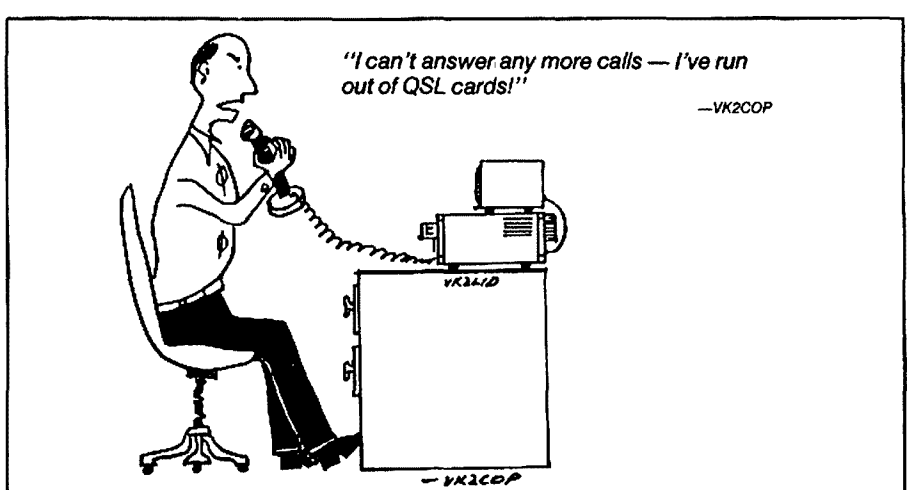


QSLs from the WIA Collection

Ken Matchett VK3TL
776 Warburton Highway, Seville, Vic. 3139

VP3VN
This QSL card from what was then British Guiana, employed a prefix now replaced by 8R. The call sign allocation VPA-VSZ was assigned to "British colonies and protectorates" and became effective after January 1, 1929. Amongst the first countries in that year to take up the new set of prefixes were Kenya, Northern Rhodesia and Straits Settlements. These were quickly followed by British Guiana using the VP3 prefix which it held until the colony became independent in 1966, changing its name to Guyana. For four years it retained a Governor-General appointed by the Queen but became a republic within the Commonwealth in February 1970.

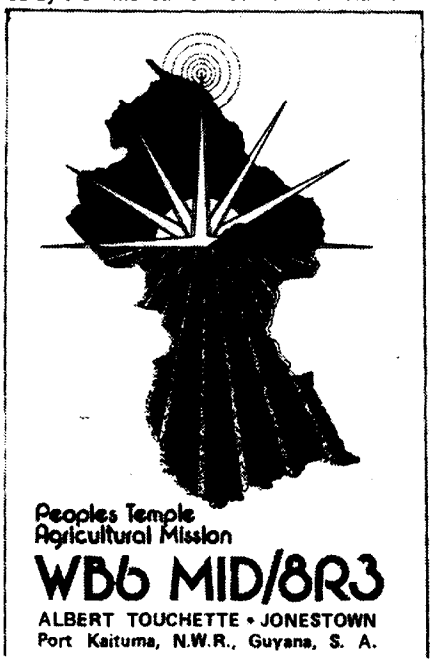
8R1P
Dated March 1967, this was one of the earliest QSLs showing Guyana's new call sign. It also displays Guyana's national flag. This is green (to the right of the flag) with a yellow triangle coming in from the left. A smaller red triangle on the left is super-imposed on this. The green colour represents Guyana's agriculture and forests (the dominant vegetation type is equatorial rain forest) the yellow Guyana's mineral resources (mainly bauxite) and the red, the country's zeal in building the nation. The country itself is rather small; in fact slightly less in area than the State of Victoria, its whole population not exceeding that of the City of Perth.

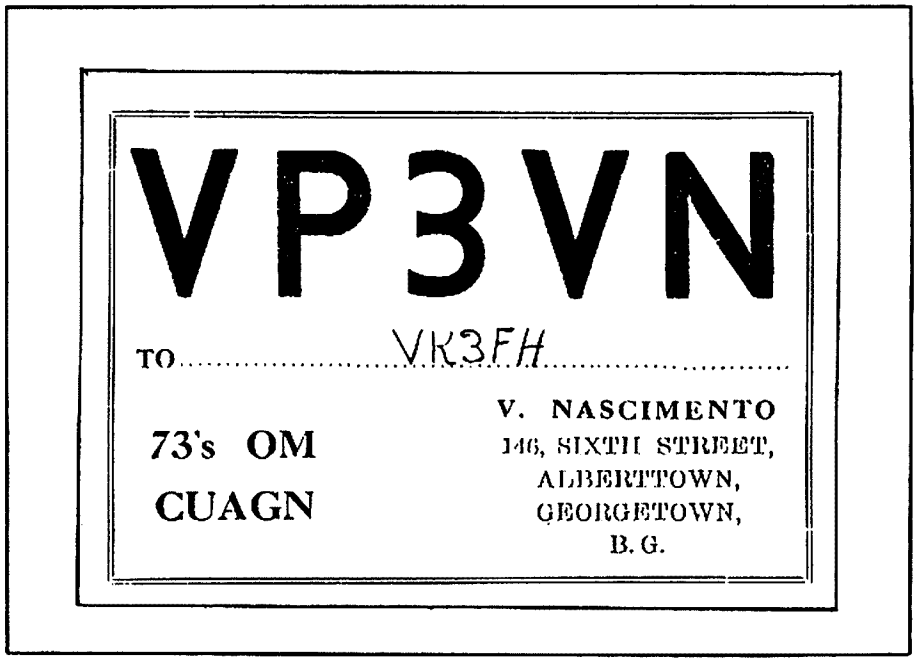
The QTH on the card is given as Georgetown, which is the chief port and capital of the country, almost all of the population being centred in and around this coastal city.

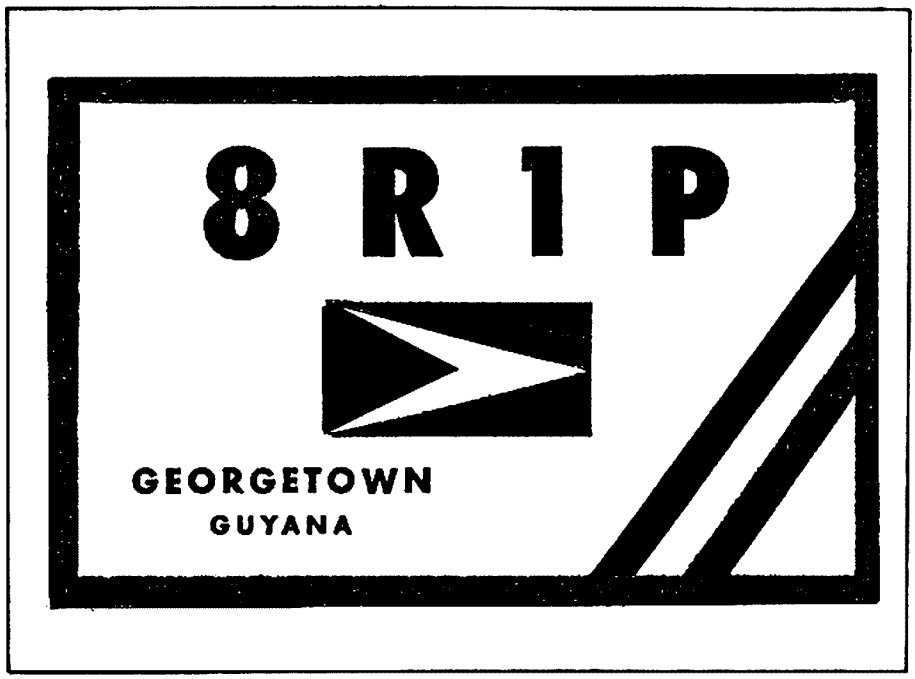
WB6MID/8R3
It would be true to say that the majority of QSLs we receive bring joy; this one is associated with a tragedy so great that it made world headlines. The QSL shown depicts an area of furrowed land with a rising sun on the horizon, presumably symbolising hope. The shape of the land and the cloud together cleverly make up the shape of the country itself.

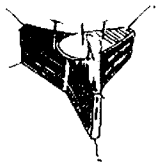
The station belonged to Al Touchette, the radio operator for the Peoples Temple Agricultural Mission. Although its purpose (as stated on the reverse side of the QSL) was "to assist the Guyanese Government, to feed, clothe and house its people and further the human service goals that have characterised Peoples Temple for many years", it was regarded by many as a religious cult, led by the American Jim Jones who established the commune at Jonestown near the Venezuelan border. At the time of operation of its amateur radio there were several complaints to the FCC concerning alleged violations of the amateur code by the station together with threats and counter-threats, so much so that at one stage the FBI was called in to investigate. Be that as it may, there was no doubt that the commune depended greatly upon this amateur station for its communication out of Guyana to the US, particularly when one remembers that Jonestown was a very isolated community situated far west from Georgetown.

This QSL was for a QSO in late September 1978, not long before the tragic suicide of over 900 members of the group, mostly of cyanide poisoning. Al Touchette was one of the unfortunate ones; he died together with his wife and small child.









AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR

INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC Sunday
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SW PACIFIC
2200 UTC Saturday
Frequency: 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements, from the AMSAT Australia net. This information is also included in some WIA Divisional Broadcasts.

AMSAT OSCAR 13 NEWS COLLECTIVE

The following assortment of news items is an historic record of the recent events relating to the launch of OSCAR 13 and the two successful firings of the kick motor. Congratulations to the AMSAT-DL team for a tremendous team-effort.

HR AMSAT NEWS SERVICE BULLETIN 177.01 FROM WA2LQQ WARWICK, NY — June 25, 1988 TO ALL RADIO AMATEURS BT

AMSAT ground controllers have successfully fired AMSAT OSCAR 13's kick motor in orbit. The result is a successful intermediate orbit one or two steps away from the final, desired AO-13 orbit. A second kick motor firing could come within a week setting the stage for general communications operations in a few weeks.

After reviewing the AO-13 attitude and spin rate, DJ4ZC gave the okay for a kick motor firing last Wednesday. The firing took place at 1857 UTC, Wednesday, June 22. The burn coincided almost exactly with apogee of orbit number 16. The IHU was loaded with a firing routine for a 50 second burn by AO-13's 400 Newton bi-propellant kick motor.

Prior to the burn decision, criteria has been established to manoeuvre to an attitude, in Bahn co-ordinates, of 90 degrees longitude and -60 degrees latitude with an angular velocity (spin rate) of 30 to 40 RPM. However, looking at various considerations, such as the overall schedule and visibility of the satellite over the next week, the decision was taken at about 1630 UTC to execute the burn two and a half hours later. Estimated attitude and spin rate of AO-13 at the time of the motor burn were found to be within tolerance for a burn and so it was executed.

According to an analysis by Phil Karn KA9Q, the change in AO-13 velocity due to the kick motor burn was 159.6 metres per second. This value is about 14.4 percent higher than the 139.5 metres per second predicted from W4PUJ's figures for spacecraft mass, motor performance, and propellant flow rates. Based on the direction of the delta-velocity vector, the attitude of the spacecraft in pre-burn Bahn co-ordinates was:
longitude 66.7 degrees (versus 75 predicted) and latitude 57.7 degrees (versus 55 predicted).

The difference is well within the uncertainty range predicted by DJ4ZC, Karn said.

"Bahn co-ordinates" is a special co-ordinate system based on the orbit of the spacecraft and will be addressed in an upcoming Amateur Satellite Report newsletter.

Apparently the performance of the kick motor exceeded expectations in terms of thrust. KA9Q points out the delta V on AO-10 was also larger than predicted (by about 11 percent), even after the longer burn time due to the Liquid Ignition Unit (LIU) wiring error was taken into account. According to Dick Daniels W4PUJ, the flow rates for both spacecraft were measured on the ground in the same fashion using isopropyl alcohol in place of real propellants. The difference in viscosity between alcohol and the actual propellants could easily account for increased flow rates (and thus increased thrust) on both spacecraft.

KA9Q points out this data is important since they "calibrate" the motor's actual performance, helping plan the next manoeuvres more accurately.

HR AMSAT NEWS SERVICE BULLETIN 177.02 FROM WA2LQQ WARWICK, NY — June 25, 1988 TO ALL RADIO AMATEURS BT

The AO-13 kick motor burn was the second in-orbit burn performed by any AMSAT spacecraft but the first fully successful one. AO-10's first and only motor burn in 1983 was longer than planned due to a hardware problem. Perigee rose to 3900 kilometres versus the desired 1500 kilometres as a result. Later, due to a Helium leak through a seal, a second burn was found to be impossible.

Last weeks AO-13 kick motor burn, on the other hand, went perfectly with no deviations except for the higher than expected kick motor performance.

Telemetry indicates the pressure loss experienced on AO-10 has not recurred with AO-13. Telemetry channels 09 and 0D in particular confirm the satisfactory performance. Channel 09 (Helium high pressure) was at about 735 Bars and Channel 0D (Helium low side pressure) was about 14 Bars.

Further refinement of AO-13's orbit should now be possible. A second and possibly a third burn can be accomplished whenever the required attitude manoeuvres are completed.

HR AMSAT NEWS SERVICE BULLETIN 177.03 FROM WA2LQQ WARWICK, NY — June 25, 1988 TO ALL RADIO AMATEURS BT

AMSAT's team of ground controllers has begun precise ranging of AO-13 in order to determine its new orbit after the first kick motor burn accomplished last Wednesday. The result is a set of successively more accurate orbital element sets. The data has proved sufficiently accurate to be adopted by official government satellite tracking agencies.

AMSAT's orbital determination process begins with range measurements from various command stations using round trip delay time measurements from the earth to the satellite and back. Stations making such measurements at present include KA9Q, DJ4ZC, DB2OS, ZL1AOX and VK5AGR.

Once the range data is acquired, a complex number-crunching process begins. A Keplerian element set results which is then checked for "fit" with other tracking data and with AOS/LOS observation reports.

HR AMSAT NEWS SERVICE BULLETIN 184.02 FROM WA2LQQ WARWICK, NY — July 2, 1988 TO ALL RADIO AMATEURS BT

All the telemetry indications from AMSAT OSCAR-13 show this to be a healthy satellite. Power generation is excellent and temperatures are all within expected ranges. The main battery temperature is hovering between 12 and 13 degrees Celsius and the two metre power amplifier is running at a comfortable 16 degrees Celsius. The coldest reading monitored is in the Mode S transponder which is not currently activated. It is indicating a nominal six degrees Celsius. In general, all temperatures lie in a range of six to 19 degrees Celsius.

AO-13 telemetry is transmitted in three forms: phase shift keyed (PSK); RTTY; CW. The RTTY uses frequency shift keyed (FSK) tones spaced 170 Hz at a signalling rate of 50 baud. RTTY telemetry is sent at 15 and 45 minutes past the hour. CW telemetry is sent at 10 words per minute at 0 and 30 minutes past the hour. PSK telemetry is sent at other times at 400 baud. The Mode B General Beacon is at 145.812 MHz. Telemetry reception in many areas has been hampered by FM users many of whom are unaware 145.800 to 146.000 MHz is, by general agreement, a sanctuary for weak signal, satellite operations.

There are 64 channels of telemetry sent in PSK. The first 60 of these are sent in RTTY as well.

Telemetry indicated effects from the huge solar flare last Saturday, June 25. By Sunday, those monitoring AO-13 telemetry had already detected "hits" in the satellite's computer. Although no damage was expected and none occurred, the intense burst of radiation from the sun registered on AO-13 when its self-correcting devices were obliged to correct for radiation-induced errors in the IHU. These were seen as memory "soft errors" meaning a temporary upset caused by radiation had occurred. The AO-13 IHU and memory are extremely radiation resistant, at least a thousand times more than AO-10, and so the radiation hits are of academic interest but pose no real threat to its health. Watching the hits can, however, give an idea when solar radiation and particles arrive in the vicinity of earth.

TO ALL RADIO AMATEURS BT

With the second and final kick motor firing now slated for this coming week, potential users are awaiting word on when the new bird will be available for use. With things going extremely well in all aspects, the answer could be more sooner than later.

According to reliable sources, once the second and final kick motor burn is accomplished, it will take about two weeks to re-orient the satellite and spin it down to about 30 RPM for general operations. Thus, if the motor burn occurs later this week, AO-13 could be released for use beginning in late July.

A detailed operating plan for AO-13 will evolve after initial operations commence and will be based on operating experience including use levels. Initially, Mode B will be used almost exclusively with Mode JL used in modest proportions. Then, depending on use patterns, Mode JL use, especially around apogee will be gradually increased. After a certain period, Mode JL operation will likely predominate the operating schedule in order to take maximum advantage of its broad bandpass. Moreover, Mode JL will straddle apogee to take advantage of the high gain, narrow beam 24 centimetre helix on the satellite. The high gain antennas will be pointing directly at the geocentre when at apogee once the spacecraft is properly oriented.

The narrow, 50 kHz, two metre J uplink in the 290 kHz Mode JL transponder, is intended primarily for and recommended for Third World uplinks.

HR AMSAT NEWS SERVICE BULLETIN 188.01 FROM WA2LQQ WARWICK, NY — July 6, 1988

TO ALL RADIO AMATEURS BT

ALINS.011 SPECIAL FLASH REPORT
New OSCAR Successfully Manoeuvred in Historic Move

For the first time in history, amateur radio has a new satellite in the right orbit tor long-duration DX communication on the amateur bands. AMSAT OSCAR-13 was successfully Inserted into its final operational orbit late Wednesday, July 6. This was the second and final orbital manoeuvre performed by the 142 kilogram (312 pounds) spacecraft.

Launched as AMSAT Phase 3C aboard Ariane 4 on June 15, the satellite became AMSAT OSCAR-13 (AO-13) the same day upon its insertion Into orbit. A week later, on June 22, AMSAT engineers started the on-board rocket engine for less than a minute to test the various systems and change the initial orbit slightly.

The rocket motor operation on July 6, was a "go-for-broke" effort where a major orbital change was accomplished and all remaining propellant fuel was consumed. The final manoeuvre performed Wednesday had the effect of raising the perigee (low point of the orbit) from about 1100 kilometres (683 miles) to about 2400 kilometres (1490 miles) and of raising the inclination from 15 degrees to 56 degrees. The apogee (high point of the elliptical orbit) was essentially unchanged at 36 000 kilometres (22 360 miles).

The 5.5 minute rocket engine "burn" began at 2105 UTC, July 6. The burn added about one mile per second to AO-13's orbital velocity. Early indications were the new orbit was right on target, AMSAT sources said. All telemetry from the satellite was nominal and the satellite remains a very healthy "bird" in the jargon of space aficionados.

A few steps remain before the satellite will be made available for general operation by the amateur radio community. Precision tracking will accurately measure the final orbit, re-orientation to the correct attitude for communications operations and final transponder check-out are all that remain. This should be accomplished before the end of July, AMSAT officials said. AO-13 employs communications transponders ranging in frequency from two metres through to the 13 centimetre band. In Its final orbit, similar to an orbit frequently used by the Russians called "Molniya". AO-13 will provide up to 18 hours coverage per day. Because at apogee it is as high as a geosynchronous communications satellite, it will cover a hemisphere at a time.

Because of its inclined orbit, users will be able to easily work "over the pole" a feat not acheivable on geosynchronous satellites. VHF/UHF QSOs to DX areas such as VU, AP, 9V and YB are at hand! These have never before been regularly possible on any prior satellite but they are about to become a daily occurrence on AO-13.

OSCAR-13 STATUS REPORT 7/7/88
Status report from AMSAT-DL Marburg/ West Germany on July 7, 1988

1. On July 6, 1988 at 2106 UTC, the second and final motor burn was performed for six minutes to change the orbit Inclination to 57 degrees. Motor performance was nominal and the orbit is now expected to have a perigee of 2500 kilometres.
2. During the next several days the newly achieved orbit will be measured using ranging techniques to obtain the correct Keplerian elements for the new orbit. The exact parameters will be available around July 10.
3. After determination of the new orbital parameters, the orientation of the satellite will be changed during the following week to aim the antennas to the earth.
4. Since the engineering phase has proved so smoothly, the satellite will be released for general use as early as July 20, instead of August 1, as was originally scheduled. Initially Mode-B (70 centimetre uplink, two metre downlink) will be put into operation.
5. The operational schedule for the transponders is expected to be as follows (subject to change as needed):

Transponder	Mean Anomaly in 1/256
OFF	MA225 . . . MA 30
Mode-B	MA 30 . . . MA 98 and MA158 . . . 225
Mode-L	MA 98 . . . MA158 (daily)
Mode-JL	MA 98 . . . MA158 (weekends only)
Mode-S	(due to sun-angle, Mode-S operations will probably occur in September, when the antenna will point at the earth)
RUDAK	during Mode-L operations

73 The AMSAT-DL team

AMSAT-AUSTRALIA NEWSLETTER

This fine monthly publication published on behalf of AMSAT-Australia by Graham VK5AGR, now has 200 plus subscribers. Should you also wish to subscribe then send a cheque for $20 made payable to AMSAT-Australia and post to:
AMSAT-Australia, C/- PO Box 2141, GPO, Adelaide, SA. 5001.

The Newsletter provides the latest news items on all satellite activities and is a must for all those seriously interested in amateur satellite activities.

SATELLITE RECEIVING CONVERTER

With OSCAR-11 now in orbit, the Moorabbin and District Radio Club, in a very timely move, have announced the release of another batch of two metre satellite receiving converters.

This converter was first described in the October 1984 issue of *Amateur Radio* as was run by the MDRC as a most successful project, with kits and finished product both being made available.

For further information contact the Moorabbin and District Radio Club, PO Box 88, East Bentleigh, Vic. 3165.

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EMI SUPPRESSION INDUCTORS

Pulse Engineering have developed a complete inductor family to provide a package with guaranteed minimum resonant frequency and leakage inductance limits. These are important parameters to consider when designing on-board filters for high frequency switch mode power supplies.

The wide variety of available component values makes it possible to design a board mounted filter with optimum performance characteristics.

The Inductor Kit has a selection of 31 inductors with rated currents from one to 15 amps. All are tested to VDE 0565 part 2 and UL 1278. Dielectric tests are 3750 Vac (winding to winding).

Complete details of the kit is available from Clarke and Severn Electronics, PO Box 129, St Leonards, NSW. 2065.

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CAPTAIN COMMUNICATIONS NOW SELLING THE WORLD'S ONLY SHIRT POCKET SIZED TWO METRE TRANSCEIVER — the Icom u2A/A

Captain Communications of Parramatta is now stocking the micro-sized Icom hand-held series — the Icom u2A/A. The palm-sized transceiver represents a breakthrough In two metre "go anywhere" technology. Measuring just 4.6" high, 2.3" wide and 1.1" deep, the IC-u2A/A has more features than large transceivers.

Features include:

* 10 programmable memories
* Odd offset capability
* LCD readout
* 2.6 watts output
* 32 in-built sub-audible tones

In Icom tradition, the IC-u2A/A has an extensive range of accessories, including rechargable batteries, carry case, headsets, and even VOX.

Captain Communications stocks the full range of Icom equipment, including amateur, commercial and marine transceivers and receivers. Captain maintains a full technical advice, service, installation and repair facility and is open seven days a week.

For further information on Icom products, call or FAX the Captain:
Phone (02) 633 4333, FAX (02) 891 2271.

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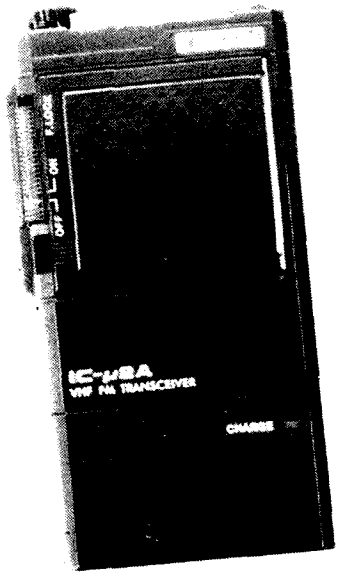

LIGHTNING PROTECTOR WILL HANDLE 5000A

Schaffner EMC has added a lightning arrester, the SAPN, to its range of RFI suppression and electronic equipment protection devices. It will dissipate transient currents as high as 5000A.

Housed in a DIN rail-mountable package, the module is designed to protect Telecom networks and modems from the effects of lightning Induced surges. Although the insertion loss on a 600 ohm line is only 0.14 dB, the SAPN which is designed to operate on 200 volts DC lines clamps at 280 volts for a current surge of 5000 A.

The effect of a typical lightning strike on a communication cable is to produce a pulse of energy typically a few hundred microseconds long and several hundred volts in amplitude. The effective source impedance is very low, so any protection device must be capable of dissipating large transient power levels. This is achieved by diverting the surge through gas discharged tubes in series with sand filled wire wound resistors, so there are no trips to reset after the strike occurs.

To achieve the necessary response time for digital circuits, high speed clamp diodes are employed in parallel with the main diverting element, a doped and fail-safe gas discharge tube. The result is high power dissipation coupled with a rise time of only 15 ns.

These arresters have been approved for use on British Telecom private user circuits and the main PSTN network. They are batch tested to CCITT recommendations at the factory to assure reliability.

For outdoor applications, weatherproof housings can be supplied, each containing one, five or 12 units.

For further information, please contact:
The Sales Manager, Industrial Products, Westinghouse Systems, Westinghouse Brake and Signal Co (Australia) Limited, PO Box 267, Williamstown, Vic. 3016, or phone (03) 397 1033.

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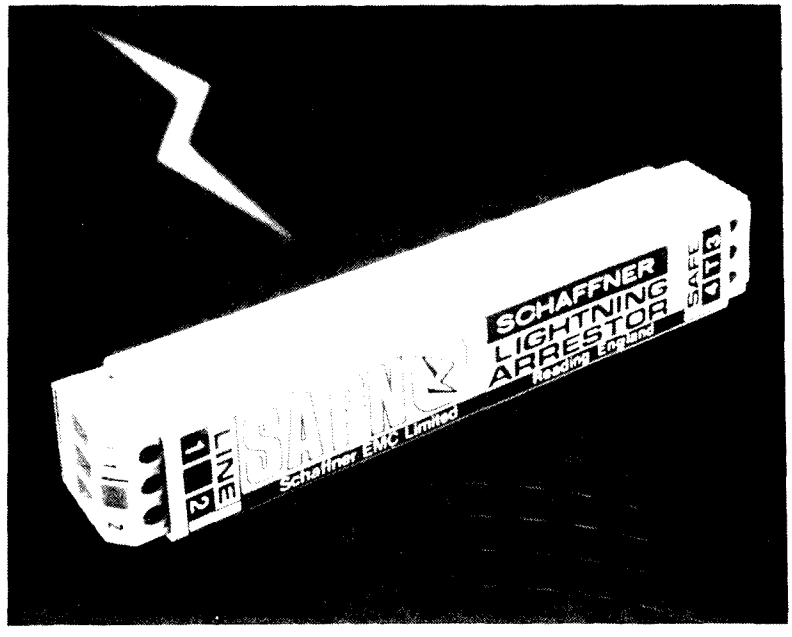
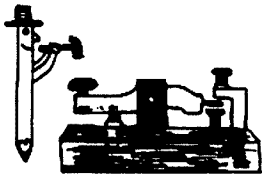




Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright. Vic. 3741

Should radio club instructors aim merely to produce candidates who can pass the DOTC examinations by 'standing on their tiptoes' or to produce new operators who have a flying start towards becoming *good operators*?

This question was proposed by Rex VK2YA, and I thought it should be passed along to all the other Morsiacs as well, especially as we may soon be doing the testing ourselves (or through the WIA). You may have already volunteered to be an official Morse examiner, realising that, at last, the users of Morse will have an important place in the testing of new amateurs. If not, some control of the situation. The following 'revised draft' was evolved from the Youth Radio Service and the New South Wales Education Service conditions, and offers a chance to bring the whole Education Service Award System back into useful prominence.

If you, the Morse user, want control, or even the continuation of Morse code as a mode of communication, you cannot afford to sit back and allow the majority of other operators to put you down through *your inaction*. If you want good operators on the Morse segments of the band you *should* volunteer as an examiner, part time teacher or whatever. Not only will you save money for the applicant and the Institute, you will find a rewarding outlet for your expertise and probably an improvement in your own procedures and results on air in DX, contests or awards. You will make it *easier* for applicants to gain their certificates through your enthusiasm alone, and be able to follow through the examinations with your new contacts, bringing them into the fold as Knights of the Key. Do you think pleasant thoughts about the person who introduced or helped you into Morse code? If you do you will see that, for an investment of some of your time and expertise, you will gain suitably just rewards.

REVISED DRAFT CONDITIONS FOR THE AWARD OF THE WIRELESS TELEGRAPHY OPERATORS' CERTIFICATES

These certificates may be awarded to members of radio clubs registered with the WIA (NSW) Education Service and to other candidates approved by the Committee of the Education Service who complete the following conditions:

A. MORSE CODE EXAMINATIONS: Candidates must pass tests in receiving and sending Morse code at seven words per minute under conditions outlined in the *Handbook for Operators of Radio Stations in the Amateur Service*. These tests shall be set and marked by approved Volunteer Morse Code Examiners authorised by the Committee of the WIA (NSW) Education Service, provided that such tests may be conducted using cassettes sent by the Education Service and administered by Volunteer Examination Supervisors appointed by the Education Service Committee.

Candidates who pass both receiving and sending tests at seven words per minute may be tested at higher speeds by arrangements made by the Committee, and Certificates may be endorsed with the speeds attained by the Candidates, provided that passes in both receiving and sending must be obtained at the same examination session.

B. SUPERVISED ON-AIR OPERATING: Candidates must have conducted on-air Morse code contacts under strict supervision of licensed Amateur Radio Operators. Where practicable in the case of radio club members, this activity should be part of Morse Code Training Courses for Novices and AOCP candidates. In the case of candidates who do not belong to radio clubs, arrangements will have to be made with the Educations Service Committee.

C. LOG BOOKS: Candidates must submit neat and complete log books to record all supervised on-air contacts made in accordance with Paragraph 2 above. All such entries must be countersigned by the Supervising Operators.

D. OPERATING SKILLS: Candidates must satisfy the Volunteer Morse Code Examiner in a practical and/or written test that they have a sound knowledge of —

i. Making general (CQ) calls and answering such calls;

ii. Tuning receivers for best reception with clear explanations of the functions of the various controls;

iii. Tuning and adjusting amateur transmitters (or transceivers) to give best performance in Morse code mode;

iv. Reporting of readability, strength and tone of received signals;

v. Frequency limits of amateur band segments available to Novice operators in authorised bands;

vi. Australian Amateur Call Sign Prefixes — and common prefixes of other countries;

vii. Operating Procedures and on-air behaviour — avoidance of common unacceptable practices;

viii. Local time and Greenwich Mean Time (UTC) — conversions.

E. REGULATIONS EXAMINATION: Candidates must gain at least 70 percent of the possible marks in a written examination based on the examination topics in the *Handbook for Operators of Radio Stations in the Amateur Service*. In addition, candidates for this certificate must undertake an additional test in operating practices which will include questions relating to the various unsatisfactory practices that are frequently heard on the amateur bands.

F. CERTIFICATES: May be issued in three grades — (i) Grade 3 requires 10 supervised on-air contacts; (ii) Grade 2 requires 20 such contacts; Grade 1 requires 30 such contacts.

NOTES:

(a) The Morse code and regulations requirement are in excess of those required by the present DOTC examinations in theory and Morse code;

(b) It is apparent that many Novices — and AOCPers — receive little or no instruction in the essentials of on-air operating and merely imitate the procedures of the less experienced operators whom they hear on the air. This certificate system will give greater direction to instructions — from the radio clubs and other sources — who seek to prepare new Novice candidates. It is fairly evident that some candidates have never been shown which operating errors to avoid — such as gross over-use of call signs, vain repetition of "73" (three and four times when once is enough), failure to make best use of recognised abbreviations and so on.

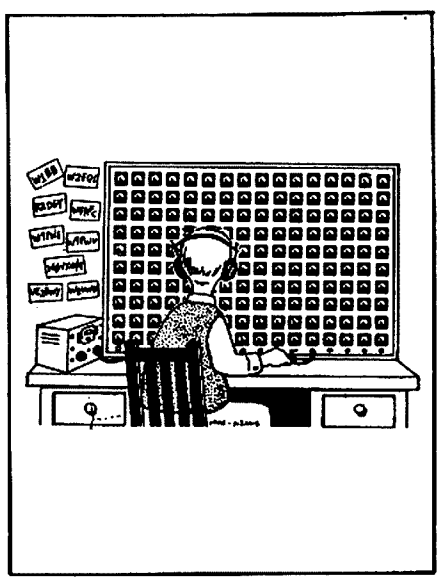
(c) It is evident that some DOTC examiners take little account of the quality of the Morse code sent by candidates. It seems that "as long as they fill the 2.5 minutes, the quality doesn't matter". I submit that poor quality Morse should result in failure. It seems that some Novices have never been told how to hold a key, how to sit, how to use spacing between letters and words. Even many AOCP operators are not above criticism and manage to send code that is practically unreadable.

(d) It is hoped that the opportunity may arise under this projected "development" to submit claims that the holders of the WIA (NSW) Education W/T Certificates should be granted exemptions from the subjects of (i) Regulations, (II) Morse Receiving, (iii) Morse Sending — on the grounds that our standards are superior to those established by the DOTC.

(e) It is proposed that there should be real testing of common punctuation marks and procedure signals and that part of the testing should include consideration of sample "overs" and detection of mistakes, poor usages and un-necessary wordage. (Morse code is often criticised as being too slow compared with voice operating. It is slower largely because of inadequate training and the imitation of poorer operators by the "new chums". These situations must be changed!).

I have mentioned operating procedures and practice in previous articles, if you are in any doubt about your own procedures I suggest you go back through your ARs and see what you make of yourself. There are too many operators who blunder their way into a contact with a mad contester who has to explain what is going on, quite often at great length with repeats, In order not to offend by disappearing, or to gain points which may mean the contest.

There are operators who talk on for (what seems like) hours when others on a net are waiting to have their say, they only have themselves to blame if they find that the other operator/s have left the shack and missed their over. Am I at fault when I resent finding my time being wasted unnecessarily? The little enough time I have on air needs to be efficiently used in communicating, whether it is a rag chew with one or two mates, serious DXIng, helping a beginner at five words per minute, or contesting for 24 hours non-stop. Or should I give it up until I am retired? The horrible thing is that the less time I spend on air, the worse my own procedures seem to get, my sending is atrocious of late because I only spend an hour or so per week in the shack. Heeelllppppp. . .



Club Corner

CENTRAL HIGHLANDS AMATEUR RADIO CLUB

In May this year, a new club for radio amateurs was formed in Tasmania. Called the Central Highlands Amateur Radio Club of Tasmania, it is open to all licensed amateurs who are members of the WIA.

Objects of the club are:

To meet as a group from time-to-time to enjoy and operate portable amateur radio stations in the Central Highlands area; and

To enjoy the company of one another in a social situation.

There are no membership or joining fees. Money is raised for club expenses by fining members for various "felonies"; eg using "Q Code" on phone, sloppy radio procedure, misbehaving on air (or anything else deemed worthy of a fine by the President of the club).

Members meet on air at 7 - 7.30 pm EAST on 3.590 MHz. Net Controller is Bob VK7KZ, using the club call sign VK7CHT. This net is for joining new members (who only need ask to be able to join), discussing future events, and listing members' fines for the past week.

CHARC will be active at London Lakes in the Central Highlands on December 2 and 3, at the World Fly Fishing Championships. Club members will be using VI88TAS on all HF bands. As over 15 countries will be represented in the Championships over that weekend, and heavy media coverage is arranged, it is hoped that amateur radio will get plenty of publicity from the event.

At present the club has 17 members — 16 from VK7 and one from VK3!

For further information contact the Secretary/Treasurer, David O'Brien VK7NDO, 27 Ash Street, Lutana, Tas. 7009 or the Club President, Bob Greeves VK7KZ, 28 Hamilton Street, West Hobart, Tas 7000.

—Contributed by Bob Greeves VK7KZ, President, CHARC

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BALLARAT AMATEUR RADIO GROUP INC

The Ballarat Amateur Radio Group inc held its Annual General Meeting on June 24, 1988. Executive officers for the coming year are:

President — John Hazledine VK3CFH
Secretary — Jim Wright VK3CFB
Treasurer — Harry Hekkema VK3KGL

Stan Widgery VK3SE and George Small VK3DKJ, were presented with Life Membership Certificates in appreciation of the many years of unselfish service to the club and their fellow members.

The 1987 Hamvention was very successful and, in line with club policy to use profits from Hamventions for the benefit of all amateurs, members have now built and installed a two metre repeater at Smeeton, VK3RBS. A digital repeater will shortly be installed in Ballarat and the 432 MHz beacon, which has been out of service for some years, has been updated and should be heard in the near future.

The 1988 BARG Hamvention will be held on October 30. Further details will be published later.

—Contributed by Jim Wright VK3CFB, Secretary, BARG

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SHEPPARTON AND DISTRICT AMATEUR RADIO CLUB INC

The Shepparton and District Amateur Radio Club is holding a Communications Day on Sunday, September 18, 1988. The event will take place at the Shepparton Showgrounds. This venue is in the City area and only a short walk from the Shepparton Railway Station. A return train runs between Melbourne and Shepparton so, leave the car at home and enjoy V-line's comfortable country service. The train leaves Melbourne at 8.56 am and arrives in Shepparton at 12.50 pm. It departs Shepparton for Melbourne at 5.37 pm.

Major dealers have indicated they will be attending. Icom will display the "Rolls Royce" of transceivers, the IC-781, plus a full range of their equipment. Tomlinson Communications will show their Australian-made antennas. Measure Tech Supplies will have a range of Kenwood equipment.

Home-brewers may care to purchase from the large supply of secondhand and reclaimed parts! A flea-market stall will operate if required, so bring along those bits and pieces you have been meaning to sell.

A friendly two-metre fox hunt is planned so remember to bring your sniffers. If required, a tour of the city and the local potteries can be arranged. Bring along the whole family.

The greater Shepparton area was proclaimed Australia's first solar region. As a result of this, the club has changed its call to VK3SOL, for SOLar. The club award if to be re-activated and for the month of September a special one contact award is available.

This year, Shepparton is celebrating its Sesquicentennial. The club decided that an endorsed award was a good way of participating in the celebrations. A contact with AX3SOL during September will qualify you for this award. There are many special events on in the area during this month as the SHEPPtember festival is held.

On Communications Day catering will be available and there is plenty of room for a family barbeque to be set up. Why not take in some of the other activities of the area at the same time?

A Talk-In will be conducted on VK3RGV, 146.650 MHz in case you get lost. A lucky door prize will be awarded on the day. Doors open at 10 am and close around 4 pm.

For further information, contact the club at PO Box 692, Shepparton, Vic. 3630, or Peter O'Keefe VK3YF on (058) 21 6070.

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CLUB PORTRAIT

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

SHEPPARTON AND DISTRICT AMATEUR RADIO CLUB (SADARC) INC

It was with great enthusiasm that over 20 people attended a meeting on June 6, 1979, which saw the formation of this club.

But it had its early beginnings back in the 1960s when radio amateurs in the Goulburn Valley, north-central Victoria, had a net on 80 metres.

This hook-up continued for many years before interest waned and it lapsed.

In the late 1960s, the WIA journal, *Amateur Radio* featured a card insert listing two metre repeaters, including one on Mount Major, near Shepparton.

This raised some eyebrows among the locals who knew that the repeater, although listed and planned, did not exist. They were then galvanised the idea of a repeater to serve the area.

Mount Major is visible from Shepparton and the prospect of the hobby being enhanced by a repeater began to haunt local radio amateurs, but little progress was made.

In the mid-1970s, the CB radio boom was heading for its peak, and the Novice licence was introduced. Club President, Peter O'Keefe VK3YF, said; "CB radio made the general public aware of the concept of hobby communications.

"This was in stark contrast to the radio amateurs who had traditionally kept a low profile."

The local TAFE college organised several local radio amateurs to run a Novice course mainly for CBers, and this started in June 1977, ending in time for the following November examination. But despite initially attracting a large number, many gave it away fairly early leaving only eight dedicated souls determined to get the Novice ticket.

Most passed the examination at their first attempt, while the remainder were successful at their second attempt.

With the encouragement of TAFE staff, the majority then formed a self-help group with the intention of passing the AOCP.

By mid-1979, the self-helpers had achieved their aim. It seemed those who had participated formed a human bond, and wanted to continue meeting socially. The obvious way was to form a radio club. A meeting was convened at the PACE Building, in Shepparton, by Jim Scott VK3KFD, who was elected the club's inaugural president.

About 80 percent of those attending were newcomers to the hobby and full of enthusiasm. They were typical of the radio amateurs born out of the CB boom. The club's name was suggested by Frank VK3NMY, the founding secretary.

Other committee members elected were Jim VK3BNM, Barry VK3KBR, and Graeme VK3ZSQ.

Soon after its formation the club became a member of the WIA. The first organised activity for SADARC was the Jamboree on the Air (JOTA) weekend of 1979.

After an address by John Waters (who later became VK3PXJ), from the local scout district, the club members set up portable stations at local scout halls.

Striking while the enthusiasm was still running, Graeme VK3ZSQ, raised the almost forgotten issue of a local repeater. Wayne VK3XQA, speaking from CB activity experience, knew that Mount Wombat, near Euroa, and not Mount Major, was the ideal site. Mount Wombat provides access to the Goulburn Valley and southern New South Wales, and large areas of Melbourne.

After considerable volunteer effort and support, and a contribution by the WIA Victorian Division, which provided half the costs of construction materials for the repeater hut, VK3RGV, Mount Wombat, started operation in 1982.

The club has been vocal on issues affecting the hobby, and was among the first to enter the debate on future directions after the release in 1985 of the Linton/Harrison discussion paper.

Its members are keenly involved in packet radio and have set up a digipeater, VK3RPW, on Mount Wombat, to provide part of the intra-state and inter-state path for packeteers.

SADARC sees packet radio as the new frontier of amateur radio, and is voicing its opinion on the still nagging protocol hassle.

The biggest event on the SADARC Calendar-of-Events is the Communications Day, held in September. This single day activity being held this year on Sunday, September 18, takes place in the middle of the SHEPPtember festival activities sponsored by business and community groups.

Being ideally located in north-central Victoria there has consistently been high attendances from throughout the State and from southern New South Wales.

Full details of the Communications Day '88, which is also aimed at the general public, appear elsewhere in this edition of AR magazine.

"It's most important to put our hobby before the general public," Peter VK3YF said.

For that reason, SADARC members have participated in various public events, including street displays, and WICEN activities, to help with out hobby's image in the community, he said.

The club sponsors the Wombat Award, although in recent times, the wombat has been in a state of hibernation. But, with the club's new call sign, VK3SOL — very appropriate because Shepparton is Victoria's Solar City — the Wombat Award will be re-activated with possibly a solar powered flavour!

VK3SOL will have a good HF signal from an IC-730 transceiver donated by Bert Randall VK3BRR, who in recognition for his fine gift has been made the club's first life member.

SADARC is an active and progressive club willing to speak its mind on issues affecting the hobby, and play its part to further the pursuit of hobby communications.

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QSP

AMATEUR RADIO IS THE HOBBY

A special station VE3CNE (Canadian National Exhibition) will be operating from Toronto until the September 5. The display is exhibiting all facets of the hobby. A special QSL will be forwarded to all stations contacting this station who is using the apt motto "Amateur Radio is the hobby!"

—Condensed from *The ARRL Letter* by Ken McLachlan VK3AH

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Forward Bias

Norm Gomm VK1GN
GPO Box 600, Canberra, ACT. 2601

DIVISIONAL PARTS BOX

The Divisional Parts Box, under the care of Neil VK1KNP, is operational, but we still need suggestions for items to stock.

MONTHLY MEETINGS

The June meeting saw a presentation by Dr David Gambling from the Department of Defence's Electronic Research Laboratory. David gave us an intelligent insight into where the world of microelectronics is heading. Over 60 members attended and the number and quality of questions asked at the end was a measure of the interest shown in the topic and the speaker.

David certainly laid to rest the old myth that boffins cannot communicate.

Hank VK1HZ, is always looking for new and innovative topics. So, any suggestions will be gratefully received. Hank would prefer topics that have a strong amateur radio flavour.

Future meeting dates are:
September 26
October 24
November 28

PACKET ACTIVITIES

The packet digipeater has been installed on Mount Ginini and will be in operation by the time this goes to press. As mentioned in the previous issue, the digipeater will operate on 144.800 and 4800 baud rate.

The ACT Packet Group normally meets on the first Thursday of each month, but this is subject to variation. Details of venues and dates are beaconed by Richard VK1UE, about one week before a meeting.

Details on the ACT Packet Group activities can be obtained from Carl VK1KCM, on telephone (062) 89 7819 (work) or (062) 58 3921 (home).

DEVOLUTION OF EXAMINATIONS

The Division will be applying to run amateur examinations under the new arrangements and will be looking for people to assist in their running. Anyone interested in helping should contact a committee member. You do not necessarily have to be a full call to be able to help.

FUTURE OF AMATEUR RADIO WORKING PARTY

The Working Party is looking for an amateur in the Canberra region to assist gathering information on amateur activities. Volunteers can be non-WIA members. If you are interested please contact George VK1GB (062) 54 1965 (AH) who will fill you in on the details.

JOTA

JOTA is approaching with incredible speed and Neil VK1KNP, out JOTA co-ordinator, is looking for about six stations co-ordinators and numerous operators. Those who participated last year will recall that the scout and guide movements were really well organised making JOTA a very satisfying activity. Get in early and reserve your place in this years activity by calling Neil as soon as possible.

VK1 AWARDS NET

The VK1 Awards net is run every Sunday night immediately after the Divisional broadcast (2000 local time) on 3.570 MHz. The net controller and awards manager for this activity is Bob VK1DE. This year the net has been using the VI88ACT special event call sign, so here is your chance to kill two birds with the one stone by collecting your award and working VI88ACT.

The first award issued on October 10, 1980 went to Egil Bohn OZ4BO, and the bicentenary award No 200 went to Alec Pickford VK2EF To date, 204 two-way and about 10 SWL awards have been issued.

Bob has asked me to make special mention of Joe VK1NDJ, and Russell VK1OP, who have been regular supporters of the net in recent times.

THOUGHT FOR THE MONTH

I was talking to an amateur the other day who was gradually losing interest in the hobby because he found it difficult to get advice or help on various aspects of amateur operations. He was a shy type which compounded the problem.

Discussing this as a general issue with a couple of other VK1s, we agreed that it was a widespread problem. We also agreed that, on the other side of the coin, a lot of experienced amateurs are equally too modest to offer their services, probably because they feel they are not expert enough.

So, there you have it! One party reluctant to ask for help, the other reticent to step forward. Who should take the first step?

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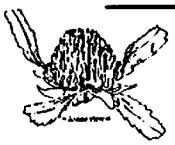

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

On June 30, 1988, Cec Bardwell VK2IR, retired from the position of Divisional Correspondence Course Supervisor. In 1960 Cec undertook to conduct a personal lecture class for the Division at the newly acquired Atchison Street property and this involvement lasted for the next 20 years. In 1961, there was a need to provide a Correspondence Course for those living in remote areas and this service has continued to the present day. There have been many thousands of amateurs, both within Australia, as well as overseas who have benefitted by the Division's courses. Margaret Bardwell has assisted throughout the Correspondence Course with the paperwork associated with the course. To you both, thank you for three decades of contribution to the Amateur Radio Service.

WICEN EVENTS

Saturday, September 19 — Batemans Bay Car Rally.
October 22-23 — Hawkesbury Canoe Classic.

POSTCODE CONTESTS

There has been a slight change in the program for the remainder of the year. September 30 — two metre SSB; October 28 — 70 cm; November 25 — two metre FM and December 30 — six metres. A report in a future issue of the scores for the first half of the year.

TRASH AND TREASURE

At 2 pm, Sunday in the car park at Amateur Radio House, September 25 and November 27.

WAGGA ARC

Wagga ARC is to conduct a Field Day on the first weekend of November. Details will be in the Club Corner notes for October.

ILLAWARRA ARS

Illawarra ARS will host the next Conference of Clubs in November. Agenda items from clubs must reach the Divisional Office by September 15. See Club postings for details.

SPECIAL EVENT STATIONS

VI88WIA will be used for the one day *Fisk Award* on September 22. See separate article this issue for details. VI88NSW will be used for the Parramatta Bicentenary Award from October 31 to December 5. Details of this award will be in October AR. VI88NSW will be active most weeks until the end of the year with various clubs and groups. There are a couple of weeks still available in December.

Don't forget to return your RD log. VK2 needs the benefit of your score.

NEW MEMBERS

A warm welcome is extended to the following who were in the July intake.

P M Broadhead VK2VBX	Bungonia
J A Burlison Assoc	Cheltenham
D S Byrnes Assoc	Regents Park
D W Chaffey VK2NBC	Chester Hill
M T Egan Assoc	Bullaburra
N C Farley Assoc	Gloucester
L O Horsfall Assoc	Newbridge
P B Marks VK2TPM	Balmain
R E Perez Assoc	Fairfield
P A Westerman VK2MPW	Wingham

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VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

VK3 BROADCAST

Members of the Wireless Institute can place advertisements on the regular Sunday morning broadcast.

The Department of Transport and Communications has granted permission to operate a service for "Wanted" and "For Sale" items related to amateur radio and shortwave listening. We are not, however, permitted to broadcast the names, addresses or phone numbers of persons placing advertisements.

If you have something to sell, or if you are searching for a particular item, prepare an advertisement just as you would if you were sending it to the classified section of a newspaper. Send two copies of your advertisement together with an *Amateur Radio* address label (to confirm WIA membership) to:

John White VK3KJW
PO Box 199
Preston, Vic. 3072

Please do not send advertisements to the broadcast post office box.

If an advertisement on the broadcast interests you, contact the WIA Victorian Divisional Office on (03) 417 3535 between 10 am and 3 pm Monday to Thursday and the advertiser's full details will be supplied. (This is where the second copy goes!).

Zones, clubs and individuals are encouraged to contribute any items they consider newsworthy or of interest to radio operators or shortwave listeners.

Send material to:
Broadcast News
PO Box 260
Cranbourne, Vic. 3977

The broadcast goes to air at 10.30 am every Sunday on the following frequencies:
1.840 MHz AM; 3.615 MHz LSB; 7.085 MHz LSB; VK3RMM 7250 and VK3RWG 7225.

By this time, the Melbourne repeater VK3RML should be back on air and will carry the broadcast. While it was off air, the broadcast was carried through the Geelong repeater, VK3RGL.

The broadcast will soon be relayed through the Geelong City repeater VK3RGC. In the longer term, it is planned to relay the broadcast through VK3RNE, on Mount Big Ben in north-east Victoria. Also planned is a six metre outlet via repeater instead of the simplex frequency used in the past.

ECONOMY QSL CARDS

The Victorian Division can have a standard QSL card printed for its amateur and shortwave listener members. The very competitive price is $95 for 1000 cards.

A standard block is used, which is then personalised with your call sign or WIA listener number, and address.

Orders must be in lots of 1000 cards and to keep the price down, we need to have 4000 cards in the one print run. Orders are held until a print run can be filled.

To place an order, contact by phone or letter the WIA Victorian Division Headquarters volunteer on Tuesdays, Bruce McCubbin VK3SO.

ZONE AND CLUB NET

Don't forget the valuable club news forum available in the form of the Zone and Club Net held at 8.30 pm every Sunday evening in the vicinity of 3.597 MHz, controlled by Marilyn VK3DMS.

—Bill Trigg VK3PTW, VK3 Council

NEW MEMBERS

The following applications were received for the month of May 1988.

Lionel Decker VK3KLD; Raymond Dunstan; Rodney Flanagan VK3CR; Roger Godfrey VK3JBK; David Gothard VK3CDG; Ormond Guy VK3DGP; Mark Harris VK3KYG; Kenneth Jennion VK3VAX; Graeme Knight VK3VGK; Frederick Oakman VK3JGO; Kenji Okubo; Terence Robinson VK3DWZ; Michael Schulz DF6AR; Colin Strong VK3YCS; John Swift; Robyn Trinder VK3MBL; Robert Williams VK3VOS and Yu-Hong Zhou BY4AA.

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

NEW MEMBERS

I am pleased to have room in this month's column to include a list of new members who have joined in the first half of 1988. It has been our intention for sometime, to include a list of new members but I always seem to run out of space. If your name is on the list, we welcome you to the VK5/8 Division and hope that you have found your first half year enjoyable and worthwhile. If you happen to be reading your friend's copy at this moment, or are perusing the copy at your local public library, why not take the plunge and join us. We will gain by the increased membership and you will gain by joining a great bunch of people with like interests, having a magazine which keeps you in touch monthly, use of all the WIA services like the QSL Outwards Bureau (which will not be available to non-members in VK5/8 after January 1, 1989) and a united voice in things which affect amateur radio. I look forward to printing your name in out next list!

NEW MEMBERS FOR HALF YEAR 1988

C A Edwards Assoc
A G Hughes ZL3KR
D J Hobbs VK5AS
M H Hillard VK5AHH
D J Cavies VK5KOC
T J Crothers Assoc
D R Nairn Assoc
T D Niven VK5NC
A Wardhana VK5KAW
W J Pickering VK5ACY
I Parkinson VK8NIP
V E Skitterall Assoc
F A Ayling Assoc
H I Greenhill VK5NGH
R G Wake VK5KZZ
K P Thompson VK5SE
K R Browne Assoc
E Leach VK5PAG
R C Scott VK5PG
B P Mountford Student
SA Packet Users Group
R E Gunnourie VK5FI
A J Gluis VK5AAQ
K P Thomas VK5ZKS
M L Patzel VK5KMP
J R Godson VK5LV
F Rutherford W2NUS
R E Padman VK5DP
I M Benn VK8IB

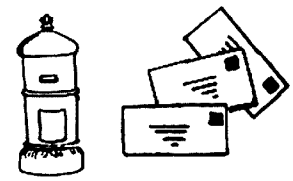
DIARY DATES

Tuesday, September 27: Display of Members' Equipment (Bring along your latest piece of "home-brew" and perhaps take home a "reward" or your efforts). 7.45 pm. BGB.

Tuesday, October 25: Speaker — Mark Spooner VK5AVQ, on his recent trips to the Antarctic, and some of the technical equipment with which he was involved (slides). 7.45 om. BGB.

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Over to You!



AMATEUR/CINEMA INDUSTRY

A couple of years ago, via these pages, an amateur requested information from those of us amateurs who had worked as projectionists in the cinema industry. It was for a planned article on that subject and the promise was that all contributions would be acknowledged.

Like, I guess others, I sent off information about myself and other past VK6 projectionists I knew, but no reply ever came. Neither do I recall seeing the article eventuate.

I know that, like me, many VK amateurs who have spent time in a bio box would have looked forward to that article but obviously something went wrong.

If any VK projectionist, retired and present, would like to be placed on a list, I invite them to send me details of theatres and equipment they best recall plus any anecdotes or memorable experiences they care to relate. Names and call signs of silent key projectionists would also be welcome.

Please include a 9 x 4 stamped addressed envelope so that a summary of replies received can be returned in a month or two.

Paul Weaver VK6OF
23 Waddell Road
Palmyra, WA. 6157

The long-delayed article is in this issue, Paul. -Ed. ar

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THE OTHER SIDE OF THE COIN

A few time in ones life things occur which must be akin to "Heaven Sent".

Some months ago, my wife, who does wonderful things on "knitting rigs" went to a Knitting Seminar at Adelaide University. During this short period I met, among many other ladies, Margaret Grundy, from Crystal Brook. The upshot was that my wife has a surplus "rig" due to updating and Margaret decided to buy the superseded model. How to get it from Aldinga Beach to Crystal Brook was something else, but was eventually solved by John, one of Margaret's family.

John duly arrived to collect the machine, was invited in, declined a "cuppa" but stayed for a good chat. It was only then that I learned that John's father was none other than Bob VK5BG, late of Murray Bridge.

Since, I have joined the boys from that area on their net — sadly after Bob had left for new pastures — therefore I did not meet Bob at any time — my loss I fear.

Eventually, I wrote to Margaret passing on condolences and asking had she anyone in the family "radio-minded" in order to pass the call sign on and retain it — if not, with her blessing, I would be honoured to replace my "BEG" with "BG".

It is too late now to try and catch up with Bob's achievements, but if you should be listening Bob and hear your call come the Spring, I shall not be aping you — just keeping VK5BG warm.

My thanks to Margaret and her family.

73

Rick Burnell VK5BEG/BG
63 Acacia Terrace
Aldinga Beach, SA. 5173

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TECHNICAL CORRESPONDENCE

I would like to make some comments on the article *Two Metres For The Newcomer* in the July issue of AR, particularly that part of the article dealing with the expected range of ground wave communication. Table 1, as stated, takes no account of the bending of the radio wave due to atmospheric refraction. The effects of refraction are to extend the radio horizon by about 15 percent over the figures given in the table, not 30 percent as stated.

A simple formula for calculating the distance to the radio horizon is:

Distance = 4.13 x sqrt (Height)

where

Distance = distance to the radio horizon in kilometres

Height = height of antenna in metres

The height of the antenna to be used in the above formula is the height above the surrounding terrain, not the height above sea level.

In the first paragraph of the article, an example is given of finding the radio line of sight distance using Table 1. It is assumed both stations have antennas on five metre high masts, and that the stations are 45 metres above sea level, giving an antenna height at each station of 50 metres above sea level. Table 1 is then used to arrive at a radio line of sight between the stations of 50.6 kilometres, extended by 30 percent for refraction to give a line of sight distance of 66 kilometres.

This calculation is misleading in that it is only correct (except for the 30 percent refraction correction which should be 15 percent), if both stations are on a cliff top on the coast with a path across the sea between each station. It is the height above the surrounding terrain which should be used for inland stations. In this case, using the example given in this article, the radio line of sight distance between the stations is 16 kilometres, or corrected for refraction (15 percent), 18.4 kilometres.

Or using the formula given above:

Distance

= 4.13 x sqrt(5)

= 9.23 kilometres to the horizon for each station

= 18.5 kilometres between the two stations

The factor of 4.13 assumes a standard atmosphere. The actual refraction of course will vary according to atmospheric conditions and height above sea level, but these refinements are of no concern to the radio amateur.

It is hoped this will prevent some amateurs from thinking something is wrong with their systems if they do not achieve the results implied in the article. In practice, many factors affect the ground wave range and the distance computed from the formula or tables is only a rough guide and is usually a minimum distance to be expected in clear open country. The formula also does not take into account scattering of the radio wave as it grazes the horizon.

Incidentally, the same formula can be used or visible line of sight if the factor in the formula is changed to 3.57. In this case, for a person standing on the sea shore with a height of eye of 1.6 metres, the sea horizon will be 4.5 kilometres away.

Yours sincerely

Kevin L Feltham VK3ANY
PO Box 61
Port Albert, Vic. 3971

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OLDIES

Yes, we are. Take a look in July's AR for example. There are some 42 amateurs amongst those in the photographs, of those only seven would appear to be under 30 years of age. Yes, the majority of us are *OLDIES*.

Why are the majority of us oldies? Well, one reason could be letters like Clive VK2DQE's and similar ones in this and other magazines that do nothing to help. We scare all but the hardy newcomer before he even starts. We have a communication hobby, yet we must be the world's worst communicators. I personally took part in an activity recently that earned amateur radio the equivalent of two full pages in Queensland's two major daily newspapers. I was communicating. Do you?

My occupation allows me, in a few months, to meet people that are not amateurs, some are CBers, some shortwave listeners and many others often looking for an interesting and active hobby. Their ages vary from 12 through JOTA to 70 years or more. In many ways I have encouraged or given advice to many of these to study or stay with their studying to obtain a licence. It is surprising just how many still drop in to say G'Day from time to time. I was communicating. Do you?

Clive VK2DQE, in his letter, mentions most, if not all full calls are against novices obtaining two metres FM. Well, I must disagree with you Clive as I would "eye-ball" a larger number of full calls than most would and the count that I have would be more like 80 percent for novices on two metres and 20 percent, if that, against.

Clive also mentioned no incentive for the novice to upgrade now. Yes, in a very small number of novices this would be correct. Often this small percentage of novices is infirmed, elderly or without the capability to progress further and will never get a full call, no matter what "carrot" is dangled in front of them. Some are blind (incidentally, I lift my hat to any such person who does sit and obtain a full call). The reasons to upgrade to a full call are too numerous to mention now but Clive seems to forget the obvious and main reason, the one that he/she can proudly and justifiably stand up, stick out their chest and say "I did it, I got my full call".

What a thrill it is when you finally make it after all the study and hard work most of us have to put in and are able to say "We can now communicate by any means at full power with the rest of the world". Incidentally, have you noticed that novices seem to be the best communicators. Do you communicate?

Clive failed to mention that the incentive novices having two metres FM now gives to non-amateurs to obtain a novice licence, the wives, friends, parents and relatives, etc now have that incentive to know that, for a reasonably modest sum, they can buy a hand-held two metre transceiver, a small power supply and a small antenna that they can fix to the guttering of their house, or to the railing of their flat's balcony, then they too can communicate *like we communicate? ? ?*

It is about time that you, I and the rest of us started to communicate. Explain, demonstrate and, what's more, *tell* people what we do and what we are about as well as actively encourage the younger generation to participate in some way in our hobby that we find most interesting, enjoying and satisfying. For, above all, we must start *communicating* not only amongst ourselves, but even more so with the general public. It's not really surprising that people in general do not know that radio amateurs have built and launched their own satellite, assisted in emergencies, communicate around the world automatically via computers, have their own television stations, send television pictures from one side of the world to the other and many of the other exciting activities that we do. Most people think we only sit and talk to each other — some do, most don't.

This is because *we don't communicate and tell them.*

Brian Beamish VK4AHD
35 Chester Road
Eight Mile Plains, Qld. 4123

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I'M STILL AROUND!

Since coming over to this country to live in the early 60s I have read the magazine from time to time and very much enjoy following the goings on down-under. I have also been active and inactive over the years on HF and managed to keep in touch with VK and ZL, but not as much as I would have liked due to pressures of business, TVI and other forms of QRM.

I am now retired and living in a quiet area of California where QRM of all kinds is at a minimum and I am always looking for VK and ZL contacts, particularly on 10 and 15 metres. My favourite frequencies are around 28.495 and 15.225 MHz. I always get a great deal of pleasure when I find an old friend from the days before and just after WWII when I was very active in VK3 and VK5 (Northern Territory).

My purpose in writing is to say how much I enjoy reading *Amateur Radio* each month and to let my old friends and acquaintances know that I am still alive and kicking. Keep up the good work.

73

Dave Medley KI6QE
(ex-VK3MJ, VK5AE, VK3DL/W5, WA5YXA)
1450 Bayview Heights Drive
Los Osos, CA 93402

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10 METRE BEACONS

From the request in June AR by the Federal Technical Advisory Committee (FTAC) Beacon Committee, it would appear that the use of time multiplexing for Australian 10 metre beacons has already been decided. The 1985 IARU Region 3 meeting agreed to multiplexing 10 metre beacons. I wonder why? Furthermore, when did the WIA pass a resolution to adopt the IARU proposal?

The last heard of this proposal was that the matter would be open for discussion. What was the result of these discussions? This should have appeared in AR; that is what AR is for.

VK2ZTM, in his report on page 60, June 1988 AR points out the complexity of multiplexing. What advantage to the amateur fraternity of this Region is there of multiplexing 28 MHz beacons? Beacons on 14 MHz are a completely different situation and I suggest that the 14 MHz case has been used quite incorrectly to apply to 10 metres.

As I pointed out to the FTAC in October 1987, even if two stations come up on the one frequency they are:

a) likely to be up to 1 kHz or more apart due to frequency tolerance.
b) unlikely to be of equal field strength.
c) unlikely to be sending call signs at the same time and if they do, and the interference is serious, there is time for the automatic repeat, so nothing is lost.

Now, consider this, as each beacon under the multiplexing system will only radiate for one minute each 10 minutes, one will have to sit on the frequency 28.200 MHz for 10 minutes and possibly hear nothing (if there is no propagation and this is the case for most of the time) and then spend *another* 10 minutes on 28.195 MHz for other beacons. That is, a total of *20 minutes* is spent to find out what now takes me 15 seconds. Is this progress?

Perhaps FTAC would like to comment on this aspect of their proposal.

I further suggest that this proposal is going to cost the WIA a lot of time and money to make and maintain the additional equipment and the user will not benefit one bit, but will, in fact, receive a degraded service. Again I ask, is this progress?

I suggest that we can well spare for beacons 100 kHz of the 1.700 MHz available on this band to save the complication of multiplexing. Furthermore, there appears no reason why two or more beacons cannot be allocated the same frequency (for the reasons given above) if all 40 allocated channels in the 100 kHz segment are used.

While it is appreciated that the corporate body of the WIA is, in fact, the member of the IARU Region 3 (distinct from the Divisions), I suggest that it is about time that members had the opportunity for an input to IARU matters *prior* to discussion/decision. In this regard, agenda items for IARU meetings should be published in AR. Remember IARU decisions affect *all* WIA members, not just members of the WIA corporate body.

R Torrington VK3TJ
4 Thistle Street
Pascoe Vale South, Vic. 3044

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WHERE IS EVERYONE?

I hope that in writing this letter I do not show my ignorance but the subject I would like to put forward is one that I don't think has been addressed.

I have travelled to Brisbane several times via the Newell Highway and I find contacts on two metres difficult, if not impossible — repeaters are scarce and, of course, can be off the air, like RML.

The problem can happen on any highway, not just the one mentioned above. I have not read anywhere that there is a declared frequency that drivers, passengers, train travellers and bus passengers (with ear plugs) can leave their two metre unit tuned to, yet much vehicle traffic carries VHF transceivers, seemingly all on different channels. May I suggest the use of 146.500 MHz as a road channel.

Amateurs living on main highways in the country would be able to say "Hi" to the people they speak to on HF Even our CB relatives use a road channel, but as far as I know we are not as well organised.

One could be driving behind a car or truck and not know that they were able to contact each other on 146.500 MHz because one is shouting at an out-of-reach or off-air repeater and the other is scanning at the other end of the band.

With Novices now on two metres, contacts which may also be urgent will be more easily made.

I hope that this suggestion is embraced by other travelling amateurs and make our journeys over this large country safer and more enjoyable.

Yours faithfully
Geoff Valentine VK3GV
3 Afton Court
Glen Waverley, Vic. 3150

The national two metre FM calling frequency was designated to be 146.500 MHz many years ago and is extensively used for this purpose. Once contact is established, stations then move to another frequency. —Ed.

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DX AWARDS — APPARENT COSTS

I refer to a letter in the June edition of AR from Neil Penfold VK6NE, concerning USSR awards.

I agree the "Box 88" specifies a cost of 14 IRCs or one Rouble for their awards. But I do feel that the fee for these awards has not been upgraded since before cats whiskers and kites, when IRCs were relatively cheap.

After some easy research through the local bank, I found that the exchange rate for the Australian dollar was 0.475 Rouble, or about $2.10 per Rouble. Working on this base I have been able to achieve and receive some of the above-mentioned awards.

So, about $A10.50 or US$8.00 would "fill the bill" handsomely, for the awards that Neil mentioned.

Yours faithfully
John Kelleher VK3DP
4 Brook Crescent
Box Hill South, Vic. 3128

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NOVICE DEBATE

Re the Novices on two metres debate, I found the contrast in attitudes of members as expressed in July AR very striking. On one hand we have VK3AFW taking the trouble to write and illustrate a three page article designed to assist the newcomer to two metre FM operation. On the other hand we have VK2DQE crying about being "kicked in the face" by this decision. The latter comment is on a par with a statement heard on 7.025 MHz high speed CW the other morning — "There's no way I will talk to them".

To my mind the final sentence of VK3AFW's article is in the true spirit of the amateurs' code, paragraph 4 — "friendly advice and counsel to the beginner".

Yours faithfully
Ray Jones VK7RQ
Howrah, Tas. 7018

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DOG IN THE MANGER

I gather from Clive's (VK2DQE) letter in the July issue of AR that he is very angry about the Novice two metre development.

It would be very easy to logically decimate his point of view quoting such parallels as the parable of the vineyard and 'Dog in the Manger; and be very nasty about his reference to CB standards and scarcely veiled suggestion of blackmail re his membership.

However, I have been in his position myself. Years ago I wrote a similar letter to my local council. Two days later I suddenly realised the contents would be debated at an open council meeting and reported in the local paper. In a state of near panic I arrived, white faced, at the Shire engineer's office where, without a word, he handed my letter back to me; from his coat pocket. I still write such angry, critical one-eyed letters; pour my heart out; but I never post them, if ever, for a few days. I sleep on it.

I commiserate with Clive as he penned his thoughts and I appreciate his mood, obviously occasioned by the facts he has stated. At first glance it would seem to make one "spit chips". There are many other obvious inequalities in our everyday lives that do so and about which we should be justifiably angry.

It is not my intention to criticise Clive's point of view. He is, like the rest of us, proud of his achievements, active, enthusiastic and interested in the progress of amateur radio. He is entitled to have his say.

On the other hand I wonder if he feels the same about the issue today? Have we hardworking bright sparks, we who have arrived, really lost anything?

Perhaps our Editor should allow us "sleep time" and query such outbursts prior to publication; just in case we have a change of heart.

Yours 73
Don Law VK2AIL
RMB 626 Adalong Road
Tumblong, NSW. 2729

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EDITORIAL

May I commend the Editorial (Leader?) in the July issue of AR, "Novices on Two".

I came to know two or three Novices on air as VK5NBD. Not one of them lives close enough to Adelaide to drive up to a WIA meeting, even if he came direct from work. As VK5KIC, I have lost contact with them, since, until two metres became 'common ground', we had no frequency in common because to finance (out of a gross income of under $200 a fortnight) a couple of hand-helds for VHF/UHF bands, my Novice HF equipment had to be sold. It will be very pleasant to meet with them again on air, possibly through one of the repeaters.

Before this two metre band opening how were Novice operators ever going to feel the incentive to upgrade to be entitled to use power enough to access the Crafers repeater, stationary mobile on the wrong side of the main building at Flinders Medical Centre?

On one occasion when I tried using 200 mW, another station came back with "QRZ the station calling. You were unreadable under the noise!"

I earned a report of 2 and 5, when I went up to two watts. Yes, this Limited has a *long way to go yet!*

Being able to work the Novice friends I made whilst on HF, when they get on the air, will be motivation to me to get to be one 'up there in those New Worlds to conquer'...

Yours sincerely

Ian Crompton VK5KIC
9 Craig Street
Richmond, SA. 5033

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MORSEWORD 19

Audrey Ryan
30 Starling Street, Montmorency, Vic. 3094

Morseword works like a crossword puzzle. It contains only one word in each row or column and each letter of that word is spelled out in Morse code. Think about the clues and then encode your answer, putting a dot or a dash in each square. For example, if the clue were fellnes the answer would be cats and you would write it in the grid thus:

-.-.-.-...

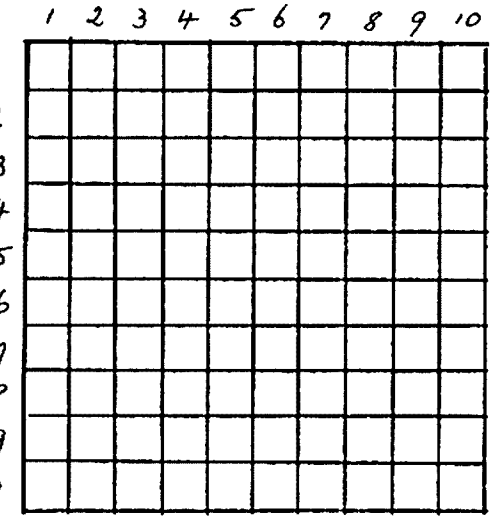
Solution page 62...

ACROSS

1. Solidity
2. Scottish roll
3. Smooth cloth
4. Where one's heart is!
5. Ancient
6. Annoy
7. A flower
8. . . . Lanchester, actress
9. Tarry for
10. Tarts

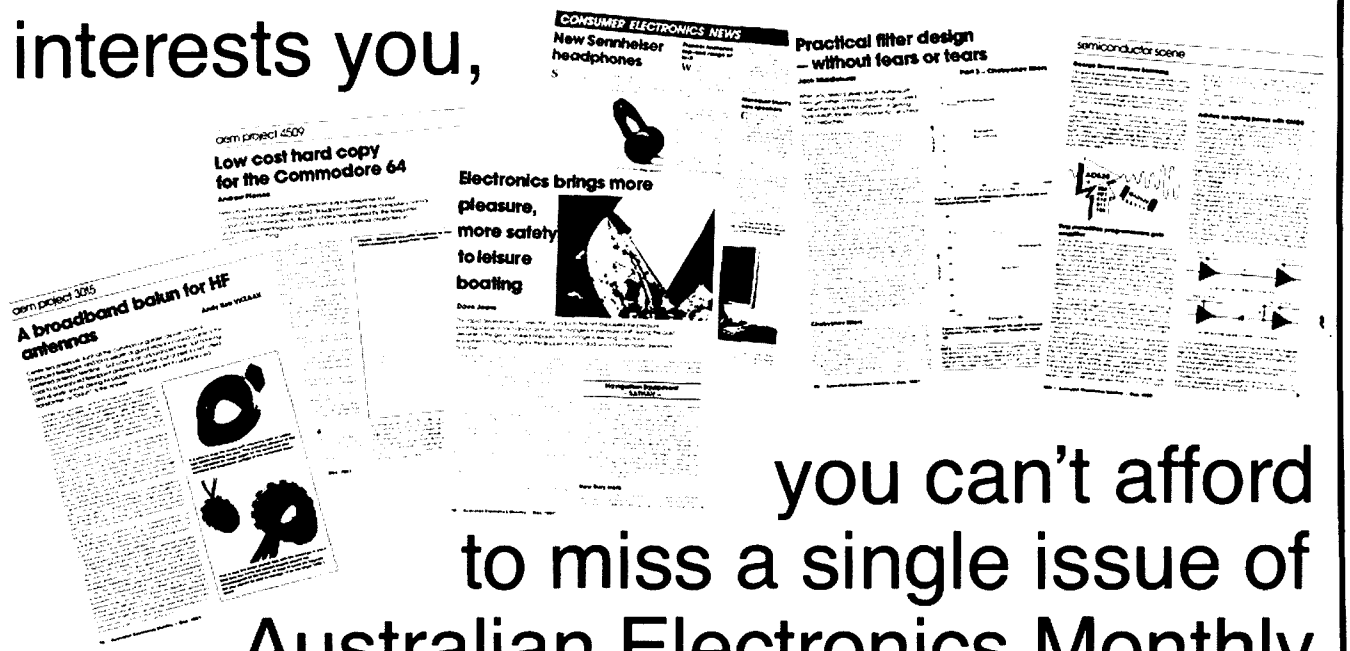
DOWN

1. Digs
2. Ship
3. . . . Joan, for example
4. Plunge
5. Keen
6. Demur
7. Hide
8. Monkeys
9. Confirms
10. Joint



ESSENTIAL Monthly READING

No matter what area of electronics interests you,



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Edited and published by industry identity, Roger Harrison VK2ZTB

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Silent Keys

It is with deep regret we record the passing ot:

MR G H CARRUTHERS	VK2BGC
MR J J S (JACK) FERRIS	VK2NC
MR FRANK G IZON	VK2DQX
MR GEORGE THOMAS SLAWSON	VK2AFN
MR ERIC SMITH	VK2NWV

Obituaries

ERIC K CHIPPINDALL VK4XR

It is with deep regret that the passing of yet another amateur from the pre-war period be recorded. In the midst ot a full and active life, Eric (Chippy) VK4XR became a Silent Key, suddenly, at his home on June 10, 1988, aged 72 years.

Eric's interest in radio began in the early 1930s when he built a 2-toober (O-V-1) and heard amateurs in QSO. The 'bug' bit and he declared, "That's for me!" During the next half-century his interest never waned. Together with most of his contemporaries home-brewing was an important activity during the pre and post WWII years.

He obtained his BOCP very early and entered commercial broadcasting, working at various 'B' Class Stations. Articulate and blessed with a beautiful, clear resonant voice his talent was soon in demand as an announcer as well as a technician. His 20 years spent at 4LG Longreach, Queensland, covered the war years, during which time he gave valuable assistance as Radar D/F Operator to the US AF Bomber Squadron based there.

Eric finally left commercial broadcasting, then successfully operated a retail grocery store for 11 years in Brisbane prior to retirement. In his later years he was very active and busy with charity work, viz Crossroads, Meals on Wheels, Red Cross and his Church, as well as amateur radio. The suddenness of Eric's demise, in the midst of all this activity, must serve as a reminder that no one has a mortgage on tomorrow.

A long time member of the WIA, VK4XR was also a member of the Wide Bay Club and a Scout master in the area during the 1960s. He was tremendously popular and the fraternity will be much poorer tor his passing.

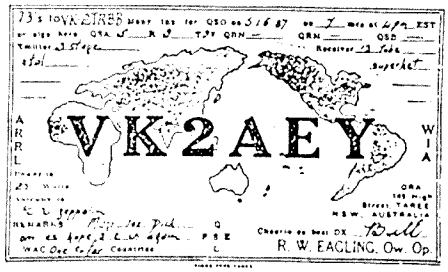
After nearly 50 year of marriage (an accomplishment in itself), he is survived by his YF Jean, son Robert and daughters Jeanette, Dianne and Erica.

May this writer pay his respects to the late 'Chippy' in the manner I know best:

"Old Hams never die,
They simply QSY,
Old soldiers may just QSB,
But the Ham's appointed place
Is on a higher frequency,
Where DXers need no mode, rig
To communicate a sig
Where QRN and static rife
Is absent — as is QRM,
Cause of such ignoble strife.
—And while on Earth ops contemplate
They, from 'up the log' await
On the infinite band.
Where DX is eternal,
To greet their kin in friendship grand."

—Contributed by Alan Shawsmith VK4SS

ar



REGINALD WILLIAM EAGLING VK2AEY
Passing of Radio Pioneer "Taree Bill" 1911-1988

The passing of Bill closes a chapter on the history of the Manning's early days of radio.

Bill Eagling arrived in Taree in 1931 and has virtually been connected with district ever since. He married Hazel in 1934 and they had four children.

From 1930 to 1950, Bill was occupied in the radio repair industry. Because of his expertise and interest in the field of radio, he obtained a "Radio Experimenter's Licence" in 1936 and became Taree's first amateur radio operator. He made his early transmitters and receivers from parts he scrounged from his radio junk box.

He served for five years with the Royal Australian Air Force during the war years as an instrument fitter, holding the rank of Sergeant. On the cessation of hostilities he was active in the formation of the Taree Returned Soldiers Services League (RSSL). Bill was involved in the establishment of Radio 2RE in the early 50s — an extension of his radio interest that was retained throughout his life.

When single sideband (SSB) was introduced Bill was one of the first to become involved and his signal was always crisp and clear. In the early days of the Civil Defense network, (now the SES) Bill and his radio equipment were a very Important adjunct to the communication section. His expertise in those early days contributed to the high esteem in which the local SES is held today.

After many years in the radio field, Bill branched Into pest exterminating and operated from his home. Without casting aside his interest in radio he became absorbed in the hobby of prospecting and the mining of precious stones which led him to Lightning Ridge after the death of Jean about 11 years ago.

It was at the Ridge in 1978 that Bill met and married Alma. Following some years together on the opal field, Bill and Alma retired to Manning Point, where they lived happily until Bill's recent illness. Bill passed away on June 21, 1988 aged 76 years, leaving Alma, his four children and their families together with many friends to mourn his loss.

—G Hunziker VK2BGF

ar

MURRAY BLOOMFIELD VK3DOV

The Land Forces Amateur Radio Group mourns the passing of Murray on June 19, 1988. Murray was elected Treasurer at the inaugural meeting of the group in January 1986 and subsequently succeeded the President, John VK1NCO, when John was transferred to Perth by the Army. He was a most enthusiastic member and rarely missed the weekly on-air meetings.

Although suffering ill health, he was always cheerful and his infectious laugh will be remembered by all who knew him.

Murray served pre-WWII in the Royal Melbourne Regiment as a part-time soldier when working with the State Savings Bank of Victoria. On the outbreak of war, he volunteered for the AIF but was medically classified as unfit for infantry service. He transferred to the Cipher section, then in its infancy, and served in the Pacific area including a time at Merauke which was then in Dutch New Guinea.

Deepest sympathy is extended to his wife, Gwen, and to his family.

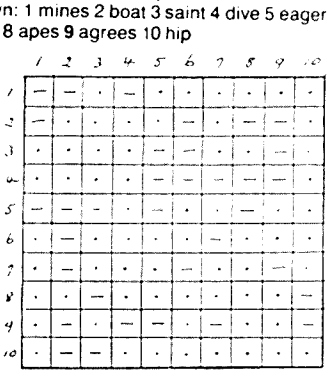
Bob Jackson VK7NBF

ar

ANSWER TO MORSEWORD 19

Across: 1 mass 2 bat 3 satin 4 home 5 old 6 rile 7 aster 8 Elsa 9 await 10 pies

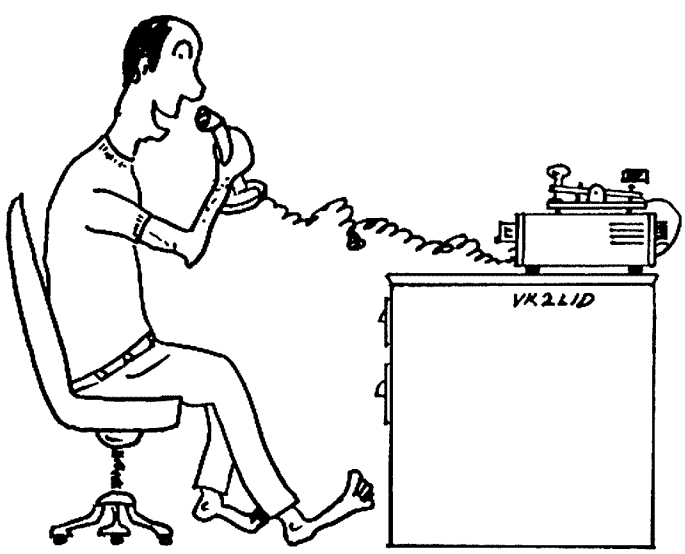
Down: 1 mines 2 boat 3 saint 4 dive 5 eager 6 jib 7 skin 8 apes 9 agrees 10 hip



THIS USED TO BE A HOUSEHOLD POWER-POINT!

This incredible mess used to be a household power socket before someone made a slight wiring modification. The overload generated a lot of heat which melted the socket, scorched the wiring and badly smoke-damaged the room. The State Electricity Commission of Victoria says it could have easily resulted in a house fire. Interfering with household wiring is not only dangerous, but it is illegal in Victoria and most other Australian States and Territories.

—Photograph courtesy State Electricity Commission of Victoria



"No — I'm only barefoot, OM!"

—VK2COP

IONOSPHERIC SUMMARY

The Solar Geophysical Summary from IPS Radio and Space Services for the month of May contains the following information.

The monthly values were 10 centimetre flux 115.4; sunspot number 59.7; A Index 10.8; I Index 65.5 and number of flares 8.

Class M flares occurred on May 17, 20, 23, 26, 27, 28, and 29. On May 26, there were two flares.

Solar activity was moderate during the second half of the month with the small M Class flares previously mentioned. The largest, an M6 flare, occurred on May 17, and caused a daylight fade-out from 1927 to 2205 UTC.

The solar flux for the month varied between a low value of 101 from May 15 to 17, up to a high of 145 on May 31. The monthly averaged value was down a little on that observed last month.

The geomagnetic field was active to minor storm levels between 0600 and 1200 UTC on May 5. A major disturbance started after 2100 UTC on May 5, and the field was at major storm levels throughout May 6. During the interval 090 to 1200 UTC, the planetary K Index reached a value of 9 indicating extremely disturbed conditions.

The geomagnetic field was active to minor storm levels for much of May 17. The most disturbed period was observed around 1200 to 1500 UTC. The disturbance persisted into May 18, but weakened in severity. On May 30, the field was at active levels at times during the day. May was mostly quiet except for the intense storm on the 6th. An Aurora sighting was reported from Flinders Island during this disturbance.

MUFs were depressed at times during May 7 and into May 8.

The ability of the ionosphere to reflect HF signals is determined by the density of electrically charged articles present in the ionosphere. This depends on the amount of extreme ultraviolet light coming from the sun, a quantity which depends on the details of the solar cycle.

The response of the ionosphere to the variation of the solar cycle is often described by an ionospheric index. The index used by IPS is called the T index which can be thought of as being an effective sunspot number, that is the sunspot number for which the ionosphere appears to be responding.

The following table gives a comparison between the 10 cm flux and sunspot number.

SUNSPOT NUMBER	10 cm FLUX
0	67
20	78
40	93
60	110
100	147
150	195
200	243

—Contributed by Frank Hine VK2QL

ar

DEADLINE

All copy for inclusion in the NOVEMBER 1988 issue of *Amateur Radio*, including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162,** at the latest, by **9 am, September 16, 1988.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write *each* on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIOON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 millimetre SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No inquiries at office please . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

RADFAX2: Hires radio facsimile Morse & RTTY program for IBM PC/XT on 380K 5.25" floppy + full Doc. Need CGA joystick port SSBhf FSK/Tone decoder. Has realign auto-start view save print + +. Also "RF2HERC" same as above but suitable for Hercules card. Programs are $30 each — $3 postage ONLY from M Delahunty, 42 Villiers Street, New Farm, Old. 4005. Ph: (07) 358 2785.

TANDY COCO OWNERS: Grosvenor Software (G4BMK) now available in Australia. AX-25 $90 (no TNC required), RTTY/ASCII $39.50, AMTOR $82, CW $37, SSTV (Rx) $39. Details from Dave Ralph VK4ASB, 23 Darwin Street, Aspley, Qld. 4034. Ph: (07) 263 3872 AH.

FREE — SA

COMPLETE SETS OF *AMATEUR RADIO:* 1964-1986. John VK5GY. Ph: (08) 263 5419.

WANTED — NSW

CIRCUIT DIAGRAM: for Galaxy III (three) transceiver. Will pay cost if photocopied. Contact Jim VK2VJ, 58 Bungalow Road, Roselands, NSW. 2196. Ph: (02) 750 0985.

HANDBOOK & CIRCUIT DIAGRAM: for Yaesu FT-202 (a photocopy will do). Ready to pay expenses. Bruno VK2BPO, QTHR. Ph: (02) 713 1831.

TELEQUIPMENT D-65 or D-66 CRO: Power transformer wanted or defunct chassis for salvage of same. John VK2ZJF. Ph: (02) 969 4539.

WANTED — VIC

LINEAR AMPLIFIER: Suitable to couple up to Kenwood TS-820S. Must be in good order. TL-922 or similar preferred but any good performer will be considered. Alan Bergman VK3CHX. Ph: (03) 848 8443 7 pm to 9 pm (home QTH) or (03) 489 1688 Mon to Fri 8 am to 6 pm (work QTH).

MANUALS: TM-11863 & TM-11858 for ex-military communications receivers R-391 & R-392. These receivers were originally made by Collins radio in the US. Prefer original books but copies okay. Terry VK3DWZ, QTHR. Ph: (054) 27 1574.

SEMATRICS: or copy of Owners Manual for Doro 721 telephone answering machine. All costs reimbursed. Write to VK3YJ, QTHR. Ph: (03) 398 4192.

TRANSCEIVER: with full coverage rx. Must cover all WARC bands. Required for mobile use but separate AC power supply desirable. Ian VK3GE. Ph: (059) 71 3020 AH.

TS-430S, TS-140S: equivalent or better. Must include PS. Rx to be general coverage including all amateur bands to 10 metres. Also require ATU capable of tuning tx through 66 foot 450 ohm line into centre fed 66 foot ant. Bern VK3FN, QTHR. Ph: (03) 306 7227.

VALVES: Types 6K7G, 6K8G, 6U7G, 6R7G, KTW62, KTW63, X66. Needed to complete renovation of R1155 communications receiver. Contact George VK3XEC. Ph: (03) 728 3597.

WANTED — OLD

19 TYPE 2 VOLT 8 PIN BATTERY VALVE: for WWII invasion tcvr. Also impedance details of Woden UMI, UM2 modulation transformers. VK4EF, 97 Jubilee Terrace, Bardon, Old. 4065. Ph: (07) 366 1803 AH please.

KENWOOD AT-130 ANTENNA TUNER & TRAPPED VERTICAL: Hygain 18AVT, Hustler 5BTV or similar. Details to Geoff VK4CET. Ph: (077) 73 7179.

QST OLD ISSUES: Wanted to complete Gympie Amateur Radio Club technical library 1939 onwards. All offers gratefully received now or at Goldfest 88. We may be able to swap. Secretary Alan VK4BWG, QTHR. Ph: (071) 83 1127 or PO Box 384, Gympie, Old. 4570.

WANTED — WA

SIX-METRE TRANSCEIVER: Icom type IC-560 or IC-505 (with FM option), in good working condition. Will pay reasonable market price. Allen VK6ZTA. Ph: (09) 448 0097 or write with details to 12 Kestral Street, Karrinyop, WA. 6018.

WANTED — TAS

ICOM IC-471A TRANSCEIVER: 70 cm all mode rig or similar. Contact Derek Mitchell VK7ZRR. Ph: (002) 43 8000 BH or (002) 43 6427 AH.

FOR SALE — NSW

FT-901DM: in perfect condition $1250. Mic and manual. VK2DTH, QTHR. Ph: (076) 76 3153.

ICOM IC-505: Zero use. $550. VK2IS, QTHR. Ph: (066) 52 3378.

MINIATURE HYBRID QUAD: Model HQ1 HF beam for 6, 10, 15, 20 m. 6 dB gain. Suitable small property. $250 ONO. Leo VK2VUB. Ph: (02) 344 8887.

TEN TEC DELTA 580: solid-state, 100W, all bands, CW filter, digital readout, with manual & hand mic. $600. Steve VK2MSA. Ph: (02) 602 2085.

FOR SALE — VIC

ACITRON SSB-400: 160-10m $345. TTY MOO-75 + punch $40. Tape Dist $20. TTY CRO tester $20. AWA N&P type A5 $85. Heath Audio Anal type M48. $85. VK3BOB. Ph: (03) 578 7441.

DRAKE HF TRANSCEIVER TR-7: with service manual. $1100. VK3DVD. Ph: (03) 726 7137.

FRG-7: Excellent condition $220. Tower 50 ft crank-up plus specs $500 ONO. 5 & 8 el 2m Yagis $45 & $65. PWR trans 240V primaries with secs 6V to 920V. Offers! Two DSE 20W amp modules built — unused & hundreds new components & bits. Call for prices. Barry VK3DKS. Ph: (058) 21 0885.

ICOM IC-290A ALL MODE 2M MOBILE RIO: used as base station only. Large digital display. 10W output, ANL, AGC, scanning mic, 5 memories, dual VFO, includes mobile cradle, manual, $575. Yaesu FT-690 6m all mode in original packing, carry strap, power cable, manual. Hardy used. $425. Roger. Ph: (051) 56 8291.

KENWOOD TH-215A HAND—HELD 2M TRANSCEIVER: with STD antenna plus 3/8 & 5/8 antenna, speaker, mic, BP1-BP2x2 & BP4 battery packs. 1 hr Kenwood charger soft case. Cost $1023, sell lot for $750. Mint condition. VK3GV, QTHR Glen Waverley. Ph: (03) 560 3773.

KENWOOD TS-440S: plus power supply & aerial tuner EAT300. New condition, tested but never used, $2000. John VK3KZC, 15 Gilsenan Street, Paynesville, Vic. 3880. Ph: (051) 56 6110 AH.

MICROWAVE COMPONENTS: Coax semi-rigid, various short lengths, SMA-SMA, SMA-N, from $4. Circulators-Isolators SMA, 2.1-2.3 GHz $25. 2.97-3.56 GHz $40. 7.13-8.5 GHz $40. SMA, PCB connectors $12. All as new. Bob Flack. Ph: (03) 232 5720.

UHF COMMERCIAL TRANSCEIVERS: Pye Europa 458 MHz. $30. Plessey MTR55 482 MHz. $60. STC Radiophone $30. Tony VK3ZMP, QTHR. Ph: (03) 700 5447.

YAESU FT-101B TRANSCEIVER: with 600 Hz CW filter, $425. Yaesu FTV-650B 6m transverter $125, or the pair for $500. (Compare that to a TS-660S). Above complete with all cables, handbooks etc. VK3ARY, QTHR. Ph: (03) 807 4798.

FOR SALE — OLD

TOWER: Steel triangular, self-supporting approx 33 feet high. Brisbane area. Geoff. Ph: (077) 73 7179 for details.

YAESU FT-707 TRANSCEIVER: YM-36 mic, FC-707 tuner. Original condition $750. Dick Smith assembled keyer $25. Imported tuner 1200 watts never used $200. Kenwood QR666 comm rx $60. All manuals. Noel. Ph: (075) 53 2832.

FOR SALE — SA

PALOMAR ENGINEERS NOISE BRIDGE: $80. Kyoritsu FET VOM K200 $80. Kenwood MC45 Touchtone pad mic. $50. Oscabfock SWR200 $60. Coax sleeve 2 kW 1:1 ATN Balun. $20. Gary. Ph: (08) 370 9196.

Advertiser's Index

KENWOOD

TM-221A THE ROVING NOVICE RIG

The new standard in mobile transceivers by which all others will be judged.

The new TM-221A 2-m and TM-421A 70-cm FM mobile transceivers have been specifically designed to condense maximum performance and operating convenience into an ultra compact package, allowing maximum flexibility in automotive installations.

In addition convenient key features include a large new easy-to-read LCD display, digital VFO with frequency step size selection, 14 multi-function memory channels, extended frequency coverage, pre-programmed automatic offset (TM-221A), memory scan and programmable band scan, memory shift function, and others for ease of operation and added versatility. An optional multi-function handset remote controller RC-10 is also available, further extending flexibility.

TM-721A FULL FEATURED DUAL BANDER

The TM-721A is designed to condense maximum performance and operating convenience into an ultra-compact die-cast chassis providing an all-powerful signal in VHF and UHF operations. An optional multi-function handset remote controller RC-10 is also available, further extending flexibility of operation.

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.

4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W. 2066. Ph. (02) 428 1455.

YOUR DEALER BELOW WILL GUARANTEE SATISFACTION

Further, beware of leaders not listed in this advertisement who are selling Kenwood communications equipment. All Kenwood products offered by them are not supplied by Kenwood Electronics Australia Pty. Ltd. and have no guarantee applicable.

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WITH ALL THE FEATURES IN ICOM'S NEW MOBILE TRANSCEIVERS, IT'S A WONDER THEY'RE STILL MOBILE.

Icom have packed so many functions into the IC228A and IC3210A mobile transceivers, you'd think there was no way you could still make them so compact. (It might explain why nobody else has made a transceiver with so many features.)

Some of the features both transceivers share is the multi-colour LCD display for easy viewing. Orange, red and green highlight the numbers and letters displayed in black.

There are various power outputs across the range, from 25W to 45W.

For novices, the 228A can be reduced to 10W.

The Programmed Scan function scans all frequencies between two programmable scan edge frequencies, while the Memory Scan function scans all memory channels in succession, except, of course, those you lock out.

Thanks to the pocket beep, you'll never miss a call. By installing a UT-40 Tone Squelch Unit (this is sold separately) the transceiver functions as a pager. When the frequency of a received tone equals the tone frequency you set, a thirty second alarm is emitted over the speaker.

As for monitoring the input frequency when you work a repeater, that's as simple as pushing the Monitor Switch on the front panel to open the squelch and check the frequency.

Every five seconds, Priority Watch monitors the Call Channel, one or all memory channels in succession. And that's while you operate! No longer do you have to flip back and forth between frequencies.

While the IC228A has 20 memory channels, the more advanced IC3210A has 40. Each channel stores all the information required to work a repeater.

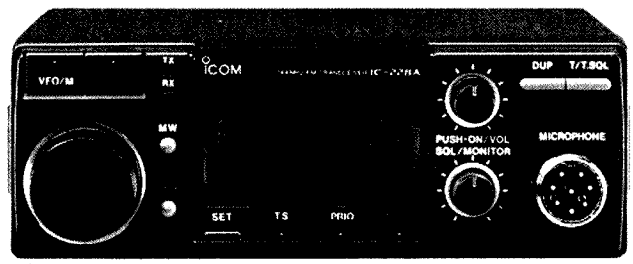
With the IC3210A, there are 20 double-spaced memory channels for 2 metres and 70 cm.

What's more, the IC3210A offers full duplex facility. Which means you can now simultaneously transmit on one band and receive on the other. You never have to wait for a long "over". You have full "break in". In fact, you can talk as easily as talking over the phone.

Call (008) 338 915 for your nearest Icom stockist today. (The telephone conversation in itself is a very good example of IC3210A's duplex facility.)

With all these functions in one small compact mobile, it really is a wonder they're still so compact and mobile.

ICOM

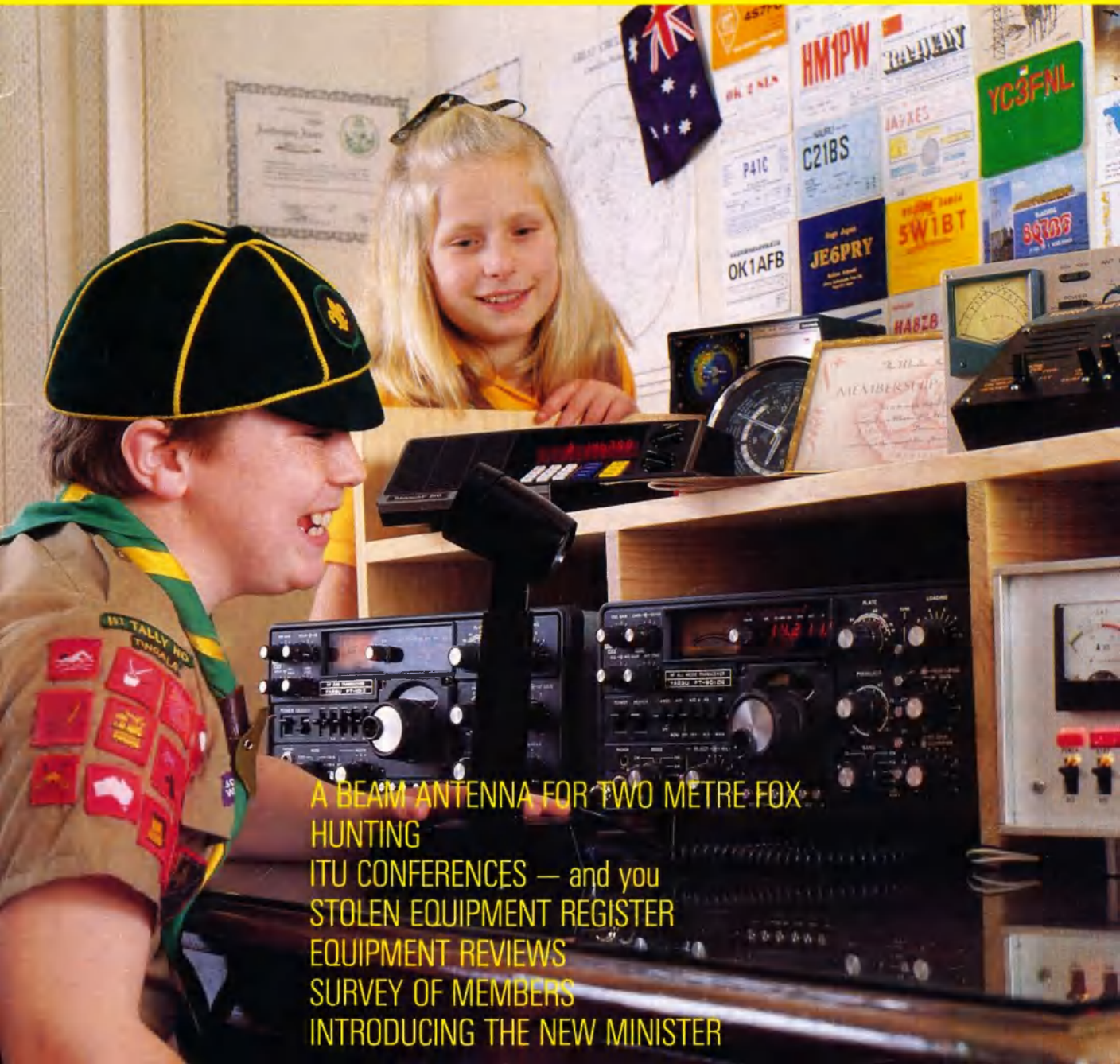


IC-228A

IC3210A

Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL. 56, No 10, OCTOBER 1988



A BEAM ANTENNA FOR TWO METRE FOX HUNTING
ITU CONFERENCES — and you
STOLEN EQUIPMENT REGISTER
EQUIPMENT REVIEWS
SURVEY OF MEMBERS
INTRODUCING THE NEW MINISTER

PROFESSIONAL ANTENNAS NOW AVAILABLE FOR THE SERIOUS AMATEUR!

Scalar brand antennas are well known in the government, military and commercial communications markets and are exported to many countries around the globe. Scalar has been in business since 1973 making it the oldest Australian-owned major antenna manufacturer. Early this year the Scalar Group of companies were acquired by Vicom International Pty Limited who are substantially expanding Scalar's activities. The new antenna company is now called Vicom Scalar Pty Limited. We are now able to offer amateurs some of the extensive range of antennas previously only available on the commercial market. Please note that sales are mail order only, cheque or bankcard with order. All prices include P&P for delivery anywhere in Australia. Regards, Michael Goode, VK3BDL, General Manager.

2 METRE ANTENNAS

M12T Stainless Steel ¼ wave, unity gain	**$7.33**
M22T Fibreglass ¼ wave unity gain	**$11.53**
M23TL Stainless Steel wave 3dB gain	**$36.91**
M25T Fibreglass wave 3dB gain	**$28.52**
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Patent Pending

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Model OW 150

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Frequency	140-174 MHz
Nominal Impedance	50 Ohms
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Bandwidth (1.5:1)	10 MHz

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Amateur Radio

—Photograph courtesy June Chapman, RMIT Photography Student

COVER PHOTOGRAPH: Melissa Hawkins, 9, of the 1st Blackburn South Brownie pack and Tony Linton, 10, of 1st Tally Ho Cub Scout pack. Both are Grade 4 students at St Thomas's Primary School, Blackburn, in Melbourne's eastern suburbs. Melissa hopes to join the Cub Scouts following the recent decision by the Scouting Movement to have girls in the Cub Scouts and Scouts. Tony is a WIA Associate member and is eager to obtain his Novice licence and has begun learning the basics and Morse code. This is his third JOTA in a row, both at the microphone and building electronic kits. Melissa and Tony were operating with the assistance of Jim Linton VK3PC, (just out of camera range) in his shack.

Special Features

Technical Features

Regular Features

DEADLINE

All copy for inclusion in the December 1988 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, October 15, 1988.

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EDITOR
BILL RICE* VK3ABP

NEWS EDITOR
JIM LINTON VK3PC

TECHNICAL EDITING CO-ORDINATOR
PETER GIBSON* VK3AZL

TECHNICAL EDITORS
EVAN JARMAN* VK3ANI
DOUG MCARTHUR* VK3UM
GIL SONES* VK3AUI

MARKETING
BRUCE KENDALL* VK3WL

CONTRIBUTING EDITORS
Frank Beech VK7BC
Joy Collis VK2EBX
Brenda Edmonds VK3KT
Ron Fisher* VK3OM
Gilbert Grillith VK3CO
Ken Hall VK5AKH
Roy Hartkopf* VK3AOH
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Eric Jamieson VK5LP
Bill Martin VK2COP
Hans Ruckert VK2AOU

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Liz Kline
Ken Kline

***Members of Publications Committee**

MEMBERSHIP AND CIRCULATION MANAGER
Helen Wageningen

ACCOUNTS AND ADVERTISING MANAGER
June Fox

Inquiries and material to:
The Editor,
PO Box 300,
Caulfield South, Vic. 3162.

Material should be sent direct to **PO Box 300, Caulfield South, Vic. 3162,** by the 20th day of the second month preceding publication. **Note:** Some months are a few days earlier due to the way the days fall. Check page 1 for deadline dates. **Phone: (03) 528 5962. HAMADS should be sent direct to the same address, by the same date.**

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamade, and reserves the right to refuse acceptance of any material, without specifying a reason.

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Editor's Comment

THEM AND US

This month's remarks have been triggered off by two things, which are themselves closely related. One is the tendency we all have to form some kind of alliance with those who most resemble ourselves, and collectively to proclaim our opposition to those who differ in any way from our ideal. Specifically, over the last few months it has been objection by some full call licensees to the proposal, now fact, that Novices should be permitted to use two-metres FM (even with a 10 watt power limit).

Without even once straying from the field of amateur radio, I am sure I can nominate dozens of examples of this "them and us" attitude. Back in the era when our hobby (activity, obsession?) began, it was probably spark versus CW. Later, it was CW telegraphy versus the phone upstarts. Later still, AM versus SSB. HF versus VHF. In the 1950s a spirited exchange of letters ran for months in the "Letters" pages of AR, in which those with "real licences" objected violently to the introduction of the "half call" Limited licence. The blighters didn't even have to know the Morse alphabet! The Editor of those days had to terminate the correspondence eventually, or it might have gone on for years!

To continue, we now have packet versus phone nets; DX versus rag-chewing; the QRPers who try to work the world with milliwatts and the QROers who don't think it's worth trying with less that the legal limit. The third party traffic net people and those to whom TPT is an immoral monstrosity! Those who live for contests, and those who can't stand them! Even on the one band (two-metres) we have the SSB DXers at the low end not only scorning those who use FM repeaters at the high end, but dismissing them as being of low technical competence! I have a letter awaiting reply in which a member objects to my claim in the July "Comment" that Novices can now talk to VHF/UHF enthusiasts on 2FM. According to him, there is no technical knowledge to be found there! I would be the last person to suggest that all 2FM operators are "founts of wisdom", but to claim that Novices will learn nothing useful from any of them! Barley, Charley!

At an organisational level, we have the obvious distinction between members and non-members, but on more subtle levels there are varying sympathies and antipathies between Divisions, between some Divisions and the "Feds", between members and their Councils. Perenniaily, the WIA and the DOTC maintain a dialogue which is more harmonious sometimes then others!

A few weeks ago I overheard (on 40 metres) a member disagreeing with my editorial about Novices on Two, and saying he would write to "Over to You!" to voice his dissension. The other operator in the QSO suggested that perhaps "The Editor" would not publish the letter, "and of course it must be remembered that the Editor is under the control of Federal Executive". I refrained with difficulty from breaking-in! I think it is more to the point to say here that in my four years so far as Editor I have never once been directed as to what we should or should not publish or what I should or should not say. But of course I am a member of Executive myself! Another "them and us"? The Publications Committee may discuss and resolve, but no one is directed other than by amicable consensus.

In another four or five years there will be a World Administrative Radio Conference at which the future of the Amateur Service will again come under the international microscope. The WIA is beginning to prepare for it now. At that Conference it is essential that all the world's amateurs speak with one voice. We can no longer allow our splinter groups and differences to divide us. "They" (the rest of the world) will not listen to "us" if we are a babel of individual voices. We have two things in common. We are all radio amateurs, and we are all vitally interested in retaining our portions of the spectrum. It is imperative that "we" or "us" in this context must mean nothing less than a united front by all the world's radio amateurs. The alternative may well be the end of amateur radio!

Bill Rice VK3ABP
Editor
ar

SURVEY

When you turn to the centre pages of this edition of *Amateur Radio* magazine you will find the previously announced Amateur Radio Magazine Readers and WIA Membership Survey.

This survey is designed to gather demographic information about the readership of the magazine, your input into issues relating to the cost of the magazine and, most importantly, direct feedback from you, the member, about current WIA performance and its future direction.

This survey has two main goals.

The aim of the first part of the survey is to gather data to enable the Institute to produce a statistical model of the *Amateur Radio* readership base. This information will allow us to demonstrate to potential advertisers the worth of advertising in our magazine. Few publications can do this, and certainly none within our field of interest.

The second part will be of help to the Editor and Publications Committee in their management of *Amateur Radio* magazine.

The third part of the survey results from a resolution by Federal Council to obtain feedback from all members so that planning for the future of the Institute accurately reflects the actual needs of the members.

The results of the readership profile section of the survey will have several uses.

Firstly, as part of a general marketing strategy, it will enable Executive and the Publications Committee to tailor AR better to its readers.

Secondly, it will enable us to draw advertising revenue from a wider base.

We have tried to keep the survey as brief as possible consistent with the necessity to achieve meaningful results.

Members are assured that information provided will be kept **strictly confidential** and will only be used to compile statistical information as mentioned above. After processing all forms will be shredded.

Individual data will *not* be released **under any circumstances.**

The Executive examined various ways of achieving as near to a 100 percent return rate as possible.

Options considered were:

Pre addressed envelope
Freepost
Business Reply Post

All of these options had their problems, mainly the cost.

After much discussion and deliberation it was finally decided that gifts drawn by membership number will be awarded to respondents of the survey.

The first gift will be an Alinco ALX-2T two metre FM hand-held transceiver. Now that all Australian amateurs finally have a common band, this excellent little unit, which is reviewed elsewhere in this edition of AR, should appeal to all. However, if you prefer, or if you are not a licensed amateur, the alternate first gift will be five-years free membership of the WIA.

In addition, there will be five *ARRL Handbooks* available as consolation gifts.

Some may question the reason for choosing the above method as an enticement to return the survey instead of the previously mentioned options.

The simple reason is that Freepost or Business Reply Paid envelopes would have cost more than the gifts on offer, and the members would have seen nothing for the expenditure of their money.

With the incentives offered, the WIA is saving members funds whilst, at the same time, giving members the opportunity to gain something tangible in return.

The survey has been designed to be pulled out from the centre of AR without leaving you with an incomplete issue. If you prefer, you may simply photocopy the necessary pages and return the completed photocopy. If the survey has been misplaced, or if you are a Family Member of the Institute, and you would like to participate in the survey, please contact the Federal Office.

Please note that there is no compulsion for you to insert your membership number or call sign on the returned survey. However, if you elect to remain anonymous, please understand that we will not be able to identify you if you are a gift winner.

Closing date for return of the survey, in order to be eligible for the gifts, is November 15, 1988.

Your co-operation is sought and will be appreciated.

ar

ITU CONFERENCES — and you

by Richard Butler W1RU
President, IARU

Every decade or so the International Telecommunication Union (ITU) holds a full-scale telecommunications conference, one which looks at every aspect of the International Radio Regulations. This is called a General WARC (General World Administrative Radio Conference), and while there are many aspects of such a conference which can have an effect on the amateur and amateur-satellite services, we are particularly concerned about the table of Frequency Allocations.

The last General WARC was in 1979. Since then there have been a number of specialised WARCs, each dealing with some specific radio service or problem area. For instance, in the past couple of years there have been High Frequency Broadcasting WARCs, and Mobile WARCs, and geostationary satellite WARCs. Each of these has a specific and detailed agenda which is agreed to ahead of time, and the work of the conference is not supposed to go beyond the bounds of that agenda. In other words, an HF BC WARC is supposed to deal only with the problems of the High Frequency Broadcasting Service, within the frequency allocation for that service which were established at the General WARC of 1979.

But life gets more complicated, and after a while there comes a time when the administrations begin to believe they can no longer solve the problems of a particular service within the confines of the frequency bands already allocated. Then there begins to be pressure for another General WARC, and some reallocation of the spectrum. And reallocation means that if one service gains some frequencies, another service has to lose.

There were two specialised WARCs during 1987, and out of both came recommendations that there be some sort of a General WARC no later than 1992. The high frequency broadcasting people believe that their channel needs of today cannot be solved within the bands presently allocated to the HF BC Service. As a result of the Mobile WARC held during September and October there were several recommendations that certain problems beyond the scope of the agenda of the conference be referred to a "competent" WARC (which means some form of a General WARC) to be held no later than 1992. And so the handwriting on the wall gets clearer and clearer.

The mobile WARC recently completed in Geneva ran into a number of problems in finding space for some new uses within those frequency bands allocated to the various mobile services (aeronautical, land, and maritime, including space). The agenda of the conference did not permit solutions to be found outside of the already-allocated frequency bands if those solutions were going to have a significant effect on another service. Even with this restriction, however, some actions taken by the Mobile WARC could have an adverse effect on the Amateur and Amateur-Satellite Services.

For example, Mexico introduced a footnote to the table of allocations which would have permitted that country to establish a land mobile service as the primary service in the band 430 to 440 MHz. The first concern of your IARU observer team at the conference (W1RU, SP5FM, I1RYS, YT7MM) was that such an allocation could have an adverse effect on the Amateur-Satellite Service segment at 435 to 438 MHz. We persuaded Mexico to change their proposal to exclude that amateur satellite segment. Our second concern was that other countries, particularly in the Americas, would join in that footnote, creating a sort of stampede. We were prepared to cope with that possibility but fortunately no other country joined Mexico.

A number of European countries added their names to a footnote which would make land mobile a primary allocation in the band 1700 to 2450 MHz. That, of course, affects another amateur band. Similarly, Cuba introduced the radio-navigation service as a primary in the band 1215 to 1300 MHz.

None of these actions is by itself catastrophic, but there is a clear indication that at the next General WARC, perhaps as early as in 1992, we may be in for a rough time in the vicinity of the HF BC bands and in the UHF/microwaves.

Fortunately, having previously read that handwriting on the wall, IARU began its preparation a couple of years ago. As in the days prior to 1979, much of the responsibility will lie with the individual member societies of IARU, to thoroughly and adequately put forward the needs and the advantages of the amateur and amateur-satellite service to their respective administrations.

We headed this article "ITU Conferences — and you." We hope that you will recognise these World Administrative Radio Conferences, generally held in Geneva, Switzerland, are really not so remote, either in distance or in concept. They have, can have, and will have an effect on your enjoyment of amateur radio. You had just better hope that your representatives are on the job!

ar

IARU REGION III CONFERENCE

The Seventh Conference of the International Amateur Radio Union (IARU), Region III area, will be held in Seoul between October 10 and 14, 1988. These conferences are held every three years, the last one being in Auckland in 1985. The WIA will be represented by David Wardlaw VK3ADW, and Ron Henderson VK1RH.

Michael Owen VK3KI, a retiring director of Region III, who has recently moved to London for his employer, will also be there. As a director he has considerable administrative responsibilities and is not able to directly participate in the conference on our behalf.

Region III, which covers parts of Asia, Oceania and Australia, has 22 member societies. In addition to member society delegates, observers from the two other IARU Regions and the International Secretariat will be present.

Considerable effort has gone into the preparation of papers for this conference. Topics covered include:

- Bandplans
- Licence standards and procedures
- Satellites
- Beacons
- QSL Services
- Packet Radio
- Emergency communications

The papers prepared reflect not only the existing policies of the WIA, but also the recently expressed opinions of members.

In addition to the formal conference sessions, there are also many working party sessions. There are often two, three or even more, of these working parties running concurrently. Our delegates must often make difficult decisions in allocating their time between the various working parties.

Although the resolutions of the conferences are not binding on the member societies, they serve as important guidelines for the development of policies.

Listen to the WIA News Broadcasts for information on the results of the conference. A more detailed report will be prepared for the December issue of AR.

Peter Gamble VK3YRP
Federal President

ar

THREE-YEAR MEMBERSHIP OF THE WIA

If you are a Full, Associate, Pensioner, or Family member of the Institute, and your membership renewal is due on or after January 1, 1989, you will be able to avail yourself of a new facility for members.

A three-year membership.

If you want to renew your membership for three years, instead of just one year, simply multiply the amount appearing on your membership renewal notice by three and forward your payment to the Federal Office in the usual manner.

Obviously, with inflation and fees rising each year, this facility will save you money.

ar

RSGB 75TH ANNIVERSARY

Our immediate Past President David Wardlaw VK3ADW, has been in the UK for some months, among other things to participate in the 75th Anniversary celebrations of the Radio Society of Great Britain (RSGB). Formal congratulations have been conveyed to the RSGB by letter, and reply received from Sir Richard Davies G2XM, its President.

These letters are published below for members' interest and information.

London,
June 26, 1988

Sir Richard Davies, KCVO, CBE, C.Eng,
FIEE, G2XM,
President,
Radio Society of Great Britain,
Lambda House,
Cranborne Road,
Potters Bar,
Hertfordshire, EN6 3JE

Dear Sir Richard,

The Wireless Institute of Australia has asked me to convey to you its congratulations and very best wishes on the occasion of the 75th Anniversary of the founding of your Society.

The Institute, the oldest amateur national radio society in the world, was honoured by the presence of representatives of your Society at the celebrations marking its own 75th Anniversary in 1985. Now we can take this opportunity to say to you why we feel that we have a very special relationship and admiration for your Society.

As a Commonwealth country, we have at a National level a special relationship with Great Britain. These ties, emotional rather than legal, are very strong. Historically, as radio amateurs, we have been conscious of the distance between our two countries, and we have recognised that amateur radio has bridged those vast distances. We have also recognised the contribution of your Society in two important areas, the valuable technical contribution made to the art by your members, and the representation of the amateur service internationally, particularly to the International Telecommunications Union and by its participation in the International Amateur Radio Union.

As amateur radio faces the challenge of the future, in a world where the magic of talking across the earth has become commonplace, but in a world where the challenge of communications, in all of the meanings of that word, remain as one of the great challenges facing mankind, the amateurs of Australia extend their best wishes to the Radio Society of Great Britain, one of the great amateur radio Societies of the world.

Yours sincerely,

David A. Wardlaw

David A Wardlaw VK3ADW,
Immediate Past President, for
P H Gamble VK3YRP,

President,
Wireless Institute of Australia

July 5, 1988

Dear David,

Many thanks to you and to the Wireless Institute of Australia for your warm letter of congratulations on our 75th Anniversary. It is much appreciated by all of us at RSGB, and all the more so because of our long association.

We cherish the special relationship between us, and trust it may continue and strengthen in the years ahead.

Yours sincerely

Richard Davies

Richard Davies G2XM
President RSGB.

ar

SUBSCRIPTION REMINDER NOTICES

As from now, only one membership subscription notice will be forwarded to members each year.

A reminder notice will not be sent!

As from now, only one additional issue of *Amateur Radio* magazine will be sent to you if your renewal subscription is not received.

Not two additional issues as in the past!

Only a small number of *Amateur Radio* magazines are now being printed each month surplus to members requirements. This means that if you do not renew your subscription on time, you may not be able to get your missing copies of AR!

WHEN YOUR MEMBERSHIP RENEWAL IS DUE, PLEASE PAY PROMPTLY AND ENSURE CONTINUAL RECEIPT OF *AMATEUR RADIO* MAGAZINE!

ar

A MODIFIED HEATH CANTENNA

David Barneveld VK4BGB
PO Box 275, Booval, Qld 4304

This article is slightly different in that it has more to do with plumbing than electronics. If you have ever owned one of those Heathkit dummy loads, you will know that it gets slightly hot after extended test runs. The smell of boiling oil in the shack is rather off-putting, so this modification was done to cool things down a little.

For those not familiar with a cantenna dummy load, all it comprises is a 50 ohm carbon resistor mounted in an aluminium tube immersed in a four litre metal paint can filled with transformer oil. The tube forms a tunnel for the heated oil to travel through.

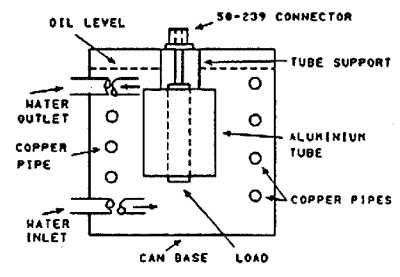
The modification simply consists of emptying the transformer oil into another container for the time being and forming a length of six millimetre copper water pipe into a series of coils which fit snugly to the inside of the can. It is a good idea to degrease the can with a solvent prior to doing this part of the modification.

The inlet connection is brought out at the bottom of the can, and the outlet at the top of the can. The two holes should only be drilled large enough to get the pipe through. The fit should be very tight. Leave approximately 25 millimetres protruding on the outside of the can and cut off with a pipe cutter or small hacksaw. Silver solder around the connections to prevent oil escaping. A tack of solder here and there on the inside will help keep the coils stay rigid.

Refill the can with transformer oil and reinsert the dummy load element. The garden hose is connected to the inlet manifold and only just cracked on so that a trickle of water comes out of the outlet pipe. A short length of plastic hose can be run from the outlet to anywhere it suits in the garden.

It was found that with the modification just described completed, that the overall temperature of the dummy load was running well below that of an unmodified version. The heat transfer characteristic increases sharply as the temperature of the oil rises, due to temperature differences between the oil and the coolant. A point worth noting here also is that care should be taken with the choice of transformer oil used in the dummy load. Whilst many types are available on the market, I personally use a grade made by Shell Oil Refinery known as Diala-B. By using the proper coolant one can rest assured that no problems will be encountered as could be the case if unknown oils are used that contain PCB materials.

ar



Side View of the Cantenna.

Novice Notes

MOSFET POWER AMPLIFIER FOR 1.8 to 10.1 MHz

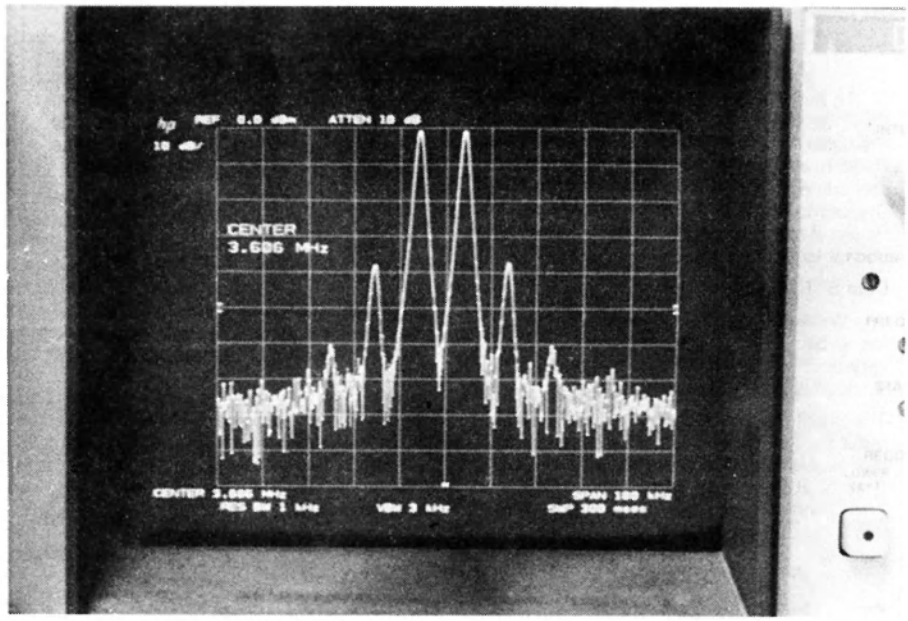
Drew Diamond VK3XU
"Nar-Meian", Gatters Road, Wonga Park, Vic. 3115

There has been a wealth of projects and circuits in recent years for transmitters which have an output power of perhaps a few hundred milliwatts to two or three watts. The generally accepted maximum power level for QRP work is five watts RF and this probably represents a level where a reasonable degree of communication effectiveness can be obtained at HF

Designs for HF amplifiers in the five to 100 watt range can be obtained from amateur and professional literature, but the perennial problem for Australian experimenters remains; that of obtaining reasonably priced power amplifying devices.

A look at the *Power TMOS FET* book from Motorola reveals a number of devices which may be useful as RF power amplifiers, and the IRF500 series, although primarily intended for switch-mode power supply applications, appears to offer possibilities for the lower HF bands. This amplifier was empirically designed around a pair of IRF510 MOSFETs, and has the following characteristics:

Output Power: At least five watts CW, five watts PEP (typically six watts) at 13 volts supply.
Frequency Range: 1.8 to 7 MHz, easily useful to 10.1 MHz.
Gain: About 17 dB (ie 100 mW in for five watts out).
Two-Tone IMD: At least -30 dBc*, typically -35 dBc (see photo 1).
Harmonics: At least -50 dBc (see photo 2).
Output Protection: Will withstand short or open load without damage. Remains stable regardless of load SWR.



Power Supply: Nominally +13 volts at 1 amp.
*-30 dBc means "30 dB below the carrier or wanted signal".

It is hoped that this project may interest novices and the more experienced experimenters alike (with due consideration to permitted frequencies).

Photo 1: Amplitude versus frequency spectrum display showing IMD products at least 30 dB down on the two wanted signals spaced 10 kHz.

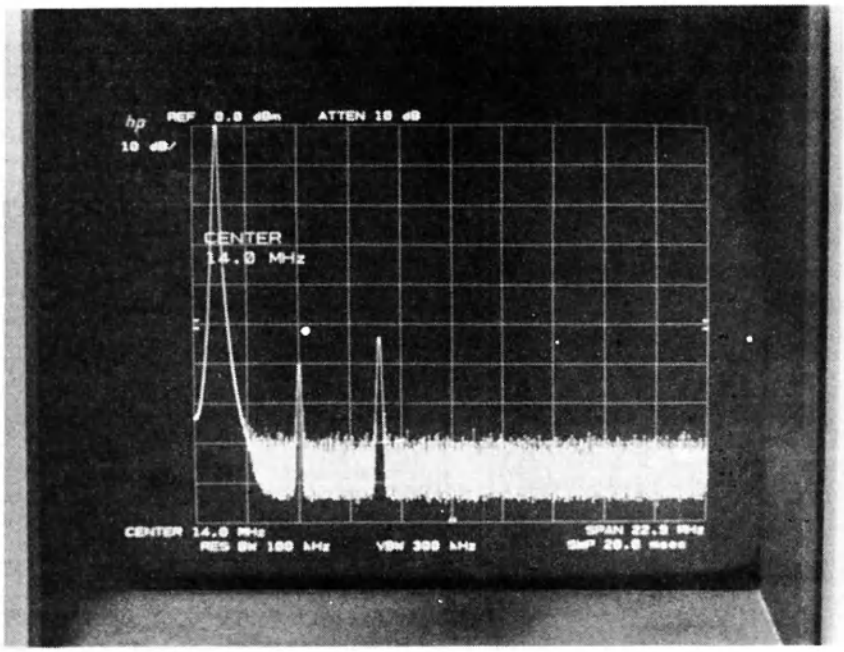


Photo 2: Spectrum display showing output purity — all harmonics are at least 50 dB down.

CIRCUIT

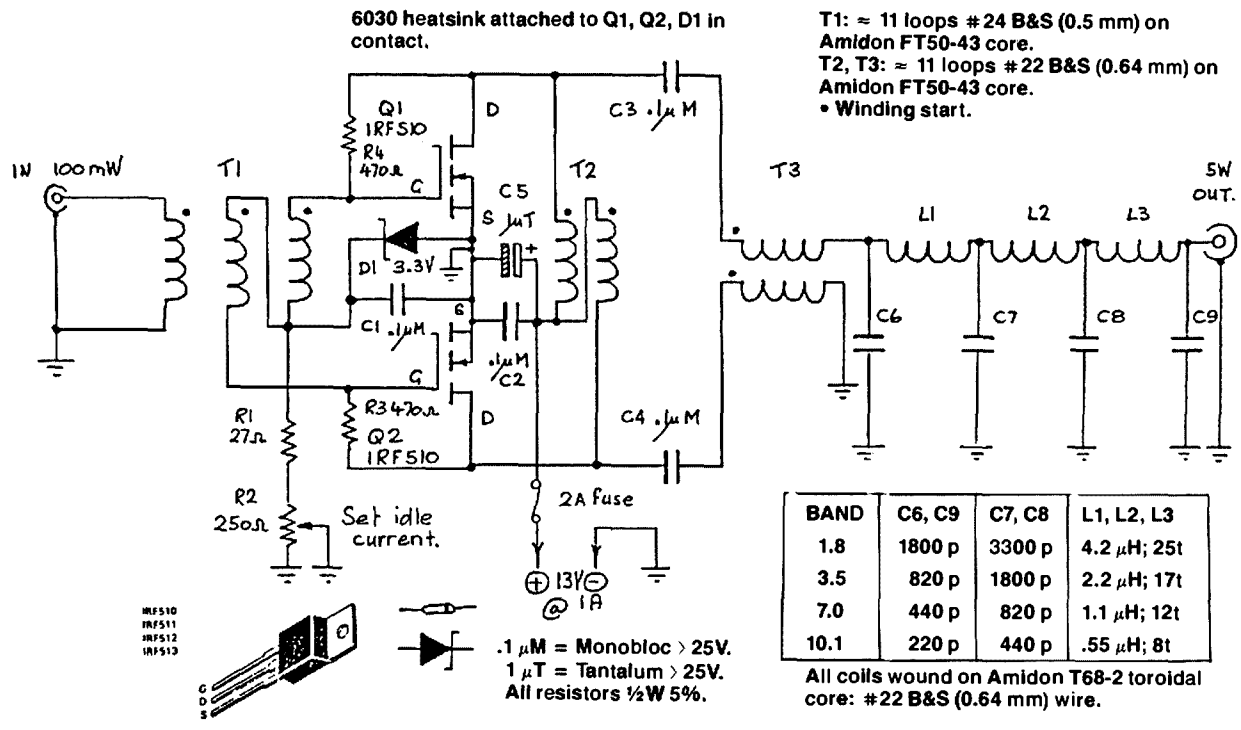
The two IRF510 MOSFETs are arranged in push-pull, class B configuration. Differential drive to the gates of Q1 and Q2 is obtained with trifilar wound broadband transformer T1. The gates are biased at about 3.3 volts, held constant by zener D1. This diode is placed in physical contact with the heatsinks of Q1 and Q2 to provide some degree of bias stabilisation; as Q1 and Q2 become warmer, the zener voltage will fall, so preventing thermal runaway under normal circumstances.

The output impedance of one device may be estimated from the standard formula;

$$Z = \frac{Vdd^2}{2Po}$$

Where Vdd is the effective drain voltage, and Po is the expected output power.

Assuming one volt drop across the source drain channel at ON giving a swing of 12 volts, and three watts output from each device, then:



BAND	C6, C9	C7, C8	L1, L2, L3
1.8	1800 p	3300 p	4.2 μH; 25t
3.5	820 p	1800 p	2.2 μH; 17t
7.0	440 p	820 p	1.1 μH; 12t
10.1	220 p	440 p	.55 μH; 8t

All coils wound on Amidon T68-2 toroidal core: #22 B&S (0.64 mm) wire.

Circuit Diagram.

$$Z = \frac{144}{6}$$
$$= 24 \text{ ohms}$$

The drain to drain impedance will therefore be 2 x 24 = 48 ohms, being so close to our required 50 ohms that no elaborate impedance transformation is necessary. T3 converts the balanced output at the drains of Q1 and Q2 to an unbalanced output for the usual 50 ohm unbalanced load. Drain current is supplied via T2, which forms a balanced choke feed arrangement. DC is blocked by C3 and C4.

Negative feedback around Q1 and Q2 is provided by R3 and R4, which stabilises the amplifier and helps level the frequency response. The bias zener is also sourced from R3 and R4, which are effectively in parallel with regard to this function.

Under some circumstances it is possible for this amplifier to produce harmonics of significant amplitude, so it is good practice (as with any solid-state amplifier) to follow the output with a low-pass filter. There is room on the circuit board for one filter, and details are provided for four amateur band filters. Multi-band operation could be provided by switching in the appropriate filter (see later).

CONSTRUCTION

All the components of the amplifier for one band are accommodated upon a home made printed circuit board with copper both sides (see Appendix for a suggested method of making boards).

Unfortunately, the professional facilities to which I had access have been dismantled, so I cannot offer a ready made circuit board for this project.

During the development of this amplifier, all kinds of construction methods were used, and it was found that layout was uncritical if signal and by-pass leads are kept reasonably short, so just about any method that you feel comfortable with will probably work — at least to 7 MHz! If higher frequency work is planned; you are strongly urged to adopt the layout used for the prototype.

The MOSFETs are screwed onto the board side by side, with a 6030 heatsink attached to each. The drain also connects to the mounting tag, and because double sided board has been used; an insulated washer must be fitted under the head of each screw. A very small amount of heatsink compound or petroleum jelly should be applied to the MOSFET/heatsink interface to improve heat transfer. The MOSFETs come with aluminium foil wrapped around the solder pins to protect the gate from static electricity during shipping and handling. You should experience no problems provided your soldering iron tip is properly earthed. I have been experimenting with these devices for some years now, and so far have had no problems with damage even after a device has been removed and replaced many times.

As mentioned earlier; zener D1 is positioned against the heatsinks of Q1 and Q2 so that any heat generated by these may influence the zener voltage. A small blob of petroleum jelly could be applied here also. Carefully note correct D1 polarity. The case or box housing the amplifier must have holes for adequate ventilation of Q1 and Q2.

For stability, the unetched 'ground plane' must be connected to the etched side earth common (-ve supply) in at least two places at the input and output areas of the board. The prototype has through links placed at the source of Q1 and at the point where C2 and C5 have their earth connections. Instability problems may be encountered if these connections are not made. These points are marked on the board layout with a small circle. Drill these with a one millimetre drill.

Transformers T2 and T3 are made as follows: Lay two 300 millimetres lengths of #22 B and S (0.64 mm) enamelled wire parallel to each other, then twist them together at each end. Clamp one end of the pair in a vice, and fix the other end in the chuck of a hand drill. Whilst keeping the pair taut, turn the drill slowly until you have about three twists per centimetre. Tug the drill gently to set the twist, then remove your twisted pair.

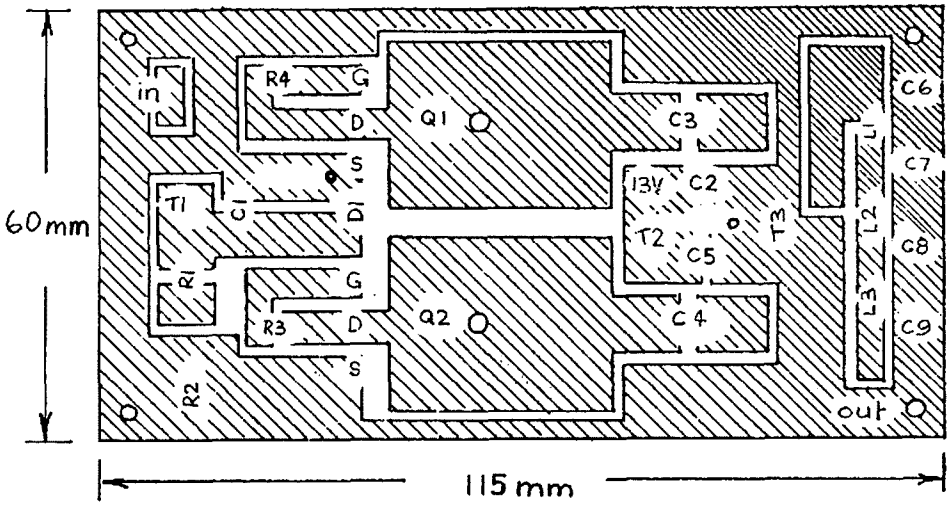
Now, carefully wind the pair through an Amidon FT50-43 toroidal core. About 11 loops should fit nicely on the core. Cut each lead to about two centimetres length, and carefully scrape about one centimetre of enamel from each wire.

For T2, use your multimeter set to ohms X1. Test for continuity of one 'winding'. Now connect the end of one winding to the start of the other winding to form the centre tap. The winding starts are shown schematically with a dot.

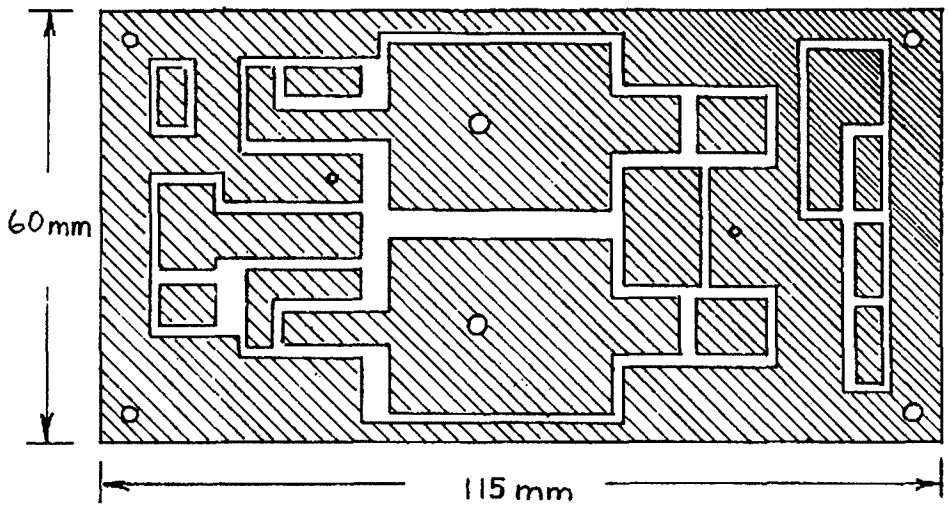
T3 is used as a balun, the signal being propagated along the winding from start to end, so there is no need to sort out connections for this one.

T1 is made in a similar manner to T2 and T3, but now we need three 300 millimetre lengths of #24 B and S (0.5 mm) wire. Take care that the twists are even throughout the length of the triplet.

Finding the correct connections can be a little tricky. Firstly, locate the start and end of one



Component Locations on PCB.



Board layout (Full Size). Shaded area indicates copper.

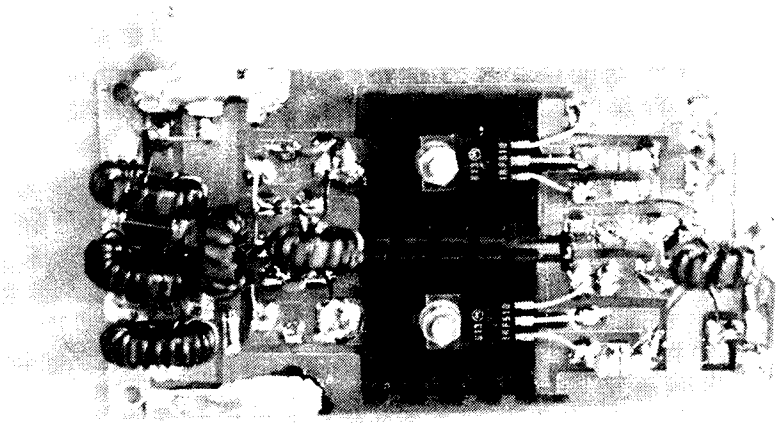


Photo 3: Prototype Board Layout.

winding. Having done so, push these two wires to one side well out of the way. This can be the input 'primary', and eliminates two wires. Now, as for T2, locate the leads for the two remaining windings, then connect the end of one winding to the start of the other winding to form the centre tap. Double check these connections before soldering.

If multiband operation is planned, it is suggested that the highest band filter be accommodated upon the amplifier board, permanently in circuit, and any lower frequency filters upon a purpose-built additional board. The signal must be routed via 50 ohm coax with their braids connected to chassis ground at each end. The table shows the capacitor values and the inductance for the coils followed by the number of turns to be would upon the Amidon T68-2 cores for each band.

Polystyrene/Styroseal capacitors should be used for the low-pass filter/s, although it may be difficult to obtain some of the larger values such as the 1800 p and 3300 p. Greencaps have been found to be entirely satisfactory in this application. Ordinary disc ceramics will work, but have slightly higher loss than the aforementioned. Of course, silver micas may be used if available (fortunate is the experimenter with a collection of silvered mica capacitors).

It would be a good plan to provide a two amp fuse in the supply circuit.

COMMISSIONING

Check that all components are properly positioned and have correct polarity. Set R2 for minimum resistance, then apply voltage (nominally 13 volts). With no input signal, adjust R2 bias so that the no- signal ideal current drawn from the 13 volt supply is about 200-300 mA. The output must be terminated in a 50 ohm non-reactive load (not an antenna at this stage). A 12 volt/4 watt (36 ohms) globe would make a reasonable dummy load if a 50 ohm dummy load or power meter are not available. Apply about 100 mW of carrier at a frequency lower than the cut-off of the low pass filter. About five watts should be indicated on your power meter, or the lamp brightly lit, indicating that the amplifier is working. The current drawn under signal conditions should be about one amp from a 13 volt supply. No discomfort should be experienced when the heatsinks are lightly touched after some minutes operation at the five watt level.

One of the incentives for this project was as a linear amplifier for the DSB/CW transmitter (see Reference 3). The driving source should be made to deliver about 100 mW PEP DSB/SSB, or 100 mW CW for linear operation. Up to about 300 mW may be required at 10.1 MHz. Do not overdrive, or flat topping and distortion will occur.

PROBLEMS

If you cannot get the amplifier to work satisfactorily, even after fruitless attempt on your part, please write to me about it, and I will extend any reasonable amount of help necessary. A SASE would be appreciated.

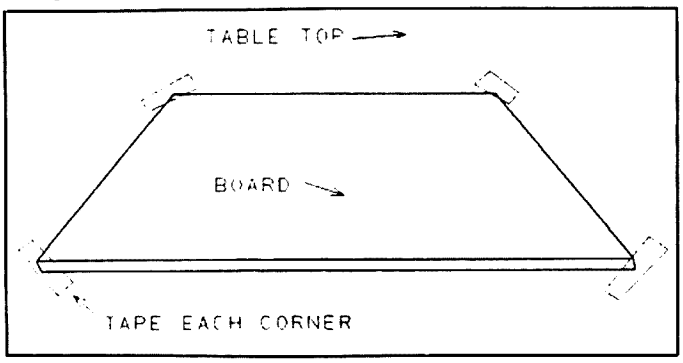
PARTS

All the components specified in this project are readily available at present, and are known to be obtainable from Ian J Truscott's Electronic World, 30 Lacey Street, Croydon, Vic. 3136. (See advertisement elsewhere this issue). Other suppliers of Amidon cores regularly advertise in this journal. (See also Trade Ads in Classified Section).

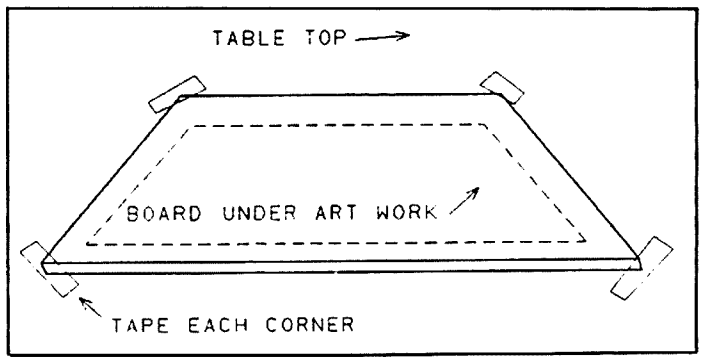
REFERENCES AND FURTHER READING
1. Power MOSFET Transistor Data Book — Motorola.
2. Solid State High Frequency Power — Gottlieb, ISBN 0-8359-7048-5.
3. DSB/CW Transmitter for 80m — Diamond, *Amateur Radio*, March 1985.
4. Practical RF Design Manual — DeMaw, ISBN 0-13-693754-3.
5. Solid State Design — ARRL.
6. 3.5 MHz 5W Transmitter — Fletcher, *Radio Communications* magazine, November 1987.

APPENDIX 1
SUGGESTED METHOD OF MAKING HOME-MADE PRINTED CIRCUIT BOARDS

METHOD 1:
1. Cut out a piece of PWB material to the require dimensions.
2. Wrap the board in carbon paper — ink side facing the copper.
3. Stick the board on to a table-top surface with tape at each corner thus:



4. Lay artwork over the board with the pattern facing upwards and aligned exactly over the board. Use a sharp instrument such as a pin to locate each corner.
5. Again use tape to stick each corner of the artwork sheet onto the table thus:



6. Using a red ballpoint pen, trace the pattern onto the board below. As most HF patterns are made from right angles, a Perspex ruler is handy to help get the lines straight.
7. When tracing is complete, the board may be removed from the carbon paper. Be careful not to rub the tracing off. Shellac may be painted onto the "wanted" areas with a small child's paint brush. This is the exacting part of the operation, and patience is required. Clean brush with methylated spirits. Allow the shellac about two hours to dry. Remember to paint the entire reverse side of double-sided boards.
8. Place the painted board into your ferric chloride solution. Check how the etching is going at regular intervals.
9. When the unwanted copper has been removed, the board should be washed and allowed to dry. When dry, the shellac may be removed with methylated spirits. Steel wool should be used to polish the board and so remove any residual traces of ferric chloride.

An alternative to the shellac approach is to wrap the board with paper packing tape before step 2 above, then trace the pattern per steps 3 to 6. A sharp knife may then be used to cut the pattern out to expose the copper to be removed. This method is slightly quicker than when using shellac, and yields a better result. More practice is required to master this method however. The reverse side of a double-sided board is simply covered completely with the tape.

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AN INTRODUCTION TO FOX HUNTING

A BEAM ANTENNA FOR TWO METRE FOX HUNTING

Greg Williams VK3VT
1 Noorabil Court, Greensborough, Vic. 3088

The following beam has proved to be a winner in many fox hunts.

WHILE MORE GAIN could be realised from wider spaced elements this antenna has reasonable gain, good front to back ratio and a clean pattern. In fox hunting the cleaner the pattern the more confidence a hound has that the direction is correct. Several regular hunters in the Melbourne area have built beams optimised for 144.250 MHz which have superior performance to this unit at that frequency, however their performance at the other end of the band falls off dramatically. This antenna has uniform performance across the whole two metre band and can be used on any two metre hunt.

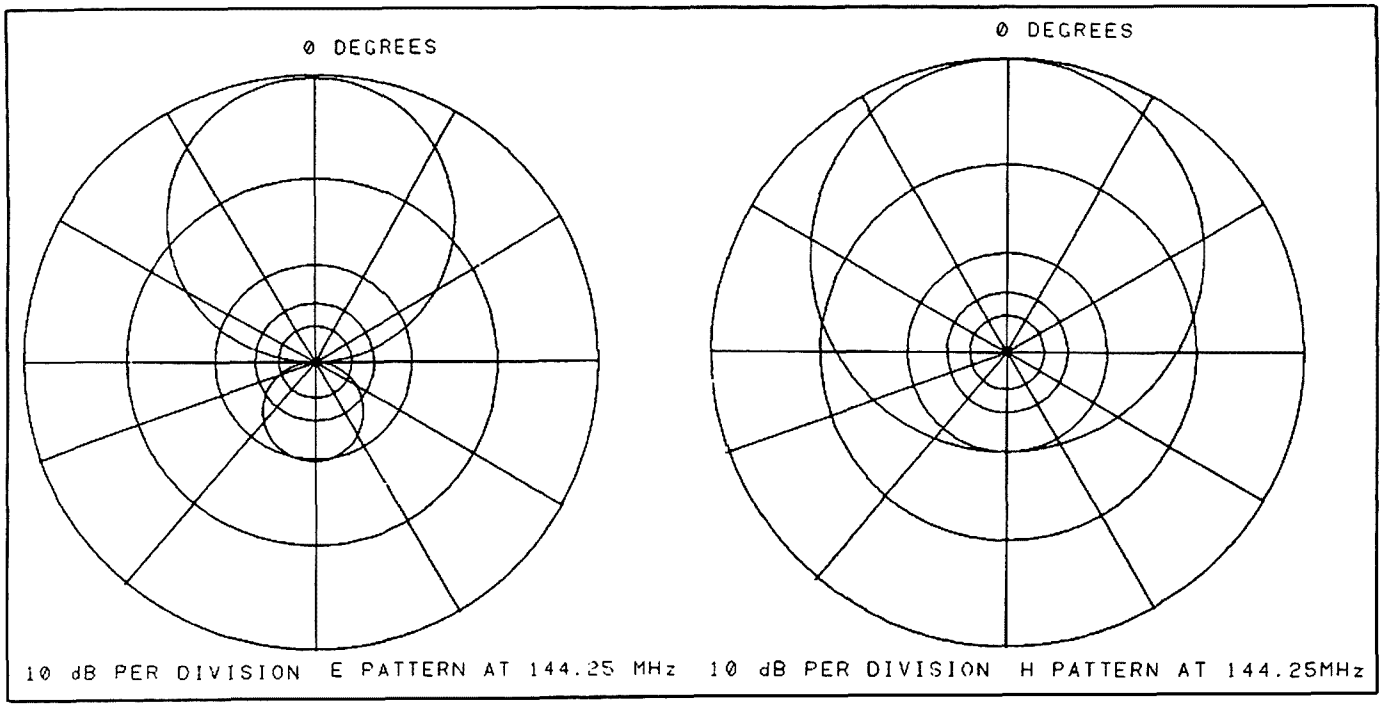
While we should be using metric measurements. ALCAN does still make some imperial products and the smallest diameter aluminium tube available is 3/16 inch. It was used for this antenna, and one four metre length is required. Therefore, imperial measurements are used when referring to the elements and any holes that must be a snug fit for them. Elements are made from 3/16 inch aluminium tube and the boom is 12.5 millimetres square section. Mounting the elements through the boom is achieved by drilling a 3/16 inch hole and forcing the tube through. Measure the amount of the element on each side of the boom and adjust until the boom is in the middle of the element. Holding the elements in place are self-tapping screws through the boom. There is no need to have these screws going through the elements as they are screwed through the boom and then pressed against the element holding it securely.

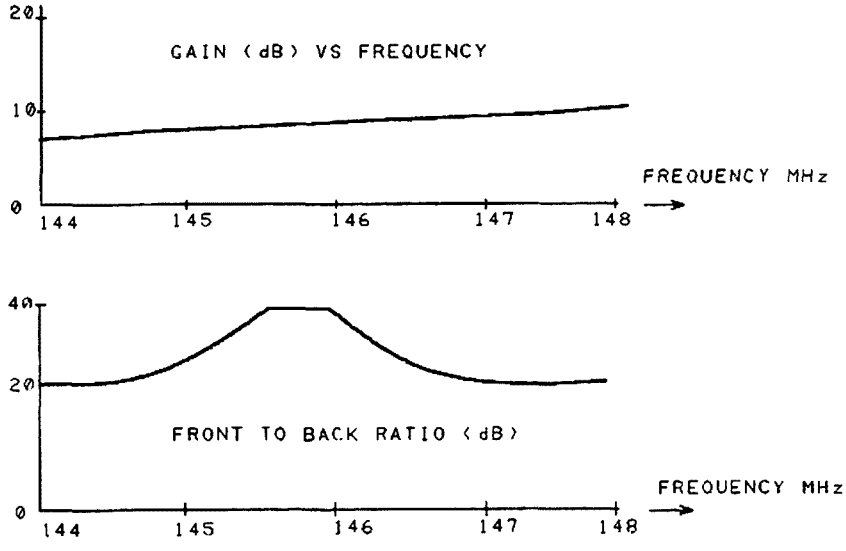
The beam is fed by a T-match as this provides a balanced feed which will not skew the radiation pattern as can happen with a gamma match. A half wave balun is used to connect the RG58 feed line. The length given is for good quality RG58 with a velocity factor of .66, however some of the cheaper cable, branded as RG58, may not have this velocity factor.

As I would not be transmitting through this antenna I made no attempt to match it, all the text books would have small capacitors in each leg of the 'T' and the length of the 'T' arms should be longer. However it seems to make little practical difference to the antenna. The length of the 'T' arms was determined by what was left of a 4 Metre length of tube once the elements had been cut!

The VSWR of my antenna is about 3:1 so do some more matching if you want to use it for transmitting. The clamps at the end of the 'T' arms are made from 10 millimetre aluminium angle. Indentations for the element and the 'T' tube are made with a round file and extend the full depth of one side of the angle. This positively locates the 'T' arms. The other section of the clamp has one side of the angle removed completely. A machine screw holds these two sections together. The addition of a spring washer will help to prevent the whole lot from falling off in the middle of a hunt.

Mount the balun in a small plastic 'jiffy' box to provide protection from the weather and the ravages of the car boot. On one fox hunt we could not get a definite direction and finally tracked the problem down to broken connections on the a balun that had not been protected. The jiffy box is screwed to the boom with self tapping screws and provides support for the arms of the 'T', drill 3/16 inch holes in each side to accommodate these. Self-tapping screws and solder lugs are used to connect the balun and feedline to the 'T' arms. The feedline is securely taped to the





Traces of Computer Generated Plots of the Yagi Antenna (see circular graphs also). These were produced by a Yagi analysis program for the IBM Personal Computer by Paul VK3DIP.

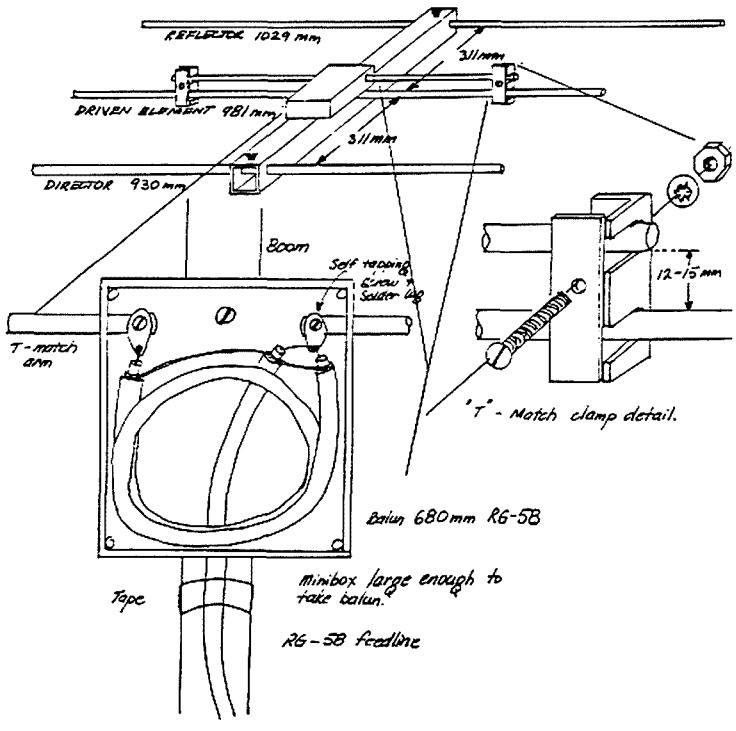


Figure 1: Balun Box Detail.

boom and then routed through a suitable hole in the jiffy box. Leave some slack inside the box to allow for small movements in the elements due to wind and rough ground. Bunch all the braids from each end of the balun and the feedline together and solder them, taking care not to overheat the dielectric in the cable and thus cause shorts. Seal the holes in the jiffy box and lock the cable in place with silicone sealant. NOTE: Use 'ROOF and SPOUTING' sealer, as 'BATHROOM' sealer contains acetic acid which will attack the copper and aluminium.

Leave enough feedline on the beam to allow for the car door to open and still have some slack in the car. To watch your new home brew super fox hunt receiver fly out the door onto the footpath is not a good feeling.

Attaching the beam to the pole on the car is done with a 'U' bolt through the boom. Make sure you put the antenna on pointing in right direction and that the handle, or other direction pointer, agrees with the beam. Many teams have fallen for this mistake and have rushed off in the wrong direction and that is the end of their hunt.

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ABOUT THE AUTHOR

Greg was first licenced in 1966 as VK3ZXW and was active on the 52 and 144 MHz bands in the AM days. He gained his full call in 1982 as VK3BGW and took out VK3VT in 1984. In 1978 he attended his first WIA Victorian Divisional monthly two metre fox hunt as a guest of Ewen VK3BMV, and he formed his own team the next month. Greg's team have been Victorian two metre fox hunt champions every year since then, including sharing in a triple dead heat with Ewen VK3BMV and Paul VK3DIP in 1980. He has been a member of successful fox hunt teams at Mount Gambier, Wagga Wagga and Ballarat conventions.

Greg was a member of the WIA Victorian Division Council from 1978 to 1982 and was the VK/ZL/O Contest Manager for four years. He was the founding president of the North East Radio Group (NERG) and is one of the lecturers for their Novice class.

He is married to Denise and has three children, Andrew (11), Kate (9) and Sarah (6). Greg is a Computer Systems Officer with Telecom Australia and his interests include Church, family, fox hunting, teaching amateur radio, building equipment (and talking about building equipment), computing, contesting, fishing, camping, observing car racing, bike riding, gardening and home maintenance.

VHF/UHF

On Friday, July 15, at 2100 UTC, GI4KIS, in Northern Ireland, whilst tuning around the two-metre band on 144.300 MHz, heard a bevy of activity. It was nothing more than EA8BE in the Canary Islands. Pointing the beam in the correct direction earned Eric a 599 report. Shortly after a SSB contact was made. Following this first and the accompanying excitement, he had a QSO with EA8BEX for a period of 81 minutes, with signal strengths wavering between S3 to S9. The distance is 3065 kilometres, probably not a world record but maybe a Region 1 example of what maybe bettered.

FINNISH AMATEURS TO USE SIX-METRES

Although not yet finalised, it appears that the amateurs in this country may receive permission to operate six-metres on a non-interference basis. The probable allocated frequency will be 50.000 to 50.450 MHz using the CW and SSB modes.

—Contributed by Ken McLachlan VK3AH, from the *ARRL Newsletter* August 9, 1988

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Equipment Review

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

KENWOOD TS-140 & TS-680 TRANSCEIVER

Since the demise of the TS-130S transceiver, Kenwood have had to rely on the TS-440 as their lowest priced HF transceiver. With the fall of the Australian Dollar over the last few years, the price of the 440 is now around the $2000 plus mark. This must be something of a shock to amateurs who payed less than $1000 for their last rig. In the days when the 130 and 430 were running-mates, they were very different pieces of equipment with the 130 being a basic amateur band only transceiver while the 430 had full general coverage receive, two VFOs and that great advancement of all modern equipment, memories. The gap has now closed. Not completely, of course, but certainly to the point where you need to look very closely to see where the differences are. At the present price of these units, I am sure that Kenwood will be rushed with orders.

Let us look at the two transceivers and see just what they have to offer and also how they compare with the still current TS-440S.

The TS-140 and TS-680 are identical in all respects except two points. The 140 transmits on all amateur bands from 160 to 10 metres, has a general coverage receiver from 50 kHz to 30 MHz, while the 680, in addition to all of this, also covers the six metre amateur band. Both transceivers have a nominal 100 watts output from 160 to 10 metres, with the 680 having 10 watts output on six metres. As a sort of payoff for this, the 680 does not have VOX for SSB which the 140 does, but both have an excellent full break-in keying system for CW. Naturally they are both fully solid state and are designed to operate straight from a 12 volt DC source and do not contain any internal power supply. If you are contemplating the purchase of one of these rigs, you should keep this in mind as a DC power supply with a peak current output of 20 amps will be required for home station use. For portable or mobile use, just hook it up to your 12 volt car battery.

Both are the same size and weight, 281 x 107 x 305 millimetres and the weight is 6.1 kilograms. Presumably, the weight of the six metre module in the 680 is exactly equal to the VOX unit in the 140. They are, in fact, just a fraction smaller than the 440S and .2 kilogram lighter assuming that the auto antenna tuner is installed in the 440S. Now, what don't you get in the 140/680 that comes as standard in the 440S. Firstly, there is no provision for a built in auto ATU. If you require one, it is necessary to purchase the AT-250 external automatic ATU. Both the 140 and the 680 have provision to interface with it. The only filter option available is for narrow CW. There is no provision for a narrow SSB or narrow AM filter. The excellent notch filter on the 440S is missing, but the useful IF shift feature is retained on the 140/680. The keyboard frequency entry of the 440S is not there nor is the automatic SWR meter or the provision for the optional voice frequency readout. Memories have been reduced from 100 in the 440 to 31 in the 140/680. I don't expect this will worry many as it is rather hard to use 100 memories! As we shall see later, the 140/680 have a few rather nice facilities that are not in the 440.

Tuning via the tension adjustable tuning knob is in 10 Hz steps for CW and SSB and in 50 Hz steps for AM and FM. This gives a tuning rate of 10 kHz and 50 kHz per knob revolution. Battery back up is provided for the tuning and memory systems, so that the last used frequency reappears when the set is switched on. An interesting addition to the tuning system is the VFO channel knob just to the left of the main tuning control. This control allows fast stepping from any selected frequency in 10 kHz steps. The first steps takes you to the nearest 10 kHz point and from there it goes in even 10 kHz steps. For the standard broadcast band these steps can be changed to a 8 kHz stepping rate to suit our broadcast band plan. When the memory mode is selected, this same control becomes the memory selector. The band up/down buttons are multi-function. In the normal mode they select the amateur bands in sequence. But, with the 1 MHz button pushed, the tuning range is stepped in 1 MHz or 500 kHz segments. This latter provision, like the 9/10 kHz broadcast stepping, is selected (as are others) on initial switch on of the transceiver. As is common these days, two VFOs are included, but in addition to this, memories 20 to 30 can act as 11 extra VFOs. As an example, by programming 14 MHz and 14.350 MHz into memory 30 it is possible to tune between these two frequencies when memory 30 is selected. By programming your favourite band segments into these memories gives rapid selection of them, a very handy feature. Frequency readout is available in either 10 or 100 Hz resolution, again available on initial switch on. Mode selection is signalled in Morse code and several alarm signals are spelled out in Morse code. Examples of these are, microprocessor reset signalled ***RESET*** in Morse, as does ***UNLOCK***, ***CHECK MEMORY***, ***EMPTY*** and ***FULL***. These last two relate to the status of the memory system. Well, at least it provides some good Morse practice.

ON-AIR

These are delightful transceivers to handle. With the exception of the memory section, it is possible to get things going quite well without the help of the instruction manual. The tuning control has the same smooth feel as the 440S and the adjustable tension is a good feature. For home station use, I preferred this set to the loosest position but the increased tension setting would be ideal for mobile operation.

The front panel display is excellent. The actual frequency readout is similar to all of the current Kenwood HF transceivers. It is bright and clear under normal lighting conditions but it does become hard to read with direct sunlight shining on it. Overall, I prefer it to the LCD type display. Incorporated in the display are indicators for mode selection, VFO, scan, memory channel, split operation and RIT. Frequency and RIT readout are in blue and the other status indicators are in red.

Perhaps the worst feature of the front panel layout is the four slider controls on the right. These are for power output, microphone gain, RF gain and noise blanker level. Initially, is is unfortunate that the RF gain is included at all among these. It should be concentric with the audio gain control. However, the squelch control has been placed here for some strange reason. I must say that this is not common to Kenwood. Both Icom and Yaesu have done the same thing. I feel that squelch is a "set and forget" control whereas the RF gain is in use for a good part of the operating time. The squelch is inoperative on all modes except FM. The trouble with the slide controls is twofold. First, the overall travel is only about one centimetre and it is necessary to use a finger nail to operate them. Then, most of the control function occurs over a millimetre or two making adjustment of power and microphone gain particularly critical. On the plus side, it does give the front panel a very uncluttered look.

The AGC can be switched for fast or slow decay times, but I feel that the slow release is not slow enough. This is accentuated by the difficult action of the RF gain control as mentioned above. A look at the circuit seems to show that it may be possible to modify the slow AGC fairly easily by the addition of about .1 or .2 MFD across the existing delay capacitor.

The noise blanker has two settings plus a lever control. The second setting is to reduce the woodpecker. In use, I did not find the blanker to be all that effective. With the level control advanced beyond halfway, a good deal of cross modulation became obvious. Car ignition was well suppressed but general electrical hash was not reduced to any marked extent.

The RIT control is excellent. Again, with the initial power on function, the offset can be changed from ±1.2 kHz to ±2.4 kHz. It does this by changing the RIT action from 10 to 20 Hz steps. This is the first dual speed RIT I have seen since the old Uniden 2020. Unfortunately there is no XIT, transmitter incremental tuning which most DX operators find so useful.

One of the highlights of these transceivers is the memory system. This certainly breaks new ground and is quite unique. Memories 00 to 09 can store one frequency and one mode each. Memories 10 to 19 can be programmed to store either single frequencies plus mode or split frequencies plus mode. This means that 10 metre FM repeaters can, as an example, be stored into these 10 memories. But, perhaps the most interesting are the last 11 memories (20 to 30). These can be programmed with the highest and lowest frequencies of any desired band which is then tuned in the normal way with the main tuning

control. I set up several amateur band segments that I normally use and found that, using the memory selector switch to change bands was much quicker than using the band up/down buttons.

Scanning facilities are most comprehensive. With the memory mode selected, memories are scanned and the speed is adjustable by using the RIT control. With the RIT set at its normal central point, the scan delays on each memory for about four seconds. In the full clockwise position this is reduced to something less than one second, while in the full counter clockwise position, the delay is 14 seconds.

When in the VFO mode, a programmable band scan can be initiated again with the speed adjustable with the RIT control. The scanning range is selected by entering the upper limit into memory 30. The scan then takes place between the selected VFO frequency and that frequency. Also, when in the VFO mode, up down scanning can be initiated with the buttons on the supplied hand-microphone. This is fully manual and lasts only while the button is depressed. When in the memory mode, these buttons also select the memories.

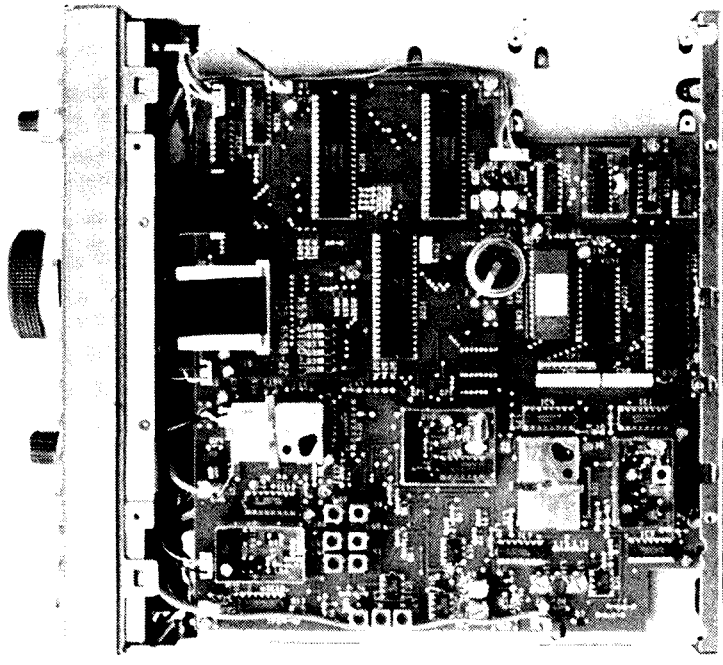
Received audio quality is generally satisfactory especially if a good external speaker is used. The in-built speaker produces about the same quality as the 430/440 which is quite satisfactory. AM received audio was okay, but perhaps a little on the thin side with a noticeable lack of low frequencies. AM selectivity again was okay for general listening but if you are a shortwave broadcast band DXer you would possibly want tighter skirt selectivity. As mentioned earlier, no optional improved AM filter is available. Our review transceivers did not have the optional CW filter fitted so I cannot comment on its performance. Its' specified bandwidth is 500 Hz at -6 dB which should be ideal for the casual CW operator.

Transmit performance was also very good and very straight forward. Just present the output with a 50 ohm load and you are in business. Transmit metering is either ALC or power output calibrated in watts. The non-linear power meter reads about 35 watts at centre scale and 150 watts full scale actually shows PEP output on SSB although the response is a little too fast to get an accurate reading. Again, a slight modification in this area might be in order.

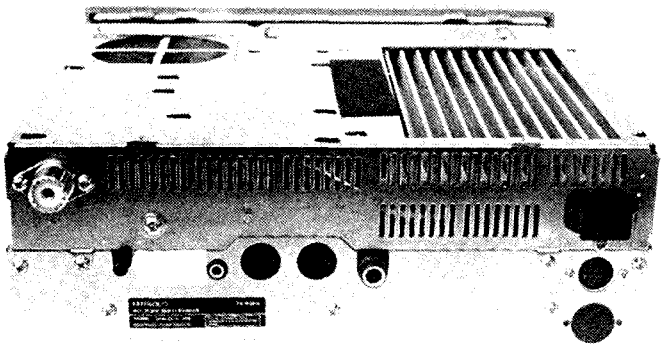
Transmit quality with the supplied hand-held microphone was quite satisfactory but somewhat smoother using the MC-60A optional microphone. The speech processor certainly gave the transmission some extra punch, but under strong signal conditions made the audio rather breathy. The processor is similar to the one used in the earlier TS-130/430 and the current 440. It is an audio limiter/compressor unit and certainly not comparable to the RF processors used in the TS-930/940 transceivers. Perhaps the greatest complaint on transmit was the action of the microphone gain control. To get the ALC reading right, an almost microscopic adjustment was needed. The power output control operates on all modes but has rather different effects on each. On CW, the power can be varied from virtually nothing to full output of about 100 watts. FM power is set to about 50 watts maximum and can be reduced to around five watts. AM, like CW, can be varied from 100 watts down to zero although maximum should be kept to about 30 to 40 watts output on carrier to allow for modulation. SSB is the one that is different though. Output can be reduced to only about 20 watts and, at this power, some funny things happen. It appears that the ALC is not effective until it is actually activated. The first speech peak produces an output of 100 watts and after that it settles down to 20 watts. If there is a pause for a few seconds, the same thing happens again. This strange happening is easily picked up on a scope and PEP power meter, and is even noticeable at full output!

Transmitted FM quality was rated as excellent and I am certainly waiting for 10 metres to really open up to put this mode to use. However, it is surprising that more amateurs don't use 10 FM for their "private" local nets.

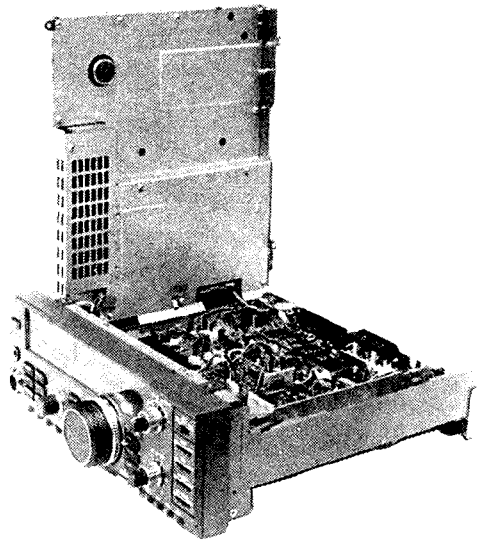
The CW and data operators are well catered for with these transceivers. They keyed very well and the full break-in facility will be appreciated by the keen Morse operator. The instruction book has information on connecting a packet, AMTOR and RTTY terminal via an accessory connector at the rear of the transceiver. It is noted that the 140/680 is not rated for continuous full power output while using data modes, as was possible with the TS-440. Recommended output is 50 watts.



Some of the intricate circuitry when the cover is lifted.



Rear view of the transceiver.



Inside view showing final amplifier compartment hinged up for easy accessibility.

While testing these transceivers on air, a question frequently asked was; "do those transceivers run hot, because they don't have a heat sink for the final, do they?".

At first glance, this may appear to be true. There is no heat sink protruding from the back panel in the usual way. However, there is a heat sink and a good-sized one at that. Lifting the top half of the cabinet discloses the missing item. It is a large diecast section covering a good-sized area. There is also a fan built in to aid the cooling when things get hot.

However, it must be said that the cooling is not as good as the TS-440 and this shows in the specifications. The 440 is rated at 100 percent duty cycle on all modes, the 140/680 is not. In normal use during a Melbourne winter there was no sign of over heating at all, even when running processing on SSB.

As a final point in this section, it is interesting to look at the overall frequency coverage of the TS-680. The general coverage receiver section covers from 50 kHz to 34.999.9 MHz and then from 45 MHz to 59.999.9 MHz. That is quite some coverage! Perhaps the next model will include the two metre band as well.

One complaint (not from me) mentioned to me by several prospective 680 buyers was that there should have been a separate antenna connector for six metres. Well, I guess that you cannot have everything!

ON-TEST

Using our normal line up of test equipment, I put the transceivers on test.

RECEIVER TESTS: The receiver audio output via the external speaker socket was terminated in our dummy load watt meter and bridged with the noise and distortion meter.

SSB/CW distortion at .1 watt output	1.3 percent or -38 dBm
Audio output for 10 percent distortion	2.1 watts at 4 ohms 1.7 watts at 8 ohms
Audio amp noise with audio gain at minimum	-59 dBm
SSB frequency response	LSB at 3.6 MHz

200	300	500	1k	1.5k	1.8k	2k	2.5k	3k
0	+2	+2	0	-3	-5	-5.5	-7.5	-11 dB

Receiver sensitivity for 10 dB S + N/H

	1.8 MHz	3.5 MHz	7.1 MHz	10.1 MHz	14.2 MHz	18.1 MHz	21.2 MHz	24.9 MHz
SSB/CW	.25	.18	.15	.18	.18	.15	.18	.18
AM 70% mod	.5	.4	.3	.4	.4	.3	.4	.6

	28.5 MHz	51 MHz
SSB/CW	.15	.1
AM 70% mod	.5	.6
FM 3 kHz dev	.15	.13

28 and 51 MHz measurements are taken with the preamplifier in.

The S-mater calibration was checked at 14.2 MHz.

S1	S3	S6	S7	S8	S9	+10	+20	+30 dB
1.6	4	10	20	25	50	100	300 uV	1 mV

Input for S9 reading was checked on the following bands

MHz	3.5	7	10	18	21	24	28	50
uV	40	40	50	50	50	60	50	40

Preamp in (680 only)

15	12.5	20

The AGC was checked and found that the signal generator output was increased from 1 uV to maximum, the audio output increased by 1 dB.

The above figures are very good in most respects. The SSB frequency response shows that the carrier frequency is a little too close to the filter. A slight adjustment here would possibly improve the received and transmitted quality. Frequency stability and frequency readout accuracy were most impressive. After several hours use, the transceiver did not drift more than 100 Hz. The frequency readout was accurate within the same limits.

TRANSMITTER TESTS: The transmitter output was terminated with a 50 ohm dummy load watt meter and bridged with a monitor scope. The following power output was noted.

160 m	80 m	40 m	30 m	20 m	18 m	15 m	12 m	10 m
CW/SSB								
110	115	112	110	105	100	100	97	95
FM (10 m only)								
								50

CW/SSB				
6 m	(680 only)	9.75	FM	9.75

AM: As the AM output should not exceed about 30 to 40 watts it was possible to achieve this on all bands. At 30 watts it was possible to obtain close to 100 percent. Finally the current drain was checked.

Receive with no audio output	1.2 amps
Receive with .5 watt output	1.5 amps
Transmit, LSB. No output	2.0 amps
Transmit, CW. 90 watts output	15.0 amps

Modulation with low distortion was indicated on the monitor scope. AM quality was rated as good with supplied hand-held microphone and excellent with the optional MC-60A. So why not try the AM on 160 and FM on 10 and enjoy some good quality phone on the HF bands.

INSTRUCTION MANUAL

The same manual is issued for both transceivers. A block diagram for each transceiver is printed but the circuit diagram supplied appears to be for the TS-140. Presumably, to get a circuit for the 680, it might be necessary to purchase the workshop manual.

Operating instructions are well covered and, in particular, the section on the memory is very well done.

The book's various sections are as follows:

1. Before operation
2. Specifications and accessories
3. Installation and connection
4. Operation
5. Circuit description
6. Maintenance and adjustments
7. Optional accessories
8. Reference data.

There are 48 pages in all. In general, it is well written but the reference under mobile operation to bond the accelerator to ground using a heavy ground strap might need a second look.

The adjustment section gives information on the following:

1. Sidetone level
2. Beep tone level
3. Adjustment for data communications level input
4. Microphone sensitivity level adjustment
5. Semi break-in delay time
6. Linear amplifier control
7. Digital display calibration

However, if you want to set the SSB carrier suppression or the S-meter zero or sensitivity, you are out of luck. It seems to me that another page or two of basic adjustments would not be out of place. Overall, the instruction manual scores seven out of 10. Not bad, but could be better.

CONCLUSIONS

I think Kenwood have got a winner with these two transceivers with the 680 taking first prize by a short margin. I think I can live without VOX. Few amateurs seem to use it these days, but the chance to try out six metres over the next few years is tempting to say the least.

Our thanks to Kenwood Australia for the loan of the two transceivers from which this review has been compiled.

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INTRODUCING THE NEW MINISTER

Ralph Willis MP, has been appointed the Minister for Transport and Communications in the third Hawke Ministry, replacing Senator Gareth Evans who is now the Foreign Affairs Minister.

A cabinet portfolio reshuffle was necessary with the resignation of Bill Hayden, who becomes Australia's Governor General.

Mr Willis, 50, married with two daughters and one son, was elected to the House of Representatives seat of Gellibrand, in inner south-west suburban Melbourne, in 1972.

He was educated at University High School and graduated from the University of Melbourne with a degree in Commerce.

First employed in the now Department of Industrial Relations as a research assistant, Mr Willis then joined the staff of the Australian Council of Trade Unions as a research officer in 1960.

In 1970, he was appointed the ACTU's industrial advocate. After spending about four years on the back bench, Mr Willis became a member of the Opposition Shadow Ministry in January 1976.

He was then spokesperson on Industrial Relations until December, 1977, Economic Affairs (incorporating Treasury, Finance and Economic Development) from December 1977 to January 1983, and Economic Development from January 1983 until March that year.

Following the Bob Hawke-led ALP victory at the March 5, 1983 general elections, Mr Willis was appointed Minister for Employment and Industrial Relations and Minister Assisting the Prime Minister for Public Service Industrial Matters.

He was re-elected to the Parliament in December 1984, and again in July 1987. Mr Willis was Minister for Industrial Relations and Minister Assisting the Prime Minister for Public Service Matters.

Mr Willis has now become Minister for Transport and Communications at a time of great change in the communications sector.

There was the switch to the FM band by some commercial AM stations, new FM radio services, expansion of the Special Broadcasting Service and community broadcasting.

Aspirants to community television licences conducting transmission tests were waiting for a ministerial decision.

The second generation AUSSAT was another area in the planing stages. Communications had undergone considerable deregulation in recent times, and the vested interest groups were pushing for more relaxation.

New uses for the radio spectrum, including an expansion of microwave Multipoint Distribution System also sat on DOTC's agenda.

The Amateur Radio Service also waited for the implementation of examination devolvement, and introduction of at least one new licence grade.

Our Minister also has to deal with the Transport part of his super ministry which includes shipping and aviation.

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KENWOOD

TM-221A THE ROVING NOVICE RIG

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The new TM-221A 2-m and TM-421A 70-cm FM mobile transceivers have been specifically designed to condense maximum performance and operating convenience into an ultra compact package, allowing maximum flexibility in automotive installations.

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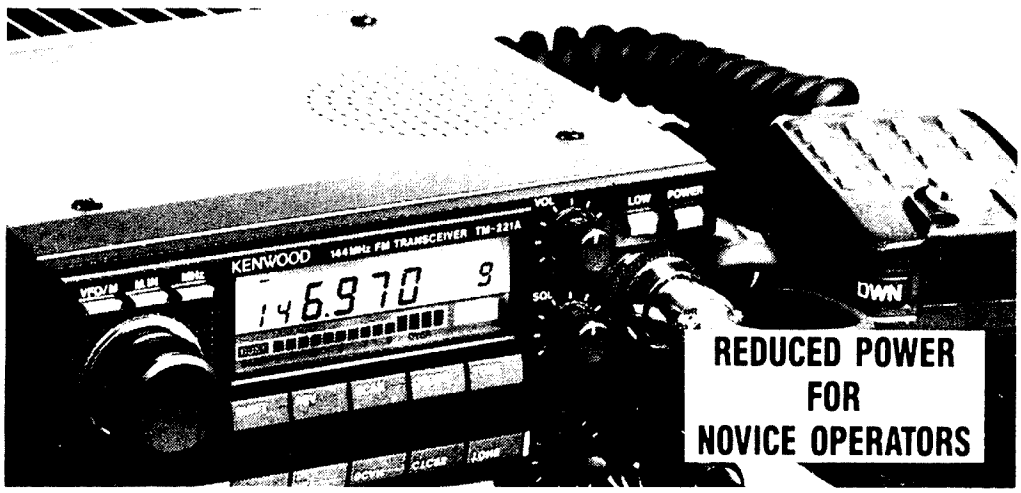

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Equipment Review

Gil Sones VK3AUI
30 Moore Street, Box Hill Vic. 3128

ALINCO TWO-METRE HAND-HELD FM TRANSCEIVER

The Alinco hand-held is a small basic two-metre FM transceiver. It is not complicated and works very well. Just the thing to tuck in your pocket or slip in your overnight bag.

When I first opened the box I was amazed at the size of the radio. The works will fit with ease in the palm of your hand. Indeed the radio itself is about the same size as the battery pack which slips onto the bottom of the radio.

Nickel Cadmium batteries are used in the battery pack and included with the transceiver is a charging stand. This charging stand can be used with any source of 13.8 Volts DC. The car electrical system is just fine. Any mains operated 13.8 Volt supply at home will be okay. The auxiliary output of the main DC Supply would be excellent. Alternatively a plug pack could be purchased if you wished.

A charging stand which uses DC input is really much better than some of the plug packs which occasionally appear. Plug packs, by the way, have to be of an approved type for use in Australia. This is not just a whim but is for a number of very good safety reasons. An adaptor plug or bending the pins is just not on.

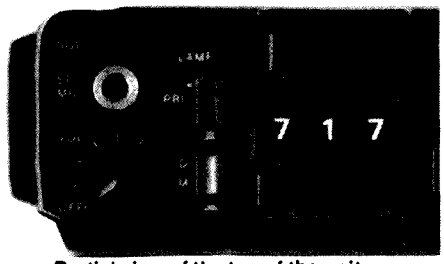
With such a simple radio the instructions can be accommodated adequately on one large sheet folded into a smaller book sized folder. As well as the instructions a circuit diagram and block diagram is provided. Very useful but I do not think very many of us will be delving inside. The use of very small components of high reliability and four layer circuit boards rules out the plumbers iron repairs and modifications.

Frequency setting is by small thumb-wheel switches which means that putting it in your pocket won't result in a strange frequency being keyed up. A set of rotary frequency setting switches are provided along with an adjusting tool to provide a memory channel. The tool is thoughtfully attached to the wrist strap so you can't lose it. By operating two push buttons it is possible to swap between memory channel and the main frequency or to monitor both channels for activity.

Battery life is, of course, limited but a battery save function is available via a slide switch. This enables extended monitoring to be carried out with a much reduced battery drain.

Low power operation is also provided so that where a few hundred milliwatts will suffice battery drain can be reduced.

Normal power output is in the two watt class. Unfortunately I could not accurately measure the output power as my power meter is not intended for this power level. The output connector is also one I had not seen before and looks to be a cross between an RCA and a Type F I could convince an RCA adaptor to make the connection but would have preferred a proper adaptor.



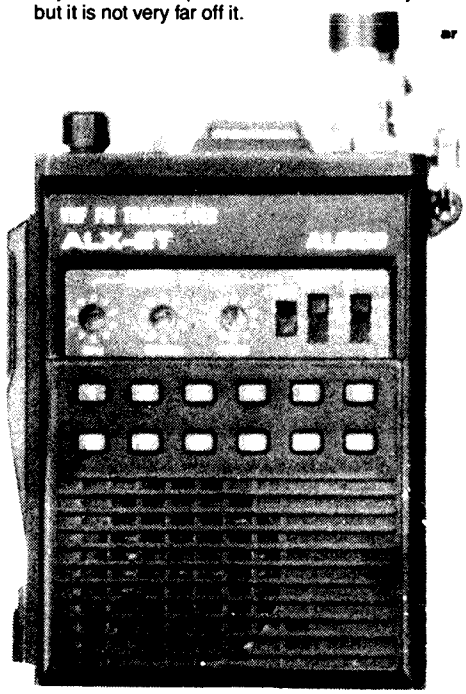
Partial view of the top of the unit.

A short rubber duck antenna is supplied and its size compliments the size of the radio.

Dual tone multi-frequency buttons are provided so that dialling through a repeater access to the telephone is possible if you visit the USA. This is not available in Australia as our phone system is different. Still it can be handy for other remote control applications.

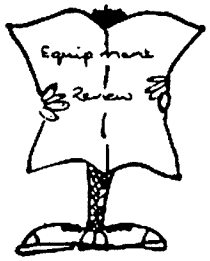
On the air I could access many repeaters and even made a contact from inside a city building. That was from the side of the building away from the repeater too. A creditable performance.

Summing up the Alinco is a very serviceable and useful Two-Metre Hand-held FM transceiver. Just the thing for travelling or to take with you any where. Not quite down to Dick Tracey size but it is not very far off it.



Front control panel of the transceiver.

Full-sized view of the transceiver with battery pack attached.



Equipment Review

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

Icom IC-32AT Dual Band FM Transceiver

When Icom bring out a new piece of equipment, you can be sure that they have researched the situation very well. The new IC-32AT certainly has some advanced features and would definitely satisfy the most particular amateur.

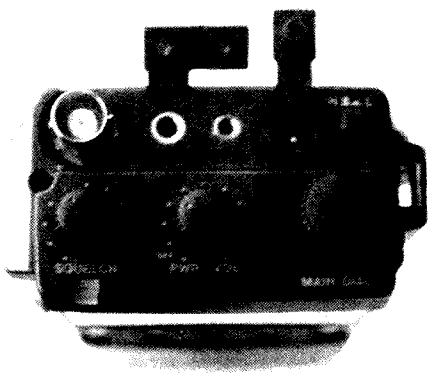
The IC-32AT incorporates the following features: It is a hand-held transceiver with a maximum of five watts output on both the 144 and 430 MHz bands. The actual frequency coverage of the Australian version is 144 to 148 MHz and 430 to 440 MHz. The frequency steps for covering this range is selectable for either of 5, 10, 15, 20 or 25 kHz steps. The transceiver is normally supplied with the BP-70 battery pack which has an output of 13.8 volts, enabling the transceiver to deliver the full five watts output. A variety of other battery packs are available as optional extras. These give a selection of voltage outputs which in turn give different power output from the IC-32AT and many are designed to be used with a rapid charger. In all, there are eight different packs including one to take either dry of nicad battery cells.

There are 20 memory channels provided and these can be set up in any combination on the two bands. One of the more intriguing features of the transceiver is its ability to transmit on one band and receive on the other simultaneously. With two transceivers, it is possible to conduct a full duplex conversation. Presumably, if you had two transceivers at each end you could have full duplex in stereo!

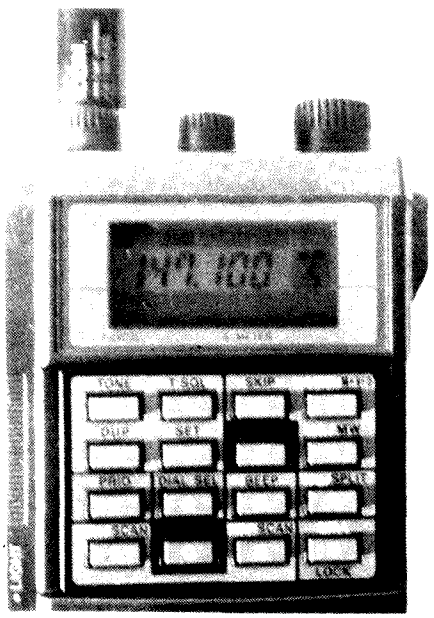
The IC-32 has, of course, a full range of scanning facilities. You can choose full band scan, programmed band scan, where any segment of the whole band is scanned, memory scan plus a selected band memory scan.

Frequency selection is duplicated with wither keyboard entry or by tuning to the required frequency with the "Main Dial" control. As mentioned above, the tuning steps are separately selected. The LCD dial readout tells the user just what is happening. As well as frequency display, it shows transmitter relative output, received signal strength, memory channel, repeater offset, call channel selection. The display is illuminated for night operation and, like its small brother the Micro Two, one push of the "light" button gives about five seconds illumination. Again, like the Micro Two, a battery saver function is provided to cut the battery drain to about a quarter of the normal receive current if no signal is heard or no controls operated for 30 seconds.

With the relatively high power output and the extreme versatility that this transceiver offers, it does no come in a miniature package, as the illustration shows when compared to the Micro Two. The overall dimensions are 65, 180.5, 35 millimetres (WHD) and it weighs 590 grams. These dimensions are with the normal BP-70 battery pack fitted. This, of course, does not put it into the shirt-pocket category. So if small size is an important consideration, you might have to settle for a single band hand-held.



Top view of the IC-32AT.



Close up view of the controls.

ON AIR

After loading up the memories with the usual local repeater and simplex channels, I got to work to try the transceiver out on the air. I should say that it was necessary to study the instruction book at some length to actually get the required frequencies into memory. Of course, the transceiver produces the usual 'beep' sounds to signify that all is okay. Entering memories requires the use of the function button which is not on the keyboard, but around on the side near the PTT button. In addition to these, there are two other buttons on the side, the display light and one labelled 'moni-

tor'. This has two functions — firstly, it opens the squelch, and allows you to hear a weak signal below the squelch level. But if the channel you have selected happens to have a repeater offset programmed, the 'monitor' button, in addition, selects repeater input frequency. Quite a neat idea!

The first impression of the transceiver was the very poor received audio quality. The sound was more like a miniature ear piece turned up loud rather than a proper loudspeaker. With an external speaker plugged into the external speaker socket, the quality sounded quite normal. At the same time, the actual acoustic output appeared to be very low. If the transceiver was to be used mobile, an external speaker would be essential.

The dual band antenna supplied with the transceiver measured 18.5 centimetres long and appeared to perform very well. Checking the efficiency by measuring the noise received back from a local repeater, it was 6 dB better than the shorter Micro Two antenna on two metres. Unfortunately, no comparison antenna was not available to check the performance on 430 MHz.

ON TEST

Unfortunately, due to the very short time that the transceiver was available to us, we were unable to carry out many of the normal range of tests. Power output was checked on each band and found to be a little down in the specified output. At 147 MHz, 4.7 watts was indicated and at 440 MHz 4.2 watts. This is a little down on the specified 5.5 and 5 watts. These tests were carried out with the battery fully charged. As a point of interest, the wall charger supplied with the IC-32AT is not compatible with other Icom hand-held transceivers as a smaller diameter plug is used to connect to the battery pack. However, Icom still retain the LED indicator on the battery to show that charge is taking place.

Receiver performance was subjectively checked. On a comparative basis sensitivity was rated as excellent, and it was noted that there was a lack of spurious signals when the transceiver was in the memory scan mode. Spurious rejection was rated better than most hand-helds and better than some mobile-base units.

The S-meter was checked against our signal generator with the following results. There are seven segments on the bar graph.

Segment 1 (S1)	Mute open
Segment 2	.5 uV
Segment 3 (S5)	.7 uV
Segment 4	.9 uV
Segment 5 (S9)	1.2 uV
Segments 6 and 7 (S9+)	1.5 uV

In general, this shows that there either is a signal being received or not. On transmit the meter showed full scale with maximum power out and three segments (S5) on low power output.

Transmit audio quality was rated as good with plenty of punch to the sound.

Received audio was as commented on earlier, rather poor.

Battery life, as you may expect, is very dependent on how long you talk. At five watts output, the current drain is a massive 2 to 2.2 amps. I calculate that you would have about 15 minutes talk time maximum. Even on low power the battery drain is about one amp.

INSTRUCTION MANUAL

The IC-32AT Instruction Manual has a total of 52 pages. This is divided into 12 basic sections that cover amongst others, control functions, pre-operation, basic operation, memory and call operation, scan and watch operation and set mode. The only technical data supplied is a schematic diagram. A separate sheet gives data on the optional battery packs and other options such as carry cases, chargers and speaker microphone and headset combinations. While the rather complex operating procedures are very well covered, there is no technical information at all.

Overall, I would rate the manual at six out of 10.

CONCLUSIONS

This piece of equipment certainly offers a wide range of operating possibilities. If you are considering the purchase of a hand-held transceiver for each of the two bands then the IC-32AT might well be the most economical approach. It is, however, rather large compared to the latest single band units.

Apart from the poor received audio quality, the set offers a high standard of performance.

The transceiver used in this review, serial number 01182, was supplied by Icom Australia, to whom all inquiries should be directed.

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A BROADCAST WITH A DIFFERENCE!

John Taylor VK3AJT
Unit 17c, Hi-Surf, 150 The Esplanade, Surfers Paradise, Qld. 4217

We tested the rig on the way to Melbourne.

During World War II, AWA produced a service radio known as the FS 6. FS stood for Field Service. It was, by present standards, extremely primitive but it worked, and often too!

The writer has a number of these sets bought through disposals. Broadcast Station 3GL, Geelong also used one as communication between sporting events and their studio.

I had known their chief radio man, Jack Mathews, since school days, and we talked about the possibility of directly feeding the output of an FS 6 into the modulator of 3GL, not to the studio for re-announcement by their announcer, but *direct* into the transmitter. Reg Gray, then 3GL Manager, agreed to allow us to "give it a try".

Williamstown to Geelong was, in those days, about the limit of possibility, but we set up an aerial on the yacht *Windarra*. It was agreed that the Williamstown to Geelong Yacht Race would be the subject of the broadcast! The author was the commentator, the year circa 1948.

The rig was tested en route to Melbourne for the race and everything seemed to be in order. The following day the broadcast was made on schedule as the race progressed. Everything worked perfectly and many congratulations were received, not only on the radio site, but also on the description of the race.

Two or three more broadcasts of this race were made from the *Windarra*, until a new yacht, *Yeulba*, was purchased.

It was agreed that the excellent broadcast descriptions of the Williamstown to Geelong Race would continue from *Yeulba*.

One year, because of business commitments, Neil McAllister, owner of *Yeulba* was unable to sail the boat in the race so it was agreed that the forward hand, the late Eustace Wilson, would take the helm for the big race.

By this time, 3GL had two FS 6s direct back to their transmitter at Grovedale. One was on the *Yeulba* the other at the finishing-line off the Yarra Street Pier.

The race began from Williamstown in a strong north-easterly wind. Once around the Gellibrand Lighthouse Eustace called for the spinnaker. "Red" Brayton and myself, working forward, brought the small storm spinnaker up through the forward hatch but Eustace immediately ordered that we stow it and set the big spinnaker. The author suggested that this could pull the mast out, but Eustace was adamant, repeating his order with much gusto and colourful language.

So, up went the big spinnaker and with it the breaking out of the stops, the backstay went, followed by the highfield levers on the weather side crumpling like a concertina! Then the upper weather shroud went and we were in real trouble!

Just at this time the monitor radio in the cabin came to life: "We are now crossing direct to the Royal Geelong Yacht Club yacht *Yeulba*, for a broadcast description of the start of the Williamstown to Geelong Yacht Race."

A young member of the crew quickly had a "handy billy" tackle from the swinging back stay to it's chain plate on the deck, thus saving the mast. Packing up the mess, a jib was set behind the mast and a safe, but monotonous, course set for Geelong.

Off Werribee the crew listened to the announcer, King Lloyd, announcing the finish of the race at Geelong. Finally he announced: "I regret to say that *Yeulba* has lost her mast and is now back in the Royal Yacht Club at Williamstown."

He was immediately advised that the yacht was off Werribee in no uncertain terms and language.

This announcement came loud and clear over 3GL, much to the consternation of Reg Gray.

Later further broadcasts were made from the three-masted schooner, *Ile Ola* but eventually the practice lapsed.

Having followed wireless from 1920 through to radio, and as an amateur radio operator, I believe that the Royal Geelong Yacht Club and 3GL can take credit for the *very first ever* direct transmission broadcast of an ocean yacht race direct from the yacht to the modulator of the broadcast station.

Other readers may like to comment on this belief!

ar

Eric Jamieson VK5LP
9 West Terrace, Meningie, SA. 5264

VHF UHF — an expanding world

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.005	H44HIR	*Honiara*
50.005	ZS2SIX	*South Africa*
50.011	JA2IGY	*Mie*
50.020	JE6ZIH	*Japan*
50.028	JA7ZMA	*Fukushima City*
50.066	VK6RPH	*Perth*
50.075	VS6SIX	*Hong Kong*
50.080	KH6JJK	*Hawaii*
50.110	BY4AA	*China*
51.020	ZL1UHF	*Auckland.*
52.013	P29BPL	*Port Moresby*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*
52.345	VK4ABP	*Longreach*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton* [1]
52.440	VK4RTL	*Townsville*
52.445	VK4RIK	*Cairns*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
52.510	ZL2MHF	*Mount Climie*
144.022	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.445	VK4RIK	*Cairns*
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK6VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier* [1]
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
144.950	VK3RCW	*Melbourne*
145.000	VK8RPH	*Perth*
432.066	VK6RBS	*Busselton*
432.160	VK8RPR	*Nedlands*
432.410	VK1RBC	*Canberra*
432.420	VK2RSY	*Sydney*
432.440	VK4RSD	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*Macleod*
432.540	VK4RAR	*Rockhampton*
1296.198	VK6HBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.440	VK4RSD	*Brisbane*
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
2304.445	VK4RIK	*Cairns*
2306.440	VK4RSD	*Brisbane*
10445.000	VK4RIK	*Cairns*

1. The only beacon information this month is to report that VK3RMV on 52.435 and VK5RSE on 144.550 MHz, have not as yet reappeared. No advice has been received that they will not be operational so they are listed for the time being.

SIX METRES

Having just gone through one of the better winter time Es periods for some years, it was good to receive a letter from Kerry ZL2TPY, outlining the state of six metres from the New Zealand viewpoint.

Kerry commences by saying that, on April 24, at 0926 he and ZL2BGJ heard the first night-time JAs for Cycle 22; on 1/5 at 0540 ZL2TPY worked JA4MBM on 51.110 MHz. In all, he worked 16 JAs, but many more could have been worked had the signals been stronger and less QSB. Signals were being heard as late as 0900. These were their first TEP Class I and Class II FIA for Cycle 22. Areas worked were JA1, 2, 3, 4 and 6. Around the same time, heard HL9CB on 50.110 MHz working VK8ZLX, but failed to get the HL9 to QSY up 1 MHz for a contact. Russian television noted until 0905 and VK Channel 0 television on 51.670 MHz in at 0822 and worked VK2YZN on 52.050 at 0748.

ZL2TPY on 17/5 worked VK4KU at 0300; 27/5 VK2XJ at 0231, VK4KU at 0253; 31/5 VK4KU at 0716 and heard VK1 working VK2 and VK4 during the afternoon. Further openings to VK2 and VK4 on 7/6, 10/6, 14/6 and 30/6.

On 2/7 worked VK4ZAZ, VK4ZAL, VK2XJ, VK2DV, VK4ZJB, VK2ZFS, VK4KU between 0419 and 0642 on 52.050 MHz. This announced the winter-time Es was starting to hot up! On 3/7 worked VK2XJ at 0459, followed by VK3YY, VK3AMK, VK3VF, VK3DFL, VK3ANP, VK3BRZ, VK2ZXC, VK2FLI and VK2ZCP, to provide what was probably one of the largest winter-time openings between ZL and VK. VK8ZLX was also heard. ZL3TIC during this time worked into VK2, 3, 4, 5, 7 and VK8GF, and heard VK6KXW. ZL1, 2 and 3 were also working these stations.

Also on 2/7, Phil FK1TS worked 25 stations in VK2 and VK4 including VK2XC on 52.050 at 0830!

On 4/7, ZL2TPY worked VK2 and on 5/7. VK4. There were further openings between ZL and VK2 and VK4 on 13/7 and 14/7. On 17/7, worked FK1TS at 0310 at 5x9 signals for 20 minutes after which FK1TS continued to work VK2s. Also on 17/7, ZL2AQR and ZL2AGI worked Wal VK4DO, at Townsville, at 0500.

The good conditions continued on 18/7 when Bob ZL3NR heard a VK6 six metre beacon at 0510 while ZL2TPY worked VK4KU at 0459. On 19/7 worked VK3YDE and VK3LK around 0610 while ZL3TIC worked into VK2, 3 and 4.

From this point onwards the winter-time Es conditions tapered off with only spasmodic contacts to VK being available. Kerry said it had been a most memorable period.

Thanks for writing Kerry, we at least know our friends across the Tasman are vigilant and looking for contacts.

SIX METRES IN VICTORIA

Maurie VK3XEX, from Rokewood Junction, has written to confirm what a great month July had been on six metres. On 4/7, from 0344 worked VK4LE, VK4ZAL, VK4WF/P and VK4ALM. On 7/7, from 0457, VK2FKZ, VK4ZOJ, VK4ZDK and VK4CEU; 12/7 from 0420 VK4ZAL, VK4KU and VK4CEU; 18/7 from 0252 VK4DLW, VK4KU, VK4APG and VK2CN; 21/7 from 0504 ZL2KT, ZL2AGI, ZL2QS, ZL2UBG and ZL2BGJ; 23/7 0515 VK4PU; 24/7 0323 VK4LE.

25/7 was a very great day. From 0135 ZL2KT, ZL3AAU, ZL3ADT, VK2GP, VK2AAK, VK4ZAL, VK2AT, VK2ZER, VK4APG and VK4ALM. 26/7 from 0100 ZL3TIC and ZL3OF; 26/7 from 0210 VK2BJU, VK4DO, VK4ZAL, VK4ZJB/M, VK4LE and VK4ZAZ.

Maurie said his QTH is surrounded for 360 degrees by hills 80 to 120 metres high and to prove it sent me a colour print! (I know the feeling, Maurie, I was in a similar location previously at Foreston). However, despite the limitations, Maurie has worked on six metres KH6, VK0, YJ8, VK9, ZL, JA, H44, FK8, 3D2, ZK2 and P29, all with his TS-600 running 10 watts.

A final comment from Maurie says there is some delay with the Ballarat 432 MHz beacon, but advice will be sent when it is operational. Thanks for the letter.

TWO METRES IN VICTORIA

John VK3ZJC, writes that the bands above 52 MHz have not been "exploding with DX" but there has been some interesting activity.

The aircraft enhancement path to Canberra and Sydney continues to provide poor contacts, despite the high level of mid-winter sun noise. VK1BG has been worked on 144 and 432 MHz every weekend; he is the most consistent Canberra station at VK3ZJC. Other contacts on 144 to VK1GL, VK1VP, VK1BUC and VK2ZAB. Heard VK2DVZ and VK2ZRE. On 432 MHz, contacts with VK1AU, VK1VP, VK2BE and VK2ZAB.

John is still trying to work Eddie VK1VP, via aircraft enhancement on 1296 MHz. In an effort to clinch a contact, Eddie went portable on 10/7 and 17/7. The only results were a burst of a few seconds on 17/7 with no positive identification.

John advises he is transmitting as follows:
Times: Saturday and Sunday mornings approximately 2215 to 2330 UTC.
Frequency: 1296.000 MHz.
Mode: CW approximately 10 words per minute; will go to SSB if anything is heard!
Cycle: On the minute and half minute, synchronised to WWV, 15 seconds transmit "VVVV de VK3ZJC VK3ZJC" then 15 seconds receive.
Notable contacts: 12/6 marginal two metre tropo opening to Mount Gambier, VK5DK worked 5x4. 24/6 to 26/6: Good openings to Adelaide area. Worked VK5NY on 52, 144 and 432 MHz. Also on two metres VK5DX and VK5LP.

3/7: VK2DVZ (Taree) heard 5x6 on 144.200 at 2225, apparently aircraft enhancement plus a strong meteor ping but not long enough to work him. 16/6 on 432 worked VK1BG, VK1VP and VK2BE.

Assorted news items: Roger VK3XRS, near Balrnsdale now has 100 watts on two metres and has erected a 40 foot long VK3AUU Yagi. He also operates on 432 with 1296 MHz in the pipeline.

Mike VK3APW, now has 400 watts and four long Yagis on two metres. On 432 MHz he has just put up 108 elements and is working on a 400 watt amplifier.

Doug VK3UM has reappeared on 432 MHz after completing rotator renovations. David VK3AUU, is also back in action on 52 and 432 MHz.

Arie VK3AMZ, now has one watt out on 1296. VK2ZRU should also be added to the list of 1296 MHz stations.

The packet radio interference on 144.100 MHz and voice repeaters has decreased. The diplomatic requests to them to keep 144.800 clear appear to have borne fruit. No doubt, however, if the "packet gateway" goes ahead on this frequency, they will be unable to avoid 144.800 (the VK5VF beacon frequency . . . VK5LP) even if they are willing. Sooner or later the problem may have to be faced in Adelaide itself, when the packet links are extended that far.

It appears the eastern suburbs of Melbourne are being plagued by unlicensed FM stations on two metres, on frequencies as low as "Channel 4000" (ie 144.000). Various attempts are being made to trace these illegal operators.

Thank you for your letter John, and hope you make it to Eddie VK1VP on 1296 MHz soon.

SOUTH AFRICA

Thanks again to Hal Lund ZS6WB, for further "VHF News" newsletters. It appears the beacons in that country are rather spasmodic in operation except for ZS1STB, on 50.904 MHz which runs 25 watts to a four-element beam aimed at Pretoria, which means a northerly direction and includes some sections of Europe. This beam heading will not be very helpful towards any possible VK contacts. ZS2SIX on 50.005 MHz which also radiates north/south is still off the air, while ZS5SIX on 50.075 MHz with 10 watts to a halo antenna is listed as present status is unknown.

ZD8VHF on Ascension Island in the South Atlantic (50.032.5 MHz) is presently off the air with its operator ZD8MB in the UK.

VK operators, particularly those in Perth, should remember the distance to South Africa from Perth is about the same as Adelaide to Hawaii and the latter path has been bridged many times in the past. With the proper vigilance on both sides of the Indian Ocean and with the improving Cycle 22 it must surely become possible for some stations to span that path. This will be a situation where liaison on 10 metres will help via 28.385 and 28.885 MHz, or the South African VHF Schedule Liaison frequency of 7.045 MHz. The DX calling frequency is 50.110 MHz.

The "VHF News" also reports W5UN has enlarged his two metre EME array from 544 to 816 elements (from 32 x 17 elements to 48 x 17 elements) with an improvement of 1.75 dB in overall gain and Dave reports more random QSOs with low power stations since its completion. A good long Yagi with about 150 watts output should be sufficient to QSO with W5UN who operates CW on 144.008 MHz and may be found easier during the last one to one and a half hours approaching moonset.

WESTERN AUSTRALIA

The July issue of *The West Australian VHF Group Bulletin* reports the Perth six metre, two metre, 70 centimetre, 1296 MHz and 10 GHz beacons are off the air at that time, for an overhaul and relocation to the Channel 7 television transmitter site.

The report also states "during the revamp a new six metre beacon will be established on 50.066 MHz with the call sign of VK6RPR. This will enable study of the puzzling differences in propagation between closely spaced frequencies in the six metre band. Two cavity resonators have been received from Will VK6UU, for the new and existing six metre beacons, which will use a common antenna.

"Peter VK6KXW, has graciously offered to supply and install the mains wiring to the new rack-mounting panel which will house all of the beacons."

NORTH AMERICA

From Bill Tynan's *World above 50 MHz* in *QST* for August comes news of some very exciting times on six and two metres in that part of the globe.

Bill started off by saying it appeared the big news was going to be the lack of Es for their summer, but from about June 1, the position changed dramatically.

On 31/5 KL7IKV reported he and AL7C, both in Alaska, worked some half-dozen JAs between 0530 and 0610.

Beginning on June 5, both six and two metres erupted into history making Es openings. For the second year in a row two metres put on a display of double-hop Es with an outstanding contact between WA4CQG and W7YOZ, at 0250 for a calculated distance of 3496 kilometres (2173 miles), which appears to be a new two metre North American terrestrial record.

On 6/6 such good conditions prevailed from 0545 to 0730 that two log pages of JAs were worked in call areas 1, 2, 3, 4 and 7 to K6 and K7 US areas.

W3XO said the eastern States had their turn on 6/6. The first overseas station Bill heard was G3POI who was worked at 1704 with signals about 5x2.

Then followed G4ASR, PA0OOS, two more Gs then PA3DOL and PA3AMF. Seven more Gs were worked until the band faded at 1746. At 2013 the signal of DXpedition station FP/KA3B on St Pierre Island burst through, then about 2100 the OX3VHF beacon on Greenland came through followed by working OX3LX. At 2115, GW3MI was heard followed by a steady stream of Gs, GWs, GJs and two GIs plus LA3EQ, with signals up to S7 at times. This gave Bill W3XO three new countries. Within the time span of the two openings Bill managed to work 39 different G station, three GWs, three PAs, OX3LX and FP/KA3B. Further north in Baltimore, W3WFM did even better, working nearly 100 Gs, 3 GIs, 6 GJs, 10 GMs, 15 GWs and 5 PAs, plus EI, LA, F, OX and FP! The opening was so good that WB2IFC/4 on Chincoteague Island, Virginia, worked 189 European stations using 12 watts to a five element beam.

From the other side of the Atlantic, GJ6OZB from the Isle of Jersey reported working 58 North American stations in 10 States and three Canadian provinces and KP4CIE.

Over the next few days the band remained open but seemed tame by comparison, although the VP5D beacon was heard and contacts were made with HH7PV, C6ANY, CT1DTQ, CT4KQ and 9H1BT. As Bill's notes were terminated on June 10, (equivalent to our December) it will be interesting to read next month what transpired for the remainder of their summer Es period.

What appears to be quite a revelation from all this, is the large number of stations now operational from the European area on 50 MHz. It goes to prove that it is possible for amateurs to operate in conjunction with television stations without too much trouble. New York to London is about 5261 kilometres (3270 miles) or roughly about the same distance from Perth to Christchurch, New Zealand, with the former being over more water. Such contacts would be triple-hop transmissions although the passage between Perth and Christchurch would probably be more difficult because of the mass of stations operating on the eastern sea-board of Australia compared with the few stations between the US and Europe.

NEWS FROM JAPAN

My very regular contributor, Graham VK6RO, sends the following information from *CQ ham radio* in Japan, for July 1988. From the information forwarded, it is possible to determine the degree of six metre activity throughout the Pacific area together with stations operating in the Asian region. I find the information most valuable and I hope readers find likewise. The dates of contacts may be somewhat dated due to publishing time-lags, but the availability of call signs and call areas is most useful. I suggest you extract the call signs listed and familiarise yourself with the area or island involved if you are not well informed on the matter of prefixes!

Most contacts with stations outside Australia have been around 50.110 MHz and Australian contacts mostly centre around 52.050 MHz. Obviously, the Japanese stations are monitoring both sections of the six metre band.

During the period from 22/4 to 22/5 contacts were made with the following stations:

VK4s, VK6s, VK8s, VK9NS, FK8EM, H44GR, P29ZEF, P29PL, KG6DX, 3D2MP, H44DL, HL9CB, P29HS, YC0UVO, XX9TA, VS6XRC, VS6XRC, BY4AA, HL2AOS, H44GP, HL1ES, HL0BIC, KX6DS, FO0AQ, HL5BNU, HL5PQ, 5W1GP, 9N88ITU, BY1PK, HL2GS, HL8N/2, HL1IEJ, HL1INQ, HL1ST, HL9TM, A35AS, plus a number of stations on JD1.

In most cases, the stations listed were worked on a number of occasions, with many contacts to the VK stations. The majority of contacts were made in the afternoons and early evenings though some contacts were quite late in the evening. As reported earlier in these notes, late in May the JAs were contacting as far south as New Zealand.

GENERAL INFORMATION

A note from Ken VK3AH, mentions advice contained in the *DX News Sheet* for August 3, 1988 (published weekly by the RSGB), that Fred VP8PTG, will be operational from the Falkland Islands from the end of August running 250 watts of SSB on six metres. Considering that US stations fairly regularly work into Argentina, there seems no reason why they should not eventually work VP8PTG. It will also be strange if JA4MBM or JA1VOK do not work Fred in due course.

Ken VK3AH has also asked me to forward my notes at least a day earlier than previously because they have not been arriving on time in Melbourne. It seems Australia Post needs more than five days to ensure the arrival of a letter in Melbourne, which is an incredibly long 730 kilometres from Adelaide!

Therefore, would correspondents please note, if you can remember that most months I will need to post my letter to Melbourne no later than the 12th, as many of my deadlines are around the 18th of the month, you will be helping everyone. Thanks.

For the remainder of this year my deadlines are: 19/9, 17/10 and 8/11, with the latter being so early to allow for preparation of the January 1989 issue prior to the Christmas break.

It has been a long time since I have received any news from the North Queensland area. Perhaps operators have been too busy working JAs on six metres with the return of suitable TEP conditions. Surely there must be some activity on two metres and 70 centimetres.

I would be equally pleased to hear from readers in Perth, an area which suffers much from VHF/UHF isolation. Reports can be read of FM activity, fox hunts, etc, but little is available on other activities.

Whilst on the question of seeking further information, it would be nice to see the Six Metre Standings Box truly reflecting the state of countries worked from a greater number of people. There are many first rate operators with plenty of countries worked whose call signs do not appear in the six-monthly list. This seems a great pity — it is not an ego thing — it is simply a recognition of past efforts. The requirements are straightforward and are repeated each six months when the list appears. The last one was printed in August 1988 and the next one will be February 1989. Details need to be on my desk by December 15, 1988.

CLOSURE

Without becoming repetitive by listing the monthly contacts between Adelaide and Melbourne stations (and those in between) there is little else to report at the moment.

Newcomers are advised to watch six metres closely during October when long distance contacts across the Pacific are a distinct possibility. Although they can occur at any time, there is an increased likelihood up to 0000 UTC. The New Zealand gang is always poised looking for contacts on any band. Also, from November onwards, it is usual to expect an increase in Es contacts. If the year is normal this will extend into January.

Calling frequencies are 52.050, 144.100, 432.100 and 1296.000 MHz. If a distant station insists on staying on a calling frequency to work a horde of stations, then it is courteous to limit yourself to a brief contact and leave the frequency for the next station in line. It is also advisable to use standard phonetics, fancy ones may be misunderstood.

Closing with two thoughts for the month: *It is said a successful person is one who makes hay from the grass growing under other people's feet,* and *Efficiency is getting other people to do the tasks you dislike.*

73. The Voice by the Lake.

ar

Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7277

CONTEST CALENDAR

OCTOBER 1988

1 — 2 VK-ZL-Oceania DX Contest (Rules August issue) SSB Section
8 — 9 VK-ZL-Oceania DX Contest CW Section
8 — 9 IRSA Radiosporting Contest
— 9 RSGB 21/28 MHz Phone Contest (Rules August issue)
— 16 RSGB 21 MHz CW Contest (Rules August issue)
29 — 30 CQ WW DX SSB Contest

NOVEMBER 1988

11 — 13 Japan International DX Contest (Rules August issue)
12 — 13 European RTTY Contest
12 — 13 OK DX Contest Phone and CW (Rules September issue)
— 12 ALARA YL/YL Contest (Unconfirmed date)
— 13 BATC SSTV/FSTV All Bands Contest
26 — 27 CQ WW DX CW Contest

JOHN MOYLE MEMORIAL FIELD DAY CONTEST — 1988 RESULTS

24-HOUR DIVISION **6-HOUR DIVISION**

SECTION (a) PORTABLE FIELD STATION. PHONE, SINGLE OPERATOR

CALL	QSOs	SCORE	CALL	QSOs	SCORE
VK3AJU	353	8899	VK3YH	208	5086
VK3BJN	186	2685	VK5QX	293	3728
VK4AG	30	1695	VK3AFW	67	1855
VK4AHO	19	1595	VK4VR	11	1345
			VK2EMU	51	837
			VK2ARZ	40	493
			VK3VF	19	270
			AX3LC	13	183

SECTION (b) PORTABLE FIELD STATION. CW, SINGLE OPERATOR

VK3CQ	175	5294	No entry

The portable shack of VK3CQ.

SECTION (c) PORTABLE FIELD STATION. OPEN, SINGLE OPERATOR

VK5AZF	152	2317	No entry

SECTION (d) PORTABLE FIELD STATION. PHONE, MULTI-OPERATOR

VK4IZ	824	12448	AX4WIN	377	5986
VK3BCG	300	11172	VK3BSH	379	5057
VK4WIE	479	9889	VK3EMJ	90	1895
VK3BML	200	6388	VK4WIM	83	1283
VI88ACT	234	4397	VK5SMO	27	525
VK4WIT	436	4281			
VK2CAM	188	2635			

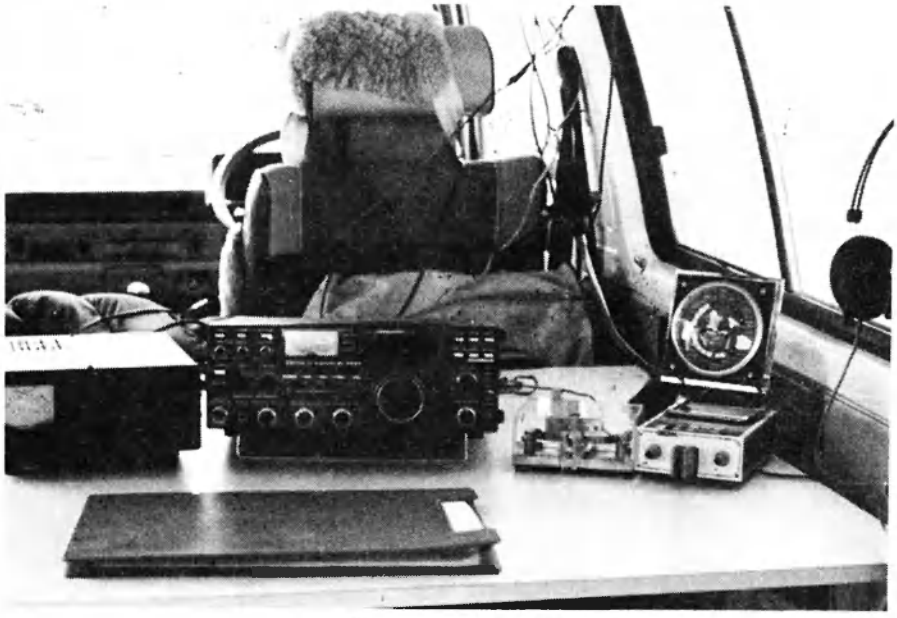
SECTION (e) PORTABLE FIELD STATION. CW, MULTI-OPERATOR

No entries

The 144 MHz Yagi used by VK3AJU was supported by the car roof rack and rotated by armstrong-rotation.

SECTION (f) PORTABLE FIELD STATION. OPEN, MULTI-OPERATOR

VK3CNE*	601	29165	AX4YX	148	2945
VI88WA	1005	19275	VK2FLS	46	839
VK2HZ*	591	15806			
VK2WG	462	13113			
VK3APC	420	9720			
VK5LZ	262	5338			
VK4WIR	194	4914			
VK5APA	247	4617			
VK5ARC	233	3549			



The operating desk.

VK3CQ operated a Field Day Station from Mount Hotham.

A number of stations did not fully understand the scoring with respect to the New Zealand Field Day Contest stations, perhaps it was not made clear enough in the rules that I published in February. However, the logs have all been rescored to allow for this misunderstanding and now reflect the fact that these ZL stations who gave the branch number after the signal report are counted as being portable field day stations and attracted the same score as the VK portable stations.

Some comments that I received with the entries: There's nothing like a first adventure with solar panels to turn an easy-going, well-balanced amateur into an obsessive weather watcher and neurotic listener to weather forecasts. . .particularly if he lives in Melbourne's fickle climate. All up it was an educational experience for somebody who had never seen a solar panel at close quarters until the contest loomed. . .and a very rewarding one since I am claiming bonus points for all QSOs. —VK3AJU.

VK4HM	70	1101
VK4WIG	64	828

SECTION (g) PORTABLE FIELD STATION. VHF

VK5BW	95	15528	VK4WIZ/2	132	19921
VK3YSY	165	12021	VK3YEJ	24	2725
VK4ANN	23	1776	VK4RX	8	1230
VK4ZXZ	17	1616	VK4BSP	16	965
			VK5DI	5	380
			VK2XGX	23	322
			VK5BDM	8	124

SECTION (h) HOME STATION, EMERGENCY POWERED

VK2MB	296	3182	VK7NXA	129	1454
VK2KL	215	2503	VK3CBT	68	842
VK4AOE	57	647	VK3BDU	19	212
			VK2JM	1	20

SECTION (i) HOME STATION, MAINS POWERED

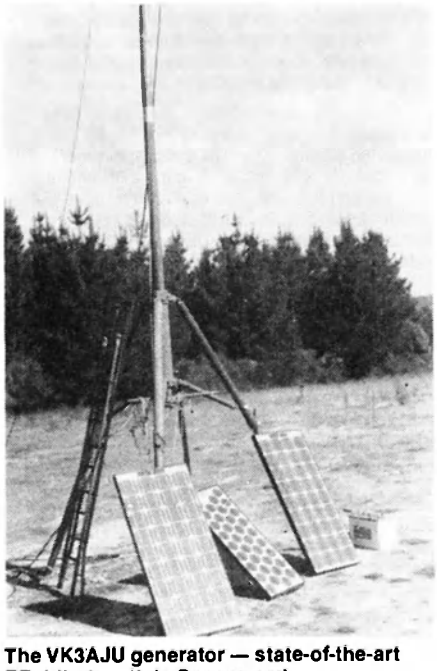
AX3XB	54	1620	VK2AGC	95	608
VK2OE/1	81	534	VK3BDJ	56	563

VK2KW	68	487	VK3DHV/2	61	286
VK5LP**	9	455	VK6DA	15	123
VK7KZ	44	368	AX3LC	9	60
VK4PT	44	321			
AX3KS	15	220			
VK1LF	28	217			

Outside the VK3AJU shack on Mount Hotham. Inside the shack was as hot as an oven!

Once again the North East Radio Group enjoyed the John Moyle Field Day. The natural power was once again provided by the usual solar panels/wind generator combination. Some of the batteries were charged by the solar panels before the field day, and there was more wind this year, so the wind generator was able to contribute a significant amount of power. . .As the aim of the John Moyle Field Day is to gain experience in setting up an emergency station in the field, the field day must remain an "open" contest; ie be an all band field day, as a true emergency would require a station to be able to operate both HF and VHF/UHF frequencies. —VK3BMV.

Once again a great contest, the weather was great, a fine sunny day only a chilly night to worry about. Now I know why they call Mount Baw Baw village, as "alpine village". Once again the multipliers helped greatly in building up the score this year. Possible a scoring system based on the Locator Squares might be possible. —VK3YSY.



The VK3AJU generator — state-of-the-art BP "Photovoltaic Generators).

SECTION (j) SWL

No entries.

I thank the Adelaide Hill ARS for sending me an excellent check log under the call sign of VI88SA. This station operated in the (f) section. VK3ZI sent in a useful VHF check log. Thank you both. —FCM.

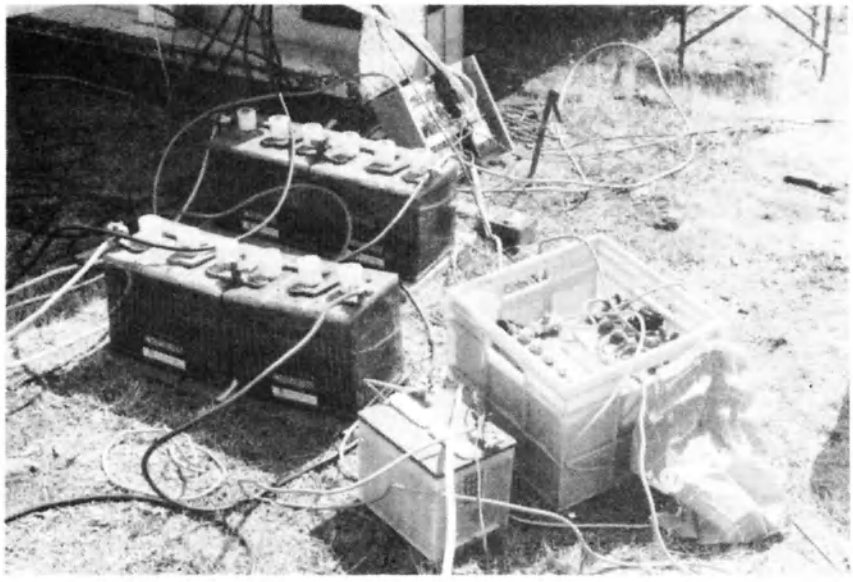
* Denotes Natural Powered Station.

** Denotes VHF

Once again Gil VK3CQ has won the President's Cup with his CW score of 5294 points. Congratulations, Gil.

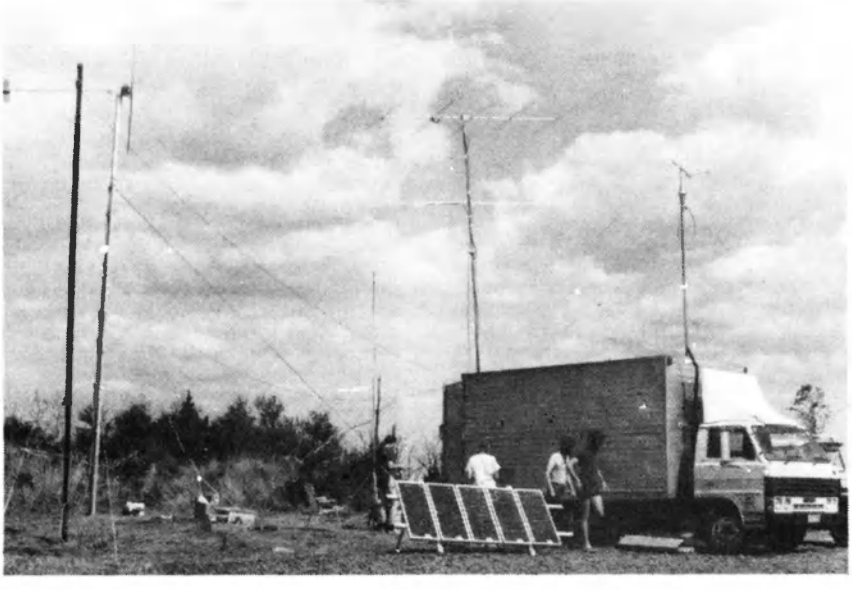
The number of logs on a State by State basis is as follows:

VK1 — 2; VK2 — 14; VK3 — 21; VK4 — 18; VK5 — 10; VK6 — 2; VK7 — 2; VK8 — 0; VK9 — 0.



The North East Radio Group battery-bank.

The operators of VK3CNE.



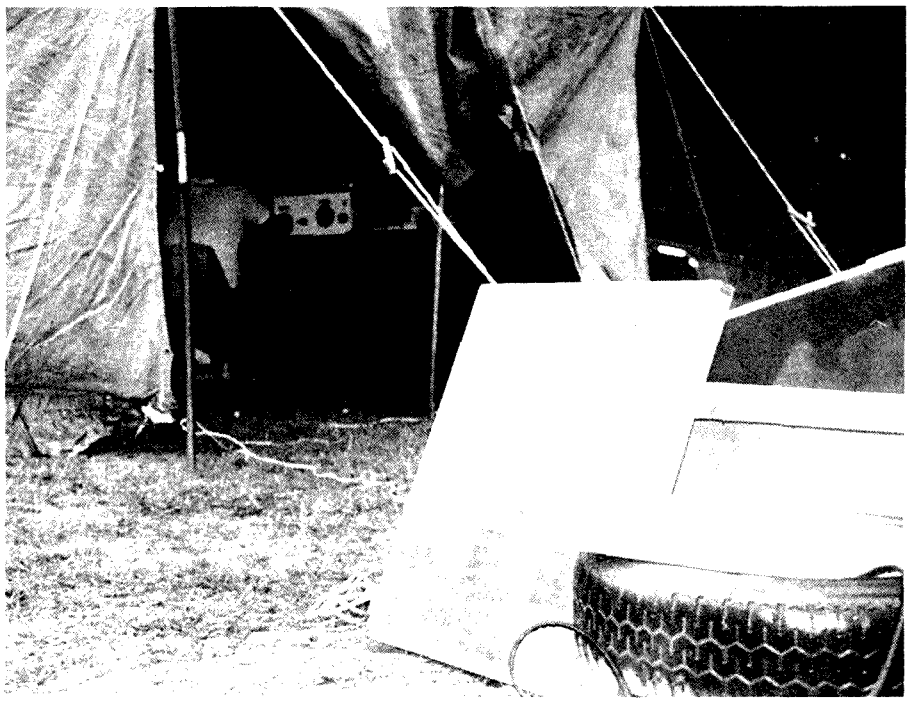
The VK3CNE site showing the wind generator, solar panels and the shack — a furniture van.

VK5DI operated portable near Narridy in South Australia, (PF96E00).

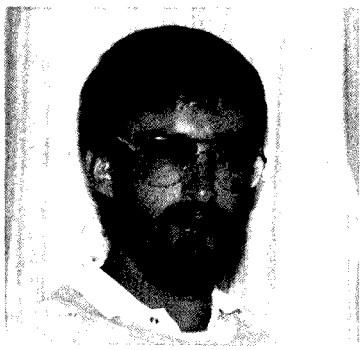
This was the first time that I have fielded a VHF only station in the John Moyle Memorial Field Day Contest, and it has been found to be a very trying experience. Firstly, the amount of work involved in erecting both vertical and horizontal antennas for each band was enormous compared with erecting a few halfwave dipoles. As you will notice in the log sheets, there were many hours of no activity. This was not for the lack of trying, there just were not the stations on the air. It seems that most VHF operators pack up their gear after the Ross Hull Contest. I have contended for nearly 20 years that there should be a national VHF/UHF field day, like in New Zealand, England, and the USA, and probably many other countries. Whilst VK5 had a field day in the early 1970s usually coinciding with the ZL VHF field day, it fell by the wayside due to lack of support in VK5. However, a national contest should stimulate plenty of activity. —VK5BW.

At my location, which is high and clear, (and I have used it many times before, there were virtually no signals. This was a disappointment to me, especially this year, as it is my 27th and last NFD. I'm just too old to go to all the trouble, but thankfully with Section (h) I'll operate from home for my remaining years. I'll even put up my portable aerial, hi! —VK2JM.

Our club has made the John Moyle our main field activity for quite some years and it has always been greatly enjoyed by the members. It provides an opportunity for the non-active members and members' families to meet and socialise apart from the more serious business of contesting. We have also regarded the field day as an opportunity for newer members to gain operating experience under the guidance of older operators. Heavy showers interrupted our preparations this year but enthusiasm was in no way dampened. —VK4BIF



One of the solar panels used by VK2HZ.



Ian VK2KL, second-time Trophy Winner in the phone Section.

Marshall VK5FN, CW Trophy Winner in a rare pose — with microphone! (on two-metres).

I enjoyed it again, as usual, and really appreciate the 6-hour division, as otherwise I couldn't go into the contest. I think I enjoy setting up the station as much as i do operating. Erecting the dipoles, installing the gear, running power leads, etc, and finally testing to discover with pleasant surprise yet again that it all works. I found that having the ZL boys on made for much more fun and got quite a kick out of seeing how many times I could make contacts at the rate of four per minute or better. Please try and ensure that the two field days coincide. I know the ZL boys also appreciate it. —VK5QX.

First time for our club to enter the contest (City of Brisbane RC). Good activity by the ZLs on 40 and 80. There seemed to be a lack of portable stations on 160 (you can say that again — FCM). Only problem was with cattle on the property, one was caught on the extension lead from the generators, in the split of a hoof, but no barbeque. I wonder if stations that use rotators and/or computers in these portable locations are being a bit too serious. Hope to hear everyone again next year. —VK4NEF for VK4WIE.

Yes, the TARC does like the field days. We go out, not with the idea of making high scores, but to have a club get-together. It almost becomes a social occasion with many of the families coming along and camping at the site. However, the site is close enough to Townsville for day trippers to come out and join the melee, and to observe how it is all done. Most of these become full time in the next year. —VK4XZ for VK4WIT.

As with the last few years, activity from field day stations fell away dramatically after lunch. This is a pity as it suggests that there are few operators who are prepared to go out on Sunday for the 6-hour section. Traditionally Saturday has been for the very keen, the rest of us having to cut lawns, etc and hence Sunday has been preferred by the 6-hour ops. I can understand that those who start on Saturday have used up their 24-hours long before Sunday afternoon. Still we need more activity. What about all the owners of FT7s, FT101s, TS120s and so on? All they need is a 40 metre dipole, two lengths of cord and a large lead sinker and they can be operating within minutes of arriving at a shady spot. Or have we lost the ancient knowledge of how to throw a wire antenna up into a tree? Anyone with a mobile station, HF, VHF or UHF need only to drive to the nearest park and have a great Sunday afternoon. Or they could pack a picnic lunch and head further afield. What about it? Let's have more activity right through the contest next year. In closing I would like to thank all those who took the trouble to give me a contact. —VK3AFW.

Had a great weekend and looking forward to others. Log submitted to indicate our interest in the event (not to win). —VK3WN for Ballarat Amateur Radio Group.

NATIONAL SPRINT 1988 RESULTS

On-air reports and comments included with logs (see comments below), all indicate the continuing popularity of the Sprints. The Third Annual CW Sprint was held on July 2, 1988 and the Phone Sprint, on July 9, 1988.

On behalf of the Adelaide Hills Amateur Radio Society and the VK5 Division of the WIA, congratulations are extended to the overall winners and the winners in the call area sections.

Overall Trophy Winner of the 1988 Phone Section is again Ian Buchanan VK2KL, who won the trophy last year. Congratulations Ian and thank you for your effort and kind remarks with the log. Will it be a "hat trick" in 1989?

Overall Trophy Winner of the CW Section is Marshall Emm VK5FN, in a tight competition, as he won by one point. Marshall's expertise with key is widely known through his many years writing "Pounding Brass" for AR.

The Sprints were originally a concept by Marshall while President of the AHARS. Now without the pressures of office and writing each month, he has won the event. All who have enjoyed his courtesy and encouragement on the key will join in congratulating his win.

This year I operated the Society's Bicentennial Call, VI88SA, on phone promoting the Sprint and the opportunity to thank participants for their support in the event. Special QSL cards have been forwarded for these contacts.

The Society will plan the 1989 Sprints to maximise the efforts of both VK and ZL stations. I understand there are already plans to run separate CW and Phone Sprints in VK4 and VK7 and we wish them success. Perhaps the development of the Sprints flatters an idea initiated by the AHARS.

Congratulations to all certificate winners (indicated by an asterisk) and thanks to all participating stations. In recognition of his meritorious performance and an incentive to Novices in future Sprints, a special certificate is awarded to VK3MBO, who received his licence in April — this was his first contest! Congratulations Steven — your score may inspire more Novices to 'have a go' next year.

CW SECTION

VK2APK*	23	VK5FN*	24
VK2RJ	19	VK5ADX	23
VK2AIC	17	VK5AGX	19
		VK5ADD	16
VK3CQ*	20	VK6AFW*	16
VK3JA*	20	VK6RF	9
VK4YB*	20	VK8AV*	22
VK4TT*	20		
VK4OD	19		
VK4SF	19		
VK4NCM	14	ZL3KR*	23

PHONE SECTION

VK2KL*	56	VK5EN*	46
VK2RJ	46	VK5NJF	43
VK2LEE	44	VK5ADD	41
VK2CKW	34	VK5FN	41
VK2AIC	30	VK5KGP	23
VK2CJH	24	VK5RV	19
VK3YH*	54	VK6APK*	31
VK3CRA	50	VK6RF	15
VK3MBO*	46	VK6DA	10
VK3JA	36		
VK3XF	24	VK7NRR*	30
VK4YB*	53	VK8AV*	46
VK4OD	46		

VK4CYL	45	ZL3KR*	48
VK4CAG	20		
VK4IS	16		
Check Log			
VI88SA	54		

SWL SECTION

ZL149*	45
Barry Thomson	
Phone Log	

OPERATORS' COMMENTS

VK2KL	It appears other Clubs are to run similar Sprints. You have really started something — a big plus for the Contest scene in Australia. Many thanks once again for an enjoyable Contest.
VK2LEE	Most enjoyable. Already looking forward to the 1989 Sprint.
VK3YH	Enjoyed my first Sprint very much. Congratulations.
ZL3KR	Very enjoyable. Looking forward to the next Sprint.
VK3CQ	One hour was enough — there were not enough CW entrants.
VK4OD	Pleased to hear a Novice in there doing well.
VK4SF	Thanks for these CW Sprints. It brings out some of the old CW operators to flex their wrists. Hope the numbers build up in future Sprints.
VK4NCM	Enjoyed the challenge to compete with the full power operators.
VK5ADX	The idea of this Contest is great. Pity there are not more CW operators taking part.
VK5AGX	Enjoyed my first Sprint.
VK2CKW	First time in a Sprint — be back again next time — really enjoyed it.
VK3CRA	Best of the three Sprints so far. There were sufficient phone stations to make it a great hour.

—Contributed by John Hampel AX5SJ, National Sprints Contest Manager

ar

OLD TIMER RETURNS FROM A WORLD OF SILENCE

"A chill went down my spine, I could feel the dits and dahs of Morse coming through my finger."

AFTER ABOUT 10 years of deteriorating hearing, Denis Richardson of Kenilworth, Cape Town, went totally deaf.

The old timer, first licensed in 1923, was left in a world of silence and unable to enjoy his lifetime hobby of amateur radio.

"I couldn't — and still can't hear my own voice. This of course put paid to my hobby, " Denis said.

"Although I was able to carry on building electronic equipment, there was a big gap in my life being unable to hear from, or speak to, the many friends made during my 50-odd years on air.

"It was so frustrating," the 79-year old retired Mobil Oil assistant paymaster remembers.

For a decade Denis lamented about being off air. Then a fellow radio amateur suggested he try to copy Morse code by vibration.

"So I removed the cap from one of my earphones — and gently pushed my forefinger onto the diaphragm.

"A chill went down my spine, I could feel the dits and dahs of Morse coming through my finger," he said.

The thrill of being able to copy Morse through vibration was a very emotional event, and saw an old timer return to the world's best hobby.

Denis said: "I knew in that instant a whole new world had opened for me again. In no time at all I was able to read up to 20 words per minute through the earphone."

Using a small valve transmitter and his trusty 40 year old receiver, Denis Richardson, now ZS1B, is on air again.

—Adapted from a Mobil staff magazine by Jim Linton VK3PC. Acknowledgment to Mobil Oil Australia Ltd for its assistance and Snow Campbell VK3MR, for supplying the magazine clipping

ar

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New PK-232 Breakthrough

A new software enhancement makes the AEA PK-232 the only amateur data controller to offer six transmit/receive modes in a single unit.
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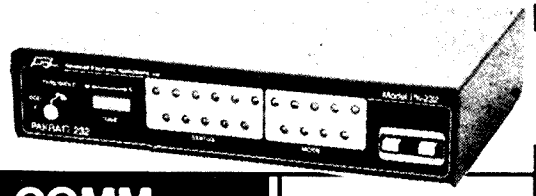

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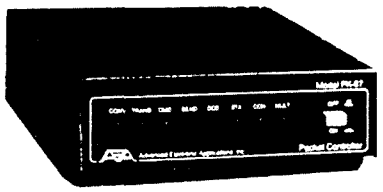

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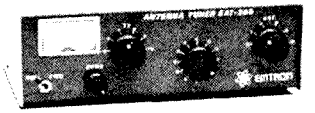

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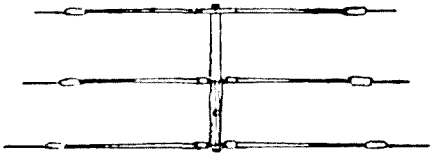
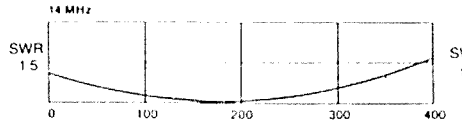
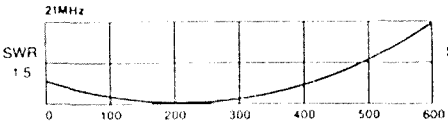
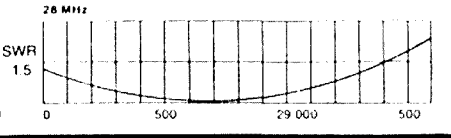
Our new antenna factory "TET-EMTRON" a division of EMONA ELECTRONICS is now producing a range of antennas aiming specially at the export markets of Japan, U.S.A. and Europe.



SPECIFICATIONS:	HB33DX	HB43DX
Frequency	14/21/28 MHz	14/21/28
No of Elements	3/3/3	4/4/4
Gain (dBd)	8.5/8.7/8.3	9.4/9.5/9.8
F/B Ratio (dB)	22/24/21.5	24/24.7/22
VSWR	1.5 or better	1.5 or better
Power Rating	2 kW	2 kW
Impedance (ohm)	50	50
Element Length (metre)	8.25m	8.25m
Boom Length (metre)	4.0m	6.0m
Turning Radius (metre)	4.54m	5.1m
Wind Surface Area (m^2)	0.58m^2	0.74m^2
Wind Load (EIA STD 80 MPH)	56.7 kg	72.7 kg
Weight (kg)	15 kg	19.2 kg
Price	$480	$580







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How's DX?

50 MHz DXPEDITIONS IN REGION III

SINGAPORE

As far as anyone presently active in Society affairs or on the air could remember, it was a first. Certainly it seemed certain it was the first time since the 9V1 prefix had been introduced that it had happened. Maybe in the 9M4 days, but that was very unlikely. However, no one was really sure if it could have happened in the days of the VS1 prefix.

What was this possibly historical event?

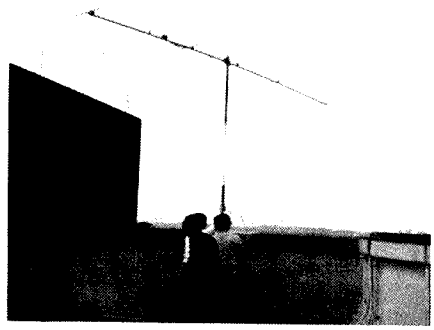
It was 50 MHz operation from the island Republic of Singapore of course!

After some 18 months of discussion, correspondence and negotiation between Yoshi Hayashi JA1UT in Tokyo, Selva 9V1UV, President of SARTS in Singapore and the Telecommunication Authority of Singapore, (Telecoms), official permission was finally given for some limited six metre propagation tests to be carried out from Singapore using the specially allocated call sign, 9V1ES. Both the time/dates of the tests and the frequencies to be used were closely specified. Transmissions could only be made on 50.075 and 50.125 MHz between the hours of 0800 to 1700 hours local time, on days between June 3 and 12, 1988. The time was subsequently increased to past 1700 if conditions were good and signals could be heard. Also, the dates were extended to June 16.

En route to Singapore Hayashi-san JA1UT (centre) took time out in Bangkok to renew his friendship with Mayuree HS1YL (right) and her family.

From left: Yathe 9V1JY, Yoshi JA1UT and Sato 9V1UU.

The view to the north from the operating position.



The six-element Yagi in position on the roof of the hotel — about 40 metres above ground.

The equipment which was brought from Japan by JA1UT and his team consisted of:

— Yaesu model FT-625D modified to crystal control transmission on the permitted frequencies.
— 10 watts CW/SSB.
— six-element Yagi CL6 DX at 40 metres.

The venue was a hotel in the Tanglin area of Singapore.

The beam was mounted on the roof of the hotel with the kind permission and co-operation of the hotel management.

Yoshi JA1UT and his team which included his wife Setsuko JA1UPA, Hideo JA4HCK, and Aki JM1BDB, amongst others, considered the tests moderately successful as 157 stations were worked. All JA districts were worked with the exception of JA5, but unfortunately no countries other than Japan were heard. Contacts were mostly on CW with some on SSB.

CHRISTMAS ISLAND

As an extension to his six metre propagation tests, Yoshi and Setsuko put six metres on air from VK4KCW/VK9X, from June 17 to 23, 1988. This station ran more power than 9V1ES but conditions were not so kind and only 105 stations, all JA, were worked.

Yoshi also activated VK4CEI/VK9X on the HF bands from Christmas Island and this station worked over 6000 stations on all HF bands. This included 19 stations on 1.9 MHz, 122 on 3.5/3.8 MHz and 123 on 29 MHz FM.

CONCLUSION

Bearing in mind the opening up of six metres in various European countries within the past 12 months, (F G, LA, PA0, 9H, amongst others) amateurs within Region III should take stock of the status of the six metre band within the various countries in the Region and work towards the opening up of a segment in this most interesting part of the frequency spectrum. Such work should and must be done by individual interested ama-

teurs encouraging their national societies to approach their administrations to open the band. The IARU and IARU Region III Association must then in turn co-ordinate and liaise with the member societies to hammer out a consistent plan for the Region.

Cycle 22 has started with a bang. With new countries now being available on six metres, it could prove to be an interesting time ahead for the dedicated six metre operators located in Region III.

—Contributed by David Rankin VK3QV/9V1RH

SOME INTERESTING DX WORKED ON 40 METRES RECENTLY AT LEITCHVILLE, VICTORIA (ALL ON SSB)

HH7PV — Pat. Has beam, very strong signal. QSL direct
6Y5IC — Wenty, Jamaica. QSL direct.
8P6JB — Ron. Barbados. QSL direct or via bureau.
W0RLX/KH5 — Palmyra Island. QSL via W2GHK.
KG6SL — Bert, Saipan Island.
HK0EFU — Moses, San Andres Island.
CU3AA — John, Azores. QSL direct or via bureau.
KB5CGA/HR2 — Dean. QSL to APDO 421, San Pedro Sula, Honduras.
PT7WX — Frank, Brazil.
FM4EB — Dominique, Martinique. QSL via F6FNU.
ZK1XB — Criss, holidaying on South Cook. QSL to HB9DKQ.
ZF2ME/8 — Jo An, Cayman Island. QSL via WB3CQN.
FY5AN — Cris. QSL to BP746, Cayenne, French Guiana.
AX0NE — Graeme, Macquarie Island. QSL via VK9NS.
HC1NCMN — Carlos. (Call is a special licence grade).
D44BC — Julio, Republic of Cape Verde. QSL via Call Book address.
F6ARC — Olivier, very good signal.
5T5NU — Marc, Mauritania. QSL via F6FNU.
CT3DL — Luis, Madeira Island. QSL via Call Book address.
CT4EM — Rui, good signal from near Lisbon.
G0EVY — Dave from Birmingham.
ZK3RVC — Bing on Tokelau Island. QSL VK2BCH.
ZP5FGS — Frank. QSL to Box 1059, Asuncion, Paraguay.
T31JS — Jim. QSL VK9NS.
J6LB — Bernard. QSL to Box 1328, Castries, St Lucia, Windward Islands.
9Y4EB — Earl. QSL via 88 Call Book.
HI3JH — Julio, Dominican Republic. QSL via F6FNU.
VP2VM — Mac, British Virgin Islands. QSL via KW1K.
CE0ZAM — Juan. QSL to Juan Torres, Box 1, Juan Fernandez Island, Chile.
FP8CW — (Was worked but later advice suggests he may be "Slim".
HD8DZ — DXpedition to Galapagos Islands. QSL to HC2DZ.
KD0TE — Steve. Was worked and confirmed as the 50th state for WAS on 40 metres.
Also worked were 85 US and Canadian stations, and nine Cuban stations.
Plenty of DX also available on the net run by John KD0JL, 7.164 MHz from 0600 and 0730 UTC.

—Contributed by Steve Jenkinson VK3YH

WORKED FROM WOODBINE, NSW DURING JULY

EA3JE	SM7ACB
EA4BKE	K200CT* — QSL via K2VV.
EA4HD	IK6GPZ
G0EVY	NQ200O* — QSL via NQ2Q.
	KD6GH

EJ1000 — QSL via EI7CC.
W200RR* — QSL via W2RR (SASE).
5T5NU — QSL via F6FNU (Baldeck, BP 14, F-91291, Arpajon Cedex, France).
W8LRZ
IT9PKO
ZL6REC** — QSLs not required as all contacts will be acknowledged.
TI2YO
NX200S* — QSL via Box 2942, Diringo, 81302, USA.
* — Special stations commemorating the 200th Birthday of the signing of the Constitution.
** — Special station commemorating the first town in the Southern Hemisphere to have commercial electricity — Reefton, South Island.
EJ1000 — Special station commemorating 1000 years of christianity.

HEARD IN WOODBINE, NSW DURING JULY

LZ5A — QSL via LZ1KDP
ZB2GR — QSL direct.
EA6VQ
XE1EEF
FT5ZB — Amsterdam Island. QSL via F6EHM.
VS67TK/DU1 — QSL via VS Bureau.
EK0AL — QSL via UW0MF
Z21BA — Zimbabwe. QSL via N5FTR.

—Contributed by Bob Demkiw AX2ENU

ar

PACIFIC DXPEDITION

From September 9, 1988, I will be travelling via the USA to the Pacific area activating some islands.

I am 21 years old, first licensed in July 1984 (Technical), and eventually upgrading to the highest licence in Sweden about December 1986. I have had about 4000 contacts since I have been licenced and have worked 187 DXCC countries. On 40 metres CW, my favourite band, I have worked 162 countries with 105 confirmed.

Following is an inventory of approximate dates, call signs and locations which will be visited:
September 14-23 — Hawaii, SM7PKK/KH6
September 25 - October 10 — Western Samoa, 5W1
October 11-24 — American Samoa, SM7PKK/KH8
October 25 - November 7 — Niue, ZK2
November 8-24 — Tonga, A3
November 24 - December 13 — Fiji, 3D2KK
March 25 - April 4 — South Cook, ZK1

Frequencies: SSB — 3.795, 7.095, 14.195, 21.195, 28.595 MHz. CW — 3.505, 7.005, 14.005, 21.005, 28.005 MHz.

QSL to Mats Persson SM7PKK, Betesv 22, S-240 10 Dalby, Sweden.

—Contributed by Mats Persson SM7PKK

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CONTROVERSIAL 4J1FS

It has been worked by many from all Continents and is the hottest news on the DX front since Peter 1 Island and the Western Sahara came on the scene without a fanfare, typical of Martii Laine OH2BH's operations.

On November 17, in 1970, this area was given the 'go ahead' by the responsible DXCC Desk person at the ARRL Headquarters. Martii, still has his original, but the original's copy has probably been through the shredder by now.

It is now left to John Parrott W4FRU, Chairman of the ARRL DXCC Advisory Committee to give it the nod as okay or reject it. Not an envious task which will probably test the new criteria of the ARRL DXCC Award.

It is interesting to note that 4J1FS (Finland/Soviet) with three Finnish and three Russian operators was using a Russian designated prefix. A little strange, nevertheless the prefix of 4J and 4K is used outside territorial USSR, such as the Arctic or Antarctic areas and the Finnish OF-OJ call sign block is reserved only for use within the Republic of Finland.

To John W4FRU and his 16 strong contingency, your deliberations will be accepted I am sure by the true amateurs who are DX hunters, though there will be quite a few opinions expressed over many air-hours in the ensuing weeks.

—Contributed by Ken McLachlan VK3AH which was compiled from various sources

ar

QSP

GLASNOST FREES UP U-LAND

Considerable reforms have occurred within the Soviet Union under the government's Glasnost (openness) policy.

The policy has flowed through to the Amateur Radio Service for the benefit of the half a million Soviet radio amateurs.

The first ever national conference of radio amateurs has been held in Moscow where significant relaxations of operating conditions were announced.

Russians can now contact Israeli radio amateurs. These contacts had been banned since the six-day war between the Soviet allay, Egypt, and Israel, in 1967.

This move has been welcomed by Israeli radio amateurs, who have regained access to a host of Russian countries on the DXCC list.

All Soviet radio amateurs were now permitted to contact stations in the capitalist countries — a privilege previously only available to a relative few.

During DX contacts they are also now permitted to give their private address, and could print this information on QSL cards. This makes direct QSLing possible, as well as the long established QSL bureau route of Box 88, Moscow.

Put Glasnost to the test next time you work U-land on the DX bands.

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SCHOLARSHIPS

The Dayton Amateur Radio Association (DARA) has just awarded its annual four scholarships for licensed amateurs to the value of US$1000 each, for High School graduates. Each scholarship entitles the student, who may hold any class of an amateur licence, to continue another years study of their choice.

DARA has run this successful scheme for quite a period. Is it food for thought to some VK Club Committees?

Fred Hammond VE3HC, was named 1988 Special Achievement Award Winner at the recent 28th Annual Dayton Convention. Fred was recognised for his participation in assisting amateurs in mainland China to again use the air-waves, DX stations in the Caribbean, outstanding efforts to preserve the early days of radio, particularly those which are pertinent to our hobby, at his museum in Guelph, Ontario. Congratulations are extended from all VKs Fred, on your achievements and assistance to the hobby we are privileged to enjoy.

THE BANDS ARE NOT QUIET!

The Canadian Radio Relay League (CRRL) Outgoing QSL Bureau Manager, first quarterly report for 1988, noted that 283 amateurs and affiliated organisations forwarded in excess of 45,000 cards to Bureaus in Canada, and other countries around the world. The CRRL provides this service free to members.

—Condensed from *CRRL News* by Ken McLachlan VK3AH

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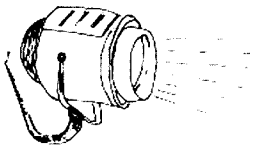
DEADLINE FOR DECEMBER IS OCTOBER 15, 1988



Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

I recently obtained my copy of the Seventh Edition of *Ferrell's Confidential Frequency List* through the Australian Radio DX Club. For many years Perry Ferrell compiled this extensive frequency list of Utility HF Stations, based cn monitoring. Sadly, he was killed in an auto accident shortly before the Sixth Edition of the List was due to be published. Several American utility enthusiasts stepped into the breach to ensure that it would be finished. Now the Seventh Edition has been published by Gilfer Shortwave, Park Ridge, NJ, USA and is priced at US$19.95.

The Seventh Edition of the CFL has been updated as far as it can be in the fast changing utility activity. Yet I still have to refer to the previous edition to check such information as power output which is not included in the latest edition. It has been compiled by Geoff Halligey, a British utility enthusiast with the co-operation of several enthusiasts throughout the world.

The CFL was able to identify one of those numbers of stations that I have often come across, especially on the 30 metre amateur band. Around 10.130 MHz, AM, I have heard a female voice repeatedly saying; "Charlie India Oscar 2". The location is reportedly within Israel and is the Israeli Secret Service — "Mossad". The same signal has also been heard around 13 MHz from time to time. The majority of these stations using Phonetic Alphabet Call Signs are believed to be the Mossad. The other number stations that are easily heard on a variety of frequencies do not use any identification but get straight into sending groups of five numbers. The language is usually Spanish and CFL claims that these are located within Cuba. Personally, I believe that some are sending coded messages to the Nicaraguan "Contras". Therefore, these could be within the USA or Central America.

Other number signals in German are in Eastern Europe, as are the Esperanto numbers. Some magazine editors in North America claim there is a correlation between the European and Cuban stations. About five years ago, I did hear number stations in Chinese within the amateur allocation on 14 MHz. It remains unclear whether the station/s were in Taiwan, the USSR or elsewhere, for these haven't been heard for some time.

Some may ask what about the CIA or KGB and can you hear them on HF?

I am certain that some activity does emanate from these intelligence organisations. As can be expected, their operations are highly sophisticated and technically superior to the smaller outfits. In one recent article about espionage, it was revealed that agents send bursts of data to satellites in low orbit. This overcomes propagational or man-made disturbances on HF and would be more secure.

There are plenty of stations, particularly on CW, sending out five figure or letter groups. Some of these would be engaged in intelligence activity, but many would be sending out the International Meteorological Code (Meteo) which are groups of five numbers. The latter do keep utilising the same channel and regular hours, while intelligence operations generally shift about both in frequency and time order. Incidentally, could somebody please send me a copy of the METEO format, as there are plenty of signals, both on RTTY and CW using this. Several intruders within our exclusive allocations employ it. I can be contacted QTHR.

Recently it was announced that the ABC was going to alter arrangements for Parliamentary Broadcasts by using their standby transmitters to carry Parliament. The exact frequencies haven't been announced yet. I also believe that the service will be only on when Parliament is in session. A similar arrangement does exist in New Zealand. Also, it has been proposed that the Radio for the Print Handicapped stations will come into band on frequencies vacated by existing AM stations in Metropolitan areas who wish to convert to FM.

The Olympics are in full swing now. Several international stations propose to broadcast live from Seoul, South Korea, including Radio Australia, and the BBC. The latter has set aside channels exclusively for "Sportsworld" coverage of the Olympics. The other major sporting event that happens in October is the Australian Cricket Tour of Pakistan. Commentary of the Test Matches and Internationals could be provided on 17.660 MHz.

The first Tuesday in November is traditionally Melbourne Cup Day, but every four years a very different race is held in the US. It is, of course, the Presidential Election and there will be extensive coverage via the Voice of America of the election results on November 2, from 0100 UTC. You might have noticed that another American shortwave institution ceased to operate in September. The Armed Forces Radio and Television Service (AFRTS) in Los Angeles ceased to use VOA from Croughton, on SSB.

Try 13.651.5 MHz or 9.242 MHz, but tune around as they do vary from day to day. These feeders are for maritime stations as well as being a back-up in case the satellite feed drops out.

Well, that is all for October. Until next time, the very best of good listening and 73.
Robin VK7RH.

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Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

Well, I finally did it! Missed the deadline for September AR — hence no column for that month. Sorry about that — I was probably preoccupied with the rig being in for repair and wondering how much it was all going to cost! I am writing this in early August, but the weather keeps trying to tell me it is Spring already. By the time you read this it will be well and truly Spring, and a wonderful time of the year.

Now, down to business. Statistics for June are as follows:
238 AM intruders
205 CW intruders
246 RTTY intruders
36 intruders using other modes, and
30 intruders identified themselves.

The figure for AM mode is misleading as most of these were Asian CB-type stations on the amateur 28 MHz band, and were reported in groups. The actual figure is much higher as individual observers were reporting these in groups of dozens and more from 28.000 Mhz up, It has reached the stage where there are too many to be listed individually. Observers kindly supplying reports for June were:
VK2s — EYI, MEF
VK3s — AMD, ATK, CMW, EMJ, PJB, XB
VK4s — ADY, AKX, BG, BHJ, BTW, BXC, IS, KHZ, WLX, YD
VK5s — GZ, TL, ZKS
VK6s — RO
VK8s — HA, JF, PT.

Thank you one and all.

The Deutscher Amateur Radio Club (DARC) of West Germany, has initiated a letter concerning illegal CB operations which are causing harmful interference to West German Amateur Operators. The letter has been sent to Communications Administrations in Rome, Buenos Aires, Paris, Madrid, Brazil and Beirut. Seems there are people all over the world who cannot do the right thing.

The Field Services Department of the ARRL has also sent the following information for the attention of the FCC — Non-amateur RTTY on 14.024 MHz; same on 14.179 MHz; a shortwave broadcast station on 21.404.5 MHz and many CB-type operations on 28 MHz. Let us hope the FCC can get some results.

Statistics just to hand for July 1988:
330 (blocks of) AM intruders . . . mostly Asian non-amateur on 28 MHz
155 CW intruders
269 RTTY intruders
72 intruders using other modes, and
33 intruders identified themselves.

Reports were supplied by:
VK3s — ATK
VK4s — ADY, AKX, BG, BHJ, BTW, BXC, IS, KHZ, OD, YD
VK5s — TL
VK6s — RO

The Australian fixed station "AXM" 32/34/35/37 has been heard in New Zealand in July, on 14.002 MHz, using RTTY at 50 Bauds and 850 Hz shift. A note has been sent to DOTC. We certainly cannot complain about intruders if our own backyard is not neat, can we? So there you are for now. See you next month unless I get all excited and miss the deadline again! 73 to all.

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Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

QSO PARTY TO HELP QUALIFY FOR LION CITY AWARD

DATE — October 15, 1988.
TIME — 0000 to 2400 UTC.

The Lion City Award is available to amateurs and SWLs who have confirmed contacts with five 9V amateur radio stations (10 for amateurs in CQ Zone 28). Applicants must submit a certified log extract (GCR) to the Awards Manager, SARTS, Maxwell Road, PO Box 2728, Singapore, 9047 with five IRCs.

QSO PARTY RULES — 9V stations will operate all bands, 80 to 10 metres (no WARC for award), CW and SSB (listen for SSTV, RTTY and packet as well). DX stations send RS/T and CQ Zone; Singapore stations send RS/T and serial number.

AWARD APPLICATIONS — For stations working five 9V stations during the QSO party, contacts need not be confirmed. Submit log extract with complete exchanges to Awards Manager, with reduced fee of three IRCs. QSO Party contacts may be combined with confirmed QSOs to qualify for the award; minimum of three QSO party contacts qualifies for the reduced fee. There is no penalty for invalid submissions, but all applications will be checked against 9V station logs. Band and mode endorsements are available.

—Contributed by K C Selvadurai 9V1UV, President, Singapore Amateur Radio Transmitting Society

PARRAMATTA HISTORICAL SITE AWARD

PURPOSE — This award is introduced as a Parramatta Bicentenary Award and is open to all who wish to participate. The award is to celebrate 200 years of European settlement, in the Parramatta area.

HISTORY — The first fleet arrived in Australia on January 26, 1788. They landed at Farm (Sydney) Cove, and set up the colony on that site. The need to start farming was most urgent. The Parramatta area was selected and the first settlers arrived on November 2, 1788. Parramatta is the only other area on the Australian mainland that celebrates its bicentenary in the same year as Australia. Parramatta has many historical sites and buildings and our station will operate from 11 of these historical sites.

DURATION — Station operation will be from 0000 UTC on October 31 to 0000 UTC on December 4, 1988. The days in between these times of operation will be started at 2100 and finish at 0900 UTC (this will give 12 hours operation each day during daylight hours local time). There will be 11 historical sites, and we will be at each site for three days. The last few days will be a catch-up time for those who missed a contact at one site.

OPERATION — The bands in use will be two, 15, 20, 40 and 80 metres on CW and phone. The operation shall conform as per amateur licence regulations. To be eligible to receive the award logs must be kept. A copy of the log entries, in sequence, according to UTC times, dates and frequencies will be accepted. An attached declaration must be completed and submitted with payment as outlined under heading of fees. All entries must be postmarked to arrive to our committee no later than June 30, 1989. Late entries will not be accepted.

FEES — The Award Fees include postage and packaging to ensure minimal damage during transit.
Australia and Territories — $2.50
Overseas Surface Mail — $3.50
Overseas Airmail — $5.00

PAYMENT — Payment by mint Australian postage stamps, money order, postal note, certified cheque, International Reply Coupons (with 1988 or 1989 date stamp).

Payments to Chairman Parramatta Bicentennial AR Group, PO Box 883, Parramatta, NSW. 2150.

The award will be issued to stations that contact the station at any one site.

SWLs may participate in the Parramatta Bicentenary Historical Site Award by logging the stations in contact with our station at any one of the 11 historical sites. The submitted logs must follow the same procedures as listed for amateur stations that are participating. Fees and payment are the same as those previously described.

QSL — A special Parramatta Bicentenary QSL card has been produced for the memorable occasion. It will be issued on receipt of your card. Cards will be forwarded through the bureau or may be sent by post providing payment of one Australian Dollar is received.

CALL SIGN — The station will be using the call VI88NSW during the whole of the operation.

BAND AND TIME SLOTS (EACH DAY)

2100 to 2300	14.088 MHz CW 14.188 MHz USB
2300 to 0100	21.088 MHz CW 21.188 MHz USB
0100 to 0300	3.500 MHz CW 3.500 MHz LSB
0300 to 0500	7.008 MHz CW 7.088 MHz LSB
0500 to 0700	14.088 MHz CW 14.188 MHz USB
0700 to 0900	14.088 MHz CW 14.188 MHz USB 146.000 MHz FM 144.120 MHz USB

HISTORICAL SITES (WHERE AND WHEN) — The station will be at the 11 Historical Sites as listed:

1. Parramatta City	
October 31	0000-0900 UTC
October 31	2100-0900 UTC
November 1,2	2100-0900 UTC
2. Old Post Office	
November 2,3,4	2100-0900 UTC
3. Lancer Barracks	
November 5,6,7	2100-0900 UTC
4. Linden House	
November 8,9,10	2100-0900 UTC
5. Old Government House	
November 11,12,13	2100-0900 UTC
6. Governors Bath House	
November 14,15,16	2100-0900 UTC
7. Australia's First Observatory	
November 17,18,19	2100-0900 UTC
8. Parramatta Park (Tudor) Gate House	
November 20,21,22	2100-0900 UTC
9. Elizabeth Farm Cottage	
November 23,24,25	2100-0900 UTC
10. Hambledon Cottage	
November 26,27,28	2100-0900 UTC
11. Experimental Farm	
November 29,30	2100-0900 UTC
December 1	2100-0900 UTC
12. Catch up day	
December 2, 3, 4	2100-0900 UTC

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DEADLINE FOR DECEMBER IS OCTOBER 15, 1988

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW, 2868

I have discovered that one of the greatest assets a person can have is family and friends. Having a loving, caring family is wonderful. Having true friends makes one rich in a way mere money or possessions never can.

Why all the philosophising? Lying in a hospital bed, post-op with intravenous drip, tubes here, tubes there, and generally feeling very miserable, I was quite overwhelmed by the flood of cards, flowers, letters, visitors and good wishes coming my way. More was to come — on arriving home I found a new computer plus disc-drive, printer, etc awaiting me, and my OM had painted and carpeted the dining-room for a "welcome home".

To everyone I can only say I am truly grateful, and count myself to be a very fortunate person.

Most of the following material was supplied by Jenny VK5ANW and Bron VK3DYF, without whose help we may not have had a column this month. My sincere thanks to both of them.

PRESENTATION AT WALFORD

On Tuesday, June 14, Marilyn VK3DMS, our President, presented a package of books on amateur radio to Walford Anglican Girls' School, Unley. The books were a gift from ALARA to thank Walford for the use of some of their facilities for our ALARA-meet last September. The books were accepted on behalf of the school, by Karen Tay, who is a member of an Extension Activity Group learning Morse code. The presentation was made at the middle-school morning assembly led by Mrs Margaret Alexander, the Deputy Principal, and participants included Meg VK5AOV and Denise VK5YL, both of whom are on the staff, and Jenny VK5ANW, who was the official (?) photographer.

If the girls at Walford don't know a great deal about amateur radio by now, it won;t be because they haven't had the opportunity! As well as the presentation of the books, preceded by a brief explanation from Meg, and the Morse classes which Meg is taking, the school has had a radio station running for three weeks as a special Bicentennial project. Not only were the girls encouraged to visit whenever they had a spare moment, but whole classes actually sat in and listened or talked to local or DX stations. The station was manned (personed?) by volunteer operators, many of whom were ALARA members. We hope that we may be sowing the seeds for some future ALARA members.

ALARA President, Marilyn VK3DMS, makes a presentation of amateur radio books to Walford Anglican Girls School, Adelaide, to thank them for allowing ALARA to use their facilities at ALARA-meet (September 1987). The books were accepted by Karen Tay, a Year 8 student.

BIRTHDAY ACTIVITIES

The ALARA Birthday Activity Day was held on July 23, and other activities held in conjunction were:

The VK5 ALARA Birthday Luncheon was held on July 24, 1988 at St Pauls, Puttney Street. Enjoying the occasion were: Back row from left: Denise VK5YL, Janet VK5NE, Maria VK5BT, Myrna VK5YW, Marg Bradbury, and Val Walte. Front: Jill Wardrop, Joy VK5YJ, Meg VK5AOV, Christine VK5KTY and Sue VK5AYL.

Marilyn VK3DMS, Meg VK5AOV, Karen Tay and Jenny VK5ANW, at Walford School.

VK5 BIRTHDAY LUNCHEON

On Sunday July 24, 12 South Australian YLs and aspiring YLs, met for lunch at St Pauls Restaurant in Pultney Street, Adelaide. (See photograph).

Needless to say a good time (and probably increased waist-lines) was had by all.

VK3 LUNCHEON

The VK3 Luncheon for the 13th Birthday was held at Raedie's on July 31, 1988, with 12 ALARA members present — Austine VK3YL, Mavis AX3KS, Phyl VK3PYL, Gwen VK3DYL, Jessie VK3VAN (and OM Gordon VK3BGB), Bonnie VK3PBL (who obligingly provided transport for a couple of hitch-hikers) Raedie and her OM Ray VK3BHL, Margaret VK3CWA (whose OM David VK3BDJ called in and stayed a while), Valda VK3DVT, and her sister Pat, Marlene VK3FML (OM Jim VK3FFF), Pat VK3PRV (who had as escort two harmonics, Tiffany and the rather young Susie), and Bron VK3DYF Apologies were received from Marjorie VK3HQ, Liz VK3JQ and Mona VK3BRE.

It was a most enjoyable day, presents were exchanged, and there was plenty of talk. See! We don't need microphones to start the conversation!

NEW STATE REPRESENTATIVE IN VK4

It was with regret that we accepted the resignation of Josie VK4VG, as VK4 State Representative, but were pleased that her vacancy was able to be filled, almost immediately, by Cathy Cooper VK4CEK. Our thanks Cathy for volunteering so promptly.

Incidentally, the following are the other State Representatives and if you know of a lady who is

interested in becoming an amateur radio operator, or perhaps already is one, but isn't a member of ALARA, please let the relevant State Representative know:

VK1 and 2	Joy VK2EBX
VK3	Bron VK3DYF
VK5 and VK8	Maria VK5BMT
VK6	Bev VK6DE
VK7	Helene VK7HD

ALARA PROMOTES THE WIA

The Federal Executive of the WIA probably didn't expect the enthusiasm which was generated when ALARA was granted permission to use VI88WIA for a month in July.

In the first two days one operator had logged over 500 contacts on CW, and at the last report, logs with a combined total of over 2500 contacts had been received, and there were still a few logs to come. Perhaps it is just as well that we decided to QSL only those contacts who requested it. Even so, Maria VK5BMT, must be getting writers' cramp by now!

Out thanks to the WIA for all their help and encouragement, and if you missed out on a contact this time around, we will be operating the call sign again from Monday, October 31, to Sunday, November 13.

VI88WIA — ONE YL'S EXPERIENCE

ALARA had the special Bicentennial call sign for the month of July, and I was rostered on for the second weekend in July.

I made my plans, transceiver alright, antenna and chair okay. Next matter, organise coffee — at suitable intervals, meals when due. Scones with jam and cream (dare we mention such things in this column? Joy) seemed a bit likely to get into the microphone, but hot buttered scones were an acceptable alternative.

Put VI88WIA on, as being operated on behalf of ALARA, had a fair number of contacts, and appreciated the many OMs who called; especially the one who "dusted off his mic" being a "key" user normally.

So all in all an enjoyable weekend of operating.

The coffee, the meals, the hot buttered scones — just a lovely dream!

VI88WIA — AN ENJOYABLE EXPERIENCE

I had the use of the VI88WIA call sign for two evenings in July (after work). I am sorry to say the long-suffering OM at this QTH had to make do with some very scrappy meals for the evenings concerned, but he seems to have survived!

Found it a very interesting and enjoyable experience, although I must admit to getting side-tracked on more than one occasion with a bit of rag chewing instead of getting on with the business in hand, and "met" some fascinating people as a result. These included a delightful gentleman in Townsville, 84 years young, who had been licensed for 52 years — and another gentleman from the same city operating a home-brew transceiver with one watt output, and putting out a 5/6 signal on 80 metres.

My score was around 70-plus for two evenings operation, hopefully adding a little to the overall total.

My thanks to Maria VK5BMT, for giving me an opportunity to use VI88WIA for ALARA, and also the WIA, who made it all possible in the first place. (Joy).

VK3BSP

The following item, while it is not strictly YL business, may give some of us a chance to encourage our young people:

Southern Peninsula Amateur Radio Club on the Mornington Peninsula, call sign VK3BSP, in conjunction with local primary schools, is running a program where a small number of students come to the clubrooms each Wednesday afternoon to learn a little about amateur radio and have a chance to speak on air. The program will run until the end of the year (except school holidays) to give all the Sixth Grade pupils a chance to participate.

If you are available between 0330 and 0515 UTC on a Wednesday afternoon, try 3.570 MHz to see if you can hear them. Time is taken during that period to explain amateur radio so transmission is not continuous.

An item in June AR refers to a book written by Ron VK5VH, which gives some idea of amateur radio to 10 and 12 year olds. It is called *The Magic of Mr Ree.*

JOTA

While on the subject of young people, let us not forget Jamboree on the Air, held every year on the third weekend in October. This is a real opportunity to demonstrate what amateur radio is all about, and give our Scouts and Guides a chance to talk to their counterparts in other places.

ALARA CONTEST

Not too soon to start thinking about our contest, which will be held on Saturday, November 12, 1988 from 0001 to 2359 UTC.

To celebrate the Bicentennial, special certificates will be issued this year to:

VK stations obtaining 200 points and contact with 10 ALARA members.

DX stations obtaining 88 points and contact with five ALARA members.

CORRECTION TO MEMBERSHIP LIST (July AR)

Jan VK6PJL (not VK6PYL).

Until next month, 73/33, Joy.

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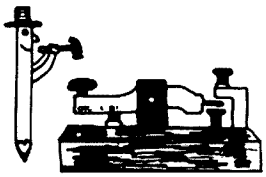


Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright. Vic. 3741

"A speed trial between the telegraph and the telephone from New York to Boston was lately undertaken at the *Sun* newspaper office in this city. The contest lasted for 10 minutes; 330 words were delivered to Boston, ready for the printer, by telegraph, and 346 words by telephone. But many of the telephone words were incorrectly received. And so the telegraph was the winner."

—From *Scientific American* June 1988 "100 Years Ago"

Also received this month from Steve VK2CSV, a copy of an article in *The Short Wave Magazine* September 1985, by Justin Cooper. The article describes the testing of the various modes of transmission as to their usefulness under both clear channel and noisy conditions. The results in brief are, that both AM and FM require clear channel conditions and both CW and RTTY can be copied below the noise level when there is no interference.

"Under QRM conditions it was SSB telephony all the way as far as any form of phone went, but the CW wins hands down. AMTOR is a runner-up, then SSB and RTTY with AM and FM not really in the hunt. Finally 'mechanical CW' out of a decoder. This is obviously dependent on the quality of the decoder, but none of them cope well with hand-sent Morse (which doesn't say much for the 'fists' of the sending operators even though they were easily copied by ear!) and none of them likes the QRM; also they seem to be difficult to tune. Results, on a par with AM but a little better. Easier to learn Morse!"

I have had a number of inquiries regarding the CW Operators QRP Club and the Club Communicator transmitter. I have a copy of the 52 page manual which is the best I have seen for *any* kit so far. I hope those of you who wrote to me about joining and ordering the kit are well on the way to some on-air tests by now. I hope you can also have a try at a home-brew receiver as well. You will find some extra pleasure when you complete your first contact using your *own* receiver as well as transmitter. Even though the receiver seems harder to build, I think you will be surprised if you compare it with a commercial rig. Under most 80 metre band conditions my little black box seems to out-perform the IC-751A, and that is with no filtering or AGC. Good audio filtering is obtained by dropping the two-inch monitor speaker into an empty cup, which resonates nicely on about 700 Hz!

OVERSEAS NEWS

Some overseas news from an article in *Morsum Magnificat* by Ron Wilson G4NZU, called "Morse Testing and Training in the UK".

"The UK has two classes of amateur licence, the Class A which requires a theory examination plus a Morse test at 12 words a minute; and the Class B which requires the same theory examination, but no Morse.

"The Class B licence restricts operation to frequencies of 50 MHz and above. Until 1985, the use of CW was prohibited for B licensees. The Class B can be converted to Class A by passing the Morse test, when all frequencies allocated to UK amateurs become available for use.

"In 1985, the restriction on the use of CW by B licence holders was relaxed as an aid to "self-training" in Morse code. At this time the administrative arrangements for the Morse test were also altered.

"The issue of licences and Morse testing is subject to the International Radio Regulations and is therefore a government responsibility. The Post Office, and later British Telecom, carried out this task as government bodies. However, on the privatisation of British Telecom, the Department of Trade and Industry took over the responsibility for these matters. The contract for Morse testing was put out to tender and the Radio Society of Great Britain, offering a superior service at a lower cost, was awarded the contract.

"Up to this time, testing had been carried out by the GPO/BT mainly at their coastal radio stations, of which there are about 20 scattered around the coast of the UK. This system was thus completely independent of the amateur movement, and most candidates were involved in considerable travelling to a testing station.

"The RSGB scheme, by contrast, provides Morse testing centres in each county of the UK, though in the more sparsely populated regions there is, in effect, a regional centre. These centres are run by teams of examiners most of whom are amateurs, although some are former BT examiners.

"The scheme is run by the Chief Examiner, Neville Ianson G3GDO, and a Deputy Chief Examiner, originally Rik Edmondson G3YEC, who between them have travelled the length and breadth of the UK testing and appointing examiners of whom there are over 230. They have also been heavily involved in setting up the administrative side of the scheme. Rik has now had to withdraw from his post and has been replaced by Phil Bell, a former professional.

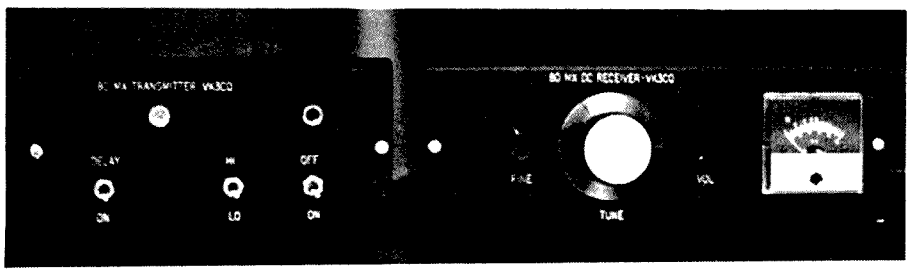
"Potential examiners are required to pass a test at 20 words per minute, and to have relevant experience in testing situations, and a suitable personality.

"Each county has a number of examiners, one of whom is designated Senior Examiner. It is his responsibility to arrange suitable accommodation and dates for the test sessions. He must ensure that each session runs as smoothly as possible, both the test itself and the reception and handling of the candidates — who are always in a highly nervous state!

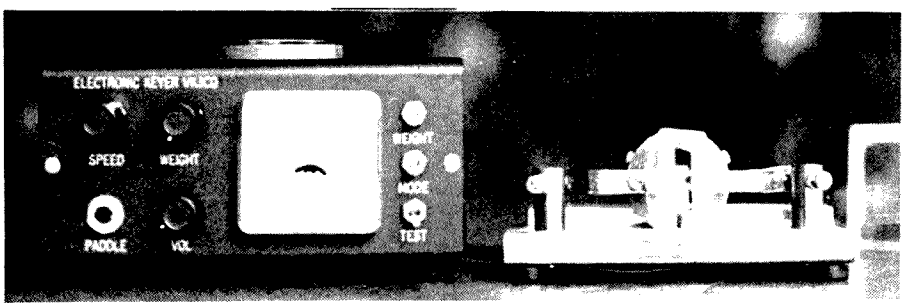
"Why this nervous state is so common is interesting, as the precise details of the test are well known by the candidates in advance. They know, or should know, exactly what they have to do. Perhaps this is just another of those fascinating psychological aspects of Morse learning!

"In the receiving test candidates are allowed four errors in plain language, and two in the numbers. In transmitting they are allowed no uncorrected errors, but are allowed four and two corrections in the plain language and numbers respectively.

"Candidates are tested in groups of three for receiving, but the transmit part is taken individu-



The Home-brew 80-metre Transmitter and Receiver.



The VK3CQ 8044ABM-based Keyer and Gilcher Paddle.

"Henry is Spending the day in bed with a code."

ally. Each session is taken by two examiners. One, the "session examiner" is responsible for the conduct of the test itself, and the other acts as a "witness examiner". His purpose is to act as a check on the session examiner, and to assist with the paper work.

"It must be appreciated that the examiners are also subject to nerves! The concentration required is considerable, as they have to ensure that the speed is correct; that they are sending the text correctly; that they are sending the correct characters, and that those characters are well formed and spaced. (How many of us *really* listen to our own CW?).

"It must be remembered that the examiners are experienced and practised CW operators who are used to rather faster speeds than 12 words per minute! As the test is required to be given and taken on a straight key, we have another reason for concentration. It is not unusual for examiners to have fairly regular sessions on a straight key, just to keep in practise!

"In any given county, tests are held at two-monthly intervals, with surrounding counties holding their tests in the months between. Thus for all candidates there are a number of test centres available within relatively easy travelling distance which, between them, provide a testing facility every month. . .

"For many years the UK has been covered by a network of stations transmitting "slow Morse" sessions as an aid to learners. This is very satisfactory for developing receiving skills. The formation of transmitting skills has, however, until the licence variation, been a matter of solitary practice, or finding some Class A licensee willing to help. The difficulties are many, perhaps the most serious being the reluctance of the helper to give a really honest assessment of the Morse received from the learner.

"This is a difficult situation, depending on the CW experience of the helper, his knowledge of the test itself, and the personalities of both helper and learner. In recent years, with the advent of Morse training programs on home computers, there has arisen the possibility of testing your sending by the computer's ability to read your CW. (Is there a better test of hand-sent Morse!).

"The variation in the B Licence allows the use of CW on-air for practice purposes. With the old testing system under British Telecom, it has always maintained that the main cause of failure was in the receiving part of the test. With the new system, it is found that sending causes the majority of failures. This is a surprising change when the availability of the licence variation is taken into account. Indeed, one really has to ask whether the majority of candidates are taking proper advantage of this facility?

"Since it became available there has been a considerable increase in the number of Morse practice nets on the two-metre band, frequently run by a helpful Class A licensee. Unfortunately, it would appear that some of them are preparing their students for a test other than the official one! Some of the advice given is such as to guarantee failure! For example, that the examiners would prefer good Morse at 10 words per minute rather than rough Morse at 12 words per minute. Of course we would like good Morse. It makes things easier for us. But the test *is* at 12 words per minute, not 10!

"Most of these nets consist of sending messages of text from a book. This is fine in the early stages, but I am of the opinion that students should move to a normal type of conversational QSO as rapidly as possible. The good test candidate is no problem, indeed it could almost be said that they are "naturals". For the weaker ones, it is evident that they are still frightened off the key.

"This could be due to insufficient transmitting practice. However, I feel there is more to it than this. To them, the key is still an unnatural thing stuck on the end of their fingers, demanding the utmost concentration, frequently pounded with great vigour, with huge gaps and incredible tensions. part from needing advise on the use of a key, if they could be involved in "real" conversations, where they are having to think about what to send, then I believe the key would rapidly become a natural part of the process.

"They should be so busy thinking what to send that they cannot afford the luxury of worrying about the key. This type of practice, using a key with a personal minimum gap and tension would, I am sure, not only improve their sending, but also their enjoyment of our glorious mode.

"The new RSGB testing scheme has now settled down, both administratively and practically. It is providing the service the aspiring Class A amateur wants at reasonable cost, at reasonable intervals, and near his home. The scheme has not been set up and left to run in a vacuum however. It is subject to inspection, both by the RSGB and the DTI, who are making spot checks on the facilities and standards of many centres. At this time all appears to be well with the scheme.

"The increase of tuition nets and the informal advice that examiners are able to give, not only at the test but also in their clubs, is having an interesting side effect. The new Class A amateurs, at least those bitten by the CW-bug, first try out their wings on the two-metre band, and the standard of operating is showing a steady improvement. Long may it continue to do so!"

It is interesting to note that in Ron's article he advocates a light tension and minimum gap on the key. This is in direct conflict to the suggestions I have received from ex-post office telegraphists who, as a rule, advocate gaps of an eighth of an inch or so and tensions of as much as seven pounds! No matter what advice one gives, there is always someone who has a better way and I suggest that all newcomers to the key experiment as much as possible to find out for themselves what suits them best. *But*, I could be wrong, as any piano teacher will tell you. If you don't learn the correct way your learned habits may prevent you from ever becoming a master. Certainly after listening to many PMG trained telegraphists and noting their beautiful rolling rhythm, I am inclined to agree that their teachers knew what they were doing. But, of course, none of this applies to the many of us who now, having their licence, have turned to electronic keys and paddles. Or does it?

73 Morsiacs for another month.

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US ILLEGAL CB OPERATION

The FCC do not 'pussy foot' when it comes to prosecutions. One character received a one year sentence for using higher than authorised power on the band. Eventually the offender received the mandatory 90 days incarceration, plus the following specific conditions such as three years probation, that he refrains from possessing or operating a radio transmitter, that he pays the United States US$1 025 and forfeits all the equipment that was seized from him by the US Marshall in 1986 and 1987. The offender must also perform community service as determined by his assigned Probation Officer.

I do not think even Perry Mason, Della Street or their able assistants would have got him off the hook on this charge. They do not 'muck' around in Michigan.

—Contributed by Ken McLachlan VK3AH, from the *ARRL Newsletter* August 2, 1988

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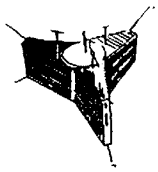

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR

INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC Sunday
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SW PACIFIC
2200 UTC Saturday
Frequency: 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements, from the AMSAT Australia net. This information is also included in some WIA Divisional Broadcasts.

AMSAT OSCAR 13

Once again this month we have a collection of bulletins that have originated from AMSAT-NA by Rip WA2LQQ and AMSAT-DL.

However, prior to commencing those bulletins, perhaps we should reflect on the happenings of the last few months since the commencement of translator communication on AO-13. Listening around the bands I have gained the distinct impression that a number of satellite operators are distinctly unhappy with the results to date, when they compare to those results they believe they were getting from AO-10. I have purposely used the operative "believe" because amateurs are notoriously prone to forgetting the minor nitty gritties with time, myself being at the head of the list. Having said that, let us avail ourselves of some facts. First, there are some amateurs who I have spoken to who are positive that AO-13 is far superior than AO-10. These are satellite communicators who have got their "act together" and totally understand what it is all about. I would hasten to add that a number of these communicators have the very best in equipment and operating expertise, the result of many years of operating and on-air experience. Materially, we cannot all aspire to those levels of excellence, although we may dream of them. However, we need not despair and become disillusioned if our current results are not up to those we obtained with AO-10. Let me give you some thought provokers so that you can sit down and reflect where you may be able to improve your operating results with your current equipment, and where to wisely spend those hard earned dollars for the best results.

Just one further point that requires consideration. We were all spoiled by AO-10 by the continual re-orientation of AO-10 to meet the best power budget due to its unplanned orbital trajectory. The continual re-orientations allowed the antennas to be earth pointing more often than not at times other than apogee, hence the path losses for communication were significantly less thus allowing "better" communication. Operators in the Southern Hemisphere enjoyed the most gains from those manoeuvres.

However, that is all history, and now we all have to learn some new ground rules. Let us look at those ground rules.

1. The satellite is inclined at 57 degrees.
2. The AO-13 antennas are not damaged, those on AO-10 were.
3. The satellite is earth pointing at Apogee.

These three points are all intertwined with each other and I shall attempt to explain how they impact on our operating habits and how we need to adjust and start from scratch. Now that AO-13 is in its planned 57 degree inclination the Power Budget can be achieved without continual re-orientation. This in itself will be a blessing to the Command Stations who, with AO-10 spent many hours agonising over the correct orientation to ensure that the all important sun-angle attitude could be achieved.

Similarly, it means that the spacecraft can also be aligned to its optimum design criteria for most of its operating life, that is to have the antennas earth pointing at apogee, which is most important for Mode L operation. You may ask, "So what?". Well, the answer lies in the fact that all antennas have a designed bandwidth and there is an optimum time within the satellite orbit that the spacecrafts antennas and yours will be "communicatively compatible". This is no different than AO-10, and that is the reason that James Miller G3RUH, included in his now world-wide acclaimed program *Plan 10* the term *Squint Angle*. James' program calculates along with the other satellite criteria the angle subtended by the satellite and your QTH and this he called the *Squint* angle. Knowing the beamwidth of your antennas you can predict the optimum operating times. With the spacecraft now in a 57 degree inclination versus 27 degrees for AO-10 the significance of Squint Angle is magnified, when it comes to planning your operations.

Therefore those operators who have computers and do not have a copy of *Plan 10* would be wise to obtain a copy from Graham VK5AGR, (refer conclusion of column). The reference I made to AO-13's antennas not being damaged is also an important consideration to reflect on. From reports to hand it does appear they are exhibiting a "true" circular sense of polarisation on both the received and transmitted paths. I understand that variances of 20 dB have been measured whilst switching between vertical, horizontal, right and left circular with AO-13 downlink signals. Admittedly, this 20 dB variance would be a combination of the effects of Faraday rotation, uplink and downlink phasing, etc. However, it is of importance because even 3 dB is of paramount importance when it comes to satellite communication, let alone 20 dB. I also understand that currently the signals are for the majority of the optimum section of the orbit, exhibiting the design criteria of RH circular. These are just a few criteria that you need to reflect on when you are going to compare AO-10 with AO-13. Personally I do not believe you can truly compare the two spacecraft, however what you can do is be wiser in the knowledge of what AO-10 could not do versus what AO-13 offers for the future. As Sol reflects in the Castrol advertisements, "Oils aint Oils". Perhaps the lack of results that you may be currently experiencing could be self-induced, "familiarity breeds contempt". When was the last time you gave the satellite antennas some maintenance? My antennas need considerable maintenance as they blew down during a storm whilst I was overseas recently. However, I was aware that their performance had degraded prior to that, and it was obvious why when I picked up the pieces after the storm.

The prime degradation was from "well-weathered" coaxial cables, brittle outer sheath plus some rubbing, etc, moisture ingress, need I continue. How long have your antennas been up in the air, simply forgotten like a lot of others. Remember those dBs, one here and one there, may mean no signals from up there (AO-13).

Therefore, to ensure that you are hearing those downlink signals it may be opportune to check the following:

1. Mechanicals of system, loose elements, etc.
2. Degradation of coaxial cables, check loss with watt-meter, etc.
3. Check the phasing harnesses for RH/LH Circular.
4. Check out the coaxial switching relays moisture ingress.
5. Does the masthead amplifier still effectively function?
6. Is your azimuth rotator correctly calibrated?
7. Is your elevation rotator also calibrated correctly?
8. Is your antenna system ideally located in respect to:
   a) Feedline lengths?
   b) Noise sources? (Why not lower the system closer to ground level and shield them from noise generators, cars, etc. Remember the majority of the time the antennas are sky-pointing.)

The cold hard facts in respect to satellite communication is the fact that, unless you can hear those downlink signals, you cannot effectively work through the translators. I recommend to all satellite communicators to use the General Beacon on 145.812 MHz, plus or minus doppler as your reference signal. It is pointless and foolhardy to even attempt communication through AO-13 (or AO-10 for that matter) unless you can consistently copy the beacon. Your downlink signals (provided you conform to the recommended uplink power requirements) will be of a comparable signal strength to that of the general beacon. It is extremely embarrassing to note operators in the downlink passband 10 dB stronger than the beacon, bemoaning the fact that they cannot hear the other signals, that the other stations must be doing something wrong, because he can hear his own signal okay.

Now follows the various bulletins from AMSAT-DL and AMSAT-NA.

HR AMSAT NEWS SERVICE BULLETIN 215.01 FROM WA2LQQ WARWICK, NY August 2, 1988

AMSAT OSCAR 13's linear transponders, Mode B, J and L have been putting in regular service for more than a week now and, while Modes B and J have been drawing rave reviews, Mode L reports from US users were not quite as rosy. Since August 1, however, US Mode L users have gotten to see the satellite from a different perspective in both a literal and figurative sense. The result is a renewed optimism in Mode L functionality.

During its first week of operation beginning July 24, would-be Mode L users in the US were discouraged by poor results and confused by optimistic reports originating in Europe. Many couldn't even find their downlinks. This has been determined to be the result of two factors:

1. The Mode L translation frequencies previously published have been invalidated (probably by a change in an electrical parameter in the transponder), so many were listening on the wrong frequency, and
2. Perspectives on the satellite from the US were poor.

Last week, European Mode L users were looking "right down the barrel" of the satellite's Mode L receive antenna and had good results. In contrast, US Mode L users were pounding against the side of the satellite outside the narrow Mode L uplink beam. Now that US users are well-situated in the beam, reports from US Mode L users are much more positive.

According to AMSAT officials, recent tests on Mode L indicate its performance is actually quite good; even better than AO-10 was expected to be had it worked properly. AO-13 is exceeding the expected performance of AO-10 Mode L by a dB or two they said. Whereas uplink recommendations for AO-10 Mode L were in the 3 kW EIRP range, it now appears a good, if not booming, SSB QSO can be had under good conditions with 2 to 3 kW (33 - 34.8 dBW) EIRP or with 1.5 to 2 kW (31.8 - 33 dBW) EIRP under ideal conditions. These values can be reduced by another 3 dB if right hand circular polarisation (RHCP) is used on the uplink instead of linear polarisation. Under transponder loading, however, the required uplink power will obviously go up.

In sum, under totally ideal conditions (boresighted, RHCP and alone on the transponder), about 800 watts (29 dBW) EIRP will be adequate for a reasonably good SSB QSO. Under less than ideal conditions, you will need more power. It would be a good idea to have another 6 to 8 dB in reserve. Using 30 watts to a pair of 20 dB loop Yagis will yield about 37.3 dBW (5.4 kW) EIRP including splitter losses.

So, AO-13 is, in fact, doing quite well! And last week's optimistic reports by G3RUH and other Europeans have been largely corroborated by subsequent reports from US users.

The key to the renewed optimism is the realisation that there is an additional constraint on Mode L use beyond that of the Mode B and J transponders. That additional constraint is the satellite's 24 centimetre uplink antenna beamwidth. Its fairly narrow beamwidth (-3 dB value is 49 degrees), combined with the beamwidth of the 70 centimetre downlink antenna means one needs to be fairly close to "boresight" to do well on Mode L. But now that that fact is recognised, Mode L users can take it into account in planning their use of this powerful mode and be successful.

Mode L is not just a higher frequency Mode B, AMSAT officials point out. When planning Mode B operations, one simply checks to see if the satellite is above the horizon and if the Mode B transponder is scheduled to be on. With Mode L, they point out, there is an additional consideration: Where is the narrow 24 centimetre footprint relative to you?

The angle between the boresight and your QTH is often called the squint angle. In AMSAT's *Quiktrak* program it is called PA or pointing angle. Using *Quiktrak*, one can readily determine when the PA is sufficiently low so as to facilitate Mode L QSOs. Best results occur when PA is less than about 10 degrees. When using *Quiktrak*, be sure to set STARTYPE to 0 to get the pointing angle correct.

The current BAHN co-ordinates for OSCAR-13 are about BLON=180,BLAT=0.

Now that both the Mode L frequency translation matter and the squint angle issues have been resolved, Mode L use in the US is expected to skyrocket. Equipment suppliers already report unprecedented activity in 70 and 23 centimetre equipment and attribute this largely to a huge ground swell of interest in AO-13. AMSAT says it is preparing numerous special event activities on Mode L including the return of the popular ZRO Test and Technical Achievement Awards Program. Stay tuned.

HR AMSAT NEWS SERVICE BULLETIN 219.01 FROM WA2LQQ WARWICK, NY August 6, 1988

With more than two weeks experience on the new AMSAT OSCAR-13, the number of users on all modes is increasing as is their apparent satisfaction. Veterans and newcomers alike are praising the new satellite even as it remains in the engineering phase prior to its official turnover for general operations. The condition of the satellite continues to be excellent and, except for an apparent glitch in the RUDAK packet system, optimism prevails.

Modes B and J have been widely applauded for their performance. Their sensitivity seems to be excellent. Although there seems to be a few times when the officially recommended uplink power levels suffice, this clearly is attributable to transponder loading and the realisation of a typical power escalation scenario.

Higher than the officially recommended uplink power levels are apparently being used by most Mode B and J users. There is thought to be a power escalation cycle that is initiated or accelerated by a few stations who have wholly inadequate receive systems. All users *must* be aware a preamplifier is essential for all AO-13 modes. Operating without one is a prescription for failure. Operating *with* a good preamplifier (preferably at the antenna) can convert all the modes (especially L) from a strain to a plain joy.

Perhaps the biggest turnaround in user opinion has occurred in the Mode L domain. When first turned on July 24, Mode L was thoroughly panned by US users. Based on what they saw, US users were wondering what European Mode L users were cheering about. It was subsequently learned European Mode L users enjoyed a very strong uplink advantage in the first few days of its operation as a consequence of the squint angle of the satellite; the offset angle between the Mode L uplink antenna and the uplinking station. Analysis now shows a squint angle greater than 10 to 15 degrees to be anathema for good Mode L QSOs.

Another confusing element. which strongly abetted the gap between US and European reports on Mode L performance, was the discrepancy between previously published Mode L frequencies and the *actual* Mode L frequencies. For reasons not yet clear, the frequencies previously published by AMSAT-DL and reiterated by AMSAT-NA and in various US publications have proven erroneous. (The Mode B and J frequency discrepancies are inconsequential; Mode L frequency disparity is substantial).

The combination of amplitude and frequency discrepancies led many US satellite users to conclude Mode L had actually failed entirely. Few could even find their downlink at all using all the power they had available to them.

Fortunately, the big swing in opinion came like a whipsaw last week as Mode L showed off its best to the west. Favourable squint angles have come to the US and Mode L users there have changed their views entirely; have been showing up in droves on the new mode.

And, as may be characteristic of US amateurs, they vote with their pocketbooks. When they like something, they support it with equipment purchases. Equipment dealers report an unprecedented run on 24 centimetre equipment; a sound vote of confidence in Mode L if there ever was one!

With the excellent conditions, analysts too have had a good chance to measure the actual Mode L performance. The results show what to expect under ideal conditions and what to expect otherwise. The resulting numbers suggest AO-13 Mode L is now working better than AO-10 Mode L ever was expected to! (Specific data in a separate bulletin).

On a slightly less positive note, AMSAT-DL workers report there is a problem with RUDAK, the packet digipeater developed in Munich. When attempting to boot-load from the PROM, the RUDAK CPU runs for a while but then hangs up. The 10 byte loader module will not allow a special program to be loaded into RAM. It is now recalled from the thermal vacuum tests that the PROM (a fusible link type) was then found to be temperature sensitive. AMSAT-DL is evaluating ways of warming the RUDAK module. One scheme being considered calls for energising the module next to RUDAK, the Liquid Ignition Unit (LIU). This will warm up RUDAK considerably and may solve the problem they say.

In sum, AO-13 continues to provide excellent performance on all its linear transponders. The RUDAK is being investigated for a possible thermal malfunction and Mode S may be activated next month. New and veteran satellite users alike are singing the satellite's praises and apparently thoroughly enjoying the new bird! Equipment dealers are being swamped with 24 centimetres equipment orders and there seem few remaining open questions on what Mode L is capable of.

HR AMSAT NEWS SERVICE BULLETIN 219.02 FROM WA2LQQ WARWICK, NY August 6, 1988

On-orbit AO-13 Mode L performance tests completed last week strongly suggest it is working well indeed; better even than its predecessor (AO-10 Mode L) was expected to work. The key to success on Mode L is now clearly shown to be closely coupled with the positioning of the satellite's Mode L 24 centimetre uplink receive antenna.

As expected, under poor conditions copious uplink power is required. Many tens of kilowatts (EIRP) will be insufficient under the worst conditions. But under good to ideal conditions, very moderate power levels will provide satisfactory results.

The key to Mode L success, analysis this week has shown, is that users must pay close attention to the pointing or squint angle of the satellite's 24 centimetre helix uplink antenna. Under good conditions, an approximate two hour sub-window of optimum Mode L time will exist within the general Mode L window for a given QTH.

About half the total Mode L time is the prime Mode L sub-window where the squint angles are 10 degrees or less. According to Mode L operator John Gayman WA3WBU, when squint angles get much over 10 degrees, Mode L uplink power requirements skyrocket.

Thus it is important to determine the timing of that prime sub-window when your QTH will fall within that acceptance cone. AMSAT's *Quiktrak* program computes the positioning of the cone based on the satellite's attitude in Bahn co-ordinates, its current position on orbit and your QTH. The pointing angle (PA) or squint angle parameter is output by *Quiktrak*.

Under thoroughly ideal conditions, it now appears a Mode L uplink of 29 dBW (about 800 watts) EIRP will produce about a 10 dB signal to noise ratio in a 2.4 kHz channel when received on a system with an approximate 50 degree Kelvin system noise temperature at or near to apogee. (Figure of Merit = -2 dB/K). A 50 degree K, 435 MHz receive system might consist of a 0.6 dB noise figure preamplifier behind a 15 dBic RHCP antenna and a standard, modern SSB UHF receiver. (CW signal performance is proportionately better).

However, under most practical operating conditions, more uplink power will certainly be required on Mode L. Factors increasing Mode L uplink power requirements include polarisation losses (3 dB penalty for running linear polarisation instead of Right Hand Circular Polarisation); squint angle (penalties mount very fast beyond squint angle of 10 degrees); increased path losses; increased absorption at low elevations angles; heavy transponder loading; local impediments (trees, houses), etc.

Based on these preliminary estimates, it now appears 33 dBW (2 kW) EIRP is the lowest *practical* level Mode L SSB users should expect to be regularly successful with. For higher reliability, that is for your ability to work well when combining penalty factors as described previously, another 5 dB or more should be available. Based on these tests then, 38 dBW (6.3 kW) EIRP can be expected to produce good SSB results under most (but definitely *not* all) operating conditions.

Obviously, if one wants to work under the most adverse conditions with strong, compound penalty factors, much more power will be needed.

The 38 dBW level seems, however, to be a reasonable compromise between performance, reliability, cost and physical structure. For example, 30 watts applied to the feed of a pair of 20 dBi loop Yagis will produce about 37.3 dBW (5.4 kW) EIRP including losses; sufficient for good SSB QSOs under most conditions and excellent for CW under most conditions.

Comparing AO-13 Mode L and AO-10 Mode L, it now appears the actual measured performance of AO-13 Mode L exceeds the expected performance of AO-10 Mode L by 1 to 2 dB. (Of course, AO-10 Mode L never actually achieved its potential performance by a factor of at least 10 dB). By contrast, AO-13 Mode L is coming close to its corrected specifications.

HR AMSAT NEWS SERVICE BULLETIN 219.03 FROM WA2LQQ WARWICK, NY August 6, 1988

AMSAT OSCAR-13 continues under engineering jurisdiction and has not yet been officially released for full operations. Spacecraft controllers and engineers have been meeting in Marburg, West Germany to evaluate spacecraft systems performance to date and to plan general operations for the near-term and mid-term period. They have agreed on the following revised schedule said to be effective until September 21, but subject to change for continued testing.

Revised Operating Schedule: V3.0 August 6, 1988

MODE	FROM (INCLUS)	THRU (INCLUS)	REMARKS	DURATION MA MINUTES
ON	MA 241	MA 002	Solar eclipse window	18 48.3
Mode B	MA 003	MA 099		97 260.2
Mode L	MA 100	MA 180	Mode JL optional	81 217.3
Mode B	MA 181	MA 220		40 107.3
Mode B	MA 221	MA 240	With omni antennas	20 53.6
Mode S			Commence September (?)	
RUDAK			Testing; ops pending	

The current attitude is approximately BLON = 180, BLAT = 0.

The updated frequencies, based on in-orbit tests and corrected for Doppler shift, to within 1 kHz, are:

Mode B: the sum of uplink and downlink frequencies equals a constant 581.398 MHz. At Mode B mid-band, 145.890, the required uplink is 435.508 MHz.

Mode J: the sum of uplink and downlink frequencies equals a constant 5800.413 MHz. At Mode J mid-band, 435.965, the required uplink is 144.448 MHz.

Mode L: the sum of uplink and downlink frequencies equals a constant 1705.356 MHz. At Mode L mid-band, 435.860, the required uplink is 1269.496 MHz.

HR AMSAT NEWS SERVICE BULLETIN 219.04 FROM WA2LQQ WARWICK, NY August 6, 1988

Over 160 persons from 19 countries attended the third AMSAT-UK/UOSAT Space Colloquium held at the University of Surrey last weekend (July 29-31). International speakers presented 20 papers on diverse topics, covering:

Geostationary AMSAT Phase 4 spacecraft designs
AMSAT Phase 3D spacecraft design
UOSAT-C, D and E spacecraft technologies
Amateur radio using High Altitude Balloons
AMSAT OSCAR-13 spacecraft orbital commissioning and operations
UOSAT-1 and 2 spacecraft orbital operations
The Chinese Space Program
Digital signal processing techniques for amateur satellite communications
Packet Radio Satellites
Soviet/Canadian Transpolar Skitrek Future Soviet amateur radio satellites

Among the many radio amateurs who attended were Jan King W3GEY, Karl Meinzer DJ4ZC and Leo Labutin UA3CR. Leo was particularly welcome and read a paper describing the Skitrek project and spoke on future Soviet satellite plans.

The Colloquium was preceded by a one-day Satellite Technical Workshop devoted to detailed discussions of advanced amateur satellite techniques and a one-day co-ordination meeting sponsored by the Radio Society of Great Britain focusing on funding, frequency allocation and educational matters.

Colloquium proceedings, comprising 16 of the papers presented, were sold out, however, additional copies will be available shortly from AMSAT-UK. The sponsors send their thanks to all who visited UOS last week and who made the Colloquium such a success! (Bulletin per UO-11 BBS; thanks UOS).

HR AMSAT NEWS SERVICE BULLETIN 219.05 FROM WA2LQQ WARWICK, NY August 6, 1988

The UO-11 Digital Communications Experiment (DCE) packet radio gateway network continues to grow. ZL1AOX, VK5AGR, GB3UP and ZS6SAT are passing messages for large packet radio user networks in New Zealand, Australia, the UK and South Africa. A new station, ZL5BA, is located on Ross Island in the Antarctic. The operator there (Sojo) is working at a Greenpeace scientific base. He will use his DCE station for recreation and to send health and welfare messages home for the others at his base. ZL5BA was activated on July 29, and is providing an interesting insight into the coverage received by polar stations from a polar orbiting satellite. He sees UO-11 on almost every pass although some times of day provide higher elevations than others.

Surrey plans to commission a USA gateway soon. The station is N6IIU in the San Francisco area. This station is located in a Red Cross headquarters which already houses an emergency communications station and a packet BBS.

Discussions are also under way with an East Coast USA amateur. Meanwhile, a gateway in West Germany is also almost ready to go. DB2OS, one of the AO-13 control operators, will bring DCE access to the well-developed European packet radio network. When the USA and Europe are on line, the DCE will be able to link together all of the major amateur radio packet networks world-wide. (Bulletin per UO-11 BBS; thanks UOS).

HR AMSAT NEWS SERVICE BULLETIN 219.06 FROM WA2LQQ WARWICK, NY August 6, 1988

Recently, Leonid Labutin of Moscow, a prime mover in the Soviet Radio Sputnik (RS) program, said that on July 15, the first western amateur visited the USSR RS command station RS3A in Moscow. Danny interviewed the chief operator, Leo Maxakov RA3AT, made tape recordings and took pictures.

According to Nico Janssen PA0DLO, upon Danny's return to Stockholm, he promised to make an extensive report on his visit to RS3A. One of the interesting things he has already told the European AMSAT Net (on July 23) was, that according to the operators at RS3A, the old RS satellites, RS-5 and RS-7, are definitely out of operation now. RS3A has gradually lost control over these last two active RS satellites of the RS-3 to RS-8 series. They are convinced that the batteries in RS-5 and RS-7 are dead so no new activities can be expected from these satellites. RS-3 through RS-8 were launched together on December 17, 1981.

AMSAT-AUSTRALIA NEWSLETTER AND SOFTWARE

The fine monthly publication *AMSAT-Australia Newsletter* published on behalf of AMSAT-Australia by Graham VK5AGR, now has 250-plus subscribers. Should you also wish to subscribe than send a cheque for $20, made payable to AMSAT-Australia and post to: AMSAT-Australia, C/- PO Box 2141, GPO, Adelaide, SA. 5001.

The newsletter provides the latest news items on all satellite activities and is a must for all those seriously interested in amateur satellite activities.

Graham also provides a software service in respect to general satellite programs made available to him from various sources. The only requirements to make use of this service is to send Graham a diskette nominating your requirements, a nominal $10 donation to AMSAT-Australia and sufficient moneys for return postage and packing. To obtain details of the programs available and other AMSAT-Australia services send an SASE to Graham.

de Colin VK5HI

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VOICE REPEATER GUIDELINES

Repeaters are established primarily to extend communication-range of mobile stations in the VHF and UHF bands. However, they may also be used as calling channels for initial contact before switching to a simplex frequency. As well, they provide contact facilities for radio amateurs in remote locations where simplex communication is not normally possible.

Operating Conventions — Each transmission should not exceed two-minutes. Repeaters have timers to limit transmission length.

Before replying, let the repeater "drop out" and wait at least three seconds before transmitting. This allows others immediate access (see #).

Do not reset the timer to extend your own transmission time.

Keep contacts brief and to the point. If you have nothing to say, don't say it! Limit your group QSO to a maximum of 10 minutes.

Avoid over-use of call signs. They are required at the start and end of a contact, and at least once every 10 minutes. But call signs can be dropped from the start and end of transmission during a contact. Phonetics are also over-used on repeaters, particularly in call signs.

To gain access to a repeater which is being used by others, simply announce your call sign during the pause between overs.

If using a repeater and another station announces its call sign during the pause, let that station go ahead immediately. He or she may have an urgent message.

Do not transmit on repeater output frequencies. Use reverse facilities only to observe another station's input signal strength. If satisfactory, then QSY to a simplex channel.

Ignore annoying transmissions. Do not respond or comment on a transmission not identified by a call sign.

There is no need to call CQ on repeaters. Just announce your call sign and say you are listening the frequency.

The use of repeaters for liaison to establish a contact on another band is permissible, but cross-band contacts using a repeater are not encouraged. Where cross-band contacts are made all frequencies must be announced by all parties.

Priority must be given to normal repeater usage.

Be courteous and unselfish at all times, and always be aware of the needs of other people who have an equal right to share the repeater.

If you hear someone new to repeater operation, assist and educate them in a courteous manner.

Remember others including new or potential radio amateurs monitor repeaters — the image of amateur radio is important.

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SATELLITE ACTIVITY FOR MAY AND JUNE 1988

1. LAUNCHES

The following launching announcements have been received:

INT'L NO 1988	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INC deg
044A	Molniya 3-32б	May 26	USSR	12hr17m	40716	636	62.5
045A	Cosmos 1949	May 26	USSR	90.0	431	412	65.0
046A	Cosmos 1950	May 30	USSR	116.0	1534	1503	73.6
047A	Cosmos 1951	May 31	USSR	88.6	272	187	82.3
048A	Soyuz TM-5	Jun 07	USSR	See	Note		
049A	Cosmos 1952	Jun 11	USSR	89.4	300	215	70.0
050A	Cosmos 1953	Jun 14	USSR	97.8	680	647	82.5
051A	Meteosat P2	Jun 15	ESA	1439	35889	35796	0.5
051B	OSCAR 13	Jun 15	Amateur	637.9	36094	242	10.0
0510	PAS 1	Jun 15	USA	1441	36162	35612	0.1
052A	Nova 11	Jun 16	USA	103.6	1105	773	90.1
053A	Cosmos 1954	Jun 21	USSR	108.6	619	783	74.0
054A	Cosmos 1955	Jun 22	USSR	89.6	382	181	64.8
0SSA	Cosmos 1956	Jun 23	USSR	88.8	265	196	82.3

2. RETURNS

During the period 62 objects decayed including the following satellites:

1987-104A	Soyuz TM-4	Jun 17
1988-038A	Progress 36	Jun 05
1988-041A	Cosmos 1944	Jun 23
1988-042A	Cosmos 1945	May 31
1988-047A	Cosmos 1951	Jun 14

3. NOTES

1988-048A Soyuz TM-5:

Cosmonauts Anatolly Solovav, Viktor Savlnykh and Alaksandr Alexsandrov wars on-board this spacecraft which will conduct 46 astrophysical experiments. The craft docked with space station MIR on June 9, 1986.

1987-104A Soyuz TM-4:

The same cosmonauts undocked from MIR on June 17, In Soyuz TM-4. The descent capsule touched down 202 kilometres south-east ot the city of Dzhezkazgan.

(An Afghan and two Soviet cosmonauts blasted off from Baikonur in the last week in August on Soyuz TM-6 to join two cosmonauts aboard the MIR orbiting station. Captain Abdol Ahad Mohmand, 29, is the first Afghan in space.).

—Contributed by Bob Arnold VK3ZBB

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Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

Discussion with DOTC officers at the Joint WIA/DOTC meeting in July and since then have provided an update on the state of the Devolvement procedures.

Those of you who have applied for accreditation as examiners should by now have received letters from DOTC explaining the situation. Staff shortages and the need to check and refine the computer program for selecting questions, has delayed the start of accreditation procedures, but I have been assured today (August 19) that both theory question banks are complete and entered into the computer, and that the Regulations bank is progressing.

The banks will probably be made available to intending examiners on disc (IBM compatible) or as a printed version. The CW examination generating system will be on disc, with a set of guidelines for producing suitable tests. The program controls the length and speed of the section.

The intended procedure will be that when applying for accreditation, and intending examiner should also request copies of the relevant banks or programs, which are then used to generate the examination paper or tape. The paper or the text of the CW sending or receiving must then be submitted to DOTC for approval. It is suggested that questions should be identified to the bank for ease and speed of checking. Non-bank questions may be used, but approval of these may take longer.

As part of the approval process, the Department will check the actual questions, the balance of questions according to the distribution table, and the overall standard of the whole paper. If it does not gain approval, the sender may be asked to make adjustments.

Examiners will be asked to notify their local State office (and RI if not in capital cities) of the intended times and locations of proposed examinations, so that inquirers at these offices can be directed to appropriate centres, and the DOTC staff can visit the examination if they wish.

Proformas will be published for examination entry, for notification of results to DOTC and for advice to candidates.

Other information to come out of the discussions is that one person is to be appointed to handle all the examination matters. The appointment should have been made by the time this is published.

We also have an assurance that however long it takes to complete the devolvement, there will be a 'phase-in' period. That is, the February examination may not be the last run by DOTC. If necessary, one will be held in May, and perhaps even August.

The new Regulations leaflets are coming along well and should soon be available for issue. Once they are generally available, they will become the basis for the examinations — so questions on mode designations will become valid. I have been assured that the leaflet will contain a clear explanation of the code, and the questions asked will not require a correct 'translation' of the code before the question can be attempted. We will be notified before any changes to the present system occur.

We must also consider possible additions to the Novice syllabus now that they have access to VHF and FM. It seems reasonable that an elementary knowledge of FM at least should be necessary.

Some readers may not be aware that a minor change to the question distribution on theory papers was negotiated recently.

The original devolvement document circulated proposed a fairly radical change, but agreement was reached to increase the emphasis on semiconductors at the expense of vacuum tubes, and, on the AOCP, to add another 'Advanced Modes' question instead of one Interference Question. These changes reflect to some extent, the advances in technology in the time since the last revision in 1984.

I think it is preferable to make small adjustments every four to five years, rather than to have major revisions every 10 or 12.

I am interested in hearing the state of devolvement planning in the Divisions, clubs or other groups. I think I have suggested before that here is a case for co-operation and sharing of resources such as examination materials or even equipment or manpower to help the smaller or remote groups.

The service we supply in providing and administering examinations has the potential to attract many of the new recruits into the Institute. This is the biggest chance we have had since the CB boom. I hope we can make the most of it by providing a quality service and a follow-up which will convince the newcomers of their need to join the Institute if they are to participate fully in their new hobby.

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QSLs from the WIA Collection

Ken Matchett VK3TL
776 Warburton Highway, Seville, Vic. 3139

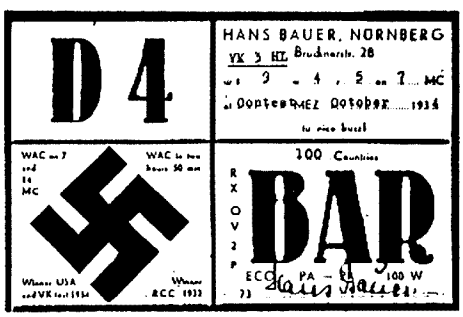
The QSL DI**9AA** shows a most uncommon prefix. It was a maritime mobile station belonging to the German exploration ship *Zarifa*, a 320 tonne three-masted schooner. The aim of the expedition was to carry out underwater research during which photography was to play an important role. We can see the underwater cameras with which the couple in the photograph are equipped.

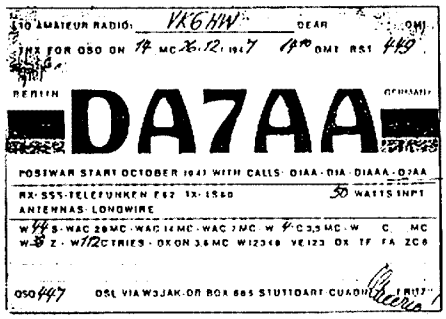
The gentleman is Doctor Hass, a prominent German zoologist. The lady, also dressed in diving gear, is his wife Lotte, who was the only female aboard. The ship set out from Hamburg, Germany and aimed to travel via the Azores and the Caribbean to the Galapagos.

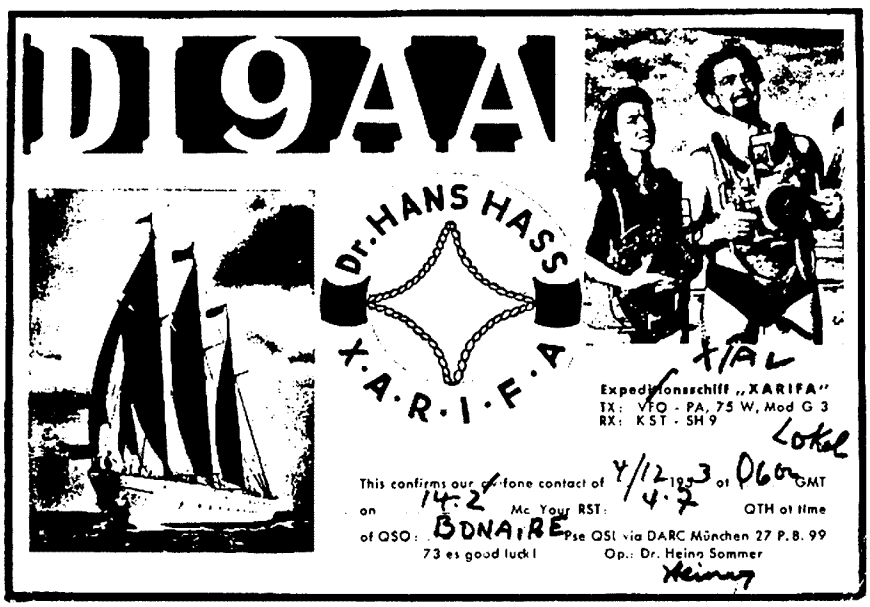
This QSO, details of which appear on the QSL, was dated December 4, 1953, and was between Stan VK3TE and Heino Sommer, the ship's doctor (who incidentally was the ship's radio operator), when the *Zarifa* was berthed at Bonaire in the Netherlands Antilles.

The QSL, **DA7AA** bearing the unusual DA prefix is that of a German national (appropriately called "Fritz"), despite the fact that no licences were granted to German nationals at that time. During the years 1947 and 1948, there were several stations on the amateur bands signing with the prefix DA. The Office of Military Government (US) in Germany, advised in June 1948 that "No DA prefixes are legally authorised and action is being taken to identify and apprehend the operators involved". At the time there were several appeals to operators not to send DA prefix QSLs through QSL bureaus. The magazine *QST* in its May 1948 edition, put the matter plainly: "This DA business over there is unauthorised stuff and until the air clears a bit there'll be no recognition of it in this pillar, okay?". Ironically, the much maligned DA prefix (DA1 to DA4), was subsequently allocated to foreign occupation personnel in West Germany.

Just after the war, the prefix allocation D2AA — D2ZZ was given to qualified British military occupation members, D4AAA — D4ZZZ to US forces, and a limited number from the block D5AA — D5ZZ to French occupation personnel. In early 1949 the D2 prefix became DL2, D4 became DL4 and D5 changed to DL5. At the same time, German nationals were permitted to hold amateur licences and were allocated other DL calls, the February 1949 edition of *QST* stating that "about 800 German amateurs have qualified for their new DL calls and should be on the air soon.". The situation is a little different today. West Germany's growing affluence has seen the number of licensees increase to more than 50 000, a figure being exceeded only by that of one other country — the United States of America.







D4BAR, is plainly adorned with the Nazi symbol, the swastika, and although this became a hated symbol of fascism and oppression in later years, was at the time of this QSO, just another national symbol not unusual on many QSLs of today such as the maple leaf of Canada, or the Cross of David on Israeli QSL cards.

The letter D is amongst the earliest allocated prefixes following the supplanting of the old "intermediates" in 1929. In the early days of course, there was only one Germany and so the German authorities had the option to allocate any call sign beginning with the letter D, using D by itself or D followed by another letter (a later development). Just after the World War II, the only German amateur licences were given to the occupation forces, and these used the old D prefix. In fact, the prefix D (Deutschland = Germany) was one of only six single-letter prefixes originally allocated, the others being F (France), I (Italy), G (Great Britain), J (Japan) and U (USA). Only the first three have survived to the present time in their original form, prefixes D, J and U having been re-allocated in recent times to other DXCC countries.

The receiver information on the D4BAR QSL "RX OV2P" (more commonly written O-V-2) indicated that the set had no RF amplifier, a detector (V) and two stages of audio amplification. Using 100 watts, Hans did very well as an operator, his QSL showing that he "Worked All Continents" in one hour 50 minutes, as well as winning a few international contests. His "Tu nice buzz" takes the place of our more modern "Tnx fb QSO".

Hans' QTH was Nurnberg (Nuremberg in English) which was a very strong centre of the Nazi party. In fact, it was the "Nuremberg Laws" of 1935 that actually legalised the widespread oppression of the Jews. Nuremberg was occupied by US forces in the last months of the war and became part of the US zone of Germany. The date of the QSO was 1934, Herr Hitler having become Chancellor of Germany upon the invitation of President von Hindenburg during the previous year.

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QRM DEVASTATES 10 METRES

This is fact, not fiction and may be backed by any 10-metre band enthusiast. It is a problem that must be dealt with, before the solar cycle peaks, as this is a band that is different from all others by the devoted attitude, co-operation and general goodwill that is instilled in all that use it.

The daily round-the-clock intrusions can be heard at any time and it is thought that operators throughout Australia are being disadvantaged by the Asian orientated QRM, from making valid contacts to other continents with good reports. Please listen and make your contribution to your Intruder Watch Co-ordinator to assist in eradicating these menaces before they remove the amateur service from the band, that may be lost for all time. The saying 'Use them or lose them', has never been so true. Anyway who wants to know who wants a taxi or where are the best fishing grounds, particularly when they cannot understand or use the information?

—Contributed by Bill Martin VK2COP and Ken McLachlan VK3AH

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Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

THE FERRITE CORE CHOKE SOLVED THE EMC PROBLEMS

It was mentioned in earlier EMC reports that most modern electronic equipment used by the general public no longer has a metal chassis, which could be considered as an earth reference point, while a two-pin mains plug with a two-core lead has replaced the former three-pin plug and three-core cable. This "improvement" means that add-on plug-in filters using L-C components, tuned filter circuits and a shielding can maybe ineffective, because the shield and filter earth points are no longer earthed, causing the filters to be largely bypassed by the unwanted RF

Ferrite core chokes can be used to reduce greatly the unwanted RF reaching the equipment (television, video recorder, Hi Fi, organ, computer, etc) via the mains cable, other attached connecting cables or the feeder braid shield. In the case of the mains choke, the wire must be thick enough to carry the operating current, and the insulation must be good enough to be safe. On the other hand, the cable must not be so thick that the choke coil is difficult to wind around the core or has insufficient turns — 15 turns, more if possible, should be used. Male and female plugs should be attached. It is sufficient in less difficult cases to attach the choke to the power point at the wall, and to curl up the mains cable near the equipment. In difficult cases the choke must be as close to the equipment as possible, cutting the mains cable. The ferrite core used must be of the low-Q high permeability type as used in television line frequency transformers. High-Q low permeability antenna rods will only be effective if 30 or more turns can be applied.

Ferrite television line-output C-cores and 15 turns of mains cable effectively stopped my amateur signal from reaching my neighbour's television set. It also stopped the RFI from the line frequency oscillator from reaching my receiver. This had been a 4 kHz wide S5 signal every 15.625 kHz on 20 metres and worse at lower frequencies, whenever my beam was pointing in the direction of the next door house.

A highpass filter near the tuner and a feeder braid breaker filter did not help greatly. A ferrite antenna rod choke did not work either, its permeability being too low.

The mains cable ferrite core chokes and feeder braid chokes were tested using a signal generator and a sensitive RF volt-meter with -70 dBm range. The attenuation amounted in all cases to about 35 dB between 10 and 420 MHz. The wanted signal is not attenuated by the braid separation choke, unlike some not so good high pass filters. The same mains ferrite choke, placed between the power point and my wife's electronic organ, stopped my signal from affecting the organ, and also the organ signal was no longer heard on shortwaves. Who is disturbing whom? The braid stopping choke was wound with thin coaxial cable on a ferrite ring core of 40 millimetres OD and 90 millimetres ID. The braid breaker choke can also be used on Hi Fi, AM, FM receivers, whilst the mains choke can be used also to protect computers and Hi Fi receivers from mains high voltage high frequency spikes, which could blow up transistors and ICs.

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A R Showcase

Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

BAIL WINDS DOWN

In early August the following note was received from Stan Roberts, Proprietor of Bail Electronics.

"Am rapidly winding down the activities of Bail Electronics and expect to close the shop in Wangaratta by about mid-August.

"Plan to maintain an interest in the Yaesu products which Bail Electronics have marketed and as far as possible will help former customers and owners of Yaesu products.

"However, I am retiring and in retirement I will not be providing an "on-call" service. I would prefer queries and requests to be made in writing to me care of PO Box 506, Wangaratta, Vic. 3677, but messages may be left on my home number of (057) 66 2359."

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SAIKO MOBILE SC7000 SCANNER

Captain Communications, Australia's leading scanner specialist, have just released the high performance Saiko SC7000 scanner. This scanner offers performance and facilities normally associated with much more expensive units.

Frequency range is unusually comprehensive, covering:

* HF band including CB band 26.000 to 30.000 MHz.
* VHF low band 68.000 to 88.000 MHz.
* Air band 118.000 to 138.000 MHz.
* VHF high band 138.000 to 178.000 MHz.
* UHF band 380.000 to 512.000 MHz.

There is a very comprehensive display show mode, channel, frequency and channel step. Search functions are very comprehensive and

work in five, 12.5 or 25 kHz steps. Sensitivity is a high 0.5 uV, an excellent figure for a wide band scanner. Scanning can be through up to 50 memory channels. Delay function, channel blockout and priority channel are all provided.

Input/output facilities include 12 volts power, antenna and speaker.

For further information contact Captain Communications, 28 Parkes Street, Parramatta, NSW. 2150. Phone (02) 633 4333.

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G — General
C — Constructional
P — Practical without Detailed Constructional Information
T — Theoretical
N — Of particular interest to the Novice
X — Computer Program

RADIO COMMUNICATIONS — May 1988. Thermoelectric Coolers. (G). Working with Operational Transconductance Amplifiers (OTAs) (G N). Digital IC Tester for the Commodore 64 (P X).

QST — May 1988. Pictures by Packet (G). Audio RFI (G N). Noise Bridges (G N). ARRL Financial Statement (G). PIN Diodes (G).

CQ — May 1988. Western Sahara Story (G). RFI and the Novice (G N). Packet Radio (G).

73 MAGAZINE — May 1988. Satellite Issue. (Satellites and the Future) (G). UoSATS and Britain (G). History of Project OSCAR (G). Hardline Connector (P). Winnebiko Solar Powered Hi-Tech Bicycle (G).

HAM RADIO — June 1988. A 10 GHz Microwave Station (P). Quad Antennas (T). Yagis versus Quad Antennas (T).

CQ — July 1988. The Western Sahara Story (G). The Tonschreiber (G). Semi-random Code Practice Program (X N).

QST — June 1988. Versatile Modem (C). New Phase 3C OSCAR (G). Digital Voice Message System (C). Low Cost Keyer (C).

HAM RADIO — July 1988. Annual VHF/UHF Issue. Six Metre Beam (P). Two metre Monitor (C). Low Cost Comb Generator Calibrator (P).

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MORE FOR LICENCE

The amateur station licence fee will rise $2 to $30 from December 1, 1988.

Radiocommunication licence fees will rise an average of six percent from that date also according to the Federal Budget.

When inquiring about products you have seen in AR, don't forget to mention where you learned of the product!

IT SEEMS TO ME. . .

(Author Unknown)

It seems to me they are building staircases steeper than they used to

The risers are higher, or there are more of them, or something.

At any rate, it is getting harder to take two steps at a time

Nowadays it is all I can do to make one step at a time.

Another thing I've noticed is the small print they're using

Newspapers are getting further and further away when I hold them.

And I have to squint to make them out.

The other day I had to back halfway out of a telephone booth to read the number on the coin box.

It is ridiculous to suggest that a person of my age needs glasses.

But the only way I can find out what's going on is to have somebody read aloud to me.

This is not very satisfactory, because people speak in such a low voice these days that I can't hear them very well.

Everything seems farther away than it used to be.

It's twice as the distance from my home to the station now,

And, they've added a fair-sized hill that I never noticed before.

The trains leave sooner too, I've given up running for them because they start faster when I try to catch them.

They don't put the same material into clothes any more, either

All my suits have a tendency to shrink, especially around the waist or in the seat of the pants

The laces they put in shoes nowadays are much harder to reach

Even the weather is changing. It's getting colder in winter and the summers are hotter than they used to be.

I'd go away if it wasn't so far.

Wood is tougher when I try to chop it

Draughts are more severe too,

It must be the way they build windows now.

I got to thinking about all this while I was shaving this morning

I stopped for a moment, and looked at my reflection in the mirror

They don't seem to use the same kind of glass in mirrors anymore!

Contributed by Dennis Dedman, 464 Mount Dandenong Road, Kilsyth, Vic. 3137

ar

Club Corner

TOWNSVILLE AMATEUR RADIO CLUB

From July 16-19, 1988, the Townsville Amateur Radio Club was involved in a display associated with the touring Australian Bicentennial Exhibition.

Whilst in Townsville, the Exhibition itself attracted a record number of local community club displays, and also record audiences. In our location not far from the main cinema tent, we were in just the right position to attract the crowds both coming and going. In fact, at times more than 50 persons were counted as they inspected out display.

For the four days and nights of the Exhibition, club members manned the display, answered questions, and operated under the special call sign, VI88QLD. Over 500 contacts were logged in the special log book over this period. The normal VK4WIT North Queensland News Broadcast, on Sunday evening, also originated from the display, and attracted much favourable comment.

The Exhibition staff assisted with the erection of the mast and antennas, which included a 10/15 metre beam (hand rotated), an 80 metre dipole, 80/40/20 metre vertical, and a two metre antenna.

The display included many items of historic value, right through to modern aspects of operational equipment such as amateur television. In addition to the laminated posters already available in the club, the Mackay club also assisted by sending a large selection of poster to be used.

The item which caused the most comment, however, was an old Model 15 teletype, which was constantly in use except for the period when its motor produced copious amounts of smoke, and had to be rapidly replaced.

Hand-held radios were also used to co-ordinate the various aspects of the fireworks display.

Although the club has been involved with numerous displays over the years, this one was voted to be one of the best in terms of interaction with the public.

—Contributed by Peter Ronton VK4PV, Publicity Officer, Townsville Amateur Radio Club

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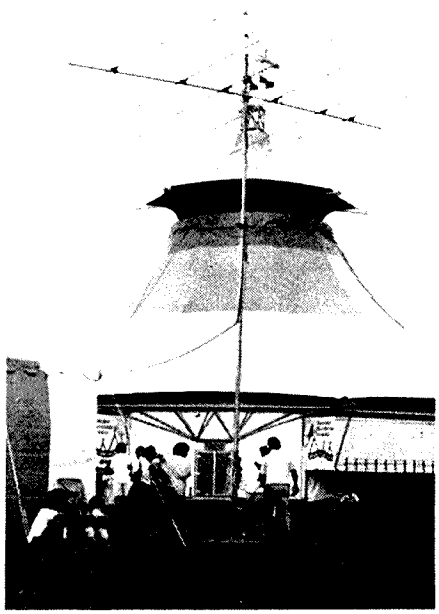
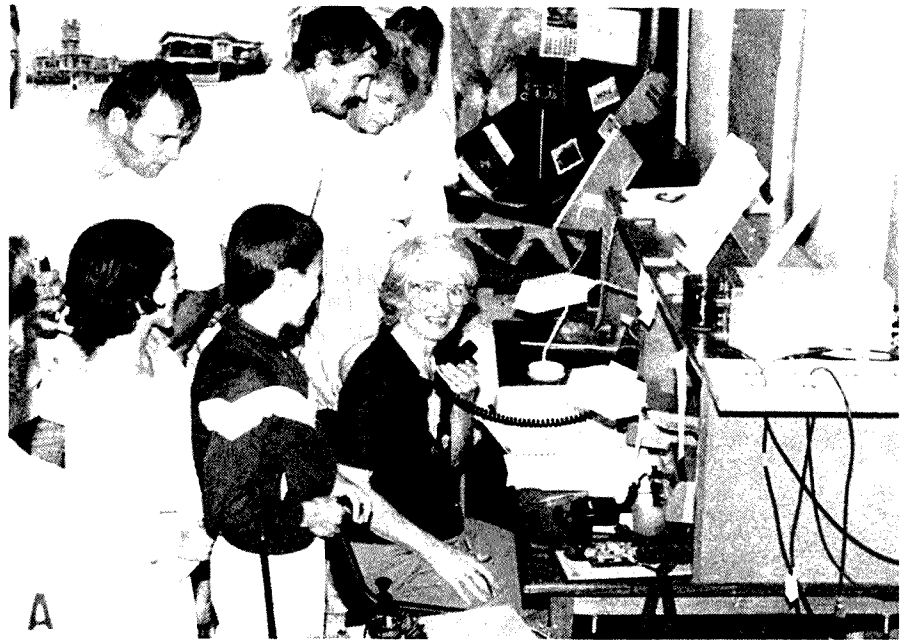


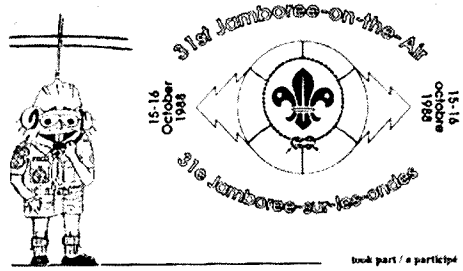
Townsville Amateur Radio Club antennas against the backdrop of the main cinema tent at the Australian Bicentennial Exhibition.



Townsville Amateur Radio Club President, Evelyn Bahr VK4EQ, conducting the normal Sunday night VK4WIT North Queensland News Session in front of an appreciative audience at the Australian Bicentennial Exhibition.

THE SCOUT ASSOCIATION OF AUSTRALIA
31st JOTA
October 15/16, 1988
0001 hours Saturday to 2359 hours Sunday, World-wide

The Australian Official Opening Broadcast will emanate from Government House, Canberra, on 7.090, 14.190 and 21.190 MHz over VK1BP at 0400 UTC, on the Saturday afternoon. This will be followed by a call-back of JOTA stations. I would be appreciated if these frequencies are kept clear from 0330 UTC for final checks.



World Organization of the Scout Movement
Organisation Mondiale du Mouvement Scout

In 1957, a Scout amateur radio was setup at the Jubilee Jamboree in Sutton Coldfield, England. The first Jamboree on the Air was held in May 1958. Interest has constantly increased. Now, each year some 300 000 participants in more than 100 countries make this event the largest "gathering" of Scouts and radio amateurs in the world.

Why don't you join In this year?

—Contributed by Peter Hughes VK6HU, JOTA National Co-ordinator

ar

BALLARAT AMATEUR RADIO GROUP

The Ballarat Amateur Radio Group will again hold its annual "Hamvention" '88 on Sunday, October 30, 1988.

Venue will be the Sebastapol Football Club Rooms at the Marty Busch recreation reserve, seven kilometres south of Ballarat on the Ballarat/Colac road.

This year's event will be similar to previous successful functions, with something for everyone. Also, a lucky registration prize, valued at $50.

The usual trade displays will again attract many exhibitors, along with a number of amateur events in the afternoon. There will be a home-brew competition, special auction of unwanted equipment (bring along your pre-loved junk for the auction!).

The usual barbeque lunch will be provided along with afternoon tea and free coffee on-tap all day. Admission for the day is $8 per person, children under 16 years free. Free Children's passes will be available to local tourist attractions when you register on Sunday. Make it a family day!

On Saturday evening, October 29, the club will host visitors to an informal counter tea at the Blue Bell Hotel, Howitt Street, Wendouree. Any visitors attending the counter tea should book their places with the person listed below as last year's tea was a sell-out.

The club can recommend motels or caravan parks, should you require overnight accommodation, and there is a motel opposite the Sunday venue, however bookings are always heavy, so book early.

Repeater Channel 3, and 3.600 MHz will be monitored during the day in case you get lost.

For further information contact Kevin Hughes VK3WN, on (053) 35 5011.

—Contributed by Kevin Hughes VK3WN, Hamvention '88 Convenor, Ballarat Amateur Radio Group

ar

NORTHERN CORRIDOR RADIO GROUP

The Northern Corridor Radio Group Hamfest will be held in the courtyard of the Carine College of TAFE on October 9, 1988, commencing at 9 am.

Anticipated features are:

Displays of amateur radio equipment by major retailers, electrical construction display, exhibition of various modes of amateur radio communication, the club station (VK6ANC) will be in operation using the special call sign VI88WA, and a white elephant stall.

It is hoped that funds raised at the Hamfest will enable the club to move into other areas of experimentation in amateur radio. The club currently operates the 28.264 MHz beacon on behalf of the WIA WA Repeater Group and rebroadcasts the VK6 WIA News on 7.075 MHz on Sunday mornings from 0130 to 0200 UTC.

For further information contact John Howlett VK6ATA on (09) 307 4407.

—Contributed by Frank Hampshire VK6KFH, Honorary Secretary, Northern Corridor Radio Group

ar

TAMWORTH RADIO CLUB

The Tamworth Radio Club will hold a Field Day on Sunday, October 30, 1988 at the Tamworth Racecourse, in Jewry Street, from 9 am to 5 pm.

Admission is free and there will be many and varied features including demonstrations of new equipment. Barbeque and refreshments will be available.

The club has only recently reformed and members are attempting to raise funds to promote a communications network in the north-west of New South Wales. The Field Day is the first official function of the new Tamworth Club so come along and help this day be a huge success.

—Contributed by Trent Sampson, PO Box 4, Tamworth, NSW 2340

ar

CENTRAL COAST AMATEUR RADIO CLUB INC

All amateur radio operators, their families, friends and all interested in amateur radio are invited to attend the club's 32nd Annual Field Day on Sunday, February 19, 1988, at the Showground, Showground Road, Gosford, NSW.

Registration will cost, Gents $5, Ladies and Pensioners $3, Children under 15 $2. A special group concession will be available on application.

Companies, persons, groups, or clubs wishing to set up a table or display at the Field Day should contact the Central Coast Amateur Radio Club Inc at PO Box 252, Gosford, NSW. 2250, or telephone Bren Connolly VK2BJC on (043) 23 1662.

Start building now for the home-brew contest and the 70 centimetre home-made antenna evaluation.

Proposed program and other special attractions will be forthcoming at a later date.

—Contributed by Les Watsford VK2CLP, for the Gosford Field Day Committee

ar

NORTHERN CORRIDOR RADIO GROUP

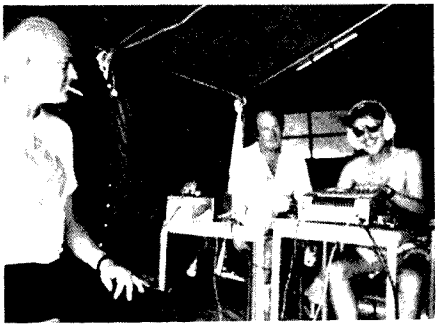
Last years John Moyle Field Day site was good, but this year the group wanted something better. After checking contour maps, a field day reconnaissance party decided on a site at Gin Gin, some 60 kilometres north of Perth.

Permission was obtained to set up a station, and after work on the Friday, cars, trailers and a caravan headed along the great Northern Highway.

Greg VK6NGM, 10 metre Station Operator and Log Keeper, Hawk an SWL.

The 10 metre station, two-element Delta beam.

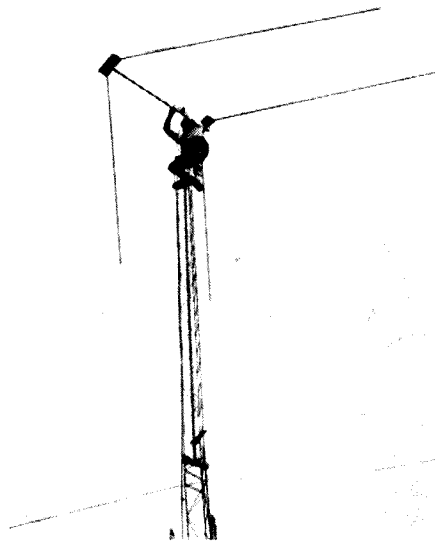
During the short time before sundown, beam antennas for 15 and 20 metres were made ready for the 24 hours ahead, then the party settled down to something to eat and drink. Jokes and unlikely stories about impossible situations were told, and even if the group had packed up and headed home next morning the trip would have been worthwhile.



The 20 metre shack. From right: Scotty W7SW (on loan), Gerald VK6YGH and Brian VK6BQN.

On Saturday, UHF, 6 and 10 metres were put on air and operating commenced. The 40 degree heat, strong wind and sand made the day's effort hard and thirsty work. The group used the special call sign VI88WA.

Antennas for 40 and 80 were built on Saturday and although they performed well, few contacts were made on these bands due to VK/ZL activity. Why call VK6 for points when ZL was worth 20? The scoring in this part of the contest severely disadvantaged Western Australia and it was necessary to work DX CW stations to get any



John VK6JX, checks the antenna.

The VHF shack. From left: Tony VK6ZTL, Jack VK6KDX, Nevil VK6ZES, Hamish and Scott (SWLs).

The VK6ANC/VI88WA team. Back from left: Hawk SWL, Greg VK6NGM, Tom VK6ATL, Ray SWL, Nick VK6JMS, Ian VK6ZIC, John VK6JX, Phil VK6ZPP, Tony VK6ZTL, Peter VK6PK, Nevil VK6ZES. Front: SWL, SWL, Hamish SWL, Jack VK6KDX, Alex VK6APK, Scott SWL, Scotty W7SW, John VK6ATA and Frank VK6KFH.

points. Let's hope for a fairer points system next year when the group will be back to enjoy another great weekend.

—Contributed by John Howlett VK6ATA

ar

MOORABBIN AND DISTRICT RADIO CLUB

The Moorabbin and District Radio Club operated in the John Moyle Memorial Field Day Contest from the Mount Martha Scout Reserve.

—Contributed by Ken Gott VK3AJU, President, Moorabbin and District Radio Club. Photographs by Max Meallin VK3ATK

ar

Doug VK3CCY, organiser of the operation and club secretary.

Philip VK3KPK, operating on VHF.

The Moorabbin Operating Site.

QSP

SIX-METRES IN QUEENSLAND

Following is a letter from DOTC outlining operating conditions applying to the use, by the amateur service, of the 50 to 52 MHz band in Queensland.

At present commercial television station ATQ-0 situated at Mount Coot-tha, Brisbane operates on Channel 0. However, during September — October 1988 this will be changed to Channel 10. The change will be achieved by swapping operating channels with DDQ-10 Darling Downs. The existing Channel 0 being transferred to Darling Downs located near Toowoomba.

This change does not alter the existing restriction that amateur stations may only operate in the 50-52 MHz band outside the hours of operation of any Channel 0 station.

—Contributed by Mr A Jordan, A/g Manager Regulatory, Radiocommunications Operations Branch, Communications Operations Division, DOTC

ar

WICEN News

POLICE CHIEF PRAISES WICEN

"Very high standards . . . a reputation for professionalism, reliability and co-operation within the emergency services."

That was how Victoria's Chief Commissioner of Police, Kelvin Glare, described the Wireless Institute Civil Emergency Network (WICEN) in the preface of the new WICEN Victoria operator's handbook, WICEN Procedures and Techniques Handbook.

The full text follows:

The State of Victoria is dependent on its volunteer organisations to provide their various areas of expertise in times of emergency.

In the relatively short history of this State, we have been involved in a number of emergencies of varying descriptions and degrees of severity, the most common being the bushfire.

History has shown that on each occasion, the volunteer organisations have performed with great efficiency and co-operation whilst working side by side with the full time, paid Emergency Service workers.

Throughout the years, WICEN members have established a reputation for professionalism, reliability and co-operation within the emergency services and it is hoped that the very high standards previously attained by its members, will continue to be maintained.

The success of combatting any emergency situation relies on complete co-operation between all organisations involved, and while the community looks to Police to take the initiative in times of emergency, the restoration of order from chaos can only be achieved with the assistance and co-operation of agencies like WICEN.

WICEN members are part of the community and as such they have accepted a collective responsibility to participate in efforts to assist in the combat of and recovery from emergencies. It is this attitude of co-operation and community self-help which exemplifies the spirit of the State Disaster Response Plan.

Forward Bias

Norm Gomm VK1GN
GPO Box 600, Canberra, ACT, 2601

DIVISIONAL PARTS BOX

The Divisional Parts Box, under the care of Neil VK1KNP, is operational, but we still need suggestions for items to stock.

MONTHLY MEETINGS

The July meeting of the Division saw Neil VK1KNP, talking about AUSSAT and space communications. Neil's presentation included a practical demonstration of the satellite's capability.

Neil gave an excellent demonstration of problems in trying to line up with a satellite, particularly in trying to work through trees. Some cruel people suggested this particular demonstration was not planned. I think the things that impressed most members were the effect of polarity on signal strength and spatial separation, and the quality of the BMAC system compared with PAL. Congratulations to Neil for a top class presentation.

Future meeting dates are:

October 24
November 28

At the time of writing, no program had been set for the October meeting. The November meeting will be the end of year social event including an opportunity to swap, sell and buy pre-loved equipment.

Remember, Hank VK1HZ, is still looking for those new and innovative topics. So, any suggestions will be gratefully received. Hank would prefer topics that have a strong amateur radio flavour.

PACKET ACTIVITIES

The ACT Packet Group normally meets on the first Thursday of each month, but this is subject to variation. Details of venues and dates are beaconed by Richard VK1UE, about one week before a meeting.

Details on the ACT Packet Group activities can be obtained from Carl VK1KCM, by telephoning (062) 89 7819 (work) or (062) 58 3921 (home).

JOHN MOYLE FIELD DAY 1989

The John Moyle Field Day usually takes place in March each year. Now is the time to start planning ahead, given the Christmas break and certain administrative requirements.

If you have any suggestions, wish to participate, or help with its organisation, please contact me, Norm VK1GN on 54 8512 at home.

CPO Ken Jone climbing the tower of one of the 3-30 MHz log periodic antennas.

VISIT TO THE NAVY'S RADIO STATION AT BELCONNEN

On August 6, 1988, Hank VK1HZ, led eight Canberra amateurs and one YL on a visit to the Navy's Radio Station at Belconnen. For those of you not fortunate enough to live in sunny Canberra, Belconnen is a northern suburb of this fair city.

The most prominent feature of the station is a very large HF antenna, consisting of three masts of approximately 100 metres height and separated by a similar amount. Contrary to popular opinion, it is not a dipole but a top loaded vertical. The loading is achieved with a capacitance hat of wire strung between the two outside masts. Just to whet an amateurs appetite, there are another 48 HF antennas on mere 30 metre masts — some antenna farm!

Our intrepid nine toured the historic transmitting station and the extensive antenna farm under the guidance of Commodore Tony Dinetta, ably assisted by the Station's Senior Technical Officer, Mr Ken Felthall. According to Hank, the Navy "bent over backwards" to make the visit memorable. According to those who went, the visit was summed up in one word — *fantastic!!!*

From left: Karl VK1KCM, David VK1ZDT, George VK1GB, Neil VK1KNP, George's wife, Frank VK1FA, Stirling VK1ZDJ, Barry VK1ABR, Hank VK1HZ and Commodore Tony Dinetta.

VI88ACT

At the time of going to press, VI88ACT has worked over 3000 stations and 481 prefixes. Details of the bands and modes worked are given in the following tables.

80m	40m	20m	17m	15m	12m	10m	6m	2M
542	641	1113	1	585	75	204	3	20

MODES USED:

CW	SSB	AM	FM	PKT	AMT	RTT
338	2737	0	13	7	10	68

So far 23 operators have used this call sign. The most active is VK1ZL, closely followed by VK1PJ. Operation from Parliament House on its opening day drew some 439 QSOs. A great effort by all involved, but special acknowledgments to Phil VK1PJ and Dan VK1ST, for their tireless efforts in co-ordinating the station and arranging QSL cards. For those who have not worked VI88ACT, there is an excellent multicoloured QSL card available showing an amateur beam superimposed over Parliament House.

REPEATERS

Both UHF repeaters are suffering from interference problems.

VK1RIR's problems have been identified, but at this stage, a cure is not readily available. The source of the interference affecting VK1RGI is yet to be identified and, due to access difficulties, it may be some time before this problem can be tackled.

In summary, it is going to be some time before these problems can be solved — so please bear with us.

ESANDA AUSTRALIAN CAR RALLY

On the weekend of August 13/14, 1988, the VK1 Division provided safety and administrative communications for the ESANDA Australian Car Rally. The organisers were very appreciative of the Division's efforts and stated that it made an important contribution to the safe and efficient running of the activity. Those who contributed are too numerous to name, but special thanks must go to Ken VK1KEN, who had the task of organising the Division's efforts.

VK1 CLASSES FOR FULL AND LICENCE CALLS

On behalf of the Division, Ian VK1IF runs consecutive courses for Novices and Full Calls. The Novice series has now finished and the Full Call classes are underway. Each class starts with 30 minutes of the dreaded Morse code, followed by two hours of theory.

The classes are held each Tuesday in Room 3 of the Griffen Centre and are run on an informal basis to suit student needs.

Even though the course is underway, additional students, particularly Novices wishing to upgrade, are welcome. Also, Ian would like to have any suggestions for running next year's courses. If you have any ideas, please call him on 51 3640 at home.

ar

MURPHY'S CORNER
Corrections to Schematic of VHF AMTOR/RTTY/PACKET MODEM (AR JULY 1988) by Ron Mills VK5XW

1. The 12 volt to pins 6 and 7 of the XR2211 should go via a 10k resistor, not direct as shown on the schematic.
2. From the centre terminal of the TTL OUT switch (Norm/Rev) there should be a 4k7 resistor to the base of the BC548 transistor instead of a direct connection.
3. If there is a problem in setting the XR2211 to 1700 Hz for Packet, change the value of the 2k potentiometer from pin 12 to 5k, or add series resistance.
4. See Figure 1 for the correct wiring around pins 1, 2, 3 and 4 of the XR2206. This was really messed up!
5. Ron apologises to anyone who tried to build this normally placid and reliable modem and couldn't spot his drafting mistakes.

ar

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

FORUMS

The VK2 Division has been holding several successful forums this year. Before the year is out it is hoped to hold one on satellites and another IPS presentation. The broadcasts will advise further information. By this time, the TVI kit based on the lecture given by Ron VK2DQ, should be ready for members to borrow.

Don't forget the video tape library at Parramatta. If you are short of a lecturer for a monthly meeting or you live remote for a radio club, you can borrow a copy — VHS format.

FIELD DAYS

The Tamworth ARC advise that they will be holding a Sunday event at the Tamworth racecourse on October 30. Contact via PO Box 4, Tamworth, NSW. 2340 or phone (067) 66 6906.

The following weekend the Wagga ARC will be holding their field day on Saturday, and Sunday, November 5 and 6. Contact via PO Box 294, Wagga, Wagga, NSW. 2650 or phone (069) 22 6973.

CONFERENCE OF CLUBS

This will be hosted by Illawarra ARS in early November at Wollongong. The agenda has now closed and clubs should check their monthly posting for details.

JOTA

This will be over the weekend October 15-16. AX2WI will retransmit the opening address at 2 pm, on Saturday if the originating signal is good enough. Have you arranged with your local Scout group to help?

POSTCODE CONTEST

Friday, October 28, between 9 and 11 pm on the 70 centimetre band. The next Trash and Treasure will be Sunday afternoon, November 27.

VK2AWI

A station is being set up at Amateur Radio House for visitors and public demonstrations. With the closure of the Powerhouse Museum station there is no place, other than Dural, that the public can see amateur radio.

VI88NSW

The next major operation will be the Parramatta Bicentenary Award throughout November. Work the station at several of the Historic Sites for the Award. Also, some operators are still required so contact the co-ordinator, Aub VK2AXT, via the Parramatta Office, from 11 am to 1 pm weekdays on (02) 689 2417, on Wednesday 7 to 9 pm.

DIVISIONAL BOOKSHOP

New stocks keep arriving and these are advised via the AX2WI broadcasts. Are you interested in either the 1989 ARRL Handbook or the US or Foreign Call Books? They will cost about $50 each. Advance orders will be taken up to October 14. Delivery would be early next year. A current book list may be collected from the office or send in a 9 x 4 sized stamped envelope to PO Box 1066, Parramatta, NSW. 2150.

MORSE CODE

First, please keep the 80 metre frequency of 3.550 MHz clear in the early evening to allow those wishing to join the ranks of amateur radio every chance to learn the code. There is also the continuous transmission of VK2RCW, on 3.699 MHz and 144.950 MHz (Sydney).

Morse code, it would seem, is not a dying art. Council has received requests recently to possibly introduce awards for Morse proficiency as well as a high speed Morse broadcast at, say 25 words per minute. Council seeks reaction to these suggestions.

BROADCASTS

A reminder that, with the daylight saving changes this month, that AX2WI follows local time and remains with the technical tape starting at 1045 and 1915 hours and the news content following at 1100 and 1930. Most of the news content may also be found on the VK2RWI Bulletin Board on 4850 and, in turn relayed to other systems. The Slow Morse VK2BWI on 3.550 MHz and ANARTS RTTY News from VK2TTY, follow UTC time and move an hour local time. There is also the telephone news service on (02) 651 1489.

NEW MEMBERS

A warm welcome is extended to the following who were in the August intake.

J R Berthelot VK2FAH	Neutral Bay
M J Farrell VK2FLR	Glebe Point
G D Frith VK2FKN	Lindfield
R M Gilchrist VK2CCM	Manly
P J Godden VK2XPJ	Coffs Harbour
G J Greenwood VK2ZIS	Sydney
E D W Kidd Assoc	Dubbo
K P McCabe VK2PMK	Grays Point
J M McLoughlan Assoc	Dundas
A J Smith VK2XFX	Leura
C T Theng Assoc	North Wollongong

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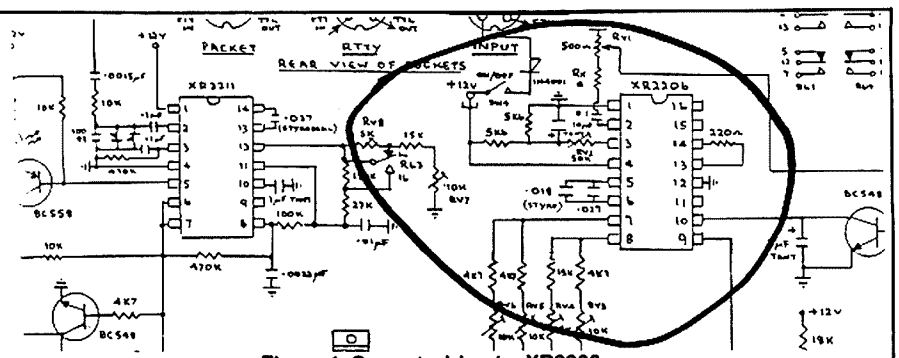


Figure 1: Correct wiring for XR2206.

VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

This month we will deal in detail with the WIA membership fees set by the VK3 Divisional Council for 1989.

Tight financial and budgetary controls of the Division's finances will most likely see to the end of the year financial statements again in the black.

It has been a difficult year with rising costs in all main areas including power, postage, printing, phone, licence fees and general expenses.

Firstly, it is necessary to appreciate that your WIA membership fee is made up of several parts — basically a Federal component and Divisional component — as shown by the following pie charts.

The WIA Federal component (AR magazine, Federal Office, and IARU) has increased $3 per member for 1989.

The Divisional component is the basic source of revenue for the Victorian Division to fund its activities including membership services.

Due to its economic performance in 1988, the Division has been able to absorb $2 of the Federal component rise for the majority of members (Full Grade). The total cost of this absorption is estimated to be around $3 000.

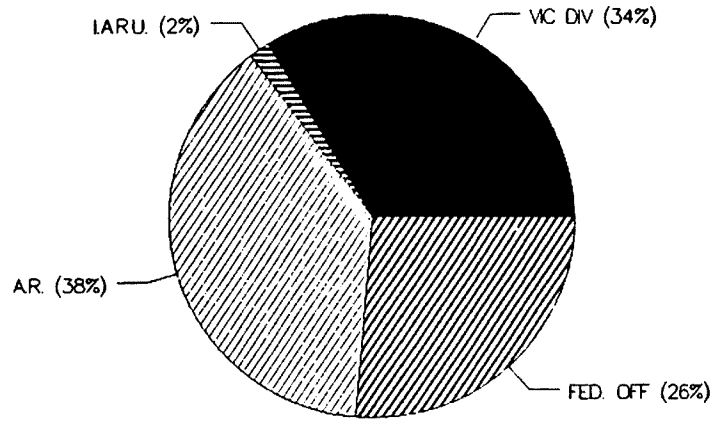
But, because the Divisional component of the other membership grade is low, there was no option other than to pass on the Federal component rise in full.

After considerable deliberation, your elected Council set a new scale of fees for 1989 (see Table).

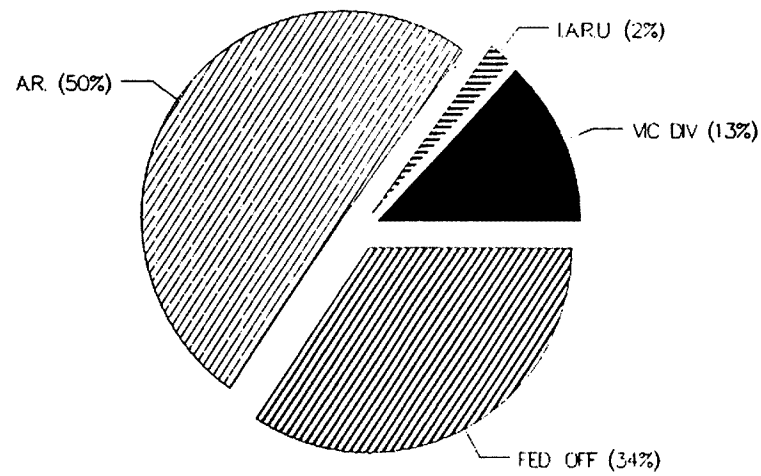
This has resulted in an average increase in membership fees of 6.4 percent — which favourably compares with the inflation rate.

Australia's current inflation level is 7.1 percent and bank economists recently predicted it would be 5.9 percent in the 1988-89 year.

FULL MEMBER FEE



PENSIONER MEMBER FEE



MEMBERSHIP FEE BREAKDOWN

MEMBERSHIP GRADE	AR MAGAZINE	FEDERAL OFFICE	IARU
Full	$19.14	$13.11	$0.75
Assoc	$19.14	$13.11	$0.75
Pensioner	$19.14	$13.11	$0.75
Student	$19.14		$0.75
Family		$13.11	$0.75

MEMBERSHIP GRADE	VIC DIV	TOTAL FEDERAL	TOTAL 1989 FEE
Full	$17.00	$33.00	$50.00
Assoc	$12.00	$33.00	$45.00
Pensioner	$ 5.00	$33.00	$38.00
Student	$ 7.11	$19.89	$27.00
Family	$13.14	$13.86	$27.00

NEW MEMBERS

The following applications were received for the months of June and July, 1988, and were accepted by Council on July 28, 1988.

Donald Anderson VK3VJP*
Reg Barker VK3NGY*
Dennis Bates VK3MBV
Fred Behrens VK3MAV*
Murray Bird VK3PBA*
Andrew Bourke VK3PGK*
William Callahan VK3VCR*
Kerry Clayton VK3KFC
Kevin Cocks VK3NPC*
Kenneth Codlin VK3VRE*
Peter Collen VK3ZTZ
Russell Davenport VK3ERJ*
David Davies VK3NDJ*
James Day VK3ZDG
Dennis Dedman
Phillip De Valle VK3PGP*
Jeffrey Gater VK3AM
Leonard Gibson VKNPG*
John Gordon VK3NUX*
Kenneth Gray VK3KEN
Bernard Gregory VK3TCR
Daryl Hooke VK3NEX*
Paul McClure VK3VBV*
Christopher McLaughlin VK3CHR*
Ronald Maskell VK3VYG*
Kingsley Meres VK3TKM
Mervyn Millward
Frederick Morris VK3VFJ*
Donald Musgrove VK3PKO*
Donald Negus VK3CDN/WD0FQA
Lynton Perry VK3MIV*
John Powell VK3YFG
Gregory Rice VK3VRU
Jeanette Rice VK3VKU
Reginald Riglar VK3NZH*
Fabian Suleau VK3MBP
Rodney Trevor VK3XOK
Anthony Verberne VK3PGU*
Eric Waterman VK3MBR
Barry Watkins VK3TCX

* Joined on a pink "Invitation to Join" form.

Membership costs less than $1 per week. This is real value for money in terms of services provided and representation of your hobby at a local, national and international level.

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

CONGRATULATIONS

The 'stork' was working overtime during the months of June and July, here in VK5. Harmonics were delivered to the QTHs of Ben VK5ABE, Mitch VK5AZM, and Glen VK5ZCF. Our congratulations to them and their respective partners.

Congratulations were also in order to George Luxon VK5RX, who celebrated his 80th birthday and his 59th wedding anniversary to Thelma.

NEW HISTORIAN

It is just as well that I was sitting down when Clarry Castle VK5KL, came up and asked at the July meeting if we were still looking for an historian, or I might have 'keeled over' with the shock. We were, and Clarry volunteered to take over the position from his 'old mate' Ray Bennett who had been wanting to hand it over for some time. Our thanks to Clarry for offering to take on the task.

SILENT KEYS

It is with deep regret that we announce the passing of two of our older members. Jack Dew VK5KX, who was first licenced in 1959, passed away on July 23, as the result of a heart attack. Our sympathies are extended to his widow and son Rob VK1VE. Our Buy and Sell nights won't be the same without Jack.

Roy Dennett (the former VK5IV) who was probably better known to the Old Timers, passed away in August at the age of 93. If you think the call sign sounds familiar, you're right! The current holder of the call sign is Kevin May, our hard-working Broadcast Officer.

TUESDAY, OCTOBER 25:

Mark Spooner VK5AVQ, will talk on his two recent trips to the Antarctic and show slides. 7.45 pm.

Listen to the Broadcast for dates and venues for the Picnic and the Old Timers' Luncheon, Both of which are usually held in November.

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WA Bulletin

John Sparkes VK6JX
VK6 PUBLICITY OFFICER
83 Anemone Way, Mullaloo, WA. 6025

The VK6 Divisional Council believes it is about time to take advantage of the column available to it in the WIA journal.

It has elected me as the Divisional Publicity Officer, with a brief to bring a report each month or as often as time permits.

To make things easy on the first attempt, I will write about something that is familiar to me.

We have quite a few amateur radio groups in this State, and one is the Northern Corridor Radio Group (NCRG).

Shortly after its foundation, this group was featured in AR magazine's Club Corner (see February 1986).

The WIA-affiliated NCRG meets on the second and fourth Tuesday of each month at Carine Technical College, 14 kilometres north-west of Perth City.

The college has provided excellent support to the group. Courses in amateur radio are conducted at the college by Wayne VK6WD.

The group has 40 members ranging in age from 14 to 80 years. Lectures are encouraged at meetings. A recent presentation on receiver performance and dynamics by Cy VK6IK, of the Hills Amateur Radio Group, was very well received. Long live valve receivers!

NCRG has a decided bent for contests, and participates regularly in the RD, Field Day, VK/ZL and Novice contests for the HF championship.

Many other major contests, such as the CO WW receives logs from NCRG.

For most of this Bicentenary Year, the NCRG has been airing the VI88WA call sign. Hundreds of operators in many countries have been worked using our commemorative call sign.

The group's equipment consists of an FT-301D, home-brew 813 linear amplifier, and a Cushcraft A4 Yagi with 40 metre band extensions on a 17 metre tower.

The rotator is a bullet proof prop-pitch motor with Selsyn direction indicator. An enthusiastic bunch of NCRG members have set up the club station, VK6ANC.

The Division's Sunday Broadcast is now relayed on 40 metres by VK6ANC, at 0130 UTC on 7.075 MHz.

A Hamfest will be held on October 9, at the Carine College. The club station is to be operational for public display. One of the activities is a home-brew competition with section prizes.

Local agents of amateur radio equipment will be on hand to display and sell their wares — why not drop in to the NCRG Hamfest on October 9?

Watch for the next installment of happenings in the WIA VK6 Division.

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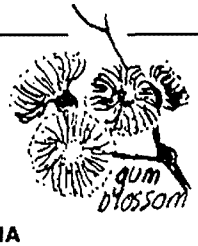

John Rogers VK7JK
VK7 BROADCAST OFFICER
1 Darville Court, Blackman's Bay, Hobart, Tas. 7052

HAMFEST FOR TASMANIA

The 1988 Hamfest will be held as near to Tasmania Day as possible, that is on Saturday, 29 and Sunday 30, October.

The Hamfest activities will run all day on Saturday from 9 am and on Sunday morning from 9 am.

The main venue will be the Southern Activity Centre at 105 Newtown Road, Hobart. At the centre there will be a series of displays depicting various aspects of amateur radio operations — satellites, packet radio, RTTY, standard HF, VHF and UHF communication practices, a Branch store and sale table, mobile clinic (bring in *your* equipment for testing!), and a complete range of social activities, with food and liquid refreshment, and plenty of *chat*.

There will also be some demonstrations and constructional activities, antenna building, adjusting and testing and a display of vintage equipment from the VK7ML collection.

The broadcast of October 30, from VK7WI, will take place from the Hamfest, and you will have the opportunity to see the system in use, what is involved in getting the broadcast to air and you can give your ideas of how the broadcast could further be improved.

The whole Hamfest is to be a get-together for all Tasmanian amateurs and visitors to swap ideas, find out about other facets of out hobby, and join in the technical, as well as social side of the weekend's program.

A BYO barbeque will be set up and refreshments will be available throughout the day. Members of the public are most welcome to visit the displays, so please spread the news, bring the family and friends and enjoy the day.

The ever-popular Sewing Circle Barbeque will be held on the Sunday afternoon to augment the festivities. Visitors from across the State will be able to take part in the Hamfest *and* enjoy the Sewing Circle without having to make two round trips and they will be made very welcome.

All VK7s are asked to listen to the VK7WI Sunday Morning Broadcasts during the month for further details on the Hamfest, so that there is plenty of support to make it an occasion to remember. There may be a special function on the Saturday evening, so keep the date free — we'd hate you to miss out!

Come to what we expect to be a real Old-Fashioned Field Day!

BRANCH MEETINGS

Northern — October 14, 7.30 pm.
North-Western — October 11, 7.45 pm.
Southern — October 5, 8.15 pm.

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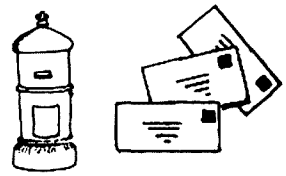
Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Over to You!



LICENCE STRUCTURE

I refer to the Future of Amateur Radio Working Party recommendation 10 outlining the preferred new licence structure, published in July *Amateur Radio* magazine, page 26. Sadly, I cannot agree with the majority of the contents of this proposal.

The structure of the amateur licensing system, as administered by the Department of Transport and Communications (DOTC) was not planned, rather evolved. It is quite a hotch-potch of add-ons, extensions and patches. The proposal seeks, once again, to modify the present licensing system.

I believe that the licensing system should be completely scrapped and restructured from the ground up. It should exhibit the characteristics of forward thinking and careful planning.

DESIRED SYSTEM

A new system should seek to:

a) examine a candidate on the modes and frequencies the candidate wishes to use

b) encourage the licensee to upgrade

c) encourage new members into the hobby

d) rename all levels or classes so as not to associate a reviewed system with the present structure

e) be simple and straightforward.

A system which may suit is outlined below.

TITLE	THEORY EXAM	MODES	BANDS	POWER
Level 1	Satellite, EME, Microwave, ATV, SSTV, FAX, Video UHF/VHF Antennas, Prop	All	All	High
Level 2	Transmit, Receive, Electronics Data (CW, RTTY, PACKET, AMTOR) AM, SSB, FM, A/FSK, PSK	Data AM SSB CW FM	Lower 50 % All	High
Level 3	Batteries, Radio Connections Fuses, Antennas, VHF/UHF Prop Regulations	AM SSB CW FM	Upper 50 % VHF/ UHF	Low

COMMENTS

Morse Code

No Morse examination is proposed. It is an operating skill and should be included with other operating skills such as typing or loading a transmitter into an aerial. The Future of Amateur Radio Working Party particularly recommended that *no* practical test be included as part of a licence restructure (Paper 4, AR December 1987, page 19, first paragraph).

CW as a mode will always be available. However, trends indicate that it will not necessarily be examined in the future. Therefore, it is appropriate that it is considered now as an exclusion to any new licence examinations.

Bands

Lower 50 percent All refers to the licensee's entitlement to operate in the lowest half of all bands. For example, 14.000 MHz to 14.177.5 MHz is the lower 50 percent of the full 14.000 MHz to 14.350 MHz 20-metre band.

Level 2 licensees naturally enjoy the privileges of Level 3, this entitling them to full VHF and UHF band operations.

Similarly, Upper 50 percent VHF/UHF refers to the licensee's entitlement to operate in the upper portion of all VHF and UHF bands. For example, 146 MHz to 148 MHz is the upper portion of the 144 MHz to 148 MHz band.

Level 3

This level is the basic introduction into amateur radio with an elementary theory examination and including the DOTC regulations examination.

Level 2

Level 2 examinations are structured to assess the candidate's knowledge in radio and electronic theory suited to this level. Included are voice and data modes, HF and VHF/UHF techniques and propagation.

RTTY, AMTOR, Packet and CW are bracketed as data modes of communication and are specifically examined.

Level 3 privileges are completely contained within Level 2.

Level 1

The examinations on this level are structured to test the candidate's knowledge in some of the specialised modes of communication. These include TV, FAX, Video, EME, Digital Electronics, Satellite, SHF and Microwave Techniques, antennas and propagation.

Level 3 and 2 privileges are again completely contained within Level 1.

CONVERSION

Conversion for present licence holders would be as follows:

AOCP (full) and AOLCP (limited) — Level 1.

NAOCP (novice) — Level 2.

All candidates holding passes in some subjects associated with the present licensing may choose wither to complete the *remaining* subjects *or* qualify or sit for the appropriate new examination level.

CONCLUSION

Any new amateur licensing system must be simple, suitable and capable of successfully carrying amateur radio well into the 21st century.

A carefully restructured system, such as the one outlined above, can only assist in providing a sound foundation *for* the real Future of Amateur Radio!

Regards.

Will Scott VK4XP
PO Box 826
Gladstone, Qld. 4680

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VHF MODEM FOR RTTY, AMTOR AND PACKET — ADDENDUM

Since submitting the article on a VHF RTTY/AMTOR/Packet modem, which was published in *Amateur Radio*, July 1988, difficulties with regard to interfacing the modem with the Digicom›64 program have been encountered with late model Commodore C64Cs. I had not intended publishing any specific interface connections at first, but as Digicom›64 V1 and V2 are becoming very popular (public domain) I included, almost as an after thought, the C64 cassette port connections for Digicom›64.

The simple interface shown on page 15 of July AR worked quite okay until the later model C64Cs arrived. They have serial numbers commencing around HB4 300,000 plus. The model can be readily identified by looking into the rear cassette and user ports. If you can see a row of disc ceramic capacitors immediately at the rear of the port contacts, then the TTL out from the C64C to the modem will not work properly (you cannot connect to anyone but reception is not affected). From cassette port pins 2 and 3 there have been fitted 0.1 uF and pins 4, 5 and 6 470 pF disc ceramic capacitors to ground. The TTL out from the junction of the resistive network between cassette port contacts 1 and 3 (2k2 and 4k7 ohms) no longer is effective due to the 0.1 uF now fitted to pin 3 of this C64C. All of this model C64C that I have seen have had a seal affixed to the centre screw hole underneath the computer preventing the removal of this offending capacitor without voiding the three-month warranty. (Most of the computers affected are of very recent origin so will be still under warranty). The lifting of this 0.1 uF capacitor probably would solve the problem if you don't mind losing your warranty.

One method of overcoming this problem is to substitute the 2k2/4k7 resistive network with a 5k tab potentiometer and adjust its value until you can connect okay with other packet stations. This is not really a good solution. I have found that by removing the resistive network altogether and replacing it with an opto-coupler, eg a 4N28 and two resistors, *a reliable solution can be found that* works with any model of C64 computer. The 470 pF capacitors fitted to the other cassette port pins do not seem to affect the reception in any way.

The suggested circuit is in Figure 1. It would, in most cases, be more convenient to fit the components inside the modem rather than at the cassette plug.

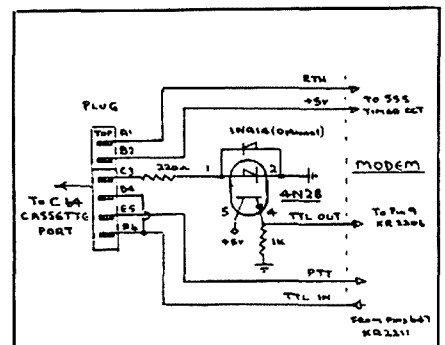

Figure 1: Wiring from the C64 to Packet AX25 Modem using Digicom›64 Software.

Hoping that this is of help to those who are using the Packet program Digicom›64 with a nice new Commodore C64C computer and are wondering why their system will not work.

73,

Ron Mills VK5XW
13 Taylor Terrace
Rosslyn Park, SA. 5072

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A "DELTA QUAD" IS THE SAME AS A "SQUARE TRIANGLE"

The VK2JMG/VK2MUZ article published in the March issue was very interesting and well presented. I would, however, wish to point out one aspect of incorrect terminology which was contained in the article and which has shown a tendency to creep into our amateur language.

In the article, the term "Delta Quad" was used about nine times. This terminology is incorrect, and I am afraid grated with me each time I read it. Elsewhere in the article the word "quad" was

freely used in such a way that again the usage was inappropriate.

A quad in the context of antennas usually refers to a "four-sided" element. A "Cubical Quad" is an antenna made up of *two* such elements. (A cube being a figure contained by six equal squares).

In view of this, there can be *no* such things as Delta Quads or even three of four element *cubical* quads. (Maybe a four-element is a "Double Cubicle Quad!").

The cubical quad antenna, and its various configurations, is known as a boon to the hobby of amateur radio. It is an extremely useful antenna for many reasons.

The main contribution such an antenna has made to the hobby is that "it is the greatest QRM reducing antenna ever devised and used on the amateur bands".

My understanding is that the quad element was first utilised by engineers at the broadcast station HCJB which was located high in the Andes and ran at considerable power. The element was devised to overcome the problems of corona at the ends of straight elements. This effect was such in the rarefied atmosphere of the mountains that the ends of the elements used to melt off. (The amateur operator to whom this may occur could be suspected of running higher power than legally allowed).

Incidentally, the explanation of the statement regarding the QRM reducing capabilities of the cubical quad is that "at any given time 60 percent of all the cubical quad antennas in the world are *on the ground.*"

Whilst said in joke, the foregoing sentence contains some grain of truth.

Many operators come on the air with fairly simple antenna systems then soon find out that a beam antenna is most desirable.

In many cases they do not, at first, wish to spend large sums (for various reasons) in building antennas. Thus, they look around for effective and cheap solutions.

The cubical quad often seems to fit the bill. Just some wire, a few crossed sticks and lo and behold they have a cubical quad antenna.

Unfortunately, the approach described is just that so often adopted and with a cheap approach, the results can be seen even after fairly minor wind gusts. Thus the cubical quad earns a name for mechanical problems not rightly deserved.

A properly designed and constructed antenna of this type can survive very heavy weather and may also have quite a number of other desirable attributes.

For myself, I have never used a cubical quad antenna and it is quite probable that I never will. I just don't like the look of them.

I trust that this letter will serve a few purposes such as education, amusement and also promote discussion.

Yours faithfully,
Ian Hunt VK5QX
8 Dexter Drive
Salisbury East, SA. 5109

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NEED FOR CW

To those who are disdainful about, and decry the use of, CW in communications, think again before you put forward unsubstantiated arguments in seeking its withdrawal. You are denigrating fellow members and many ex-service personnel who handled Morse efficiently under most trying combat and geographical conditions. Your attitude reflects negatively upon your own experience, general knowledge and valued call sign. This can be off-putting to recruitment of new blood to the amateur ranks.

Yes, I know only too well that this is a democracy and you have every right to express your opinion, but for goodness sake research your subject constructively.

I am convinced that Morse code is vital, up to the present time and possibly into the immediate future for the following reasons:

a) It will cut through atmospherics far more efficiently than "voice". Invaluable in receiving weaker signals that would be rendered unreadable despite refinements such as crystal gates, crash filters, selectivity slope tuning and sundry other resorts to arrive at an intelligible signal.

b) A rougher note can be introduced to shatter the band somewhat by the introduction of MCW by disconnecting smoothing condensers. Spark transmitters were admirable and were carried by warships and merchant men right through World War II and some time thereafter. They saved many lives by crashing through on a wide spectrum. Mainly used for emergencies but could be used on occasions for establishing initial contact. (Not now, 40 years later. I imagine! Ed).

c) Transmitter notes could be altered to assist in the above. If a master oscillator was in use it could be "swung" slightly while keying to alert operators who had a tendency to "sit" on a frequency and wait for things to eventuate — not uncommon!

d) Morse is a definite aid to DXing in conditions that place "voice" at a disadvantage — QRN and difficulty with the language.

To justify my defence of CW I should present my own credentials. I served with the RAN 12 years permanent service with nine years continuous sea time, joining a few months before the outbreak of World War II.

I became a radio instructor as a Chief Telegraphist with the RAN and obtained my Commercial Operators' Certificate of Proficiency, First Class, in Marine and Broadcast.

Alan VK4SS, is quite right when he stated in his letter that even rookies could learn to handle 10 words per minute in as many weeks.

The Navy fellows were a little luckier in the earlier days as they did an average of nine months at Flinders Naval Depot.

The passing out requirements in Morse were 95 percent receiving code, plain language in English and Foreign, 95 percent transmitting and about 85 percent for the remaining Radio Theory, Magnetism and Electricity, practical demonstration of equipment, oral examination and the ability to handle W/T procedure. In the latter case, in the course of time, they had to learn in addition to their own Naval procedure, combined operations procedure, and of course, commercial procedure — all of them being vastly different from one another. There also came three changes in the phonetic alphabet for the voice circuits. Speed, 21 words per minute, before a rating could proceed to sea rejoicing! An absolute minimum of Morse-raw recruits failed to make the grade. One or two in ever-continuing classes of 12 to 15 men.

Later in the War we had to read taped Morse American Broadcasts at speeds never below 28 to 30 words per minute. We were in Australian units operating with Task Forces of the American 7th Fleet and therefore had to read *everything.* The transmissions were continuous with only a few seconds spacing between messages, and after a four hour watch our wrists were about numb. We couldn't scream RSI and benefits — my handwriting was never the same afterwards! All this forced us to take a crash course (one week) in touch typing which we had to master in double-quick time, not without initial difficulty in synchronising Morse to the keys. All of a sudden it "clicked" and from then on it was just plain routine for fast traffic, Morse or voice circuits.

Young recruits joining the ships had mastered typewriters at 21 words per minute and soon were on top of 30 words per minute along with the experienced operators.

My point is this, mobile operators know with absolute certainty that, under severe atmospheric conditions, Morse will get through when the case for voice is hopeless.

I well remember the time when three of us, all experienced operators, tried for about an hour to read a SOS when we were patrolling in the Coral Sea. It was easier to read the crashing static than to read the Morse under the murderous conditions of a major electrical disturbance. Headphones forward of the ears, loudspeakers and BFOs. We finally got it on repeats through joint effort. The ship was on fire plus the exact latitude and longitude and the fact that another ship was closer and racing to her aid.

If *voice* had been used for the distress message, I doubt if we could even have distinguished the word Mayday.

Before RTTY was fashionable in the amateur ranks, I was involved with it on a fixed Naval service during strained international relations. I was in charge of about 20 operators in the watch and was constantly bringing up remotely-controlled transmitters and numerous different frequencies in an attempt to clear heavily mounting traffic — to no avail. The exchanged tape call signs were just plain garbage. The dogged operator was, however, clearing the priority ones by hand-keying while I was trying short and long routes around the world — to no avail. After a long while conditions improved, the calls became crystal clear and the traffic finally cleared. But, hand Morse got through when RTTY did not. Pity I didn't have satellites to rely upon!

I became a radio amateur because I witnessed personally their invaluable contributions during WWII both technically and operating. Amateurs must carry on this proud tradition, stop arguing about Morse versus voice, and involve themselves in assistance during fires, floods, cyclones and earthquakes. We must continually improve without scorning the proven basics.

John Grieve VK2EBG
Lot I
Butlers Road
Bonville, NSW. 2441.

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CONFIRMATION

This letter is to confirm, in my case, the editor's comments in July AR, re novice upgrade incentive with the advent of novice privileges on two metres.

I had not been active in amateur radio for many years. The two metre privilege prompted me to build a two metre transceiver, hence renewing my interest in amateur radio.

Since becoming active again I have joined the Wireless Institute and, because of an interest in non-voice communication, am studying hard for the next exam. Perhaps then I can put the interest into active use.

I assure all amateurs that I don't have two heads and am indeed quite normal. Therefore, I would be saddened by any fellow amateur feeling degraded and debased because I've been given the opportunity to better myself by learning from him.

I hope my feelings and incentives are similar to other novices because when you have thrown away the tags, (Full/Limited/Novice) we all share the same interest — *amateur radio.*

Cheers
Daryl Hooke VK3NEX
269 Mansfield Street
Thornbury, Vic. 3171

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STRAIGHT TO THE POINT

In reply to the "Future of Amateur Radio" article by R A Fenton in August issue of AR.

I must congratulate him on an excellent article straight to the point with a lot of common sense. His article and I am in complete agreement, with the exception of 500 to 1000 watts output for full

calls, as I have found with reasonable conditions one can work DX anytime on 10 to 25 watts output. It was of great interest to me, as it should be to everyone else, to read his statement of "What else does Morse do". And I quote; "It acts as a "Mechanism of closure" and creates an elite who are "in."". How very true and I personally think a greater requirement of entry to full call status should be the ability to operate and understand the regulation completely apart from the theory examination, not Morse as it is now.

I know, in my case, there is no way possible I can receive 10 words per minute due to my age of 72 years, suffering from a heart attack some 10 years ago, which restricts my capability to do so. And, if I could ask the question, would it make me a better operator or home-brewer which is what amateur radio should be all about. No, it would not, but knowing the regulations properly and theory would.

I often listen to full call operators playing with their computers on packet radio and RTTY using two metres as a medium of contact and one hears; "This disc won't load", "This program won't run", etc and I ponder why they didn't sit for an examination to prove their ability to operate such equipment and modes. Yes. I am sure there is an elite who are "in" an there is much discrimination in the whole of the hobby of amateur radio.

I recall when I first obtained my novice licence some four years ago after being a CBer for about eight years. I could not get on 80 metres quickly enough to put out a CO call. In due course a VK3 full call answered my CQ — to whom I asked; "What is your personal, my name is Jim". I got a shock with the reply; "You must be one of those b..... CB b.....! We on amateur radio don't say personal, it is your handle. Why don't you go back to CB."

What a great welcome to amateur radio after five years of study and hard work. So don't think for a moment I did not earn my place in amateur radio and I thoroughly believe I should be able to operate on all bands with an output of say 100 watts. What we need is more new blood in our hobby so I strongly suggest we all pull our weight together, open up all bands for novices, limited and full calls with output restrictions for novices and limiteds on the HF bands, and make our hobby more attractive to the many waiting out there to join us if it was not for Morse.

We can only use one band at a time and if we don't let other fellow amateurs use all of our bands the time is fast approaching when pressure will be applied from other interests to use them and we would lose them for ever. Think about it and start acting today as tomorrow could be too late, or is it we are all helping to slowly kill amateur radio for the future.

Thanking you.

Jim Thornton VK2KAX
PO Box 80
Umina, NSW. 2257

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RECOMMENCEMENT OF VNG TRANSMISSION

I am very pleased to be able to inform readers that VNG was expected to commence transmission on 4.5 MHz about August 17, from the International Transmitting Station at Llandilo, NSW. The other two frequencies, 7.5 and 12.0 MHz should be operational soon.

Llandilo is situated west of Sydney and north-east of Penrith. The transmitter field is run by the Civil Aviation Authority, and its geographic co-ordinates are:

150 degrees 45 minutes 45 seconds east
32 degrees 42 minutes 40 seconds south

The purpose of the rest of this letter is to bring all contributors up to date with what has been happening with VNG in the five and a half months since the VNG Users Consortium was formed.

Telecom agreed to donate the VNG equipment to the National Standards Commission, and the Consortium collected over $10 000 in donations, more than sufficient to pay for the dismantling and packing of the equipment ($4500), for its removal from Lyndhurst to Llandilo ($1600) and for transit insurance ($250). The remainder of the Consortium's equipment acquisition funds will be used to partially reimburse AUSLIG (the Australian Surveying and Land Information Group of the Department of Administrative Services) for paying the $30 000 setting up costs at Llandilo.

The bulk of the VNG equipment, including four transmitters, was moved from Lyndhurst to Llandilo on June 16-17, 1988. The remainder followed on July 1-2.

As a result of some very hard work by the people at Llandilo, the initial VNG test transmission took place from there on August 11, on 4.5 MHz and 2.5 kW.

A second test commenced on August 12, on full power (10 kW) with the aerial properly tuned. It has continued intermittently since then and reception has been reported from Canberra, Melbourne and Hobart. Please note that this transmission is purely to test the equipment. It is *not* "on time" and does not have a voice announcement so, if you picked it up before it has been set accurately, remember that it is for your listening pleasure only!

On August 17, 1988, staff from Telecom Research Laboratories and National Measurement Laboratory will install and set a rubidium standard which is being used as an interim measure until a Telecom private line is installed. This line will provide the two-tone signal from Telecom Research Laboratories to control VNG's own precision quartz oscillators. The slow time code incorporated into VNG in 1986 also awaits the installation of a private line. Application has been made for the two lines.

The new voice announcement was made free of charge on August 8, by Radio Australia, and the voice is Barry Seeber's. The voice in the old Lyndhurst announcement was that of the ABC's Len Grice, who died recently.

We would like to thank you for your contribution to the VNG Users Consortium. Without donations from users, the "impossible" could not have been achieved, and VNG would have been dead and buried. Please remember that continuing contributions towards the yearly running costs will be essential to keep VNG on the air.

Please contact me if you have any questions, and we will be pleased to receive reception reports.

Happy time signal listening!

Yours sincerely,

Marion Leiba
Honorary Secretary
VNG Users Consortium
26 Fimister Circuit
Kambah, ACT. 2902

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FUTURE OF AMATEUR RADIO [1]

I wish to thank you for publishing the article on the Future of Amateur Radio (AR August 1988) by R A Fenton.

Mr Fenton gets right down to the fundamentals of the problems facing amateur radio in Australia today and I hope the WIA Executive will give the subject matter in his article very serious and urgent consideration.

Another item that appears to have been neglected is the suggestion that the WIA Federal Office should send a short letter of congratulations to all newly licensed amateurs (also those who update) and if they are not already members, point out the advantages of WIA membership and invite them to join.

Yours sincerely,

S J Oldroyd VK2JSO
51 Frederick Street
Concord, NSW. 2137

(While the Call Book contract was being re-negotiated new licensee information was unavailable. Now that the situation is resolved, we hope soon to be able to welcome newcomers appropriately. Ed.).

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FUTURE OF AMATEUR RADIO [2]

Referring to the article, "Future of Amateur Radio" by R A Fenton, August AR, I am an avowed home-brewer but lately have been loaned a professional transceiver which I can only commend as to its ease of operation. In his arguments re cost, convenience and more power, I suggest one may as well use the telephone and write off the ISD calls to the communication hobby. What satisfaction in connecting a hunk of wire and pressing a button?

I sat for my limited licence when I was 17 and was 52 years old when I attempted the Morse after only six weeks of practice.

I cannot see what huge amount of study (which is pleasant anyway) is required. I fear you are subscribing to the ills of the nation viz, "too easy to come by". I have studied the hobby for 40 years and thought I knew a lot until (a) I commenced building my equipment (b) I commenced operating (c) and now I am commencing to improve.

The thrill and sense of achievement in getting one's own equipment on the air (with the knowledge that it can be amended at any stage of operation or repair) and the consequent flexibility far transcends the actual on-air operation.

My argument against more power is, consider the 1 kW operators who transmit world-wide to ragchew with another 500 miles away, with their respective receiver gain controls no doubt set well down to prevent overloading one another! I have never exceeded about 100 watts and it is, and will continue to be, a thrill to achieve the difficult. I estimate the total cost of my equipment to be about $200 — using old television sets, etc, given to me.

The argument re the Morse requirement is paralleled in any worthwhile pursuit in life — we all know a lot more then we do — even if it only boils down to a test of mental discipline to keep the particular pursuit at a high standard. With a commercial installation and a button to press — why have a technical examination at all? The profile argument I feel could be resolved by a change of name from "amateur" to some other designation which does not conjure up visions to the uninitiated of "that queer bloke down the street who is always fiddling and spoiling my program on my (perfect) TV".

Alternatively, this change could apply to those amateurs with a long proven track record of design — construction and operation to differentiate with the newcomers.

At least when home-brewers have the good fortune to meet each other on the air, they have much more to talk about than the weather, signal reports and the seemingly endless antennas. On this basis I would have given up the hobby much sooner, considering the other facets of life — work, family, etc. There is still a desire in me to advance to a five-watt CW rig and find out how far I can get out with it.

I am convinced power is of little consequence — I easily reached Norway on 20 watts more than once, so it has little reward value. A more sensitive and selective receiver (which is open to any operator) to me is far more important. The headphone/loudspeaker argument is something akin.

Finally, many empires and governments have fallen from lack of initiative and enterprise to a decadence of a life of ease, no competition for

those who could afford it and apathy for the rest. Congratulations to the Department and the WIA for their stand on these matters.

Perhaps those who say that the spectrum allocated to us is unoccupied would better spend their time improving their receivers to hear the other 90 percent of world-wide operators.

Yours sincerely,
Bill Freeman VK4AQW
63 Elizabeth Street
Acacia Ridge, Qld. 4110

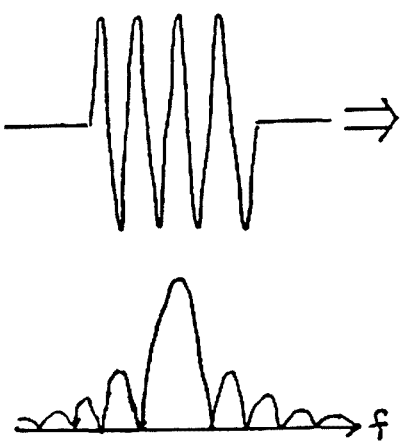
ar

▽ ▽ ▽

KEY CLICKS

I was rather horrified and dismayed to read the "explanation" of key clicks presented by Lindsay Lawless in *Topical Technicalities* in August *Amateur Radio*.

The initial statement, upon which his entire argument is based, that a pure sine wave contains no sidebands, is only true if the sine wave continues for an infinite time without any amplitude or phase variation. A sine wave which is keyed on and off is no longer a pure sine wave, and reference to any book on Fourier analysis will show that the spectrum for such a waveform is as follows:



This spectrum has a main lobe centred on the carrier frequency, and many sidelobes. It is these sidelobes that are heard as key clicks. By "rounding off" the corners of the pulse, the amplitude of the sidelobes can be greatly reduced, and this is the principle behind shaping the keying waveform to reduce clicks.

Key clicks are *not* caused by "shock excitation of the receiver aerial system and associated tuned circuits". Indeed, the aerial and tuned circuits are linear networks, and linear networks cannot produce frequency components which are not present in the exciting signal.

The only time that it is valid to blame the other guy's receiver for key clicks is when the signal is so strong that the receiver is being overdriven into non-linearity. Noise blankers in particular are prone to this sort of overload. Provided the receiver is operating linearly, any key clicks heard will be coming from the transmitter.

I hope that in future Lindsay will take greater care to ensure that his explanations in *Topical Technicalities* are technically correct.

Yours faithfully,
Jeff Pages VK2BYY
62 First Avenue
Berala, NSW. 2141

ar

▽ ▽ ▽

HALF IN DECIBELS

Reading the article by VK2PY on Measurement of Input/Output Impedance (August page 24), I found myself confused.

". . .continue until the output has decreased to half (-6 dB)." it says. Double the power, I thought, was 3 dB, double again (four times the power) to 6 dB.

Half the power, I thought, was -3 dB, ¼, -6 dB.

The rest I follow. My thanks to him for sharing it.

Yours sincerely,
Ian Crompton VK5KIC
9 Craig Street
Richmond, SA. 5033

(As published, there is some ambiguity. The requirement is for voltage to be halved, which represents one-quarter of the power, which is -6 dB. Ed.).

ar

▽ ▽ ▽

GET A READER'S RESPONSE

In *Editor's Comment*, in *Amateur Radio*, August 1988, I noted that you referred to President Eisenhower as the president who had a sign on his desk with the inscription "The buck stops here". Not so, It was President Harry S Truman.

There is an old saying, "Editors who never make any mistakes, never do any work." The best way to get a reader's response, is to make an error now and then. By doing this, you will know if your publication is being read.

Best of 73,
Bill Bentson W7QFY/VK4QF
15 Kapunda Street
Toowong, Qld. 4066

(Thanks for pointing out my error, Bill. Since Eisenhower succeeded Truman I guess I was only out by one! Ed.).

ar

▽ ▽ ▽

MORSEWORD 20

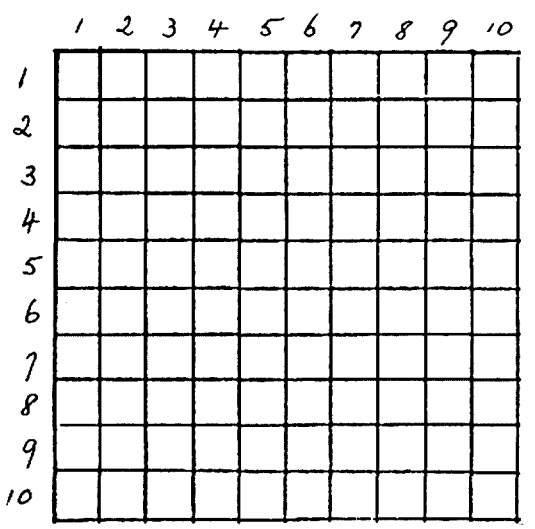
Audrey Ryan
30 Starling Street, Montmorency, Vic. 3094

ACROSS

1. Untruths
2. Road
3. Vehicle
4. Acts without words
5. Satisfied
6. Measure of medicine
7. Presented
8. Correct
9. It floats
10. Indian garment

DOWN

1. Vessels
2. 365 days
3. Ignite
4. Maori village
5. Pack away
6. A flower
7. Lift a weight
8. Interior
9. White lie
10. Facial feature



Solution page 59. . .

Silent Keys

It is with deep regret we record the passing of:

MR T D DANGERFIELD	VK5ATD
MR M J DEW	VK5JX
MAJOR ALBERT RANDALL	VK3BRR
MR JACK SCOTT	VK2NI (ex-VK2NR)
DR R K SMYTH	VK3AKS

Obituaries

TANIGUCHI (MAC) YOSHIMI JA3MP/JG1PEA

It is with deep regret we announce the passing of Mac JA3MP/JG1PEA, in Sydney on July 22, 1988.

Mac was well-known for his famous TET antennas based on the "phase-feed" system and used by many amateurs worldwide. Perhaps not as well-known is the fact that Mac also played a major role in the introduction of the semiconductor and microcomputer industry to Japan.

Mac will be sadly missed by his many amateur friends, not only in Japan and the USA, where he spent most of his life, but throughout the world.

—Brian Beamish VK4AHD
ar

HAROLD WRIGHT VK2AWH

Harold VK2AWH, passed away in mid-July, after being hit by a motor cycle in Sydney. He was aged 59 years. The day before his death Harold had been presented with the Telecom Special Medallion Award for bravery after risking his life during a flood rescue operation. He was in Sydney to see his son receive an apprentice award.

A specialist in radio communications, Harold was a member of the Telecom radio community support service when floods ravaged the northern New South Wales town of Lismore in May. (See also page 53, August AR).

He risked his life three times by scaling a 50 metre Telecom radio communications tower in appalling weather conditions to put up a new aerial.

Sympathy is extended to his widow and family.

—Compiled from an article written by David Coren
ar

FRANK SHARPE VK4FV

It is a sad duty to inform readers of the passing of one of Queensland's most distinguished pathfinding pioneers. Sir Frank Victor Sharpe CMG, OBE, ED, VK4FV, became a Silent Key on July 9, 1988, at the age of 85 years after a long illness.

Throughout his professional life Frank wore several hats and was a member of many clubs. Besides being Chairman and Director of his family companies, mostly in tools and hardware, he obtained the Bell Helicopter Company Franchise for Australasia in 1955. He was a member of the following clubs:

Brisbane, Queensland, Tattersalls, Royal Queensland Golf, Queensland Turf, Rotary, and of course, the WIA. Impossible though it may seem, he still found time to experiment, successfully, with fruit growing techniques.

Frank joined the Australian Military Forces and attained the rank of Acting-Colonel in Charge of *all* AMF administration in Queensland. One of his many responsibilities during World War II was the creation of a logistic branch to handle the sudden influx of American armed forces arriving in Brisbane. For all these services to the community he was knighted in 1979.

He obtained his amateur radio transmitting licence in 1923 with the call sign, OA4AZ. (This early document is still in existence and is held by long-time friend, W Bentson VK4QF). Immediately, he set up a MW station on the roof of the old Trades Hall in Brisbane (now demolished) and from this elevated vantage point conducted regular *sound* broadcasts on 240 metres. These transmissions were among the very first programs of voice and music received in Brisbane homes. OA4AZ was instrumental in setting up the Radio Society of Queensland.

A key to Frank Sharpe's character can be had from the motto which he pinned to the shack wall as a young man; "You can never be beaten if you never give in".

The WIA Queensland Division extends its condolences to his Yf; daughter Jennifer and son Peter.

(Was he the first pilot to land a "chopper" on top of Ayres Rock — without permission?).

—Alan Shawsmith VK4SS, WIAQ Historian
ar

PAT HOGAN VK4NJL

Pat succumbed on June 22, 1988, to an illness he had bravely borne for about two years.

The extension of Novice privileges to two metres came in time to provide Pat with much pleasure during his final days.

Pat always watched for a new country on 10 and 15 metres even at the worst of the low sunspot cycle. His voice will be missed there as well as on 80 and two metres.

Pat was intrigued by radio from his youth. Though first trained in the plumbing trade, he made the break to conduct his own radio sales and service business at Mundubbera in the 1950s. Subsequently he became involved in the theatre industry as a projectionist, but was unable to find the time to attain his amateur licence until his retirement in 1978.

All of Pat's many friends, especially members of the Brisbane North Radio Club, extend sympathy to his wife Eunice and family.

—Bill Rahmann VK4BIL, Honorary Secretary, Brisbane North Radio Club
ar

JACK SCOTT VK2NI

Jack passed away after a long illness on July 29, 1988. He was active in telecommunications and amateur radio for well over 50 years.

Jack's original call sign was VK2NR, until the suffix was allocated to the Northern Rivers Broadcast Station many years ago.

Vale Jack Scott VK2NI.

—Bert Dimmock VK2OW
ar

N A R (ROB) WILSON VK5WA

Rob Wilson was born in Perth, WA, on May 25, 1900.

In 1916, he enlisted in the first AIF and sailed from Perth as a member of the 6th Tunnelling Company.

Some time after his arrival in France the authorities caught up with him (under age) and he was discharged.

He returned to the UK and immediately enrolled in a Marconi Course for Ship Radio Operators. He qualified and went to sea in the Merchant Marines operating across the North Atlantic using spark and crystal.

He left the marines in 1924 and joined the motor industry in North America.

In 1932, Rob returned to Australia as Superintendent of a silk weaving mill in Ballarat, but left in 1935 to return to the motor industry again by joining General Motors, in Melbourne.

He subsequently transferred to the GMH plant in Adelaide, where he remained until he retired.

For many years he owned and used the Paddle Steamer *Torella*, now a holiday cottage which can be seen nestling among the willows on the eastern bank of the River Murray, five kilometres upstream from Mannum.

Rob's interest in radio communication was revived in 1960 when he obtained the AOCP and call sign, VK5WA. This enabled him to fulfill an ambition to join the Firebird Club, the amateur radio group associated with the world-wide General Motors organisation. He maintained this interest until two years ago when falling health forced him to cease operating.

During 1969, he was co-opted on to the local council and given the task of finding a suitable building for the Divisional Headquarters. With this he was successful ad the modified Burley Griffin Incinerator is a standing memorial to his effort. He was made a Life Member of the WIA (SA Division) in gratitude for this success.

Ron passed away on May 5, 1988. Sincere sympathy is extended to his wife, Joanna.

—John Allan VK5UL
ar

JOHN (JACK) HUDSON VK3XL

With deep regret we record the passing of Jack Hudson on May 10, 1988.

Jack first became interested in radio during the war years after serving with the 57/60 Battalion, later transferring to the RAAF. After initial training, he was posted to the Wireless School in Winnipeg, Canada, and later the Gunnery and Bombing School, Mossbank.

Upon completion of these courses, he was sent to England for refresher courses at Radio School, before being posted to Einshemer, Palestine. Jack attained the rank of Flying Officer.

He was a member of the RAAF "Odd Bods" Association and RSL.

Post-war, Jack married and settled in East Ivanhoe with his wife Muriel and daughter Janine. He was a devoted family-man, keen gardener, talented artist and true "Jack-of-all-Trades" always ready to help with odd jobs.

He was a ladies shoe designer by profession, but after a short break following his

retirement in 1973, he joined the RMIT accounts branch. Early in this period, Jack and the writer became acquainted, with the result that Jack's old passion for Wireless was rekindled. He attended another "refresher course", this time with the WIA, and obtained his AOCP on February 19, 1974 and the call sign VK3XL.

By this time, Jack had bought a second-hand home-brew receiver and spent some time listening to the amateur bands. Anxious to get on the air himself he decided to build himself a transmitter rather than to buy "off the shelf". Despite many other interests, he managed to devote some spare time to this priority project and an entry in my log dated August 18, 1974 reads; "VK3XL testing his home-brew HF transmitter — 10 watt, valve type".

The call sign VK3XL soon became well-known on some of the local nets. He later acquired an SSB transceiver and extended his interest to DX. He made many friends on the VHF bands and always ensured there was room left for his radio equipment when packing for holidays.

He became an enthusiastic watcher of ATV transmissions and eventually acquired some ATV equipment and began his own transmissions.

In June 1986, Jack contracted Leukemia and had been undergoing constant treatment for the past two years. Despite this, he carried on as normal a life as was possible, never losing his sense of humour.

He will be sadly missed buy his many friends in the amateur radio fraternity. Sincere sympathy is extended to his wife Muriel and daughter Janine.

—Ike Tarbit VK3OW

ar

PHIL BOWERS VK1YS

Phil's short 39 years ended tragically in a skiing accident at Thredbo on July 12, 1988.

He was born at Cooma on December 29, 1948, where his father was stationed in the police force. Later the family was transferred to Pambula, followed by Coolamon (near Wagga Wagga). Phil attended Wagga High School. His family then transferred to Lithgow, and after 12 months at the PMG Training School in Sydney, Phil returned to finish his time with the PMG in Wagga, in 1967. At this time he joined the original Wagga Radio Club training course and very soon obtained his amateur licence (VK2ZOE).

He was a very imaginative amateur and was particularly energetic and a perfectionist in most things that he became involved in. As well as being a very keen amateur, he took a very keen interest in hockey and was a dedicated player.

As time progressed, his work and general responsibilities with the PMG saw him transfer to Canberra. Initially he worked in the telephone exchange, but later transferred to the then Radio Branch as an Assistant Radio Inspector. Upon his untimely death, Phil was Acting Manager, Licensing in the Canberra Central Office of DOTC. His specialty within DOTC in recent years was the setting up and managing changes to the new DOTC computer network.

Phil spent from around 1972 (when he left Wagga) in Canberra, except for a few years with DOTC in Sydney. During his time in Sydney he met and married Vilma before returning to Canberra in mid-1985, and setting up a home.

During his time in Canberra, he exhibited the familiar energetic approach to anything he undertook. He had a mix of activities including a great involvement in the Capital Territory Caving Group, the ACT Car Rally Group, and amateur radio. He was in the winning team of the prestigious Rally Championship event in 1974 and was also editor of the Car Club magazine for some time around 1976.

It has been said by many that Phil achieved more in his 39 years than most men would hope to achieve in 60 years or more.

He was an inspiration to all. Deepest sympathy is extended to his wife Vilma and family. He was a real achiever.

—Sid Ward VK2SW/VK2ZMP

ar

GEORGE THOMAS SLAWSON VK2AFN

Tom passed away suddenly on June 28, 1988. He will be sadly missed by his many friends.

Tom was born on November 7, 1916, and was educated at Christian Brothers' College, Manly. Upon completion of his education he became a Dental Technician with a keen interest in amateur radio, receiving his licence in 1937.

At the outbreak of World War II he enlisted in the Army, (8th Division Signals) and rose to the rank of Sergeant. When Singapore fell he became a Prisoner of War and, along with many other Australians, was put to work on the notorious Burma Railroad.

At the end of the War, and five years as a POW, he returned to Australia and subsequently took up employment with the Taxation Department.

Tom resumed his amateur radio activities and was a top CW operator, keeping scheds with numerous friends around the world. He excelled in home-brewing, building most of the auxiliary equipment installed in his shack, including the 40 foot free-standing tower supporting his TH-6 beam.

Sincerest sympathy from his many amateur radio friends is extended to his family.

—Bert Dimmock VK2OW

ar

FRANCIS JAMES SULLIVAN VK3ZJ

Frank Sullivan became a Silent Key on July 23, 1988, at the age of 73. He was first licensed in 1947 as VK3AZJ, later taking the call VK3ZJ when it became available on the untimely death of his long-standing friend, Jim Salmon.

He served in the Army from 1940 to 1945, most of that time in a Heavy Anti-Aircraft Battery where he specialised in the Predictor when it represented a new technique. Later he became an instructor in the use of this equipment before moving into a Cipher Section.

Frank retired in 1979 as a Director of Bowater Paper after a long and distinguished career in the paper industry.

His main interest in amateur radio was in HF with a particular interest over many years in working into South Africa on 21 MHz. After retirement, he was active in several daytime VK nets where he made many friends who will remember his friendly cheerful manner. He was also very interested in the new 18 and 24 MHz WARC bands where he worked the world on a rotary dipole until shortly before he died.

Sincere condolences are extended to his wife Betty.

—Jack O'Shannassy VK3SP

ar

COMMUNICATING

Signalling has been in use since humanity began and had to communicate with one another, to express wants and needs, emotions and intentions. These feelings were expressed through eyes, mouth, cheeks and by moving the limbs.

Practically, all the above require the communicators to be either visibly or audibly near each other. Therefore, the need for other distinctive methods came into existence for long distance communications. The red Indians used smoke signals, drumbeats were used by African tribes, and pipes were used in India. Often these were relayed signals.

However, there too were not adequate for long distance communication. When electricity was discovered and transmission through electric current was invented, the Morse system proved quite handy. Morse can be used in many ways — the buzzer as in telegraphy and wireless, torch light or heliographs, whistling, tapping, tugs or pulls, smoke are a few methods of relaying Morse.

During World War I, two German soldiers were kept under guard in solitary cells and were not allowed to talk to each other. However, they communicated with each other by blinking their eyes in Morse code and escaped from prison.

The sounds of 'SOS' being tapped by a trapped crew from within the cabin of a sunken ship attracted the attention of a rescue party and the crew were duly brought to safety.

Today, radio signals and wireless communication facilities of many different kinds are being invented and used daily world-wide. But Morse is still practiced by Scouts and others in the community.

During Jamboree on the Air (JOTA), Scouts, Guides and amateurs communicate nationally and internationally.

In India the National Headquarters of the Bharat Guides and Scouts have launched an inaugural radio scouting and amateur course with the help of the National Institute of Amateur Radio. Distinguished guests from the ministries of Delhi have visited Headquarters to witness the program and expressed their delight in such a worthwhile exercise.

—Written by K V Prasad Naidu VU2JES for the NIAR Newsletter, June 1988 and condensed for *Amateur Radio*

ar

SEANET '88

The Radio Amateur Society of Thailand (RAST) cordially invites all amateurs to the 16th Annual Southeast Asia Network Convention (SEANET 88) to be held in Bangkok from November 11 to November 13, 1988. The event will be staged at the Ambassador Hotel in Bangkok.

The main purpose of the convention is to give SEANET participants a chance for eyeball QSOs. SEANET '88 will begin formally on Friday with a welcome dinner in the evening. There will be lectures, discussions and commercial exhibits throughout the convention and RAST will operate a station *from* the Hotel.

As a special attraction there will be a performance of Thai classical dancing on Friday night. The grand banquet on Saturday night will feature awards and a raffle with many prizes. SEANET '88 will formally close with a buffet luncheon on Sunday although there will be special programs on Sunday afternoon for delegates wishing to stay over. RAST will offer arrangements for shopping and sightseeing tours, etc.

For more details of SEANET '88 contact the RAST Secretary, PO Box 2008, Bangkok, Thailand.

—Contributed by David Rankin VK3QV/9V1RH

ar

STOLEN EQUIPMENT REGISTER

The Stolen Equipment Register is one of many services offered to members by the Wireless Institute of Australia.

It has now been in operation since 1984, and is now maintained on a computer database in the Federal Office.

At regular intervals, updates of the complete list, sorted into categories of:

Equipment Manufacturer/Model
Owner
Date Stolen

are distributed to each Division.

Members wanting to take advantage of this register, either to publicise the theft of their equipment, or to check equipment they are about to purchase, may contact their Division, or write or telephone the Federal Office.

Any telephone reports of stolen equipment must be followed immediately with written confirmation of the details.

For maximum efficiency, these details should include:

Manufacturer's name
Model
Type of equipment
Serial number
Date stolen
Owner's name, address, and call sign
Any distinguishing features or modifications
Police contact (if any)

When equipment is recovered, it is important that you advise the Federal Office as soon as practicable.

This list is the best information we have at the Federal Office at the time of going to press, but is based entirely on information received from you, the member.

Would all readers please check this list and immediately advise if there are any amendments required.

Bill Roper VK3ARZ
July 31, 1988

MANUFACTURER MODEL	SERIAL NO	OWNER	STOLEN
Dick Smith Audio			
Gen		VK2XJC	*15.05.85*
Dick Smith Explorer		VK2KUR	*24.09.84*
Dressler EVV2000	1027	VK2XJC	*15.05.85*
Galaxy 5	5672V2118	VK3UB	*06.06.87*
Galaxy 5	5503V1309	VK3UB	*06.06.87*
Icom			
IC02A	29901052	VK2CKD	*05.02.86*
IC202	03482	VK3ZJY	*11.08.87*
IC202	5144	VK4ZSH	*03.09.85*
IC202	41013 616	VK3ZBI	*01.10.85*
IC211	6804309	VK3BRV	*17.10.84*
IC215	05156	VK2AMX	*20.11.84*
IC22	12266	VK3BLC	*29.04.85*
IC22A	3402112	VK2ZIG	*01.07.87*
IC22A	1914	VK4ZSH	*03.09.85*
IC22A		VK3YV	*21.08.87*
IC22A	8853	VK3ZU	*03.05.84*
IC22S	11912	VK2ETJ	*06.03.88*
IC22S	14957	VK3OYZ	*11.09.84*
IC22S	14727	VK3ME	*14.08.85*
IC22S	07570	VK3KJA	*14.12.87*
IC22S	62014533	VK3KAW	*23.12.85*
IC25A	03831	VK2DPM	*04.11.84*
IC280	02592	VK2BVW	*30.03.88*
IC290H	17701965	VK3ZBI	*01.10.85*
IC290H	17703342	Emtronics	*17.02.86*
IC2A	12213830	VK3YOD	*02.12.83*
IC2A	12209700	VK2AHF	*08.09.87*
IC2A	04484	VK1MX	*21.01.85*
IC3200	01046	VK2CIM	*02.08.87*
IC45A	01876	VK2DPM	*04.11.84*
IC45A	18351005	VK3KJC	*22.02.84*
IC490A	16101192	VK3BVO	*01.03.83*
IC4E		VK2KZZ	*16.08.87*
IC4E	18103021	VK3YOD	*02.12.83*
IC502	00618	VK3ZJY	*11.08.87*
IC551	01273	VK4ZSH	*03.09.85*
IC551	9401253	VK3ZBI	*01.10.85*
IC551-D	99003878	VK3YSG	*01.01.84*
IC701	8001039	L20470	*15.02.88*
IC701PS	7800978	L20470	*15.02.88*
IC720A	06242	VK4ZSH	*03.09.85*
IC730	13806798	Mel Uni	*18.09.85*
IC735	36304455	Emtronics	*17.02.86*
ICPS20	10101966	VK3YSG	*01.01.84*
K D K 2025 Mk II		VK2ETJ	*06.03.88*
K D K FM2025 Mk II	A5020	VK2AML	*03.07.88*
K D K Multi 7		VK2TJB	*09.02.88*
Kenwood			
AT180	0020450	VK2???	*11.11.87*
AT200	820049	VK2DCB	*16.08.84*
DG5	730475	VK2DCB	*16.08.84*
SP520		VK2DCB	*16.08.84*
TM221A	8022541	VK3ZJY	*11.08.87*
TM221A	8110722	VK2CCD	*09.04.88*
TR2400	0061926	VK2PJ	*20.04.85*
TR2400	0061950	VK2DPM	*28.08.84*
TR2500	3033045	VK2DYW	*18.02.87*
TR2500	3040009	VK2ZQC	*29.05.85*
TR2600A	7030631	VK5AAR	*03.10.86*
TR7850	202080	VK2DED	*06.03.84*
TR7850	1111125	VK2CCK	*07.02.86*
TR7950	4010747	VK2TVG	*08.08.85*
TR9000	1020527	VK2KAH	*03.01.87*
TR9000	1050780	VK3YSG	*01.01.84*
TS120S	950819	VK2???	*11.11.87*
TS120V	0081224600	VK2VWN	*03.05.85*
TS130S	40401C8	VK2BVM	*30.03.88*
TS130SE	2060697	VK2KAH	*03.01.87*
TS430S	4010322	VK2XJC	*15.05.85*
TS520S	820972	VK2DCB	*16.08.84*
TS700A	350409	VK3ZJY	*11.08.87*
TS930S	3050176	VK7JG	*13.01.83*
VFO-520		VK2DCB	*16.08.84*
Kyoto FM144-10	5027	VK2KUR	*24.09.84*
Leader LSG11	0041244	VK3KJA	*14.12.87*
Leader LSG16	1081098	VK3YSG	*01.01.84*
Mirage B1016	550779	VK3KAW	*23.12.85*
Realistic AX190	500111	VK3KJA	*14.12.87*
Realistic SP190	20-5191	VK3KJA	*14.12.87*
Regency HX2000		DSE Vic	*13.05.85*
Salko SC7000		VK2XJC	*15.05.85*
Tempo 1S	012240	VK3UB	*06.06.87*
Thorn R&W TV	107512	VK2XJC	*15.05.85*
Tokyo HL160V	829331	VK2XJC	*15.05.85*
Tokyo HL86V	819595	VK2XJC	*15.05.85*
Tokyo HL90U	8304246	VK2XJC	*15.05.85*
Trio CS-1560A2	10-20171	VK3YSG	*01.01.84*
Uniden 2020	50806009	VK2KSY	*16.09.85*
Welz SP200	600384	VK2XJC	*15.05.85*
Yaesu			
FAS14R	140138	VK3KJA	*14.12.87*
FC787	11140775	VK2DBB	*28.04.86*
FC707	11140765	VK3DHV	*28.04.86*
FRA7700	2H050293	VK2???	*11.11.87*
FRG7	299L26099	VK3ZLY	*28.07.83*
FRG7700	2K210752	VK2???	*11.11.87*
FRT7700	2K070479	VK2???	*11.11.87*
FT101B	83L102373	VK3KJA	*14.12.87*
FT101E	8G350283	VK2SS	*29.06.84*
FT101E	8L370414	VK3DYZ	*11.09.84*
FT107M	1T110012	VK2ALN	*03.03.87*
FT200	2K332252	VK3DYZ	*11.09.84*
FT203R	4H081794	DSE Vic	*13.05.85*
FT207R	10132725	VK2EMC	*04.03.85*
FT207R	1D132704	VK2ETJ	*06.03.88*
FT208R	3N350964	VK2CBA	*30.07.85*
FT209R	4L06245	DSE Vic	*13.05.85*
FT209RN	4K050838	VK3CE	*01.01.85*
FT209HH	5K190401	VK2HW	*21.02.86*
FT224	6G307290	VK3OV	*28.05.87*
FT230		VK2EGD	*18.08.87*
FT290R	1L081321	VK3KJC	*22.02.84*
FT290R	4E360554	VK3KGH	*01.06.85*
FT290R	1M081340	VK2VE	*04.01.87*
FT290R	3C260713	VK2EGD	*12.11.86*
FT290R	5G450016	VK7HW	*18.04.88*
FT480R	1H12069	VK1ZUR	*29.05.84*
FT620	010489	VK4ZSH	*03.09.85*
FT680R	3H080202	VK2XJC	*15.05.85*
FT7	81090839	VK3BYK	*28.06.83*
FT7	81090728	VK2KSY	*16.09.85*
FT707	1D161414	VK3DHV	*01.06.87*
FT708R	1H010948	VK2PJ	*20.04.85*
FT757GX	3N040371	VK2DBB	*28.04.86*
FT780R	1J061616	VK3ZBI	*01.10.85*
FT760R	3F070521	VK2XJC	*15.05.85*
FV101	1E353	VK3KJA	
Y901P	9L030072	VX1ZVR	*15.12.84*
YP150	81090469	VK2DCB	*16.08.84*

128 Items

ar

For further information of

HOW TO JOIN THE WIA

Fill out the following form and send to:

THE MEMBERSHIP SECRETARY
WIRELESS INSTITUTE OF AUSTRALIA
PO BOX 300
CAULFIELD SOUTH, VIC. 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms: .....

Call Sign (if applicable): .....

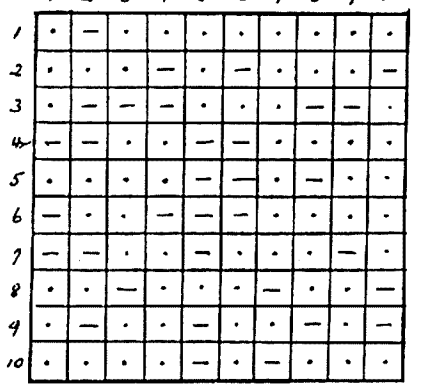
Address: .....

.....

State and Postcode: .....

Solution to Morseword 20

Across: 1. lies 2 street 3 jeep 4 mimes 5 sated 6 dose 7 gave 8 fix 9 raft 10 sari
Down: 1 vats 2 year 3 fire 4 pah 5 stow 6 rose 7 heft 8 inner 9 fib 10 lip



HAMADS

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 millimetre SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW 2223. (No inquiries at office please . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

RAOFAX2: Hires radio facsimile Morse & RTTY program for IBM PC/XT on 360K 5.25" floppy + Iull Doc. Need CGA, input port, SSBhf FSK/Tone decoder. Has re-align auto-start view save print + +. Also "RF2HERC" same as above but suitable for Hercules card and "RF2EGA" for EGA card (640X350 mode). Programs are $30 each + $3 postage ONLY from M Delahunty, 42 Villiers Street, New Farm, Old. 4005. Ph: (07) 358 2785.

TANDY COCO OWNERS: Grosvenor Software (G4BMK) now available in Australia. AX-25 $90 (no TNC required), RTTY/ASCII $39.50, AMTOR $82, CW $37, SSTV (Rx) $39. Details from Dave Ralph VK4ASB, 23 Darwin Street, Aspley, Old. 4034. Ph: (07) 263 3872 AH.

WANTED

MANY AMATEURS WANTED: at the Ballarat Hamvention on Sunday, October 30. Bring your unwanted gear to the Auction. Stall holders wanting space contact Kevin VK3WN. Ph: (053) 35 5011.

WANTED — NSW

KENWOOD TS-600 6M ALL-MODE TRANSCEIVER: any condition. AWA Voltohmyst VTVM, any condition. Replies please to: Nev VK2QF, Hargraves, NSW. 2850. Ph: (063) 73 8624/73 8554.

YAESU YC-7B OUTBOARD DIGITAL READOUT: Perfect condition wanted urgently. Norm VK2PIP Ph: (065) 68 2544.

WANTED — VIC

CIRCUIT DIAGRAM: instruct/description etc. Anything on unidentified "Radiola" 8-valve, tuned RF, MW/SW radio, poss late 30s, with most "Selex" transfers rubbed off/ unintelligible. In 3 feel tall cabinet, with 8 x molorised MW stn-preselect — and 2 x SW "scan" keys, plus a "manual" & "phono" key. Has dynamic speaker type 12EI, F1060 manuf std cert label, & punched in chassis No B0093843. Uses 5V4G, 2 x 6F6G, 2 x 6B8G, 2 x 6U7G, 6K8G valves. Will recompense any costs. Hartmut VK3DYD, QTHR. Ph: (03) 555 6714 evenings.

EX-ARMY PRC10: or PRC25 low band transceiver & AM-4306/GRC RF amp. Must be working & in good cond. Damien Vale VK3CDI, PO Box 2395, Mildura, Vic. 3500. Ph: (050) 23 0919 AH.

FT-101E or ZD: Frequency meter. Dummy load. Power & SWR meter. Contact Orm VK3ASY. Ph: (03) 723 4688.

PROPELLER PITCH MOTOR: in working order & IC MC1469. Stan. Ph: (053) 32 2340.

VARIAC OR SIMILAR: 150 watts or any small unit. Ron VK3BRC, QTHR. Ph: (03) 819 3568.

WANTED — QLD

CIRCUIT: Handbook, service manual for Eddystone EC-10 receiver. Will pay costs for photocopying. Pye 9 MHz crystal filter, type 9-0A 10.7 MHz IF transformers. Len VK4JZ, QTHR. Ph: (07) 398 2002 AH.

CIRCUIT OR DATA ON THE FOLLOWING: Audio Generator Tech Model 22D. Audio Generator Techtron type 020K (Made in Melbourne). Kenwood digital DG5 display counter for TS-520 transceiver. Advance Electronics digital voltmeter Model DVM1 (Nixi tubes). "Astor" waveform generator No 2 Model A. Marconi TF2333 signal generator 30 Hz - 550 kHz. Also the following valves wanted for radio restoration: 5Y3GT, (Philips 58), (Mullard A7), (AWA 2A5-2A6), (Eveready ER57), & Taylor Model (101) Multimeter. VK4DY, QTHR. Ph: (071) 96 1186.

MOBILE MOUNT MB-100: for TS-130S Kenwood. VK4BIK. Ph: (071) 91 7317.

OWNERS MANUALS: for Uniden 2020, Yaesu FT-101Z & FV-101DM. Photocopies OK. Will pay costs. Please write to B McIvor, 30 Brennan Parade, Strathpine, Qld. 4500.

SERVICEABLE 80M RESONATOR & WHIP ASSEMBLY: for Hy Gain 18 AVT vertical antenna. Can anyone help please? Consider complete antenna if necessary. Cress VK4CCA. Ph: (07) 261 3363.

YAESU FC-707 AND FV-707: must be in good condition. Contact Pat VK4VGS, PO Box 152, Pomona, Old. 4568. Ph: (071) 85 1240.

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.

* Eight lines free to all WIA members, ninth line for name and address. Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.
* Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment. (A courtesy note will be forwarded that the ad has been received and will appear in . . . . . issue of AR.
* Copy in typescript, or block letters to PO Box 300, Caulfield South, Vic. 3162
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

STATE

	FOR SALE	WANTED	MISCELLANEOUS

Name and Call Sign: .....

Address: .....

Phone Number (if applicable): .....

WANTED — SA

CIRCUIT FOR HOME-BREW 70 CM S/STATE TRANSVERTER: 2m or 10m input. Will pay any costs. Details to Alan VK5BWG, QTHR. Ph: (086) 43 6455.

TWO 572B VALVES: Will pay a good price or swap for other tx tubes I have. I have bought a FL-2100B linear which has flat valves in it & need either new or good used valves to get it going. Gary VK5DX. PH: (08) 370 9196 AH or (08) 230 7133 BH.

WANTED — WA

HEATHKIT HR-10B RECEIVER: Companion to DX-60B transmitter. Bruce VK6OO, PO Box 28, North Perth, WA. 6006. Ph: (09) 328 8064.

WANTED — TAS

IC-502 OR SIMILAR: 25W linear to suit. 25W 2m linear. 144/432 MHz & 144/1296 MHz transverters or converters. Need not be "state-of-the-art" but must be GWO. Wayne VK7WD. Ph: (002) 67 2356 AH.

FOR SALE — NSW

IBM EXPANSION UNIT FOR PC or XT: Contains 1 10MB drive & controller, 130W power supply & bus interface cards. Gives 6 free slots. Room for second hard drive. Unit is as new. $500. Hidaka VS-33 triband Yagi, heavy duty 2 kW rating. Good condition, ready for DX. Buyer collect. $250. VK2HL for further details. Ph: (02) 981 4762.

ICOM IC-04A H/H TX: used only once complete in carton with battery pack & charger etc. 13 el Yagi 70 cm Tokyo hi-power. HL-45U 45 watt lin with preamp VGC. $675. 6 metre all-mode tx or 28 MHz to 6 metres transverter. Price & details. VK2KAX. Ph: (043) 41 7693.

KDK 2M TRANSCEIVER FM-2016A & P/S 12 WATTS: Excellent cond $250. Nine element 2m beam. $40. Swan (Astro) 102BX transceiver & P/S solid state; good cond $500. All manuals. Freda VK2SU, QTHR. Ph: (069) 68 1556.

KENWOOD TS-520: in good cond, with new finals. 100 watts output, spare power lead. $350. Kenwood TS-120V in good working cond, plus hand mic. $300. Will sell both together for $500. Am updating equipment for new shack. Contact Ken VK2PKW, QTHR. Ph: (065) 62 5755.

TRIANGULAR TOWER 8M HIGH: Never used, fully galvanised. $250 ONO. Details VK2CJV. Ph: (02) 809 5024.

FOR SALE — VIC

ATN 8-ELEMENT LOG PERIODIC ANTENNA: 2 years old. 13-30 MHz $475. VK3NAJ. Ph: (051) 74 6559 AH.

HISTORY OF AMATEUR RADIO: QST magazines from 1932 to 1970 complete with quantity both before & after these dates. $300 or make an offer. They must go. Yaesu FT-709R 70cm hand-held. With FNB-4 nicad pack, charger, leather case, etc. Almost unused, in original box. Cost over $700. Sell $400. Also Icom Micro 2A 2m FM hand-held. Also as new in original box with leather case $350. Yaesu YM-38 dual impedance scanning desk mic, in original box. $60. VK3OM, QTHR. Ph: (03) 560 9215.

KENWOOD TR-2400: with l/case, base stand/charger & car quick charger (needs attention). Unit recently o'hauled by Kenwood. New display, antenna & nicads. Excellent condition $400. Dave VK3TDI. Ph: (03) 232 7492.

KENWOOD TS-940S: Excellent condition. Must sell. $3500 ONO. Call Sean Neylon VK3SN. Ph: (03) 318 3716 AH or (03) 521 1666 BH.

KENWOOD TS-940 HF TRANSCEIVER: includes auto ATU & general coverage rx. $3800 ONO. Brand new (still in box) never been used. Owner transferred overseas. Kenwood TL-922 Linear Amplifier. Never been used. $2000 ONO. John. Ph: (03) 794 8077 BH or (03) 232 6587 AH.

VALVES: New in boxes. 2C39A SHF transmitting. $30 plus P&P. Dick VK3AHT, QTHR. Ph: (03) 874 4967.

FOR SALE — QLD

ANTENNA TUNER: Kenwood AT-200. Good condition, original carton, manual. VK4BIK. Ph: (071) 91 7317.

FT-690R 6 METRE TRANSCEIVER: New in carton. $450. Icom IC-22A 13 channels fitted good order. $160. Sony Umatic VO-2630 Video Recorder & JVC Tuner. Good order. $450. VK4KDK, Brisbane. Ph: (07) 800 1406.

FOR SALE — SA

TRANSMITTER: 6V6G osc, 6V6dbr, 6V6 dbr, 807 PA driver to 829B final. 160m to 6m. Three pwr supplies. 1 swilch operation with PS relays. Tx tubes: 4-65A, QE3-300, 4E27(813), 815, 829B & socket, VCR139 & socket, 5 Vintage Radios. B/C Grundig reel to reel recorder (valves) 200 + tubes. VK5LC. Ph: (08) 271 6841.

Advertiser's Index

ESSENTIAL Monthly READING

No matter what area of electronics interests you,

you can't afford to miss a single issue of Australian Electronics Monthly

Incorporating Elektor Electronics

HERE'S WHY:

Edited and published by industry identity, Roger Harrison VK2ZTB

You'll find something to interest you every month in Australian Electronics Monthly, no matter what your special interest might be. The magazine is "sectioned" into categories for easy reading and easy reference, each section headed by its own news column.

If you've found AEM hard to get in your newsagent, DON'T DELAY. SUBSCRIBE TODAY!

SUBSCRIBE & SAVE!

Buying AEM at the newsagent each month costs you $57/yr. A subscription costs just $42 for one year, $78 for two years!

YES! I want to subscribe for:

☐ Two years ($78) ☐ One year($42)

I wish to pay by:

☐ Cheque ☐ Money Order

☐ Bankcard ☐ Visa ☐ Mastercard

Card No _____ Expiry _____

Signed _____

(Unsigned credit card orders cannot be accepted)

Name _____

Address _____

_____ Postcode _____

Telephone:( ) _____

Send coupon to: AEM, PO Box 507, Wahroonga 2076 NSW

Regd Address:
1st Floor, 347 Darling Street, Balmain, NSW 2041

Issue by issue, 'AEM' brings you –

- **Communications coverage**
  – news, reviews and practical features on RF techniques and radio communications, covering everything from circuit techniques to cellular radio, from satellites to amateur radio.
- **Topical technical features**
  – covering consumer electronics, topical technological and scientific fields, current issues and circuit techniques.
- **What's new in the market**
  – occasional features on new products and developments, giving topical and informative coverage of specific fields and product groups.
- **Practical computing articles**
  – a whole section each month devoted to electronics enthusiasts exploring computing and computing enthusiasts exploring electronics.
- **Hi-Fi, sound and video news, reviews & features**
  – independent, professionally conducted reviews from Robert Fitzell Acoustics; features from well-known writers like Dennis Lingane and Malcolm Goldfinch.
- **5 to 10 projects to build each month**
  – the best from our Australian designers and the cream from the British Elektor.
- **Monthly Project Buyers Guide**
  – each issue we detail where you can get the components featured in our projects as well as which firms are stocking kits of our projects.
- **Telephone technical enquiries**
  – yes, you can speak to the editorial team direct and have your queries answered. We don't live in an ivory tower!

THE NEW ICOM IC32AT, OVER. WITH ITS DUPLEX FACILITY, OVER. MEANS YOU WON'T HAVE TO TALK LIKE THIS, OVER AND OUT.

The IC32AT is the newest dual band handheld transceiver by Icom.

It has been designed with the most advanced VHF technology the electronics industry can offer.

And this little 2 metres and 70cm compact handheld offers full duplex facility.

Which means instead of a broken conversation, you can now simultaneously transmit on one band and receive on the other. Just like a telephone conversation.

No longer do you have to wait for a long "Over". It's full "Break in".

And with its high output power, you can be sure your words are heard. The IC32AT uses a custom designed power module as the final amplifier. Which means this transceiver puts out 5.5W on 2 metres and 5W on 70cm.

So you will never be at a loss to make that repeater.

What's even more incredible, each of the twenty memory channels can store two frequencies: operating frequency and offset frequency are just a couple of examples.

The Programmed Scan function scans all the frequencies between two programmable scan edge frequencies, while the Memory Scan function scans all memory channels in succession, except, of course, those you lock out. In short, you can scan 2 metres, 70cm or all channels.

Thanks to the handy little pocket beep, you'll never miss a call. By installing the UT-40 Tone Squelch Unit (sold separately) the transceiver functions as a pager.

You can use the built-in DTMF keyboard to access a repeater and to make a phone patch. The key numbers and letters are printed large for quick and easy reading.

As for monitoring the input frequency when you work a repeater, that's as simple as pushing the Monitor switch on the side panel to open the squelch and check the frequency.

Every five seconds, Priority Watch monitors the Call Channel, or one or all the memory channels in succession.

And that's while you operate!

When you want to change the frequency or the memory channel fast, the Dial Select changes the 1MHz, 100kHz digit or the memory channel directly. One push of the button does it.

All these functions not only make the Icom IC32AT the most advanced dual band handheld transceiver available, but also very easy to use.

Call (008) 338 915 for your nearest Icom stockist today.

The telephone conversation in itself will be a very good demonstration of the IC32AT's duplex facility.

Over and out.

ICOM

The Ball Partnership ICO 0024

Wireless Institute of Australia

MEMBERS SURVEY 1988

This questionnaire has been commissioned by the WIA to gather information from its members as to their views on the Institute, their current and future needs from the Institute, and their thoughts on *Amateur Radio* magazine.

Like most similar organisations in our society today, the WIA needs to continually improve its performance to keep pace with the rapidly changing perceptions and expectations of its members.

The WIA is, first and foremost, a service organisation and, as such, must be responsive to the needs of its members.

We need your help, as a member, to help us plan wisely for the future by telling us what you want and expect from your Institute.

The first section requires some general information about yourself, and is needed to equip the Institute to produce a statistical model of the *Amateur Radio* magazine readership base. This information will enable us to demonstrate to potential advertisers the worth of advertising in *Amateur Radio.*

Section 2 relates to *Amateur Radio* magazine — its cost, quality and readership.

The third section is concerned with how you see the Institute at present, and what you want from the Institute in the future.

The first questions are asking for facts about yourself.

The other questions ask for your opinions. On these questions, obviously, there are no right or wrong answers. What we want to know is just what you think. If you are not certain what your answer is, please give us the choice that appeals most to you at the moment. Please record any additional comments you may have about particular questions, or the survey as a whole. Such comments are often invaluable in interpreting your answers to other questions.

This survey is strictly confidential! ! !

Only overall results will be published from time to time in *Amateur Radio* magazine. ***No individual results will be published or disclosed!***

It is not compulsory to insert your call sign or membership number on the returned survey. However, anonymous returns will be ineligible for the gifts. Membership numbers may be obtained from your AR address label.

MEMBERSHIP NUMBER:

. . . . . .

OR

CALL SIGN: . . . . . .

AMATEUR RADIO MAGAZINE ADDRESS LABEL

Bill Smith
1 Jones St
NoTown, 1234

140956 — Membership Number

SECTION 1. PROFILE OF MEMBERS

1.1 AGE GROUP IN YEARS (tick one box only)

1 - 15	☐ A	41 - 50	☐ F
16 - 20	☐ B	51 - 60	☐ G
21 - 25	☐ C	61 - 70	☐ H
26 - 30	☐ D	71 PLUS	☐ I
31 - 40	☐ E		

1.2 OCCUPATION (tick one box only)

AGRICULTURE	☐ A	RETIRED	☐ H
CLERICAL	☐ B	SALES	☐ I
HOME DUTIES	☐ C	SEMI-SKILLED	☐ J
MANUAL — RURAL	☐ D	STUDENT	☐ K
MANUAL — OTHER	☐ E	TECHNICAL	☐ L
NOT EMPLOYED	☐ F	TRADE	☐ M
PROFESSIONAL	☐ G		

If you are unable to fit your OCCUPATION into the above categories, please write your OCCUPATION below, using no more than 15 characters:

OTHER (specify): .....

1.3 POSITION (tick one box only)

FOREMAN /WOMAN	☐ A	SELF EMPLOYED	☐ D
MANAGER	☐ B	SUPERVISOR /LEADING HAND	☐ E
OTHER EMPLOYEE	☐ C		

1.4 INDUSTRY (tick one box only)
(Retired, unemployed and students indicate the industry you were/would like to be in).

AGRICULTURE	☐ A	FINANCE	☐ O
AUTOMOTIVE	☐ B	FOOD	☐ P
AVIATION	☐ C	FURNITURE	☐ O
CHEMICAL	☐ D	INSURANCE	☐ R
CIVIL	☐ E	LEGAL	☐ S
CLOTHING	☐ F	MECHANICAL	☐ T
COMMUNICATIONS	☐ G	MEDICAL	☐ U
COMMUNITY SERVICES	☐ H	MINING	☐ V
COMPUTER	☐ I	PUBLISHING /PRINTING	☐ W
CONSTRUCTION	☐ J	REAL ESTATE	☐ X
EDUCATION	☐ K	REFRIGERATION	☐ Y
ELECTRICAL	☐ L	SERVICE	☐ Z
ELECTRONIC	☐ M	TEXTILES	☐ 1
ENTERTAINMENT	☐ N	TRANSPORT	☐ 2

If you work in the RETAIL industry, please indicate the relevant section of the RETAIL industry using no more than 20 characters:

RETAIL (specify): .....

If you are unable to fit your INDUSTRY into the above categories, please write your INDUSTRY below, using no more than 20 characters:

OTHER (specify): .....

1.5 FORMAL QUALIFICATIONS (tick one box only for your highest qualification)

PRIMARY /SECONDARY (up to Year 10 only)	☐ A
SECONDARY (Years 11 and 12)	☐ B
TRADE	☐ C
TERTIARY	☐ D

OTHER (specify): .....

AREA FORMALLY QUALIFIED IN ABOVE: .....
(eg. Business, Carpentry, Chemical, Electrical, English, Mechanical, Science, etc) using no more than 20 characters.

OTHER QUALIFICATIONS: .....

1.6 MAJOR HOBBIES AND INTERESTS in addition to amateur radio (tick no more than five categories)

ANGLING	☐ A	GARDENING	☐ M
ANIMALS	☐ B	GOLF	☐ N
ARTS /MUSIC	☐ C	MODELS	☐ O
AVIATION	☐ D	PHOTOGRAPHY	☐ P
BALL SPORTS	☐ E	POLITICS	☐ O
BICYCLING	☐ F	RACING /HUNTING	☐ R
BOATING	☐ G	RACQUET SPORTS	☐ S
CARS	☐ H	RUNNING /BUSHWALKING	☐ T
COLLECTING	☐ I	SCUBA DIVING	☐ U
COMPUTERS	☐ J	SHOOTING	☐ V
CRAFT	☐ K	SNOW SKIING	☐ W
FOOTBALL	☐ L	WATER SKIING	☐ X

If you are unable to fit your HOBBIES and INTERESTS into the above categories, please write your HOBBIES and INTERESTS below, using no more than 15 characters:

OTHER (specify): .....

SECTION 2. AMATEUR RADIO MAGAZINE

In 1988 Amateur Radio magazine is expected to cost you 63.2 percent of the $30.00 Federal Component of your membership subscription. This equals $1.28 plus postage per issue to your address.

2.1 IS THE CURRENT RELATIVE COST TOO MUCH? ☐ **A**

OR

DO YOU WANT THE PRESENT AR OUALITY TO BE HELD CONSTANT IN THE FUTURE EVEN IF THE COST INCREASES? ☐ **B**

OR

ARE YOU PREPAREO TO PAY A HIGHER SUBSCRIPTION TO FURTHER IMPROVE THE OUALITY OF PRESENTATION OF THE MAGAZINE? ☐ **C**

2.2 DOES ANYBODY ELSE, APART FROM YOU, READ YOUR COPY OF AMATEUR RADIO MAOAZINE?

YES ☐ **NO** ☐

IF YES, HOW MANY? ☐

FEDERAL COUNCIL QUESTIONNAIRE

STRICTLY CONFIDENTIAL

The information provided to the Wireless Institute of Australia on this completed form will be kept **strictly confidential** and will **only** be used to compile statistical information for the benefit of the Institute.

SECTION 3. CURRENT PERFORMANCE AND FUTURE DIRECTION OF THE WIA

Please read the following questions carefully and completely before answering.

3.1 WHAT OOES THE WIA DO WELL? (Tick no more than five relevant items in column 1 on the attached questionnaire sheet).

3.2 WHAT DOES THE WIA NEED TO IMPROVE? (Tick no more than five relevant items in column 2 on the attached questionnaire sheet).

3.3 WHERE SHOULD THE EMPHASIS BE PLACED IN THE FUTURE? (Tick no more than five relevant items in column 3 on the attached questionnaire sheet).

FREE SERVICES	DO WELL	TO IMPROVE	FUTURE EMPHASIS
BEACONS AND REPEATERS	☐ A	☐ A	☐ A
CONTESTS	☐ B	☐ B	☐ B
CONVENTIONS	☐ C	☐ C	☐ C
COURSES ADVICE	☐ D	☐ D	☐ D
DOTC /GOVERNMENT LIAISON	☐ E	☐ E	☐ E
EMC ADVICE	☐ F	☐ F	☐ F
EXHIBITS /RALLIES /MEETINGS	☐ G	☐ G	☐ G
HAMADS	☐ H	☐ H	☐ H
HEADLINE NEWS — PHONE BBS	☐ I	☐ I	☐ I
IARU LIAISON	☐ J	☐ J	☐ J
INTRUDER WATCH	☐ K	☐ K	☐ K
MORSE PRACTICE FACILITIES	☐ L	☐ L	☐ L
NEWS BROADCASTS	☐ M	☐ M	☐ M
OPERATING AWARDS	☐ N	☐ N	☐ N
PROPAGATION PREDICTIONS	☐ O	☐ O	☐ O
SAMPLE EXAMINATIONS	☐ P	☐ P	☐ P
SPECIAL EVENT CALL SIGNS	☐ O	☐ O	☐ O
STANDARDS ASSOCIATION PARTICIPATION	☐ R	☐ R	☐ R
STOLEN EQUIPMENT REGISTER	☐ S	☐ S	☐ S
WICEN	☐ T	☐ T	☐ T

PAID SERVICES	DO WELL	TO IMPROVE	FUTURE EMPHASIS
AOCP and NAOCP CLASSES	☐ U	☐ U	☐ U
BOOK SALES	☐ V	☐ V	☐ V
LICENSING and TECHNICAL ADVICE	☐ W	☐ W	☐ W
MAGAZINE	☐ X	☐ X	☐ X
NAOCP STUDY GUIDE	☐ Y	☐ Y	☐ Y
QSL BUREAU	☐ Z	☐ Z	☐ Z
RECIPROCAL LICENCE INFORMATION	☐ 1	☐ 1	☐ 1
SPECIALIST INFORMATION /NEWS SHEETS	☐ 2	☐ 2	☐ 2
TOWN PLANNING ADVICE	☐ 3	☐ 3	☐ 3
VIDEO TAPE LIBRARY	☐ 4	☐ 4	☐ 4
FUTURE SERVICES			
AOCP STUDY GUIDE	☐ 5	☐ 5	☐ 5
EQUIPMENT INSURANCE	☐ 6	☐ 6	☐ 6
EXAMINATIONS	☐ 7	☐ 7	☐ 7
MORSE TESTS	☐ 8	☐ 8	☐ 8
SPECIALIST NEWS BBS	☐ 9	☐ 9	☐ 9
OTHER (Name):	☐ 0	☐ 0	☐ 0
OTHER (Name):	☐ !	☐ !	☐ !
OTHER (Name):	☐ @	☐ @	☐ @
OTHER (Name):	☐ #	☐ #	☐ #

Thank you for completing this questionnaire, and showing your interest and concern about the future of the WIA and amateur radio in Australia. Please forward the completed questionnaire to: **Survey, Wireless Institute of Australia, PO Box 300, Caulfield South, Vic. 3162, by November 15, 1988.**

(See also page 3, this issue AR).

Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL. 56, No 11, NOVEMBER 1988

WIA VIDEO TAPE PROGRAM TITLE LISTING
RF IMPEDANCE MATCHING USING FERRITE TOROIDAL CORES
RSGB 75TH ANNIVERSARY
MAKE YOUR SYSTEM COMFORTABLE
HURRICANE GILBERT DISASTER

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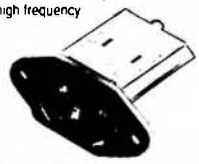
RFI Suppression Filters

Electronic equipment which draws power from mains must be protected from mains-born interference at frequencies up to 300MHz as well as preventing high frequency interference being fed back into mains as defined in international regulations. **Wide range available.**

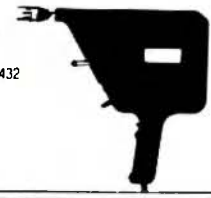


RFI Suppression Chokes

Current compensated chokes are used for suppression of high interference levels such as from ultrasonic generators, rectifiers, switched mains equipment etc **Wide range available.**

NSG 432 Line Interference simulators

The aim of these compact devices is the simple and low cost simulation of static discharge NSG432



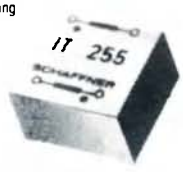
High Voltage Testers

The equipment NSG509.510 permit the test of insulation (hipot) on systems and equipment with a variable leakage current according to international standards. Both comply with worldwide safety standards.

Pulse Transformers

Igniting thyristors and triacs driving bipolar transistors, preferred in the main power transistors in switching applications, line coupling transformers in high speed data transmission

Wide range available.



Low Profile Transformers

These low profile transformers are specifically designed to be mounted directly on printed circuit boards and, because of their minimal height, are ideal for use in compact electronic circuits and equipment
Ask for details.

Variable Auto Transformers

Dimmerstat. Input nominally 240V, output, 0-270V. Current range
1A-28A single phase
2A-200A 3 phase

Hockey Puck Transistors

One of a large range of Westcode power transistors.

Up to 300A I_C (PEAK) and

V_{CEV} of 1400V

Digital Panel Meters

Suitable for AC and DC measurements voltage current and frequency options inbuilt power supply to suit 240V 50Hz

Ask for further details

Fast Recovery and Rectifier Diodes

Part of a large range of Westcode rectifier diodes. From 17A to 4310A. Maximum VRRM of 4400V – DO4 DO5 style up to large capsule assemblies

High Power Thyristors

From Westcode – phase control thyristors, fast turn off thyristors and high frequency up to many thousands of ampere

Lightning Arrestor

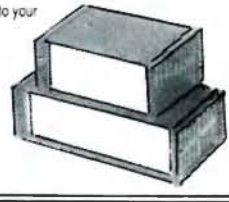
- Protects systems on any line
- Ideal for RS232 links and modems
- British Telecom approved for PW and PSTN use
- Remote outstation protection
- Easy to install
- High density protection system
- Fit and forget. Unique test check
- Failsafe choice of components
- Low volt burden for DC loops
- Wide bandwidth for communications
- Low profile, low leakage, low cost
- No fuses to replace
- Designed to protect & still survive

Computer and Video Protector

The unit incorporates a potted line filter (single stage or two stage with earth line choke) and a metal oxide varistor supplying clean output voltage to an integral three pin 10A socket for equipment connection. The computer and video protectors are available in 1, 3, 6 and 10A

Instrument Cases

Series 100 and 75. Gives – fully professional appearance to your finished product. Very strong rigid and lightweight Durable anodised finish – no painting required Max. width of the housings is 2000 mm.



Bridge Rectifiers

A full range of encapsulated single phase bridge rectifiers is also available with ratings up to 1000V PIV and 100A

Silicon Assemblies

A wide range of units are available incorporating international standard outline silicon semiconductors From 30 Amps to 4000 Amps Ask for details

Heat Sinks and Mounting Hardware

A full range of aluminium extruded heatsinks and suitable mounting clamps are also available. The range includes bar-clamps, box clamps, special insulators and heat transfer compound

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Amateur Radio

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Students in years 8 to 12 at Mentone Girls' Grammar School use computers whilst learning about satellites in physics, science and electronics lessons. They use some of the software programs written by AMSAT. Recently the girls fo lowed the progress of the Russian-Canadian Skitrek Expedition via the satellites. The photograph shows Narelle Lamb, Brooke Fitcher, Catherine Prattico and Amanda Wilson during a lesson.

—Photograph courtesy Paul Butler VK3DBP, Head of Science and Computing, Mentone Girls' Grammar School

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Technical Features

Regular Features

DEADLINE

All copy for inclusion in the January 1989 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, November 7, 1988.

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EDITOR
BILL RICE* VK3ABP

NEWS EDITOR
JIM LINTON VK3PC

TECHNICAL EDITING CO-ORDINATOR
PETER GIBSON* VK3AZL

TECHNICAL EDITORS
EVAN JARMAN* VK3ANI
GIL SONES* VK3AUI

MARKETING
BRUCE KENDALL* VK3WL

CONTRIBUTING EDITORS
Frank Beech VK7BC
Joy Collis VK2EBX
Brenda Edmonds VK3KT
Ron Fisher* VK3OM
Gilbert Griffith VK3CQ
Ken Hall VK5AKH
Roy Harlkopf* VK3AOH
Robin Harwood VK7RH
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Colin Hurst VK5HI
Eric Jamieson VK5LP
Bill Martin VK2COP
Hans Ruckert VK2AOU

COMPUTER DRAFTING
Liz Kline
Ken Kline
*Members of Publications Committee

GENERAL MANAGER & SECRETARY
Bill Roper VK3ARZ

MEMBERSHIP AND CIRCULATION MANAGER
Helen Wageningen

ACCOUNTS AND ADVERTISING MANAGER
June Fox

Inquiries and material to:
The Editor,
PO Box 300,
Caulfield South, Vic. 3162.

Material should be sent direct to PO Box 300, Caulfield South, Vic. 3162, by the 20th day of the second month preceding publication. Note: Some months are a few days earlier due to the way the days fall. Check page 1 for deadline dates. Phone: (03) 528 5962. HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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Editor's Comment

POSITIVE FEEDBACK

There are two concepts, both very basic to us in our use of electronics, which are far more generally widespread in their scope. There is, in fact, virtually no limit to their application. They are gain, and feedback.

Gain may be defined as a property, possessed by some systems, which enables a small stimulus applied at one point in the system to appear in larger, ie amplified, form at another point, these two points commonly being called input and output respectively.

Feedback is a process whereby some (possibly even all) of the output phenomenon (be it motion, temperature, voltage or whatever) is somehow transferred back to the input point. This, of course, can be done in two ways. If the fed-back signal opposes the original input, this is negative feedback. If it assists the input, the feedback is positive.

Negative feedback systems have a multitude of applications, but for the present let us concentrate only on positive feedback. The fed-back output increases the input, which in turn produces more output, so that the system continues to move off in this direction, as far and as fast as it can. In most cases it reaches a limit of some kind. For example, in the case of an explosive reaction it eventually runs out of fuel. In our electronic circuits the supply voltage imposes a limit, or a transformer core saturates (no more flux change, no more output). The process may then reverse direction until it reaches a limit of the opposite polarity. If so, we have a square-wave oscillator (although the transitions are more likely to be exponential curves than ideal squares).

Let us consider the stock market. The aim is to achieve profit by selling at a higher price than was paid, so one buys if the price is rising and tries to sell if it starts to fall. But prices rise because people are buying, and fall when they start to sell. Human reactions are slow; some may "hang on" even against logic. So we have over thousands of stocks a complex positive feedback system with time lags in the feedback paths. That such a system can maintain the stability it does, is itself amazing. In recent years computers have been introduced, programmed on-line to buy and sell automatically. Lacking human inhibitions, and operating much faster, it is not surprising that some have blamed this "program trading" for the stock market crash of October 1987, in which instead of conforming to an overall steady rise, average prices collapsed rapidly to the levels of a year or more earlier.

This normally expected steady rise in mean stock prices is necessary to compensate for yet another positive feedback phenomenon; inflation. This is the result of the so-called "wages-prices spiral", which devalues the currency as slowly as it does only because of various legal and procedural time delays inserted in its feedback path. To continue with the electronic analogy, it is as though each year we need a higher-voltage power supply than that which sufficed for the same job last year!

"Enough", you say, "We've been remarkably patient, but why don't you come to the point? Is there, in fact, a point at all?".

Yes, there certainly is! In this case, our positive feedback system is the Wireless Institute and all that it implies. Particularly this magazine. We, that is the Council and Executive, representing the Divisional Councils, provide as input to you, the membership, the dozens of organisational functions carried out by the WIA on your behalf, together with all the news and information we can assemble each month into AR.

You, in return, feed back into the system an amount of money, your annual subscription. Many of you, like me, also provide many hours of your time at no charge, to carry out the Institute's functions. The greater this feedback, the better are the functions performed. The magazine becomes more attractive and readable and more people are persuaded to join, which further boosts performance. A more attractive magazine with more readers appeals more to advertisers; yet another positive feedback boost to advertising income. The system moves in this direction until it encounters a limit, which in this case is when all Australian radio amateurs belong to the WIA. An unreasonable expectation, maybe, but it must be possible to improve greatly on our present less than half!

What is the other alternative? More members drop out, dissatisfied in some way. Less income is available, less work is done, the magazine becomes less attractive, advertisers lose interest, more members drop out. The limit in this case is for the WIA to disappear. Those of us doing the work will reorganise to make collapse impossible, but we cannot work miracles!

Positive feedback is inherent in the system. No-one can change its polarity. But those of you who are not at present members have the power to change its direction. How about it?

Bill Rice VK3ABP
Editor

ar

APPOINTMENT OF THE GENERAL MANAGER/SECRETARY

At the Federal Executive meeting on September 20, Bill Roper VK3ARZ, was appointed to the position of General Manager and Secretary of the Wireless Institute of Australia for a five-year term. Bill has been sitting in the chair in a temporary capacity since May 9.

The duties of the position centre around the management of the WIA Federal Office by:

- Controlling the financial interests of the Institute
- Analysing the Institutes services by using the results of surveys and other feedback from members
- Oversighting the performance of member service activities
- Negotiate and manage contracts on behalf of the Institute
- Represent the Institute at meetings and in negotiations with government, industrial and international bodies

The duties also include being the business manager for the Institutes publications and carry out the legal requirements of a company secretary.

The requirements for the position included a good knowledge of the role and objectives of the Institute and an appreciation of the roles of the Divisions, international bodies and government departments with whom the Institute interacts. Also required is a sound understanding and knowledge of business planning, forecasting, market research, service strategies and costing techniques applicable to the Institute's objectives and a knowledge and understanding of amateur radio and the services provided to members.

Amongst the personal characteristics sought is the need to lead and motivate a team of people, some of whom are volunteers, and highly developed communication and presentation skills. In addition, a high level of initiative and judgment, demonstrated capacity for innovative thought and significant accomplishments are required.

Bill is employed under a contract which contains the usual conditions for holidays, sick leave, hours of employment, reimbursement of out-of-pocket expenses and details the salary package. The initial base salary is aligned with that of a senior manager in the Public Service and has been set at $42 763. On top of this, at the Institute's discretion, a performance incentive payment may be made. This will be reviewed on an annual basis. There are also conditions for the extension and termination of the contract.

There is a very big task ahead as the Institute moves towards the 1990s. We must ensure that we become, and remain, a viable member oriented society. The Federal Executive have every confidence that Bill Roper is the right man to assist them in this task, but both Bill and the Executive need the help of you, the member to achieve this aim.

Peter Gamble VK3YRP
Federal President

BILL ROPER — a profile

Bill Roper is 52-years young, has a family of four daughters and three grandchildren.

Bill has spent 36 years in the banking industry, much of that time being spent in specialised areas such as administration, legal, accounting, personnel training and retail banking. He has completed a substantial number of training courses in a variety of subjects ranging from personnel and financial management, to negotiation and marketing.

In recent years he has held appointments at senior management level as a District Manager responsible for *up* to 36 bank branches, as Principal of a live-in Staff Training College, and as manager of a large retail banking branch office.

The call sign VK3ARZ is well-known to many amateurs and was first issued to Bill in 1959. Because of family and work pressures in recent years, his first love of designing and building receivers and transmitters has had to give way to finding ways and means of improving the performance of even the most sophisticated of commercial HF transceivers, and experimenting with antennas.

Bill, whose voice is familiar to amateurs because of the Federal Tapes over the past 12 years, has been actively involved in a number of aspects of the WIA, at both Divisional and Federal level, since 1960. Amongst the many positions, such as Victorian Divisional Councillor, and as a member of the Federal Executive, he was Editor of *Amateur Radio* magazine for several years in the 1970s.

Amateur radio is not Bill's only interest — he also has a particular interest in computers, especially when used as a tool for financial and administrative management. Other interests include reading, photography and light classical orchestral music.

In taking this position with the WIA, Bill has had to resign from his present employment, a move he did not take lightly. However, Bill, with the full support of his wife, Wyn, a schoolteacher, has made the move. "I could not resist the almost impossible challenges presented by the position of General Manager and Secretary of the WIA," Bill commented recently.

ar

COIL DESIGN MADE EASY

Arthur Solomon VK3LJ
RMB E788, Millbrook, Vic. 3352

What if the information is lacking or incomplete? ? ?

There are many times when we want to construct single-layer air-core coils — for ATUs, tank coils, antenna traps, antenna loading coils, filters of various types, etc — and it is fine when the full details for the construction of those coils is at hand — and the recommended materials! But what if this information is lacking or incomplete?

The author decided recently to take an 80 metre dipole, add a loading coil and resonate it on 160 metres. Such an antenna had been built several years ago but the original notes were not available. A perusal of the *ARRL Antenna Handbook* located a graph from which information was gleaned that if the 160 metre dipole was cut to 50 percent of its length (equivalent to an 80 metre dipole), and a loading coil was placed in each leg at a point 80 percent of its length (ie approximately 52 feet) down from the dipole feedpoint, the loading coils would need to have an inductive reactance of 2500 ohms each. A few minutes with a calculator showed that, for a mid-band frequency of 1.830 MHz, a coil of 2500 ohms reactance would have an inductance of 217.42 microhenries.

So far so good; but where to from here? Several pieces of two inch diameter PVC were located which would serve well as coil formers. Some #18 enamelled wire was also found and from the Wire Tables in the *ARRL Handbook* it was discovered that close winding this wire would give 23.6 turns per inch. Now, this is where the "cut and try" approach begins. We are all familiar with the time-honoured formula:

$$L(\text{microhenries}) = (an)\wedge 2/9a + 10b$$

where a = radius in inches, b = length of coil in inches, and n = number of turns. So, what we usually do is try various figures for "n" until we get as close as possible to the required value for "L". To try to transpose this formula to get an expression for "n", I finished with not one unknown but two, because "b" is not known until "n" has been determined! Thus it takes considerable time and patience to arrive at a tolerable value for "n". There had to be a simpler way . . . and there was!

Firstly, let b = n/t, where t = number of turns per inch, which is easily found in wire tables for any gauge wire. Secondly, substitute back in the original formula and get the expression:

$$a\wedge 2xn\wedge 2 = 9aL + (10L/t)n$$

This, despite its apparent complexity, is a simple quadratic equation and easily solved by the Quadratic Formula, thus:

$$n = (10L/t +/- SQ.ROOT(100L\wedge 2/t\wedge 2 + 36L a\wedge 3))/2a\wedge 2$$

Lastly, transfer this equation into a computer program and the "game is sown up".

The accompanying *Coil Maker Program* will do all of the following:

1. It will calculate reactance, given the inductance of a coil and the frequency of operation.
2. It will calculate inductance, given the reactance and frequency.
3. It will calculate inductance, given the usual physical parameters of the coil.
4. It will calculate the number of turns, if it is told the required inductance, coil diameter and turns per inch (from the wire gauge).
5. It will tell, from the number of turns and the coil diameter, the exact length of wire required in both feet and metres.

Although the program is written for the 128 Microbee Premium disk system, it should not be difficult to adapt it to other computers. It would certainly be worth the effort of doing so as it will save a great deal of time in both the shack and workshop. It took less that two minutes on the computer to design the required loading coils, ie on a two inch diameter former I needed 110 turns (109.9) of #18 enamelled wire, with a coil length of 4.6 inches, and using 57.54 feet (17.54 metres) of wire.

```
00100 REM ***  THE COIL MAKER  ***
00110 REM  A programme to design air-cored coils for radio
00120 REM  purposes. It will calculate, given the necessary
00130 REM  parameters, the reactance, inductance,number of
00140 REM  turns and length of wire used in the making of
00150 REM  single-layer air-cored inductors.
00160 REM  #### Written by Arthur Solomon, Milburn,Vic.,1988 ###
00170 REM ########### T H E  C O I L - M A K E R  P R O G R A M M E  ###########
00180 CLS
00190 PRINT" ###  C O I L - M A K E R  P R O G R A M M E  ###  "
00200 PRINT"================================================="
00210 CURS 1,3:PRINT"Select your requirement:"
00220 CURS 5,5:PRINT"1. Calculation of Inductance from the Reactance."
00230 CURS 5,7:PRINT"2. Calculation of Inductance from physical parameters "
00240 CURS 5,9:PRINT"3. Calculation of Reactance from the Inductance."
00250 CURS 5,11:PRINT"4. Calculation of Number of Turns."
00260 CURS 5,13:PRINT"5. Calculation of Length of Wire needed."
00270 CURS 5,15:PRINT"6. Exit from this programme."
00280 A0$=KEY:IFA0$=""THENGOTO280
00290 IFA0$="1"THENGOTO360
00300 IFA0$="2"THENGOTO490
00310 IFA0$="3"THENGOTO590
00320 IFA0$="4"THENGOTO680
00330 IFA0$="5"THENGOTO820
00340 IFA0$="6"THENEND
00350 GOTO280
00360 CLS
00370 PRINT"CALCULATION OF INDUCTANCE FROM THE REACTANCE:"
00380 PRINT"============================================="
```

```
00390 CURS 10,5:INPUT"What is the REACTANCE in ohms? ";R1
00400 CURS 10,7:INPUT"What is the FREQUENCY in MHz? ";F1
00410 U1=2*3.1416*F1:L2=R1/U1
00420 CURS 5,11:PRINT"The INDUCTANCE is ";[F10.2  L2];" microhenries."
00430 CURS 5,12:PRINT"-------------------------------------------------------"
00440 CURS 5,14:PRINT"Do you require further calculations?  (Y/N)    "
00450 AO$=KEY:IFAO$=""THENGOTO450
00460 IF(AO$="y")OR(AO$="Y")THENGOTO480
00470 IF(AO$="n")OR(AO$="N")THEN END
00480 GOTO180
00490 CLS:PRINT"CALCULATION OF INDUCTANCE FROM PHYSICAL PARAMETERS:  "
00500 PRINT"=================================================":PRINT
00510 CURS 5,4:INPUT"What is diameter of coil in inches?          ";D1
00520 CURS 5,6:INPUT"What is the number of turns?          ";T1
00530 CURS 5,8:INPUT"Give the turns per inch of the winding.    ";P1
00540 A1=D1/2:X1=T1/P1
00550 L2=(A1*T1)^2/(9*A1+10*X1)
00560 PRINT:PRINTTAB(5);"The Inductance of your coil is ";[F10.2 L2];" Microhenr
ies."
00570 PRINTTAB(5);"-------------------------------------------------"
00580 GOTO 440
00590 CLS
00600 PRINT"CALCULATION OF REACTANCE:"
00610 PRINT"========================="
00620 CURS 10,5:INPUT"What is the INDUCTANCE  in microhenries?     ";L2
00630 CURS 10,7:INPUT"What is the FREQUENCY in MHz.?   ";F1
00640 X1=2*3.1416*F1*L2
00650 CURS 5,12:PRINT"The REACTANCE of the coil is ";[F10.2  X1];" ohms."
00660 CURS 5,13:PRINT"-----------------------------------------"
00670 GOTO440
00680 CLS
00690 PRINT"TO CALCULATE NUMBER OF TURNS TO OBTAIN GIVEN INDUCTANCE:"
00700 PRINT"============================================================"
00710 CURS 10,4:INPUT"Required INDUCTANCE in microhenries?    ";L2
00720 CURS 10,6:INPUT"DIAMETER of former in inches?   ";DO
00730 CURS 10,8:INPUT"TURNS PER INCH of the winding?   ";T1
00740 D1=DO/2:B1=(10*L2)/T1:B2=(10*L2/T1)^2:C2=36*D1^3*L2:C3=2*D1^2
00750 R2=SQR(B2+C2)
00760 IFR2<B1THENGOTO790
00770 N1=(B1+R2)/C3
00780 GOTO800
00790 N1=(B1-R2)/C3
00800 CURS 5,11:PRINT"The NUMBER OF TURNS required is ";[F10.1  N1];"."
00810 GOTO440
00820 CLS
00830 PRINT"CALCULATION OF LENGTH OF WIRE NEEDED FOR THE COIL:"
00840 PRINT"================================================"
00850 CURS 5,4:INPUT"Diameter of coil in inches?   ";D1
00860 CURS 5,6:INPUT"Number of turns?   ";T1
00870 CURS 5,8:INPUT"Turns per inch?    ";X1:B1=T1/X1
00880 L1=3.1416*D1*T1:L3=L1/12:L4=L3/3.28
00890 CURS 1,10:PRINT"COIL REQUIRES ";[F10.2  L3];" FEET OR ";[F9.2 L4];" METRES
 OF WIRE."
00900 CURS 4,13:PRINT"The length of the winding will be ";[F6.1 B1];" inches."
00910 CURS 4,11:PRINT"Note: add extra length to allow for wastage and inaccuracy
 of measurement."
00920 GOTO440
00930 END
```

NOT ANOTHER RD CONTEST PROGRAM!!!

Terry Neumann VK5ATN
PO Box 200, Balaklava, SA. 5461

Log-keeping is a tedious task.

Not another RD Contest Program! . . . Well! Yes and no. It is not a new program, but a plagiarised version of the C-64 program written by Dion Thomas and published in the July edition of *Amateur Radio*. In this version, specifically for the HF section of the contest, the program has been rewritten and enhanced for the TRS-80 Model IV computer. The Model IV, the last of the Tandy series of Z80 computers, is a fine computer in it's own right, but came just a little too late to follow up on the early success of it's predecessors and was trampled underfoot in the rush to the IBM PC and it's innumerable look-alikes, or alternatively to the Commodore 64, which has been embraced by many amateurs as the machine of the moment.

THE BACKGROUND

I have always enjoyed having a run in the RD contest. Not that there are ever any aspirations to win; but being the only contest in the calendar which I take at all seriously, I usually join in the fun on the HF bands for as long as is possible.

However, this enjoyment was seriously diminished by two factors. The first was the tedious, but essential, checks for duplicate contacts, either during the contest or in the weeks after. Secondly, since my writing is, to say the least, abysmal the entire log had always to be re-typed so the contest manager could actually read it. This often meant that the log was submitted right on the deadline, and sometimes was not submitted at all. I wonder how many other logs never reach the FCM for the same reason?

Consequently, I have always been on the lookout for a computer program which would take care of these two deterrents. When no less than four RD log programs were published in the July 1987 issue of AR, my interest was really aroused. Of these, the one written by Dion Thomas offered all of the features I most needed, especially the concept of writing contacts to disk immediately. (Our rural power supply is not as reliable as one could always hope for!). However, there were obviously some serious problems since the BASIC used by the C-64 series varies considerably in some areas from that used by the Tandy computers.

ADAPTING THE PROGRAM FOR THE TRS-80

Since my talents as a programmer were questionable at best, the task of re-writing and adapting Dion's program was tackled with some trepidation. A C-64 manual was borrowed from a neighbour, and work commenced. As it progressed, it became apparent that in some respects the task was easier than expected since the Tandy does not need constant opening and closing of the printer port in order to print a contact. Similarly, not having a colour monitor meant that much of the screen routines and commands could be simplified.

Finally a working version was ready for the 1987 contest. Whist the program worked well during the contest, it became apparent that several modifications and enhancements could be made to suit the features of the Model IV. A virtual rewrite of the program was undertaken to incorporate these changes. Special emphasis was given to saving space, since the Model IV has a somewhat limited free memory after BASIC is loaded. Accordingly REM statements have been kept to a minimum in the final version. The program as it presently exists has space for about 850 contacts, which will be adequate for all bit the top gun contesters given the present band conditions. If you are really serious about catching the top contesters, then you will probably need a program which offers more capacity than this one!

USING THE PROGRAM

My standard TRS-80 Model IV produces very little RFI so the unit was able to be operated next to the TS-43X without any real problems in this area. My TRS-80 also has the G Clock real-time clock installed. This is a very useful modification for any Model IV since the time is always accurate irrespective of disk identification and the machine knows the date and time whenever it is needed. The clock is set to UTC date and time before the contest. Accordingly, these details are not required in the program. Since the TRS-80 can also display the clock on the screen at all times, this facility was utilised. The < BREAK > key is also software disabled prior to the contest to prevent accidents.

The main operating menu for the RDLOG/BAS program is shown in Figure 1. Most of the features offered are similar to Dion's original C-64 version, but the layout has been altered to suit my own preferences. For the most part, I would expect that the operating features of both this and the original C-64 version would be similar.

In operation, the program works something like this:

1. On start-up, after previously setting the system date and clock for UTC, the user is prompted for band, and mode required, and whether the printer is to be selected. A previous check on other bands for each station worked is automatically enabled. This later feature is a useful one for what is, after all, the friendly contest, (Hello again, nice to meet you on this band as well. . .) but it does take a little extra time in execution of the program. If not required, it can be disabled from the main menu which then appears as shown in Figure 1.
2. When a call sign is entered, the computer checks for previous contacts from that station, listing (if required) previous contacts on other bands. If the station has already been worked on the band in use, a notice appears on the screen to that effect in inverse video, a tone is sounded, and the contact is cancelled. Pressing < ENTER > returns the screen to the main menu ready to try again.
3. If no previous contact has been made with the station on the band in use, the number to be sent is shown, and upon entry of the number received, the contact is immediately saved to disk with the correct time added. The contact will also be sent to the printer (if enabled) in the correct form for the FCM.
4. A contact can be cancelled at either of two points in the exchange, firstly by entering a minus < — > instead of the call sign of the other station, or by entering a minus instead of the number received. When this happens, the screen clears and again returns to the main menu.
5. Since some 90 percent or more of the stations worked in the RD will be from VK, the program assumes a VK prefix if a number is entered as the first part of a call sign. Therefore, my own call sign is entered as 5ATN. This save two keystrokes on each contact, (they all add up) and reduces the fumble factor. For ZL and P29 contacts (and VK if you wish) the full call sign, including the prefix, must be entered.
6. The functions of most of the command options on the main menu will be readily apparent. Pressing < F3 > forces a string clean-up "trash collection." The machine will sometimes do this of its own accord as the memory fills. This apparent 'hang-up' can take some time and is a nuisance if it happens during an exchange. The option of 'forcing' this to happen at a free time in the contest helps to overcome this problem.

SPECIAL POINTS

1. As with the original C-64 program, a new disk **must** be used for each contest. The data is always saved with the file-name *RDLOG/DAT* and chaos will result if an old disk with this file present is used for a new and different contest.
2. Testing with a friends standard TRS-80 Model IV without a G Clock installed revealed some worrying problems with accurate time keeping, even though recommended procedures in the manual (SYSTEM, SMOOTH=NO) were followed. It was found that the clock would still lose time during disk write operations, although it remained accurate otherwise. The loss was in the order of about 15-plus seconds in 10 minutes of continuous entries. It is not known whether this was a unique case, or an expected occur-

```
 RD CONTEST LOG - Version 4.02 - - -  Date is: 06/03/88   - -  TIME: 21:05:26
================================================================================
 20297 Bytes free  - -    849 Contacts left.        Force G.C. - < SHIFT F3 >

Recall Disk Files - < ! >                          Print New Heading - < > >

Display Log - < Shift  F1 >                        Hard Copy - < Shift F2 >

To Change: -   Band - < F1 >                       Mode - < F2 >

Cancel contact  - < - >
--------------------------------------------------------------------------------
Printer is  OFF                                    < & > for ON

Previous Band Check is  ON                         < $ > for OFF
--------------------------------------------------------------------------------

Present Band is : 3.5   - - -    Mode : SSB    - - -     Next Number is:  2

Last contact: 1   2058 SSB 3.5 VK3ABP   3

Enter Callsign or Select function:
```

Figure 1: The Main Menu of the RDLOG program. The Time, Date, and last station worked are for demonstration purposes.

rence with all 'standard' Model IVs. Whilst this order of error might be tolerated over a period of an hour, it is apparent that, unless a return to DOS is done at intervals, to reset the clock, the accuracy of the log over the duration of the entire contest would not be acceptable.

There are three possible solutions to the problem.

a) Obtain and install a G Clock.
b) Reset the clock at regular intervals (say every hour) as described above.
c) Dispense with all reference to the Model IV clock and change two lines in the program to accept a physical four digit input of the time at each contact. This is easily done and may well be the best solution if the problem is encountered. The changes needed will be included in notes supplied with the program listings.

3. TRSDOS 6.3 does not allow input of system date past 12/31/87 (or 31/12/87 in Australian). Therefore to use this version of the program (RDLOG402) you will need the new DOS LSDOS 6.3 which has vastly improved features in almost every area, and of course, allows dates up to the end of 1999 to be entered. If you have only TRSDOS 6.3 and have disabled the date prompt to be still able to use it, Version 4.03 of the program can be used. This version includes the original date entry routine as used by Dion in his C-64 program at the cost of some memory space. However, since the date will be re-entered when the log is later reprinted, there seems little point in being too meticulous about this detail for the contest itself. However, if perfection is your aim, use it by all means, but be sure to watch for the change in UTC date during the contest.

4. If it is necessary to close down the station at some point in the contest (after all most of us have to sleep sometimes), the computer can be shut down, and re-started by re-loading the log thus far saved to disk, and continuing on as before. The printer can also be shut down, but should not be physically disturbed, neither is a new heading needed on the next start-up. If this is done, the printout should continue without any interruption being obvious.

A WORD OF WARNING

Finally, and most importantly, operating a keyboard in the red haze and fury of a contest will probably be a new and confusing experience at first. For most people it is much easier to write whilst operating then it is to type. Proceed with caution, because mistakes are easy to make, and once the contact is finally entered, and is sent off to disk, it has gone and cannot be changed, for the present anyway. Keep a correction sheet at the ready in case any mistakes are detected, so that they can be altered later after the contest.

Being fully aware of my own inadequacies in this area, a second program was developed to allow the log to be reprinted in full at a later date from the disk file. Using the LDOS utility file editor (FED) mistakes can be corrected, or, if there is a real doubt about the correctness or validity of a contact, the points score can be reduced to zero for that contact.

In a following issue we will discuss this program.

THE CAPACITIVELY LOADED DIPOLE ANTENNA
Some New Findings

Dick Turrin W2IMU
PO Box 65, Colts Neck, New Jersey, 07722, USA.

Some findings with thin wire dipole antennas.

THE CAPACITY LOADED wire dipole antenna has appeared in amateur radio literature for over 20 years, and in the professional literature for over 30 years (Refer 1, 2, 3, 4, 5, 6). Some of the claims include very wide band operation and high performance.

This article reports on some recent findings with thin wire dipole antennas of the design type introduced by W4FD, which received some notoriety and acceptance in the amateur radio fraternity [4]. The results presented here were generated by computer analysis using the *MININEC3* (Numerical Electromagnetic Code) program on an AT and T 6300 PC and is available from the WIA for the IBM XT/AT computer. The MININEC program originated at the Naval Postgraduate School in California, USA, and is admirably suited to analyse wire antennas of the type presented here.

THE CAPACITIVELY LOADED WIRE ANTENNA

The capacitively loaded dipole wire antenna which was analysed in this report consisted of 38 capacitors each 390 pF uniformly distributed at one metre intervals along a 40 metre long dipole of # 12 copper wire, as shown in Figure 1.

This particular antenna design results in a fundamental resonance at 7.0 MHz for a full wavelength long dipole. The simple empirical design criteria for this antenna, is that each capacitor series resonates with its adjacent "free-space" wire inductance at 7.0 MHz.

For a 40 metre long dipole, this design implies a stretching factor of two, at the design frequency. There is nothing unique about the choice of dipole length. In this case it was chosen as a convenient and practical length as well as a length used in one of the references [4].

The computer analysis was performed for "free-space" conditions and the generated results include:

1. The input impedance at the centred feed,
2. The current distribution along the dipole,
3. Far-field radiation characteristic patterns, and
4. Absolute gain in dBi (decibels above isotropic) in the direction of maximum radiation.

INPUT IMPEDANCE

The input impedance over a frequency range of three to 30 MHz is presented in Figure 2, in which the real and imaginary parts are graphed separately. Of particular interest is the behaviour around the fundamental resonance of 7 MHz but also the non-integer "harmonic" resonances of which there are three, at 12.6, 19.5, and 26.5 MHz.

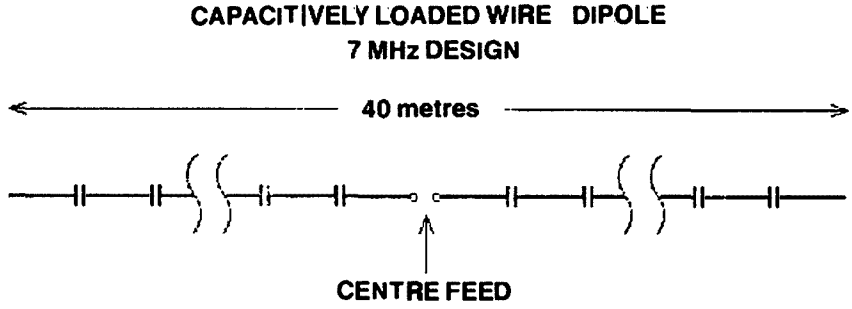

Figure 1: A physical drawing of the capacitively loaded antenna which was analysed in this report. The design length was arbitrarily chosen at one wavelength (40-metres) for the design frequency of 7 MHz. All wire segments are one metre long and the 38 capacitors are 390 pF each. The model wire is # 12 copper.

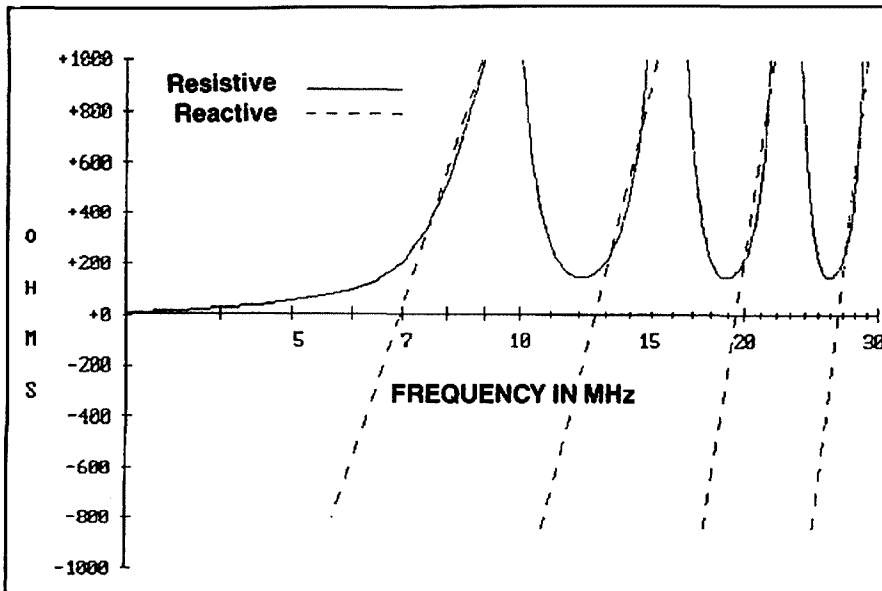

Figure 2: The computed input impedance, resistive and reactive parts graphed separately, for 40 metre long centre fed capacitively loaded dipole antenna shown by Figure 1. Note the non-integer harmonic resonances and the gradual decrease in the resistive component of the input impedance below the design frequency of 7 MHz.

An interesting features of this graph is that the fundamental resonance input impedance is 200 +j 0 and the higher resonances are between 150 and 160 ohms. Between these resonances the antenna input impedance experiences stop-bands where the reactive component can be rather high.

This is not an ultra-broadband antenna, nor will it operate at integer harmonics without a suitable reactive tuner.

However, at the fundamental resonance of 7 MHz, the input VSWR computed for a 200 ohm feed system is a marked improvement compared with a simple halfwave wire dipole antenna. Figure 3 shows computed graphs of VSWR for both a wire dipole and the capacitively loaded wire dipole.

CURRENT DISTRIBUTION

The current distribution along this capacitively loaded wire antenna at the fundamental resonance was found to be very close to cosinusoidal, similar to a halfwave dipole, while at higher resonances it behaved very nearly like a centre fed long-wire antenna. This in contrast to some claims of a more uniform current distribution.

An intuitive understanding of wire antenna tells us that the current must fall to zero at the ends of the dipole radiator, but the current distribution along the rest of the wire is sometimes difficult to predict for a complex structure, such as the capacitively loaded thin wire dipole.

The MININEC3 computer program can approximate the current distribution with good accuracy by a complex process of dividing the wire into many short segments, and then calculating the uniform current in each small segment by including mutual couplings with all other wire segments. There were 40 segments used for this particular antenna analysis.

The current distribution is crucial to calculating the input impedance, and the radiation characteristics; which are also computed by MININEC3.

RADIATION AND GAIN

The radiation characteristics and absolute gain values are probably of more general interest since they are good indicators of how well the antenna will perform as a radiator of radio frequency (RF) energy. For "free-space" conditions, the characteristic radiation patterns of this antenna at its fundamental and three higher resonant frequencies are shown in Figure 4. To generate the full three-dimensional space radiation characteristics, simply rotate the pattern about the axis of the wire antenna.

While the 7.0 MHz pattern resembles a dipole radiation characteristic with a broadside radiation maximum, the higher resonance patterns are similar to centre-fed long-wire antenna radiation characteristics. This is as to be expected because the capacitive reactance decreases with increasing frequency, tending to short circuit the wire sections together into one continuous wire.

The absolute gain of this capacitively loaded wire antenna in the broadside direction and at 7 MHz, is +3.0 dBi (dB above isotropic). By comparison a standard halfwave dipole is +2.15 dBi. This modest improvement in gain is due to the increased antenna length from a half wavelength to a full wavelength, and the spreading out of its current distribution.

In contrast, the gain of the familiar double Zepp or two-halfwaves in-phase is +3.69 dBi. The capacitively loaded full wave dipole gain falls short of the double Zepp because the current distribution is concentrated at the centre for the former and spread into separated crests for the latter. In addition, the capacitively loaded dipole does not have uniform phase along its length. Both antennas are the same physical length.

In antenna theory, maximum gain is always achieved when the current amplitude and phase distributions along the wire are uniform. A very improbable situation to achieve since the current must fall to zero at unconnected wire ends.

At the higher resonances this antenna exhibits gain in the direction of maximum radiation. At 12.6 MHz the gain is 3.45 dBi, at 19.5 MHz it is 4.81 dBi and at 26.5 MHz it is 5.56 dBi.

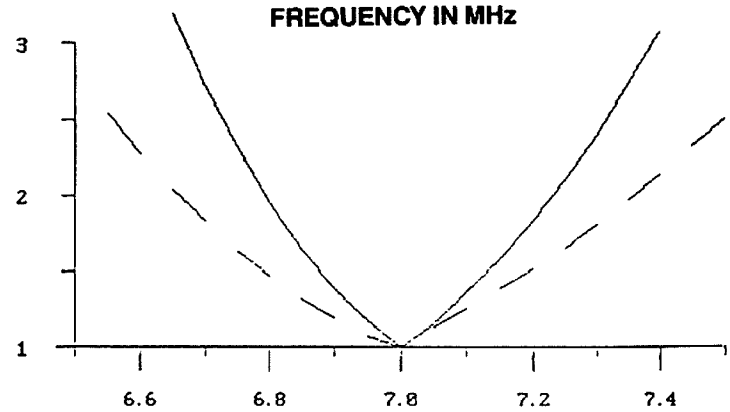

Figure 3: Computed Voltage Standing Wave Ratio for a halfwave dipole (solid curve) normalised to 72 ohms, and the capacitively loaded full wave dipole normalised to 200 ohms.

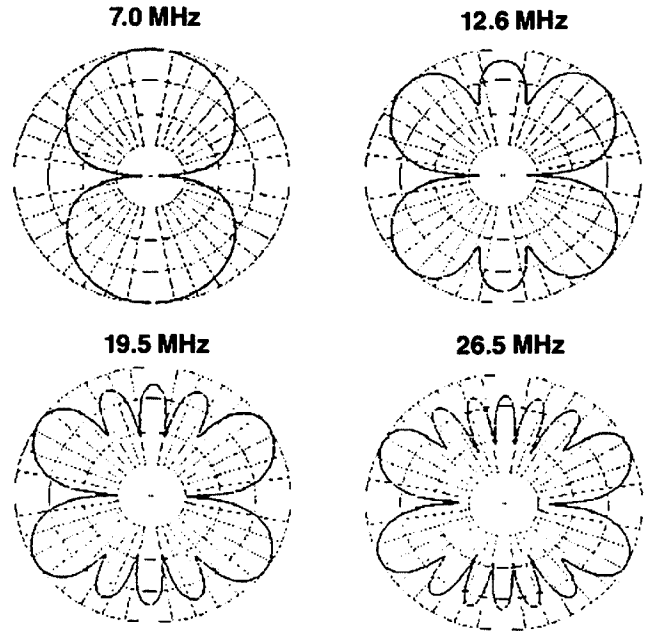

Figure 4: The computed "free-space" radiation characteristic patterns in the plane of the dipole. For the 40 metre long centre fed capacitively loaded antenna at its four resonant frequencies in the 3-30 MHz range, as indicated. Patterns are normalised to the maximum radiation level for each frequency. The radial scale is 0 to -40 dB.

REMARKS

The capacitively-loaded wavelength-long thin-wire dipole antenna shows a modest improvement in broadside gain over a conventional halfwave dipole by 0.84 dB. This cannot be regarded as a high-performance antenna nor can it be considered an ultra-broadband antenna. Although at fundamental resonance its bandwidth is better than a conventional wire halfwave dipole.

In the author's opinion, the physical size and difficulties of including capacitors along a wire antenna do not justify the predicted increase in performance.

An improvement in current distribution (more uniform) can be achieved using mixed, inductive and capacitive, loading. One such design, shown in Figure 5, employs four inductors and six capacitors on a full wavelength long dipole to achieve a broadside gain of 3.51 dBi. A unique feature of this particular design for 7 MHz is that the centre drive impedance is very close to 300 ohms resistive, making it convenient to feed with 300 ohm television ribbon feedline. The bandwidth of this antenna is only slightly broader than a halfwave dipole. Radiation is broadside, similar to the double Zepp antenna.

There are literally an infinite number of combinations of capacitive loading alone which may be analysed. However, it has been found, after an extensive search, that ultra-broadbanding cannot be achieved with only uniform or tapered capacitive loading of thin wire antennas.

Some early reports have achieved broadbanding in the UHF/SHF range employing capacitively loaded "fat" conductor antennas [2]. The conductor size requirement renders these designs rather impractical for HF application.

The purpose of this report has been twofold. First, to report some findings on the capacitively loaded dipole antenna which will aid prospective users and add to the knowledge of this type antenna.

And second, to make amateur radio antenna enthusiasts aware of the powerful MININEC program which permits a fairly straightforward and rapid analysis of complex wire antennas using readily available personal computers, a facility which, as little as 10 years ago, was virtually impossible.

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6. ATKINS, David, W6VX. *The High Performance Capacitively Loaded Dipole, Ham Radio*, May 1984, pp. 33-35.

Dick Turrin W2IMU, a retired Senior Engineer from Bell Telephone Laboratories, Homdel, New Jersey, is a world renowned expert in the antenna field. He has, in the past, been closely associated with the infamous Crawford Hill VHF Society through which he is remembered for the many years of technical notes he has presented through this Society.

His association with VK came to prominence when he had the first Australian EME QSO with Ray Naughton VK3ATN. This QSO was with K2MWA portable W2, later to be W2NFA (a 60 foot dish) which was operated by none other than Dick Turrin W2IMU.

Dick has been to Australia and presented a lecture to the Eastern and Mountain District Radio Club (EMDRC). He has, over the years, followed our magazine through Ray VK3ATN.

We are indebted that he has forwarded this article on capacitively loaded dipole antennas. The conclusions drawn will certainly interest all of those that may well re-think their views after reading this article.

—Doug McArthur VK3UM, Technical Editor

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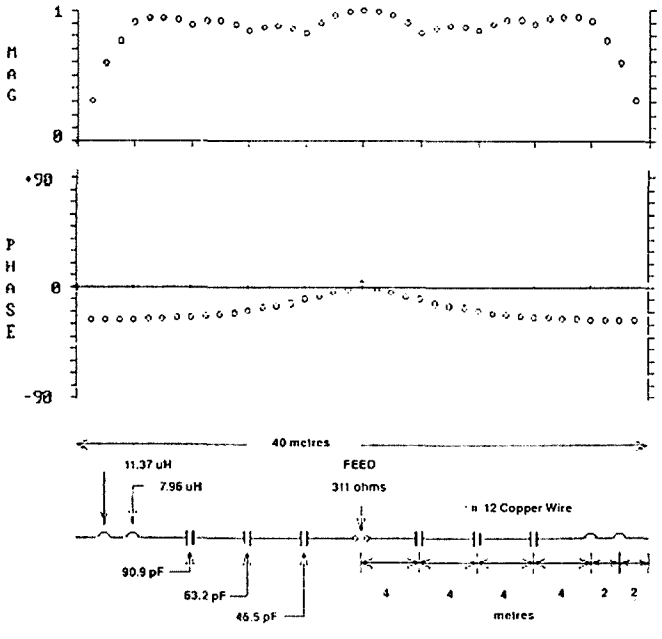


Figure 5: An antenna design employing mixed inductive and capacitive loading to achieve a nearly uniform current distribution along the wavelength long dipole antenna. Current distribution as computed by MININEC3 is shown along with design values for 7 MHz. The gain is 3.51 dBi and the radiation is broadside, similar to two-halfwaves in-phase.

A BOY AND HIS RADIO

The era of broadcasting had begun in Australia and it was up to a 12-year-old boy to demonstrate the wonders of wireless.

Don Reed VK4CDR, remembers the proud occasion adjusting the cat's whiskers on his crystal set as members of the Hornsby Council (NSW) looked on.

His interest in wireless reception began while a student at the Hornsby Public School.

New equipment arrives on Christmas Island in 1968.

It was around 1924 when Morse code transmissions and then broadcasting from Farmer and Company, 2FC, and Broadcasters Ltd, 2BL Coogee had begun.

At the age of 18, prior to the start of World War II, he joined the No 1 Corps Signals of Carlow Street, North Sydney.

There he served under Major Rupert Sainsbury, who held amateur call sign OA2YJ. The Major taught Don how to build a transmitter using one 210A valve.

After being given an army call sign by the Major, he operated the transmitter on 45 metres from home to contact the army signals station.

On one occasion a station with a strong signal using an army code queried Don by asking: "What station is that and where are you located?"

He replied in the secret code: "Official outstation of the Army Corps of Signs". Don passed his AOCP in 1931, while living at Waitara, New South Wales, and operated under VK2DR.

Lured by the thrill of DX, his station gained the IARU Worked All Continents Certificate on June 25, 1936.

At the outbreak of war he tried to enlist only to be rejected because an Xray showed an unacceptable lung scar.

Don, who qualified for the First Class Commercial Operators Certificate, was then employed on the technical staff at 2GB, Sydney.

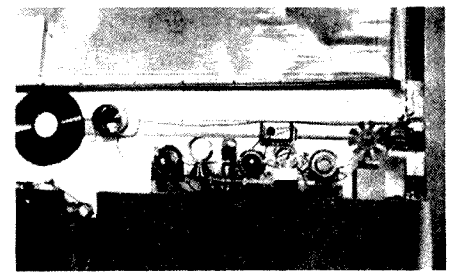
He also worked at 4LG Longreach, 4CA Cairns and 4TO Townsville. Later he was the Officer in Charge of Communications for 10 years on Christmas Island in the Indian Ocean from 1962.

Don helped start the Christmas Island Amateur Radio Club, and himself signed VK9DR, from the island.

After suffering a heart attack and returning to Australia to recover, Don took up a two-year posting with the Coastal Radio on Nauru in the Pacific, and was active as C21DR.

He encouraged local amateur radio activity on Nauru and neighbouring Ocean Island.

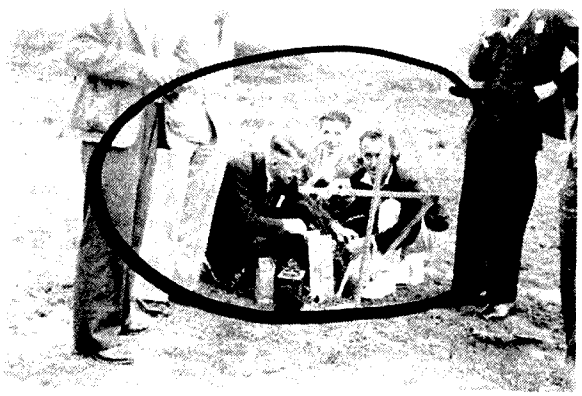
A caricature of Don on Christmas Island.

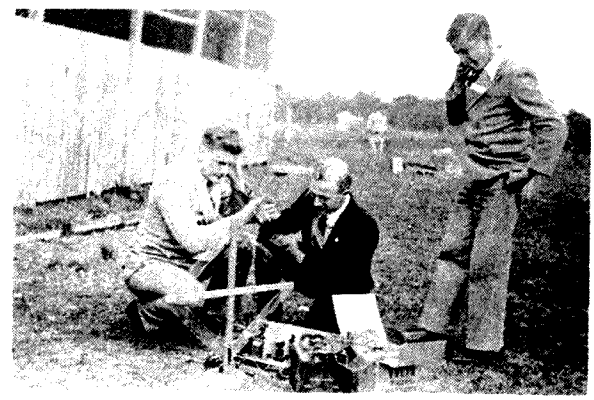


The station of VK2DR.

The next posting for 18 months was to Rabaul (PNG). Now in his 77th year, Don lives in retirement and keeps in contact with his many friends on air.

The WIA Queensland Division bestowed Honorary Life Membership on Don Reed in recognition of his efforts in encouraging our hobby in the various places he was posted, and in particular, Christmas Island.





Does any Old Timer recognise these amateurs? They were photographed at a Field Day at either Wyong or Gosford by Don VK4CDR.

TRY THIS! 1924-style "A Christmas Day Edition"

–Contributed by Bob Demkiw VK2ENU

THE DAILY TELEGRAPH, THURSDAY, DECEMBER 25, 1924
WIRELESS WORLD

JACKS

Three Valve Sets

HOW THEY ARE WORKED

The use of telephone plugs and jacks enables the number of valves in use to be changed in a simple manner. The accompanying diagram shows the circuit of a three-valve set, using three jacks, thus enabling either one, two, or three valves to be used as desired by simply pushing the telephone plug into the proper jack. The circuit without the jacks has been already described in a previous issue, so it is necessary only to consider the action of the jacks.

When it is desired to receive on one valve only the plug is pushed into the first jack (counting from the left), thus raising the upper blade of this jack from its contact with the lower blade, and connecting the 'phones in between the upper blade and the frame, and, at the same time, breaking the circuit to the transformer. The circuit from the plate of the first valve is then through the tickler coil to the frame of the jack, and 'phones to the high tension battery, then direct to the frame of the jack, and through the upper blade, through the transformer being cut out of the circuit automatically when the plug is inserted in the jack.

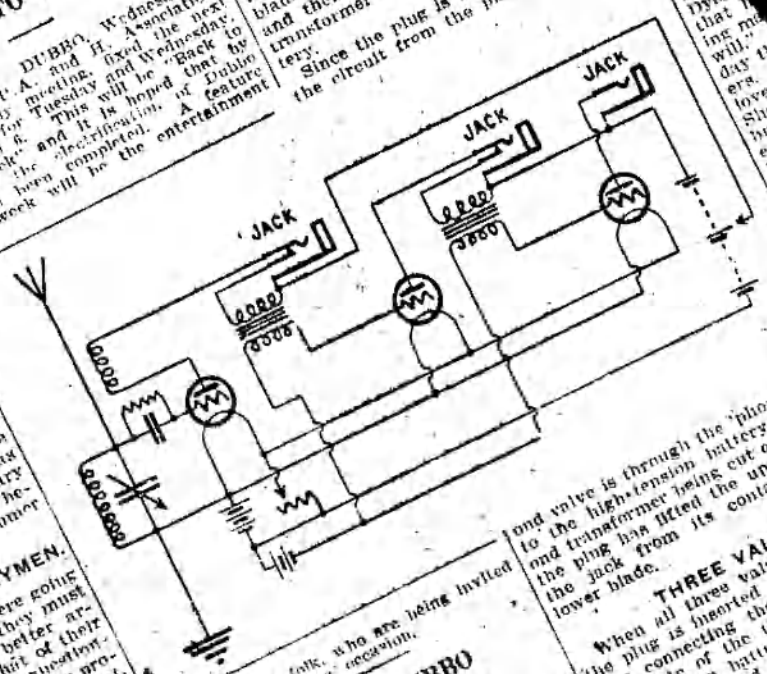
TWO VALVES.

If it is desired to use two valves, the plug is pulled out of the first jack, and inserted in the second jack. The upper blade of the first jack now makes contact with the lower blade, and the circuit from the plate of the first valve is through the tickler coil to the upper blade of the jack, to the lower blade, and then through the primary of the transformer to the high-tension battery.

Since the plug is in the second jack, the circuit from the plate of the second valve is through the 'phones direct to the high-tension battery, the transformer being cut out, because the plug has lifted the upper blade of the jack from its contact with the lower blade.

THREE VALVES.

When all three valves are required, the plug is inserted in the third jack, thus connecting the 'phones between the plate of the third valve and the high-tension battery. In each of the first and second jacks the two blades are making contact, and, hence, the transformers are connected in the plate circuits of the first two valves. It will be noticed that the third jack requires only one blade, because it is not necessary to cut out any transformer from the plate circuit of this valve.



News

TO DUBBO

DUBBO, Wednesday.

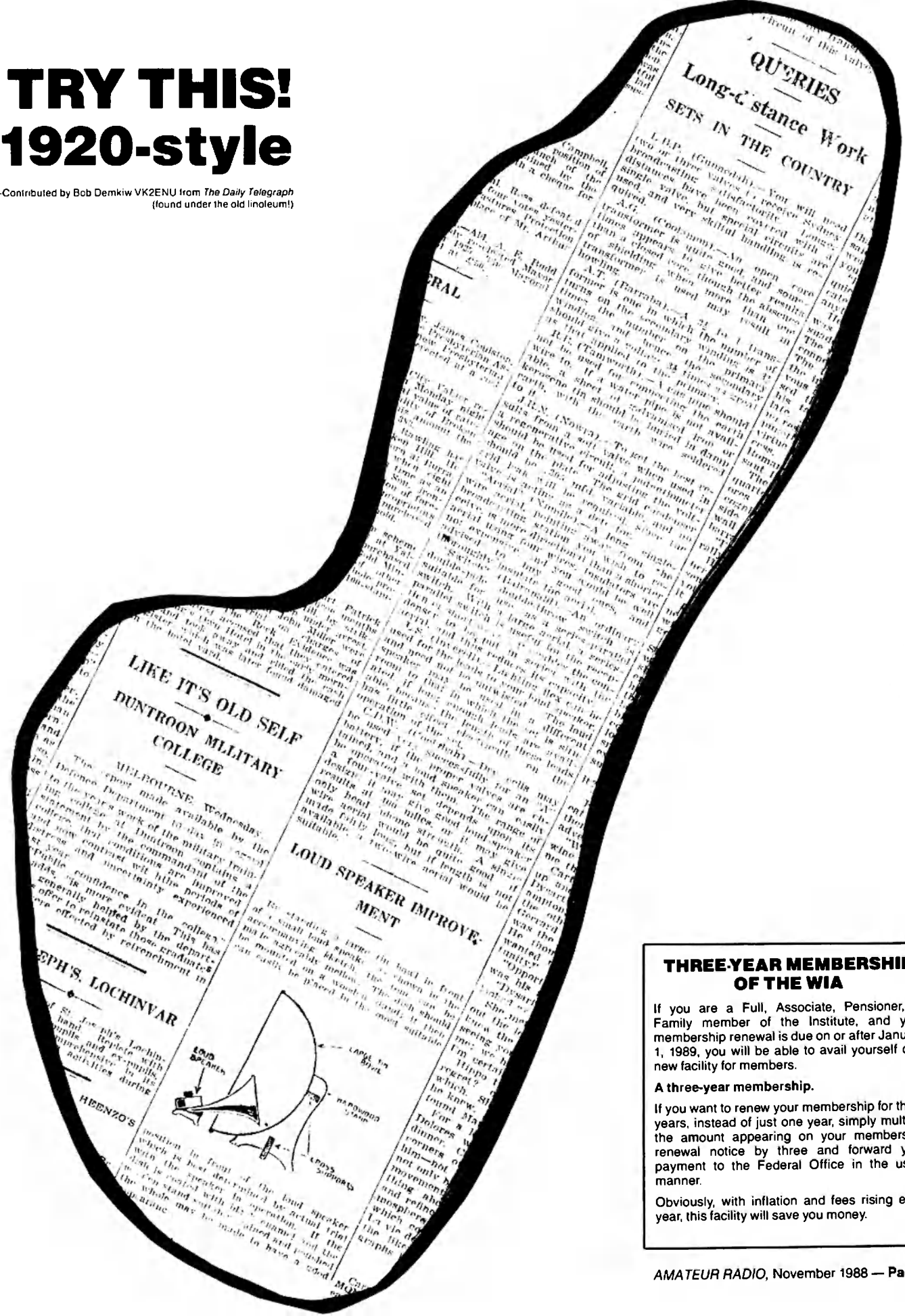
Dubbo P.A. and H. Association, its monthly meeting, fixed the next Dubbo show for Tuesday and Wednesday, May 5 and 6. This will be "Back to Dubbo Week" and it is hoped that by that time the electrification of Dubbo will have been completed. A feature of the week will be the entertainment of old Dubbo folk, who are being invited to return for the occasion.

FIRE AT DUBBO

W. Handover's produce

TRY THIS!
1920-style

—Contributed by Bob Demkiw VK2ENU from *The Daily Telegraph* (found under the old linoleum!)



QUERIES

Long-distance Work

SETS IN THE COUNTRY

LIKE IT'S OLD SELF

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'AN EXPERIMENTAL 'Q' METER

Lloyd Butler VK5BR
18 Ottawa Avenue, Panorama, SA. 5041

Q factor, the method of measuring Q factor and an experimental unit built up for that purpose.

For many years, the Q meter has been an essential piece of equipment for laboratories engaged in the testing of radio frequency circuits. In modern laboratories, the Q meter has been largely replaced by more exotic (and more expensive) impedance measuring devices and today, it is difficult to find a manufacturer who still makes a Q meter. For the radio amateur, the Q meter is still a very useful piece of test equipment and the writer has given some thought to how a simple Q meter could be made for the radio shack. For those who are unfamiliar with this type of instrument, a few introductory notes on the definition of Q and the measurement of Q, are included.

WHAT IS 'Q' AND HOW IS IT MEASURED?

The Q factor or quality factor of an inductance is commonly expressed as the ratio of its series reactance to its series resistance. We can also express the Q factor of a capacitance as the ration of its series reactance to its series resistance although capacitors are generally specified by the D or dissipation factor which is the reciprocal of Q.

A tuned circuit, at resonance, is considered to have a Q factor. In this case, Q is equal to the ratio of either the inductive reactance, or the capacitive reactance, to the total series loss resistance in the tuned circuit. The greater the loss resistance and the lower the Q, the greater the power lost on each cycle of oscillation in the tuned circuit and hence the greater the power needed to maintain oscillation.

$$Q = fo / \triangle f$$

where fo is the resonant frequency and $\triangle f$ is the 3 dB bandwidth

Sometimes we talk of loaded Q (such as in transmitter tank circuits) and, in this case, resistance for calculation of Q is the unloaded tuned circuit series resistance plus the additional loss resistance reflected in series into the circuit from its coupled load.

There are other ways of expressing Q factor. It can be expressed approximately as the ratio of equivalent shunt resistance to either the inductive or the capacitive reactance. Series loss resistance can be converted to an equivalent shunt resistance using the following formula:

$$R(shunt) = R(series).(Q^2 + 1)$$

Finally, Q factor of a resonant circuit is equal to its voltage magnification factor and Q can also be expressed as the ratio of voltage developed across its reactive elements to the voltage injected in series with the circuit to produce the developed voltage. To measure Q factor, Q meters make use of this principle.

A basic Q meter is shown in Figure 1. Terminals are provided to connect the inductance (Lx) to be measured and this is resonated by a variable tuning capacitor (C). Terminals are also provided to add capacitance (Cx), if required. The tuned circuit is excited from a tunable signal source which develops voltage across a resistor in series with the tuned circuit. The resistor must have a resistance small compared to the loss resistance of the components to be measured so that its value can be ignored. A resistance of a mere fraction of an ohm is necessary. Metering is provided to measure the AC injection voltage across the series resistor and the AC output voltage across the terminals of the tuning capacitor. The output measurement must be a high input impedance circuit to prevent loading of the tuned circuit by the metering circuit.

Q is measured by adjusting the source frequency and/or the tuning capacitor for a peak in output voltage corresponding to resonance. Q factor is calculated as the ration of output voltage measured across the tuned circuit to that injected into it. In practice, the signal source level is generally set for a calibrate point on the meter which measures injected voltage and Q is directly read from calibration on the meter which measures output voltage.

SOME USES OF THE Q METER

The Q meter can be used for many purposes. As the name implies, it can measure Q and is generally used to check the Q factor of inductors. As the internal tuning capacitor has an air dielectric, its loss resistance is negligible compared to that of any inductor and hence the Q measured is that of the inductor.

The value of Q varies considerable with different types of inductors used over different ranges of frequency. Miniature commercial inductors, such as the Siemens B78108 types or the Lenox-Fugal Nanored types, made on ferrite cores and operated at frequencies up to 1 MHz, have typical Q factors in the region of 50 to 100. Air wound inductors with spaced turns, such as found in transmitter tank circuits and operating at frequencies above 10 MHz, can be expected to have Q factors of around 200 to 500. Some inductors have Q factors as low as five or 10 at some frequencies and such inductors are generally unsuitable for use in selective circuits or in sharp filters. The Q meter is very useful to check these out.

The tuning capacitor (C) of the Q meter has a calibrated dial marked in pico-farads so that, in conjunction with the calibration of the oscillator source, the value of inductance (Lx) can be derived. The tuned circuit is simply set to resonance by adjusting the frequency and/or the tuning capacitor for a peak in the output voltage meter and then calculating the inductance (Lx) from the usual formula:

$$Lx = 1/4\pi^2 f^2 C$$

For L in uH, C in pF and f in MHz this reduces to

$$25330/f^2C$$

Another use of the Q meter is to measure the value of small capacitors. Providing the capacitor to be tested is smaller than the tuning range of the internal tuning capacitor, the test sample can be easily measured. Firstly, the capacitor sample is resonated with a selected inductor by adjusting the source frequency and using the tuning capacitor set to a low value on its calibrated scale. The sample is then disconnected and using the same frequency as before, the tuning capacitor is reset to again obtain resonance. The difference in tuning capacitor calibration read for the two tests is equal to the capacitance of the sample. Larger values of capacitance can be read by changing frequency to obtain resonance on the second test and manipulating the resonance formula.

A poorly chosen inductor is not the only cause of low Q in a tuned circuit as some types of capacitor also have high loss resistance which lowers the Q. Small ceramic capacitors are often used in tuned circuits and many of these have high loss resistance, varying considerably in samples often taken from the same batch. If ceramic capacitors must be used where high Q is required, it is wise to select them for low loss resistance and the Q meter can be used for this purpose. To do this, an inductor having a high Q, of at least 200, is used to resonate the circuit, first with the tuning capacitor (C) on its own and then with individual test sample capacitors in parallel. A drastic loss in the value of Q, when the sample is added, soon shows up which capacitor should not be used.

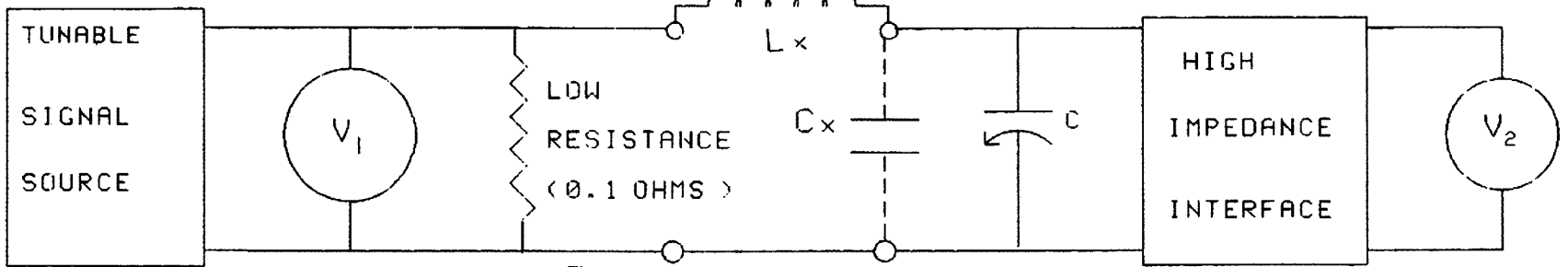

Figure 1: A Basic Q Meter.
At resonance of L_x and C, Q = V2/V1
*** Meter is calibrated to read voltage referred to that across C**

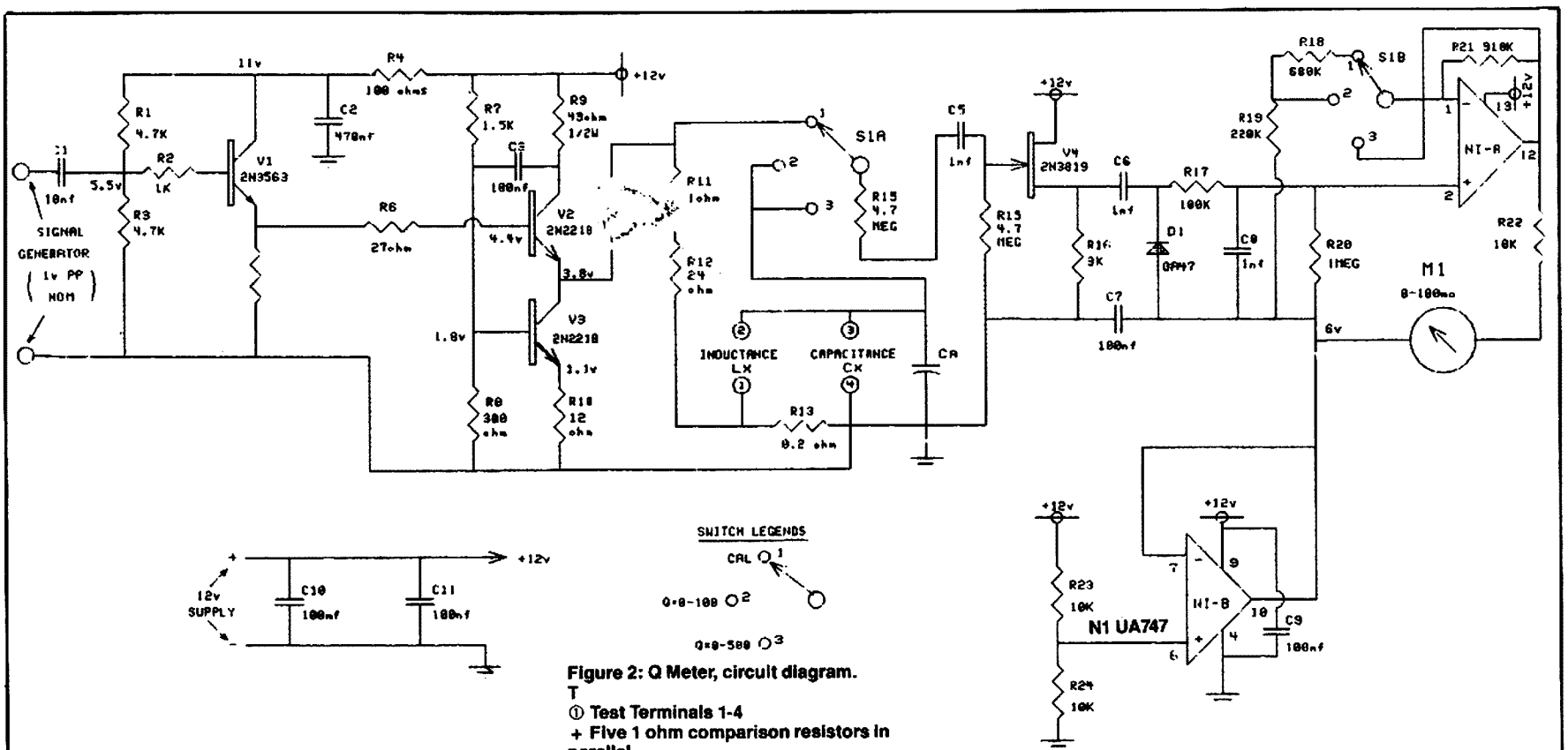

Figure 2: Q Meter, circuit diagram.
T
① Test Terminals 1-4
+ Five 1 ohm comparison resistors in parallel
*** Calibrate — set signal generator level for half scale on M1**

DISTRIBUTED COIL CAPACITANCE

Direct measurement of Q in an inductor, as discussed *in* previous paragraphs, is based on the circuit having two components, inductance and capacitance. Inductors also have distributed capacitance (Cd) and if this represents a significant portion of the total tuning capacitance, the Q value read will be lower than its actual value. High distributed capacitance is common in large value inductors having closely wound turns or having multiple layers.

Actual Q can be calculated from Qe, as read, from the following:

$$Q = Qe(1 + Cd/C)$$

where Cd = Distributed capacitance
and C = Tuning Capacitance

Q value error is reduced by resonating with a large value of tuning capacitance, otherwise distributed capacitance can be measured and applied to the previous formula. Two methods of measuring distributed capacitance are described in the *Boonton Q Meter Handbook*[1]. *The simplest of these is said to be accurate for distributed capacitance above 10 pF and this method is described as follows:*

1. With the tuning capacitor (Ca) set to value C1 (say 50 pF), resonate with the sample inductor by adjusting the signal source frequency.
2. Set the signal source to half the original frequency and re-resonate by adjusting Ca to a new value of capacitance C2.
3. Calculate distributed capacitance as follows:

$$Cd = (C2 - 4C1)/3$$

Another effect of distributed capacitance in the inductor is to make its inductance value (as calculated from the calibration of the tuning capacitance and the calibration of the signal source) appear higher than its actual value. Again, this error can be reduced by tuning with a large value of capacitance Ca and/or adding Cd to Ca in the calculation.

THE EXPERIMENTAL UNIT

A little circuit design and experimentation have led to the Q meter circuit shown in Figure 2. A signal source is not included as it was thought that most experimenters would have some type of signal generator which could be used as a source. Addition of a signal source, normally internal in a commercial Q meter, would have added complexity which it was decided to avoid at the initial stage.

In designing a circuit, the biggest problem seemed to be how to develop an easily measured source voltage with a source resistance of a mere fraction of an ohm. An initial thought was to use a small multi-filar wound toroidal step down transformer from a higher resistance source. (In such a transformer, coefficient of coupling is high and leakage inductance is low). For this application, leakage inductance reflected in series with the secondary proved to be still too high and the idea was abandoned.

Another idea was to make use of the low source resistance of a power voltage follower stage to directly inject a signal into the tuned circuit. The follower circuit shown as V2-V3 in Figure 2 was used for this purpose. This type of circuit has wide bandwidth with very low source resistance and has been used before for such purposes as driving video signals into a low impedance transmission line. For the Q meter case, it was found necessary to operate the stage at the high collector current of 100 mA to achieve a sufficiently low source resistance. Because of this, transistors V2 and V3 ran with their TO5 cases quite hot. The circuit worked well at low frequencies but at higher frequencies, in the region of 10 to 30 MHz, the stage source resistance appeared to rise causing the Q values to read lower than expected.

The ultimate circuit, as shown in Figure 2, made use of the voltage follower stage but the stage was used to develop voltage across R13, a resistor of a fraction of an ohm as described in previous paragraphs. The value actually chosen is 0.2 ohm. Of course, the follower stage could not drive directly into such a low resistance and it feeds via resistors R11 and R12 (a sum of 25 ohms) so that the follower output voltage is 125 times that injected into the tuned circuit.

The power driver stage is preceded by an emitter follower stage (V1). This has high input resistance and hence the load resistance presented to the external signal source is essentially the parallel result of R1 and R3 (about 2300 ohms).

The test inductance (Lx) is connected across terminals 1 and 2 and external capacitance (Cx), if used, is connected across terminals 3 and 4. Tuning is provided by variable capacitor Ca, an ordinary receiver tuning gang with sections in parallel to provide about 800 pF maximum capacitance.

The high impedance volt-meter is provided by FET stage V4, connected as a source follower, peak reading detector (C6, D1, R17, C8, R20) and operational amplifier N1-A which drives a 100 microamp meter. The second operational amplifier N1-B in the uA747 package splits the rail voltage for N1-A.

Selector switch (S1) has three positions. The first position, labelled CAL, is used to set the signal input level which is adjusted for half scale reading on meter M1. (A signal level of around 1 VPP is needed at the input of V1). When the signal is set to the correct level, switch position 2 provides direct reading of Q = 0 to 100 on the meter and switch position 3 provides direct reading of Q = 0 to 500 on the meter. For low values of Q, the calibrate level at switch position 1 is increased to full scale on the meter so that switch position 2 reads Q = 0 to 50.

Signal levels into the AC volt-meter circuit are proportioned so that they are above the non-linear region caused by the diode characteristics, but within the limits of signal voltage swing set by the power supply rails. In switch position 1 (CAL) the amplifier N1-A has a voltage gain of 2, in switch position 2 it has a gain of 5 and in switch position 3 it has a gain of 1.

A rail potential of 12 volts was selected to power the unit but its precise value is not critical. The supply current is quite high, at around 100 mA, because of the current consumed by the V2-V3 transistor follower stage.

PERFORMANCE

Comparing Q readings with those measured on other instruments, the experimental unit appears sufficiently accurate to assess the performance of most inductors around the radio shack. For very high values of Q (around 400), with Ca set to minimum, the Q reads a trifle low. This occurs because of loss in resistor R14 connected in series with the input capacitance of V4. (The reading can be improved by eliminating R14, but without it, V4 is inclined to be unstable when Ca is bridged directly across its input). For a higher setting of capacitance Ca, the input capacitance of V4 is masked and the Q error is less noticeable.

Accuracy of inductance and capacitance measurement is set by the accuracy of the signal source and the accuracy of the tuning capacitor dial calibration. For anyone interested in building the Q meter, the calibration of the dial can be carried out by direct measurement of the tuning capacitor, at various dial settings, using a capacitance bridge or another Q meter. Another method is to make use of the signal source calibration in conjunction with an inductor of known accurate value. For various settings of the tuning capacitor dial, the signal source frequency is set for indicated resonance in the Q meter and the value of capacitance calculated. Assuming the inductor value and signal source frequency to be accurate, this is probably the best method as it takes into account added wiring capacitance and the active input capacitance of V4.

The unit was found to work quite well over the frequency range of 100 kHz to 40 MHz. Attempts to tune above 40 MHz gave erratic results but operation into the VHF range had never really been anticipated.

NOTES ON ASSEMBLY

The circuit shown in Figure 2 is simple and should not be too difficult to duplicate. All resistors in the RF sections of the circuit must be carbon types with low inductance. Resistor R13 (0.2 ohm) is made up of five one ohm resistors connected in parallel. The RF drive circuit (V1, V2, V3) is separated from the detector circuit (V4, D1, N1) by fitting on separate cards which are kept apart to reduce stray coupling between them. RF inter-wiring into the test terminals, capacitor Ca and switch bank S1a, is kept direct and short and must not be loomed. Resistor R13 is mounted directly on the test terminals. Terminal 4 is directly earthed to chassis and Ca is strapped to terminals 3 and 4 with a short length of tinned copper wire to minimise series inductance.

Transistors V2-V3 (type 2N2218) have a cut off frequency of 250 MHz and can dissipate 680 mW at 50 degrees Celsius. These could be substituted with other transistors of similar characteristics. Likewise, transistors V1 (2N3563) and V4 (FET — 2N3819) could be substituted with other small signal transistors having a high cut off frequency.

SUMMARY

A few ideas have been presented on how a simple Q meter can be built and how it can be put to use. Other applications of the Q meter can be found in manuals on early Q meters such as that prepared by the *Boonton Radio Corporation*[1].

References

1. *Manual of Radio Frequency Measurements for the Q Meter.* Boonton Radio Corporation.

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An Afterthought!

A SIGNAL SOURCE PREAMPLIFIER FOR THE VK5BR Q METER

The original experimental Q meter, required an external RF signal source of around one volt PP. Not all signal generators can deliver quite this level of output voltage and, for use with these generators, some preamplification is needed at the Q meter signal input.

The wideband amplifier shown in the diagram provides a gain of approximately 10 over the operating range of the Q meter of 100 kHz to 40 MHz. Connected at the input of the Q meter, it changes the input sensitivity to about 0.1 VPP to make the Q meter usable with a greater variety of RF signal sources. No gain control is provided as signal generators normally have an adjustable attenuator to set the output level.

For those who might be considering duplicating the Q meter, the preamplifier is a useful addition to make it operate in conjunction with lower level signal generators.

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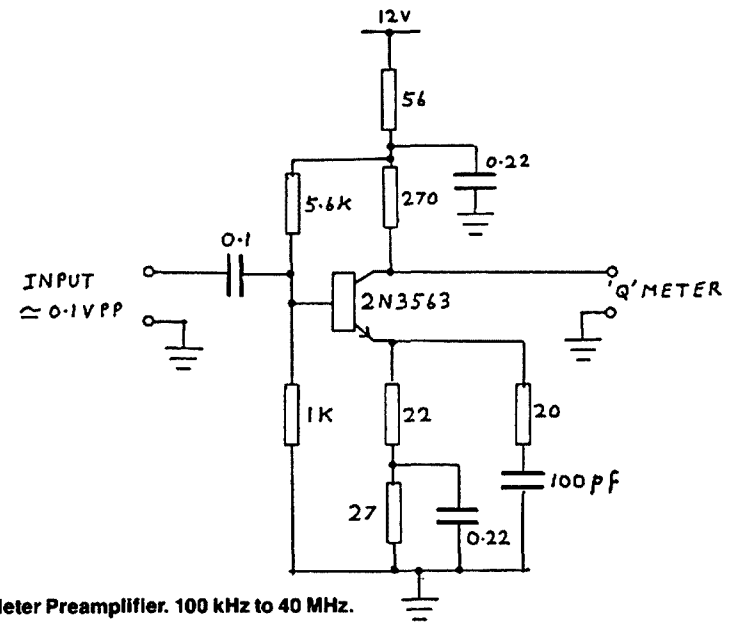

Q-Meter Preamplifier. 100 kHz to 40 MHz.

THE INTERNATIONAL AMATEUR RADIO NETWORK

Sam Voron VK2BVS
IARN AUSTRALIAN DIRECTOR
2 Griffith Avenue, Roseville, NSW. 2069

The IARN provides world-wide emergency communications during disasters through 750 radio amateurs in a network maintained by regional directors.

It started at the time of the Mexico City earthquake disaster of 1985, and had since spread internationally.

The IARN airlifted a number of radio amateurs into Mexico from the USA and their role in providing emergency communications was very effective.

The regional directors form the IARN emergency communications activation plan which can, by a phone call, harness the resources of amateur radio into focus on any international communications requirement.

The directors are Sam VK2BVS (Australia), John ZL2ARF (New Zealand), Les G4BCP (United Kingdom), Moshe 4X4MG (Israel), Maggie YS1ZA (El Salvador), Rob VE7AGO (Canada), Charles 9H1FBS (Malta), Ruben HC1RF (Equador), and Tetsuji JA1EQZ (Japan).

The USA Regional Manager is Glenn K1MAN, local in Belgrade Lakes, Maine, who is also the IARN General Manager.

The IARN directors monitor two HF frequencies — 14.275 MHz and 7.228 MHz — which are used to handle Third Party Traffic health and welfare messages during a disaster activation.

During normal times the IARN provides humanitarian help through various projects.

These have included the airlifting of babies requiring urgent heart surgery from El Salvador for medical attention in the USA.

Another aspect of the IARN is five daily 45 minute information bulletins. These contain news about developments in amateur radio, disaster preparedness information, interviews and editorial comment.

Bulletins are anchored by Glenn Baxter K1MAN. They are broadcast on 3.975, 14.275 and 28.475 MHz at 1400, 1800, 2200, 0100 and 0500 UTC. Plus Sundays on 3.890 MHz (AM) at 2300 UTC and 7.290 MHz (AM) at 2400 UTC. Between April and September, times are one hour earlier.

PACIFIC E(MERGENCY) NET

In Australia, radio amateurs have a proud history of helping its community in times of international disasters.

They received third party traffic handling privileges in August 1980. The following year, during the national telephone breakdown, radio amateurs handled health and welfare messages for those in desperate personal need to contact friends and relatives.

The first international involvement was the Mexico City earthquake (1985). Then came another earthquake in El Salvador (1986), the cyclones of Vanuatu (1987) and New Zealand (1988) and the Edmonton Canada tornado (1987).

The Japanese E(MERGENCY) NET comprises 200 radio amateurs dedicated to the public service aspects of their hobby.

To develop an emergency amateur radio communications capability in the Western Pacific, Asia and Australia — the Japan E Net and the Australian Traffic Net have combined to form the Pacific E Net.

This net introduces radio amateurs in the region to emergency preparedness planning by operating at 0001 and 0600 UTC on 21.160 MHz (± 15 kHz) and 1130 UTC on 7.090 MHz (± 10 kHz).

This time schedule is used whenever a disaster hits the region. One capability Australian radio amateurs have developed for the Pacific E Net is phone patch.

In a disaster, an operator in any of the wide variety of foreign language countries could be patched via Australian phone patch to pass detailed emergency traffic to translators who are readily available.

VK2 DISASTER TRAFFIC NETWORK

A club station of the IARN is VK2DTN, in Sydney, which has been set up to assist those studying for their amateur radio licence and provide training in international disaster public service.

The station has been fitted with two operator positions dedicated for national communications on 80 and 40 metres, international contacts on 40/20/15 metres, two metres FM and 11 metres CB for local communications.

An IBM compatible XT computer completes the line-up for linking into Bulletin Board Service telephone systems.

Inquiries about the club station and the training available through the IARN, can be directed to the author of this article. Sam Voron, on telephone (02) 407 1066.

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RF IMPEDANCE MATCHING USING FERRITE TOROIDAL CORES

Part 3: CONVENTIONAL TRANSFORMERS

Stephen Bushell VK3HK
74 King Parade, Knoxfield, Vic. 3180

In parts 1 and 2 we realised the benefits and limitations of using transmission line transformers and auto-transformers. The main restriction was the inability to provide a universal current balance format with any required transformation ratio. To meet this requirement it is necessary to have separate primary and secondary windings on our transformer.

3. CONVENTIONAL TRANSFORMERS

A conventional transformer consists of two separate lengths of wire which are electrically insulated from each other and which form the primary and secondary circuits. When an alternating current is applied to the primary winding, a voltage will be induced in the secondary winding. The intensity of the voltage which is thus induced depends upon the ratio of turns between the windings.

The degree of magnetic coupling between the windings is determined by their proximity to one another and by the permeability of the core about which they are wound. The permeability is, in turn, affected by the degree of current flow and consequent flux density existing in the core. A point will be reached where the core will not pass any greater power. The core is then said to be saturated.

Because of the mode of current transfer just described, the size of the ferrite core when used in a conventional transformer must be larger than for the equivalent current flow in either a transmission line transformer or an auto-transformer.

When a load is connected to the secondary winding, power will be drawn by the primary winding from its current source sufficient to provide for the secondary circuit consumption and any other losses associated with the transformer itself. The impedance of the primary winding is therefore almost exclusively determined by the load connected to the secondary winding and by the turns ratio.

The following formula may be used to determine the primary winding impedance (Z):

$Z = Zs (Np/Ns)^2$

Where:
Z = Primary impedance
Zs = Secondary impedance
Np = Primary turns
Ns = Secondary turns

From the above we can derive the following:

$Np/Ns = \sqrt{Zp/Zs}$

Where:
Np/Ns = Primary:secondary turns ratio
Zp = Primary impedance
Zs = Secondary impedance

If we have a primary impedance requirement of 75 ohms and a secondary impedance of 300 ohms then:

$Np/Ns = \sqrt{Zp/Zs}$
$\therefore Np/Ns = \sqrt{75/300}$
$\therefore Np/Ns = \sqrt{.25}$
$\therefore Np/Ns = .5$

The primary coil must have half as many turns as the secondary.

Such a transformer is very easily constructed on a toroidal form by using a single trifilar winding which is spread to occupy at least ⅓ of the core circumference. (See Figure 1.).

Each winding may be identified although I always leave the primary unmarked. The other two are marked according to ones preference. These two secondary windings are then joined bottom to top to provide a series winding which has twice the number of primary turns.

The most important requirement we wished to cover with conventional transformers was current balance format. This is arranged for very easily by simply grounding one side of the winding according to which side of the transformer — primary or secondary, is required to be unbalanced. (See Figure 2.).

Various methods may be employed in constructing the conventional transformer when using ferrite toroidal cores. One method already described used a single multifilar windings applied to the same core. (See Figure 3.).

Yet another, probably the most conventional method of winding is to simply apply the primary winding to occupy at least ⅓ of the core body and to then wind the secondary over the primary to occupy the same amount of core.

So far we have seen that we can transform most impedance ratios with any current balance by using one of our three transformer families.

Next time we will look at assembly ideas, methods and circuit configurations.

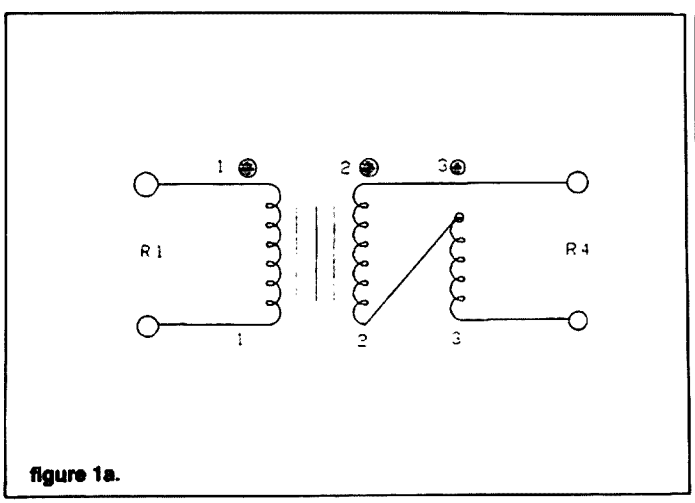


figure 1a.

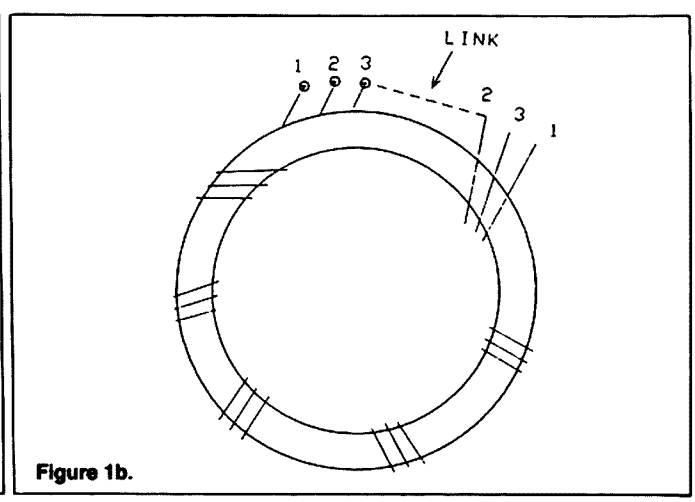


Figure 1b.

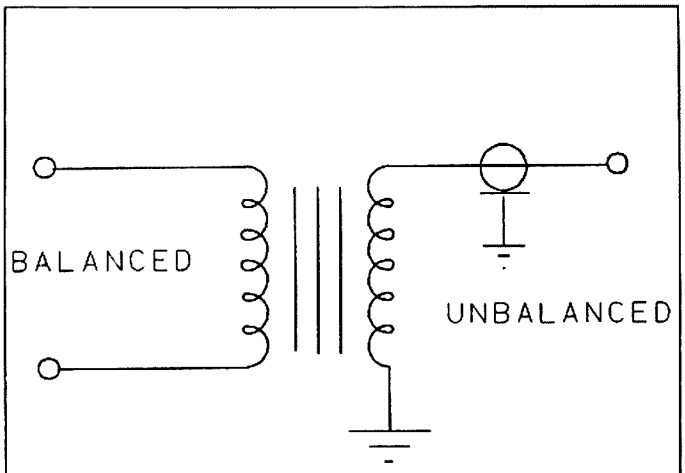


Figure 2a.

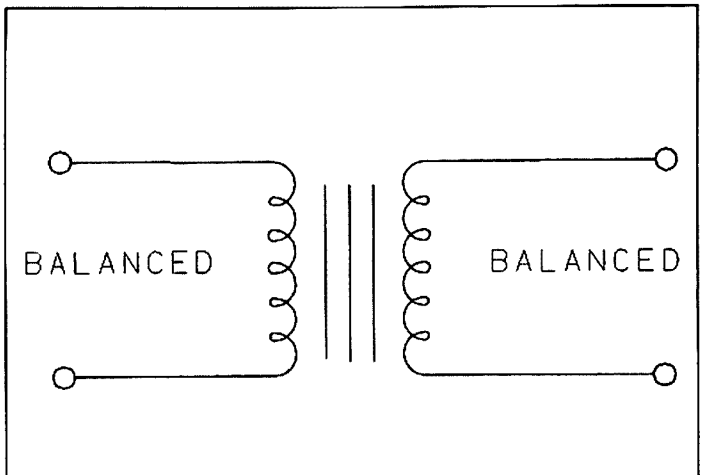


Figure 2b.

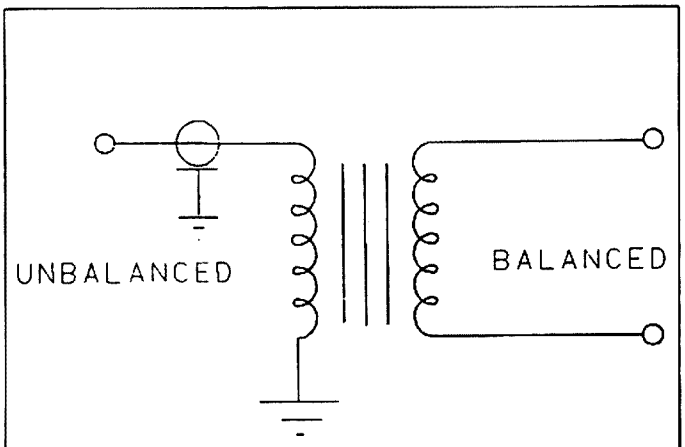


Figure 2c.

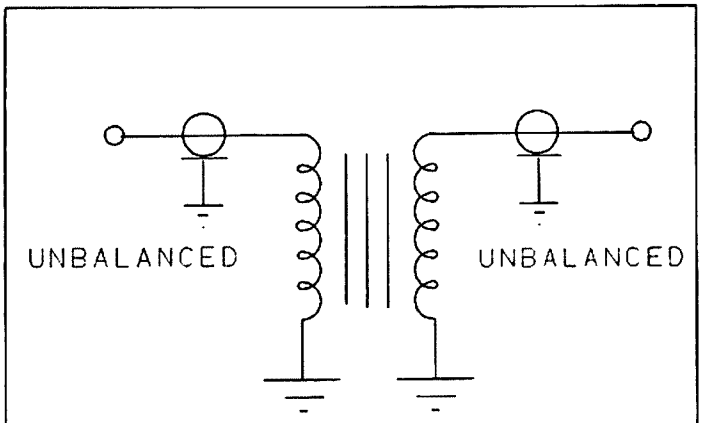


Figure 2d.

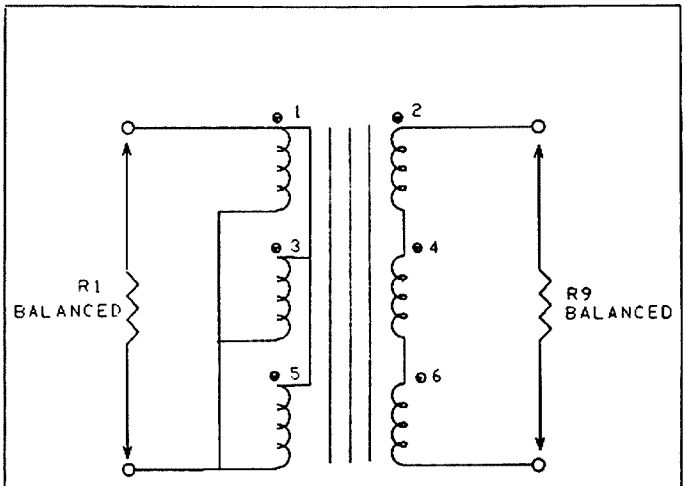


Figure 3a.

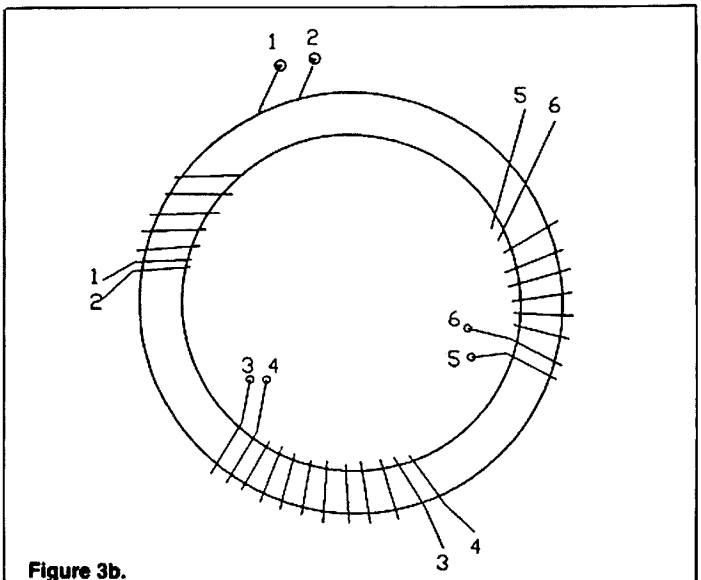
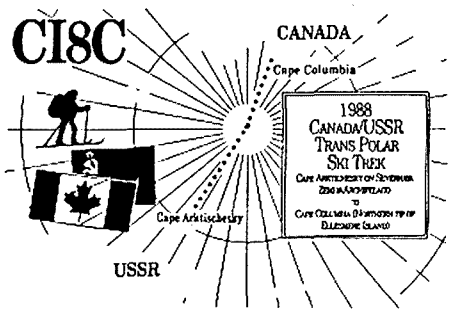


Figure 3b.

SKITREK



Three months across the ice with amateur radio — a success.

David Adams VE3HBF
RR1, Sutton West, ON. L0E 1R0

Printed with permission from QST CANADA, September issue, the Official Journal of the Canadian Radio Relay League Inc

This year, 13 skiers made polar history by skiing without motorised transport, dogs or sleds from the Soviet Union to Canada by way of the North Pole, a distance of some 1750 kilometres. The four Canadian and nine Soviet skiers reached Ward Hunt Island at 1035 on the morning of June 1, 90 days after setting out from Cape Arktichesky in the Severnaya Zemla Archipelago on March 3. They stepped ashore in line abreast so that no one could claim to be first, symbolising the teamwork and co-operation that made this unique event successful.

This splendid feat, the Polar Bridge Skitrek Expedition, was supported by an amateur radio communications network that also made history. Never before had this kind of international expedition relied solely on amateur radio for all its communications needs.

Co-ordinators of the amateur radio effort were Tom Atkins VE3CDM, President of the Canadian Radio Relay League, and Leonid Labutin UA3CR, a veteran of several previous Soviet polar expeditions. Leonid approached Tom in March 1987, asking for the support of Canadian amateurs. The basis for co-operation would be a unique reciprocal operating and third party traffic agreement between the two countries, the first such agreement ever for the USSR, allowing Soviet and Canadian amateurs to operate from each other's countries, and to handle messages between them, without restrictions, through base stations in the Arctic.

Chief operator, Barry Garratt VE3CDX, recruited the team of Canadian operators that would man the Canadian base station at Resolute Bay, CI8C. Both Tome VE3CDM and Barry went to Moscow to make final arrangements with Leonid and the Soviet amateurs. While visiting UK3KP, the club station of *Komsomolskaya Pravda* (a Soviet youth newspaper), Tom and Barry became the first Canadian amateurs to operate from the USSR under the newly signed reciprocal agreement. Soon after, Rick Bourke VO1SA joined Leonid at EX0CR, the main Soviet base station at Sredniy Island, some 200 kilometres south of Cape Artichesky, the point from which the skiers started their trek. Rick's own call, VO1SA/UA0, was often heard S9 by scores of Canadians and others monitoring further to the south, as he passed traffic to Resolute Bay, Toronto and Ottawa.

In Ottawa, Ron Bellville VE3AUM, was the expedition's tireless anchorman, passing messages to and from Expedition Manager, Peter Baird and between the skiers and their families, and dealing with the government and media. In Toronto, it was Tom VE3CDM, who was besieged with phone calls and visits from the media as he effectively dealt with problems of logistics, movement of equipment and operators, and a score of other matters as new situations arose.

Icom supplied a full range of equipment: HF and VHF transceivers and amplifiers for the base stations, two metre FM hand-held transceivers and a VHF AM transceiver that would permit communication with the aircraft bringing supplies for the skiers. The base station equipment, in the hands of Barry VE3CDX, and his team of experienced operators, provided contacts between the skiers (known as the "moving group"), and their families, their support groups and suppliers, and the world-wide amateur radio community. Never before did an expedition like this have communications that functioned so smoothly around the clock, or did more to keep up the morale of its participants through every kind of hardship. Much credit must go to the Soviet operators, most of whom had worked together for many years in the remote harsh climate of the polar regions, and to the Canadians whose experience and teamwork resulted in plaudits from radio amateurs around the world.

Besides the Icom equipment the moving group carried a Soviet-designed miniature transceiver operating on crystal-controlled frequencies in the 20, 40 and 80 metre bands, and a dipole antenna that could be raised on a mast made of 34 ski poles connected end to end. All of this was developed over years of Arctic travel and experimentation.

Garth Hamilton VE3HO, who operated CI8C during the critical first two weeks of the expedition, later became the principal backup for Tom VE3CDM. Garth maintained a constant watch on expedition frequencies and forwarded messages and technical advice. Olle Ekblom SM0KV, and his Swedish colleagues also maintained a daily watch throughout the Skitrek, recorded daily satellite position reports, checked in daily with CI8C, and kept an eye on Soviet radio and television reports. Active support also came from AMSAT, through President Vern Riportella WA2LQQ, Richard Ensign N8IWJ, and AMSAT Director John Henry VE2VQ.

Once the skiers approached the North Pole, "mission control" shifted from Sredniy Island to the base station at Soviet Ice Island NP28, then located only 20-30 kilometres from the pole. Here Barry VE3CDX, joined Piotr, operator of 4K0DC, and used his personal Soviet call sign, 4K0DX, for a month of intensive traffic handling.

On April 26, when the skiers arrived at the North Pole, they were greeted by a gathering of almost 200 Soviet and Canadian officials and media people. Barry was up to his ears in official and unofficial duties and was delighted when Mike G0/PA0BHF, the UoSAT technician from the University of Surrey, UK, offered to assist by operating CI8UA and giving scores of amateurs their first ever OSO with the North Pole. Mike had been flown in with the Soviet group, in recognition of his key role in operating the UoSAT OSCAR II digitalker that gave the skiers their daily position reports.

Now, CI8C at Resolute Bay became the communication hub. Just before Barry VE3CDX, left for Resolute, he had a chance to experience a danger that the Soviet team on NP29 faced daily. The ice island split apart, breaking the runway for supply aircraft in two and sending Barry's camera, some supplies and some valuable Icom equipment to the bottom of the Arctic Ocean.

Media coverage of the Skitrek expedition was considerable. The job of keeping everyone informed was handled by Al d"Eon VE3AND. Al issued regular news releases and made direct contact with key media people. Interviews with an amateur radio flavour appeared on *The Journal*, *Midday* and other television programs across the country. Newspapers carried feature articles and radio stations carried frequent reports. Amateur radio publications around the world, gave prominent coverage to what was clearly recognised as a major milestone in amateur radio communications.

Throughout Skitrek, Tony Fegan VE3QF, provided the amateur radio community with OSCAR II orbital data and advice for would-be monitors. Any radio amateur with a two metre hand-held could hear the digitalker on board OSCAR II by listening at appropriate times on 145.825 MHz. Many amateurs who were teachers made a strong effort to involve their students in monitoring and charting the progress of the skiers across the Arctic. The Ontario Science Centre in Toronto (an education facility where, for students of any age, science becomes fun) mounted a display that included a large map, recordings of the digitalker and a special on-the-air message from CI8C.

Following the completion of the expedition, both the Government of Canada and the Soviet ambassador in Ottawa gave official receptions.

Questioned in Ottawa about "What next?", the expedition's leader Dmitri Shparo UA3AJH, hinted at the possibility of an Antarctic expedition. Now that the USSR-Canadian Skitrek had laid the foundation for closer co-operation between these two countries, it might be possible for the USSR to achieve something similar with the United States. Hopes were also expressed that members of the Canadian communications team might visit Moscow in the near future.

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Operation Update

Ken McLachlan VK3AH
PO Box 39, Mooroolbark, Vic, 3138

New portable radios currently being issued to Victoria's police would mean a significant improvement in the Force's present vast and sophisticated network according to discussions with senior police, recently.

Chief Superintendent Peter Graham, the Officer in Charge of the Communications District, stated that the radios were the most advanced and efficient in police use anywhere in Australia. Mr Graham stated that it was the aim of the Victoria Police to develop a portable radio network which would 'keep all operational police in the metropolitan area in touch at all times'.

Within two years there would be two portable radios in every city and suburban patrol car, and the radios would be carried by all foot patrol police.

The number of portable radios in the Force has already been doubled with the purchase of 535 of the new Motorola *Saber III* radios, at a cost of over one million dollars and it is envisaged that another thousand radios which represent the latest portable radio technology, will be purchased as part of a six million dollars communications package over the next three years.

Chief Superintendent Graham stated that these units ". . . are smaller, more flexible, more reliable and more durable than anything we've had before — and they're cheaper than the radios currently in use.

"They have the capacity to handle up to 200 channels, which means they can be used on the same frequencies as organisations like the State Emergency Service and the Alpine Resorts Commission if we are working together on operations such as searches," he said.

— Photographs courtesy of Beiken Productions

Senior-Constable Kaylene Fraser.

These miniature technological wonders are a world-wide winner. They have a sensitivity of nominally 0.3 uV across the frequency spectrum ranges of 146-172, 403-420 and 450-512 MHz with a transmitting output of two watts, nevertheless Motorola does manufacture a larger five watt unit. The removable power source is Nicad batteries which are charged in either a one-hour rapid rate state or the more preferred and conventional longer period from the AC mains. Provision for charging from the vehicle is another attribute which will be provided in the future.

Strict quality control is a feature that allowed Motorola to gain the contract from other manufacturers and a stringent accelerated testing period taking into account the type of work that the unit was designed to endure such as humidity, extreme temperature variances, precipitation environments and still maintain a simple unit to be used by all personnel with a minimal amount of training. These units, it is felt, surpassed their designers dreams after enduring this 'speed' testing.

Chief Superintendent Graham said recent major incidents such as outside Police Headquarters, also the disastrous shooting incidents within the city and its environs, involving the loss of lives and massive injuries to innocent people, emphasised the need for more police portable radios.

'It's vital for operational police to be able to remain in touch with D24[1] and each other when they have to leave their vehicles in situations such as that.

Chief Superintendent Peter Graham, who will be responsible for the commissioning of the SABER III transceivers.

'The expansion of our portable radio network, and the consequent improvement in communications, is good news not only for police but the community. Improved police communications means more effective and efficient use of police resources, and that means improved service to the public,' he said.

The personnel who recommended the use of such a method of direct communications as those that evaluated the units, are to be congratulated on their forethought and choice which will upgrade all operational officers in their unenviable task of continual community protection.

Sergeant Dennis Johnson.

Further information on this and other Motorola products may be obtained from Mr Tim Herring, Marketing Manager, Motorola Communications Australasia, 666 Wellington Road, Mulgrave, Victoria, 3170. Mr Herring has greatly assisted in the preparation of this article. Sincere thanks also to Mr Geoff Wilkinson, Victoria Police Media Director, Chief Superintendent Peter Graham, and his staff for their patience and assistance.

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1. D24 A New Concept in Communication Technology Bett McLachlan, *Amateur Radio* Volume 50, No 8. August 1982.

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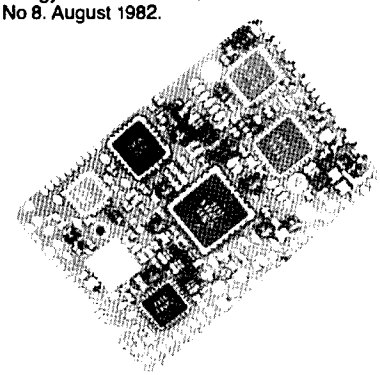

Close-up view of the internal microcomputer board.

HURRICANE GILBERT DISASTER

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

All aviation communications and navigation aids were knocked out by the hurricane!

When hurricane force winds ripped through Jamaica in September, news of the disaster was made known to the outside world through amateur radio.

The hurricane left 500 000 of the 2.5 million population homeless, and various reports of loss of life left the death toll unclear.

The United States Federal Communications Commission declared 14.275 MHz an emergency frequency. Numerous amateur radio stations, plus the Jamaican Military call sign, 6Y5B64, and commercial aircraft on disaster relief missions, used this frequency.

All aviation communications and navigation aids were knocked out by the hurricane. Via amateur radio stations, the Red Cross and US State Department also relied on the channel to get emergency traffic through. International Amateur Radio Network (IARN) Australian Director, Sam Voron AX2BVS, was net controller of the 14.275 channel on several occasions, due to propagation between Jamaica and the US being non-existent.

Sam also assisted the National Hurricane Centre, in Miami, which used the frequency, 14.325 MHz. The Centre broadcast updates of hurricane warnings continuously as the 500 mile-wide hurricane moved through the Caribbean. Keeping in contact with an observation aircraft over the hurricane, the Centre was frequently heard under the call sign, W4EHW. It gathered amateur radio reports of wind velocity and temperatures as Gilbert travelled through the region.

The IARN sent five radio amateurs into the disaster area to set up emergency communications, and another radio amateur from Canada was separately involved.

The Radio Society of Great Britain was also understood to be considering sending two radio amateurs to help with communications. The British RAYNET organisation handled official traffic for the British High Commission in the early stages of the disaster.

The Deutshe Amateur Radio Club also helped provide a link with Jamaica for a US Army station in West Germany.

In Australia, the Australian Traffic Net (ATN), through Sam, Ken VK3CKK, Harry VK6AP, and Ray VK6RQ, handled over 100 third party health and welfare messages. This traffic from the general public was relayed via the USA as Australia does not have a third party traffic agreement with Jamaica.

The Australian media ran reports of the amateur radio involvement giving the hobby some well deserved publicity.

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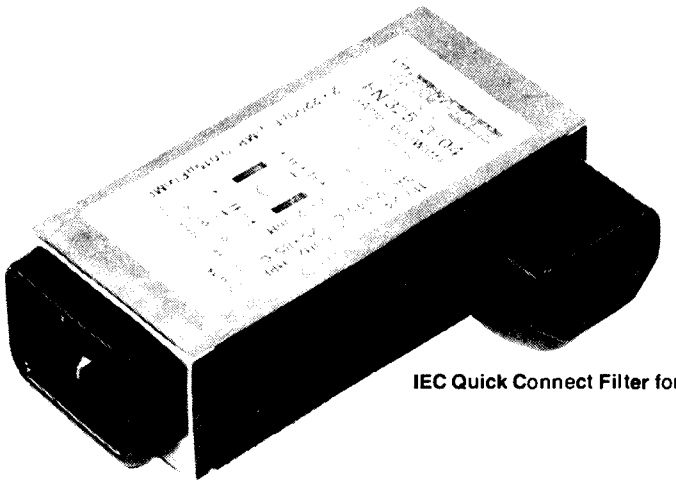
Electromagnetic compatibility

Make your system comfortable

Fred Rode VK3AFR
Sales Manager, Industrial Products
Westinghouse Systems
PO Box 269, Williamstown, Vic. 3016



IEC Quick Connect Filter for Service Work.

Increasing environmental pollution caused by solid, liquid and gaseous waste is readily perceived by the human senses. Environmental contamination by electromagnetic energy also is steadily increasing but, as the human senses are not attuned to perception of this energy, the pollution is less obvious. Man-made electric systems, which are designed to operate within the electromagnetic environment, suffer the most harm from electromagnetic pollution.

The expression "electromagnetic compatibility" (EMC) defines the capability of electronic equipment or systems to be operated in the intended electromagnetic environment at design levels of efficiency. This article reviews some of the more frequent hazards to EMC.

INTERFERENCE SOURCES

Quite frequently, designers of electronic and computer control systems ignore the very harsh environmental conditions commonly found in heavy industry. Unless protective measures are taken, erratic operation of the hardware systems — even total failure — can result.

Four fundamental interference sources are:

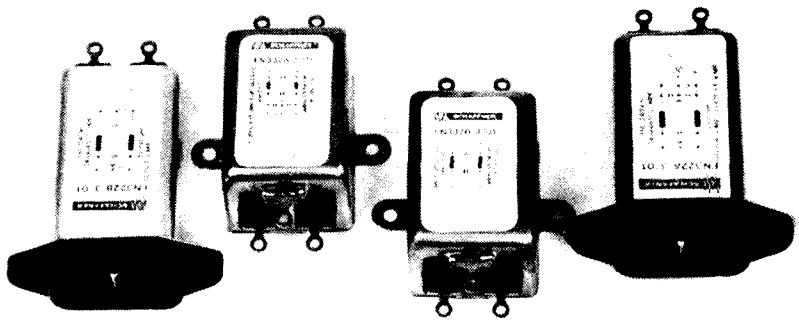
* man-made noise (from electrical consumers);
* electro-mechanical pulses through nuclear reaction;
* atmospheric events (from lightning, electrostatic discharges); and
* cosmic noise.

SUSCEPTIBILITY

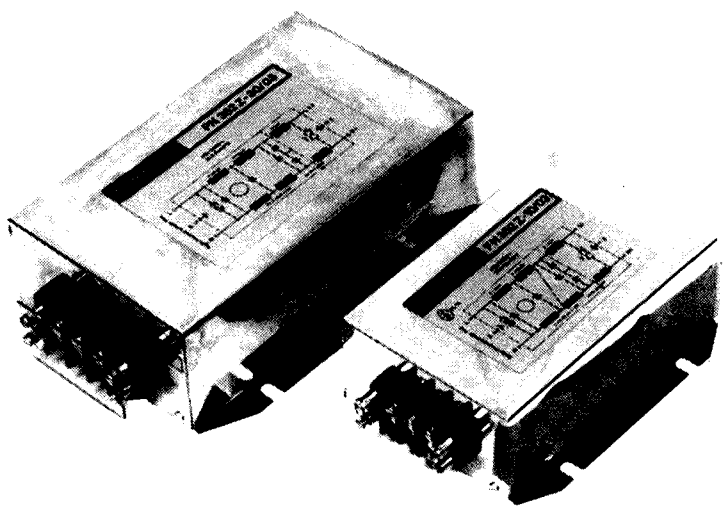
Since the control system designer has little control over the environment in which his equipment will be working, it is important that he should determine to what degree the equipment is susceptible to interference. Levels of susceptibility often are determined both against erratic operation and against total failure of hardware. For this purpose, special test equipment (such as the Schaffner range supplied by Westinghouse Systems) is available for pulse, high voltage and other simulation testing of process control and electronic equipment.

SUPPRESSION MEASURES

The most cost-effective means of attenuating an interfering signal are those steps taken in the design phase of a project. Later, so-called "improvements" may be at least very expensive and, in some cases, impossible to achieve.



Variety of Power Line Filters from one Amp to 10 Amps.



A Very High Performance Filter with Surge Protection. Maximum Current 30 Amps.

Many methods of suppression are available t the designer. These include:

* the use of optocouplers, isolation transformers, twisting conductors, fibre optics; suitable power line or signal line filters;
* separation of wiring; shielding;
* EMC hardened design of system, including the design of printed circuit boards; and
* impediment of electrostatic charges (by increasing air humidity; or by use of conductive working surfaces, for example).

FILTER SELECTION

When a filter is required, further factors need the designer's consideration.

How much insertion loss will be required over the frequency range of interest? Often, the high attenuation, a multiple-stage filter must be used. Where a switch-mode power supply is involved, very high loss at lower frequencies is important.

It is important, too, to match the power supply current-rating of a filter to that of the equipment: when a switch-mode power supply is used, it is essential to consider that peak currents often are 10 times the average current. For this reason, the system requires filter chokes which will not saturate when such conditions arise.

A filter with an earth line choke must be specified when the conducted interference is asymmetrical.

It is also possible to absorb the very high energy of power supply voltage spikes by transient voltage suppression. Some filters have such suppressers fitted.

Finally, the wide range of filter sizes can be considered. These vary between filters suitable for an entire cabinet of equipment and, compact units which combine an IEC power connector, fuses and switch. Schaffner filters, from Westinghouse Systems, are available to suit all applications.

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THE HAPLESS AMATEUR

a true story of the 1988 John Moyle Memorial Field Day Contest

As always, I enjoyed the contest and, as always, something happened to make it a little different. Last year I flattened my battery and, after some pushing and grunting, finished with the car at the bottom of a hill with nowhere to go, the engine not running and the battery still very flat.

This year I took along two extra batteries and, just as I was about to commence operations, two Four Wheel Drive vehicles drew up on the opposite peak at Mount Fatigue and the occupants proceeded to erect an antenna. Arrrh bother, another field day operator on the same site and lots of QRM! But no, it was Col VK3BLE, and assistants erecting the antenna for a CB UHF repeater. Phew!

But then, at lunchtime, about 12 horsemen (and horsewomen and horsechildren) accompanied by several dogs appeared out of the bush and made straight for the disused CFA tower that I had selected to fix my antennas to. It was quickly apparent to the head horseman that I was in their way, "Them wires are in the horses way" he observed in a meaningful manner. "Well, someone has a problem," I retorted and, looking up at the milling posse, decided on positive action. "I'll move them in a moment" I said.

So, concluding the QSO I had been engaged in, I rolled up the radials for the 10 metre-high vertical. I decided to leave the three lengths of coax on the ground and chance any damage from the horses hooves. Likewise, especially as the horses were now tethered all around me, it seemed wise to leave the rest of the antenna farm (a dipole and two metre vertical) where it was and return to the rig and hope that none of the horses were inclined to kick. Fortunately, they seemed satisfied merely to graze and leave the occasional calling card where I might find it when packing up.

It was about this time that two of the dogs took a violent dislike to each other and it was only good luck that they chose to do most of their fighting on the far side of my car, rather than beside the batteries and card table on which the station sat; and where they had previously been lying.

Nevertheless, I had several anxious moments as they stood either side of my set-up expressing contempt for each other before returning to the fray.

When several bikies, a pair of pensioners and a honeymoon couple also joined the crowd I realised that I was not really as far out in the bush as I had thought.

In due course, some of the horseriders cautiously engaged me in conversation and within a few minutes a friendly discussion on horses and amateur radio was underway. Some strong, clear signals from Japan impressed the younger members of the group and I regretted not having some WIA information sheets on hand.

After about an hour they saddled up and I was left one again to the tranquillity of the mountain top.

—The experiences of Ron Cook VK3AFW, contributed by Frank Beech VK7BC

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REPORT ON SPECIAL CALL SIGNS

Since publishing the Report to Executive on Special Call Signs as printed in August AR page 10, the WIA has received a query as to its accuracy.

The suffixes list was prepared with assistance from DOTC and a copy has been referred back to DOTC Central Office, for comment.

To date no reply has been received, so the matter will be placed on the agenda for the next DOTC/WIA joint meeting.

It has been noted that a draft of the new DOTC 72 pamphlet appears to be a copy of the WIA's suffixes list, unfortunately with a transcription error. Readers will be advised of any corrections made by DOTC, when they come to hand.

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RUSSIA EMBRACES AMATEUR RADIO FOR YOUTH

The Soviet Union was promoting school radio clubs in recognition that it was one way of developing the technical creative abilities of the nation's youth.

Editor-in-Chief of the Russian magazine *Radio*, A Gorokhovsky said a special resolution aimed at further development of the technical ability of youth, was recently adopted by the Council of Ministers of the USSR, All-Union Central Council of Trade Unions, and other organisations.

Encouragement was being given to amateur radio clubs which were in many high schools, universities and polytechnical institutes.

In a letter to Ron Smith VK4AGS, the WIA Queensland Education Officer, Mr Gorokhovsky said teacher training colleges had included in their social sciences faculty training, basic knowledge on how to organise and manage a school amateur radio station.

When graduating as teachers they were equipped with the knowledge and skills to involve school children in amateur radio activities.

This sounds like an excellent idea and something Australia could adopt to lift the technical awareness of its youth.

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SOLDERING STATION SAFETY RECALL

Dick Smith Electronics has recalled a temperature controlled soldering station because of a safety risk.

DSE said the power switch in some of the units had been found to be incorrectly wired. The model involved was the Dick Smith Electronics catalogue number T-2000.

The units which may be affected were fitted with a meter having a white, translucent background and bear the Australian Design Registered Number 86081.

As a matter of urgency, the units should be returned to the nearest Dick Smith store for immediate attention.

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RSGB PROJECT YEAR

In recognition of the low number of under-18 radio amateurs, the Radio Society of Great Britain has initiated a special project called YEAR (Youth into Electronics via Amateur Radio).

RSGB Secretary, David Evans G3OUF, said the aim was to create and develop, among young people, an interest in science, engineering and electronics by introducing them to the hobby of amateur radio.

"Major UK electronics-based companies report severe shortages of manpower — RSGB has conceived project YEAR to help alleviate this problem," David said.

One prime objective of Project YEAR is the development of a new licence grade. The licence would be designed to encourage students and beginners into the hobby with Novice type privileges.

An outline of Project YEAR was given to industry, government and armed forces representatives at the recent RSGB 75th Anniversary Convention.

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RSGB 75TH ANNIVERSARY

The Immediate Past President of the Wireless Institute of Australia, David Wardlaw VK3ADW, has recently returned home after an enjoyable overseas trip.

Whilst in England, David attended the 75th Anniversary Celebrations of the RSGB, representing the WIA during this auspicious occasion. (Coincidentally, David also attended their 50th Anniversary in 1963). During the celebrations, David presented a special plaque to Sir Richard Davies KVCO, CBE, C.Eng FIEE, G2XM, the President of the RSGB, expressing best wishes from the WIA to the RSGB.

The main event of the celebrations was the 75th Anniversary Convention which was held from July 15 to 17, at the National Exhibition Centre, near Birmingham. The Convention was opened by His Royal Highness Prince Philip, Duke of Edinburgh, KG, the Patron of the Radio Society of Great Britain.

In opening the Convention, the Duke congratulated the RSGB on their achievement of 75 years existence and service to the amateur service, which had been pioneered in the United Kingdom. Whilst not an amateur, he said he had caused many messages to pass to and fro on the air, and during his time in the Navy was well acquainted with the "jabber box".

After officially opening the Convention, the Duke toured the exhibition before proceeding to the 75th Anniversary Luncheon. At the luncheon, a feature was made of the launching of Project YEAR (Youth into Electronics via Amateur Radio), an entirely new initiative to create and develop, among young people, an interest in Science, Engineering and Electronics by introducing them to the hobby of amateur radio. Amateur radio encompasses not only Electronics, Science and Engineering, but also IT (Information Technology) Principles, Languages, Travel and Geography. It also enables participants to enjoy a high quality of personal communications. Indeed, amateur radio is already a proven training ground for young people and is seen as a creative and disciplined form of practical preparation for their future careers.

From left: David Evans G3OUF; Dick Baldwin W1RU, John Allaway G3FKM and Nigel Roberts G4IJF, at the International Meeting which was held during the RSGB 75th Anniversary Celebrations.

On the Saturday, an informal IARU meeting was hosted by David Evans G3OUF, Secretary/ Chief Executive of the RSGB, and John Allaway G3FKM, Secretary of the IARU Region I, and chaired by Dick Baldwin W1RU, the President of the IARU. Representatives from 17 countries were present.

One of the major topics discussed was the preparation for a major ITU Frequency Allocation Conference, which is likely to be held in 1992 or 1993.

General consensus was that a uniform policy for all IARU Societies is essential, and the amateur service, through the national societies, must become involved in the preparation by their own administrations for the Conference, if this is at all possible. The IARU Regions must also develop funding strategies for IARU participation in the Conference, and, where possible, the amateur service must be involved with the CCIR, especially as CCIR is usually charged with preparation for ITU administrative conferences.

Other matters covered were EMC and standards, a subject which is becoming extremely important to the amateur service, and the promoting of amateur radio which was of very much concern to all the societies involved in the meeting.

The RSGB is to be congratulated on their very successful 75th Anniversary celebrations.

David VK3ADW, presented a plaque to Richard G2XM, on behalf of the WIA.

Joan Heathershaw G4CHH, Immediate Past President of the RSGB, Shozo Hara JA1AH, President JARL and Michael Owen VK3KI, Director of the IARU Region III Association, share a quiet moment during the 75th Anniversary Luncheon.

Equipment Review

Reviewed by:
Ron Cook VK3AFW
Lew Whitbourn VK2ZIP

IC-2GAT and IC-4GAT TRANSCEIVERS

Icom seem to have stolen a lead over their competitors in the field of hand-held amateur transceivers with this pair. A quick glance at their features shows why. These two rigs are almost identical twins; the IC-2GAT is for use on two metres FM and the IC-4GAT is for 70 centimetres FM. Unless otherwise stated, comments in this article refer to both units.

FEATURES AT A GLANCE

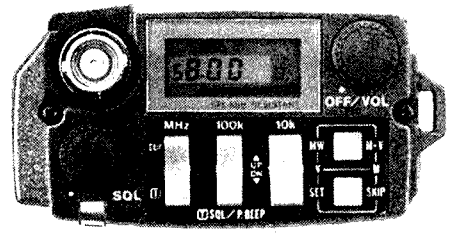
- ★ Small, compact FM transceiver with seven watts output on two metres and six watts on 70 centimetres.
- ★ Splash resistant case with rubber gaskets to prevent water entering the case.
- ★ 20 memory channels plus one call channel. Stores all information required to work any repeater.
- ★ Power saver. If there is no received signal for 30 seconds the current drain is reduced to one quarter of the normal receiver current.
- ★ Programmable frequency scan and memory scan, including the ability to skip selected channels.
- ★ Squelch open button (Squelch monitor function) to allow monitoring of weak signals without disturbing the normal squelch setting.
- ★ Pocket beep function: operated by reception of sub-audible tones (optional).

TECHNICAL DETAILS

FREQUENCY COVERAGE
IC-2GAT — 144-148 MHz.
IC-4GAT — 430-440 MHz.
TUNING STEPS: 5, 10, 15, 20 or 25 kHz.
POWER SUPPLY: 5.5 to 16.0 volts.
CURRENT DRAIN:
(at 13.2 volts DC) for the IC-2GAT
receiver — power saver — 10 mA typical. Maximum audio — 250 mA.
transmitter — High — 7 (6) watts out — 1.8 amps. Low — one watt out — 0.9 amps.
RECEIVER DETAILS:
Double conversion superheterodyne with 16.9 MHz (21.8 MHz for IC-4GAT) first IF and 455 kHz second IF
SENSITIVITY:
0.25 uV for 12 dB SINAD. Audio output 400 mW at 10 percent THD into an eight ohm load.
SIZE:
With BP-70 battery pack, 65 x 151 x 35 millimetres, weight 500 grams.
ACCESSORIES SUPPLIED:
Battery pack BP-70, charger BC-18, flexible antenna with BNC connector, hand strap and clip, belt clip and rain proof caps.

CONTROLS AND INDICATORS

With a small unit equipped with so many features, either very small controls must be used or each control must perform several functions. Icom have opted for the latter approach, fitting a *Function* button on the side panel. Pressing this at the same time as another button causes the second function to be executed. The controls are briefly listed and described in the following paragraphs.



TOP PANEL

There are two rotary controls, one for the volume/on-off function, the other for the squelch. A LED indicates when the transmitter is on. A BNC connector is provided for the antenna connection. Three rocker type switches allow selection of the operating frequencies in 1, 0.1 and 0.01 MHz steps. When pushed in one direction the frequency increases and when pushed in the other direction, the frequency decrease. Duplex and tone functions can be actuated through the alternative function mode for these switches. Two push buttons allow frequencies to be written to, or recalled from, memory, VFO/memory mode selection and memory skip operation.

A comprehensive LCD display gives the operating frequency in five digits (the hundreds of MHz are not shown); it also indicates duplex (+/-) or simplex operation, and memory channel number. A most useful feature is the provision of a wodge shaped bargraph display of RF output power level or received signal strength. Tone and squelch monitor operation are indicated by the characters "T" and "SQL". "SKIP" indicates memory skip operation and "LOW" denotes low power transmission setting is on. Unfortunately, no indication of the battery state is given. As the receiver will operate at voltages down to under five volts, reverse charging of some cells can occur in rechargeable battery packs giving 8.4 or 13.2 volts when charged.

SIDE PANELS

The function change button, PTT lever switch, light (for LCD display) button and battery pack release button are fitted on the left side panel.

Sockets for external microphone and speaker are on the right side panel. Sockets for the charger and external power supply are on the side panels.

FRONT PANEL

The loud speaker and microphone are behind this. Along side them are the Call, High/Low and Moni (Squelch monitor) buttons. In the duplex mode the Moni button allows monitoring the repeater input frequency. Beneath is an alphanumeric keyboard with 16 buttons which is used exclusively for DTMF audio tone transmission.

INSTRUCTION MANUAL

As with most modern instruction manuals, the one provided with this unit is well laid out with copious diagrams to aid the owner. It is necessary to read the manual to be able to access all the functions.

ON-AIR

The small size and light weight make this a delight to carry around. The sensitivity was found to be excellent and the higher power certainly cured the problem of being noisy into out-of-town repeaters.

A most appreciated function was the received signal strength indicator. No more experimenting to find the best position to get back into the repeater. No need to press the button to see if you are getting in either as a strong received signal indication is sufficient to ensure that you will get in.

Also, the ability to use the hand-held from the car battery without requiring a pre-regulator is a bonus. One of the reviewers has had a small box containing a pre-regulator, battery charger and PA to allow use of his hand-held in the car for extended periods. The extra box and associated cables are a nuisance that can now be done without. Of course, you will need to purchase the AD-12 external power adaptor which slides on in place of the battery pack. The extra power available when operating from the car is also very useful.

The recovered audio is of good quality and sufficient for most applications. In some vehicles, a larger speaker may be required for mobile operation, but in most the available level from the in-built speaker will be adequate.

ACKNOWLEDGEMENT

The review equipment for the section of the review was kindly made available by Icom Australia. Inquiries should be directed to Icom or. their authorised agents.

FURTHER THOUGHTS ON THE IC-2GAT by Lew Whitbourn VK2ZIP

I have extensively used quite a number of synthesised hand-held radios: Icom's IC-2 thumb-wheel tunable model. their IC-02 microprocessor controlled radio, Yaesu's FT-203, 207 and 209, as well as Kenwood's TR-2400 and TR-260, and/or UHF versions of all these. I have not yet used any of the super-tiny multi-function radios that have recently appeared on the market, such as the IC-μ2A, FT-23 and TH-25, so I cannot compare the IC-2GAT with any of those. However, the IC-2GAT is the best hand-held radio that I have ever used and it is certainly one that I would like to own. Nevertheless, there is always room for improvement. In the following sections I draw attention to areas in which the IC-2GAT excels and to others in which it could be even better.

FEATURES

It is good to see that Icom have, at last, decided to give us their top-of-the-line VHF hand-held, with sub-audible tone encoder and DTMF facilities included. (There are versions of the IC2-GAT without these). The emergence of a DTMF controlled digital voice bulletin board in Sydney is an indication of future trends. DTMF has many possibilities, with decoder chips readily available at Tandy Store for around $24.95 these days. Also I find sub-audible tone and encode/decode to be the most widely accepted and least obtrusive of selective calling systems. A very interesting option is a sub-audible tone decoder with 'tone-beep' operation, allowing the radio to be used effectively as a pager.

OPERATION

Icom have achieved a very large number of functions with a relatively small number of keys. The trick is to have "modes" of operation: The VFO, MEMORY and SET modes are the main ones. Most keys have different uses in the different modes and then there is a "function" key which gives a second function to most keys in most modes. You can toggle between the VFO and MEMORY MODES by pressing the V/M button and get into the SET mode from the VFO mode by pressing FUNCTION + V/M. This may sound complicated but I very quickly found it very user friendly. Operation is largely menu driven, especially in the SET mode, which is used to set sub-audible tone (from 38 standard frequencies), repeater offset, tuning step, scan limits and power saver ON/OFF There is one other "official" mode, the CALL channel mode which you can toggle in and out of with the CALL button.

There is also, what I call, an "unofficial" mode, the SCAN mode. When the radio is scanning, most keys serve only to stop the scan, so that is a different mode of operation of the keys.

MEMORIES AND SCANNING

All 20 memories can store individual offsets, sub-audible tones, scan skip status and tone beep status. There are two separate memories for scan limits and there is a separate call channel memory. This is all great. In memory mode the radio can scan all the memories or skip any designated channels. In VFO mode it will scan between the scan limits set up in the SET mode. I like all this too, but I think it could have been done better.

To start scanning, press FUNCTION and the 10 kHz up or down keys. When scanning, the radio looks for, and stops on, a busy channel. Scan resumes after two seconds of inactivity on that channel or after 15 seconds, regardless of activity. This is an unusual mode of scanning, quite different than that used by Icom in their IC-02, and *not* particularly to my liking. If you want to stop on a particular busy channel, pressing almost any key suffices, which is fine. However, if you want to scan-on you must either wait 15 seconds (which can seem like forever on some channels) or stop the scan then restart, which takes two hands. It is alright the first time, but it gets you down after a while! It would have been possible in scan mode for Icom to designate keys for pause, resume and stop, rather than all stop. This would be a great improvement. Whist I am making a wish-list, the feature I have always hoped for is a scan between limits where some or all memories can be used to define channels (or sub-bands) to be skipped. *Go to it Icom!*

I did notice one interesting peculiarity with band scanning. If the current VFO frequency is not between the defined scan limits, A and B (which are set up in the SET mode as described earlier), the radio first scans to one or other of the scan limits before starting a cyclic scan between the two limits. This is quite puzzling at first. You can have scan limits at, say 146 and 147 MHz. If you happen to be at 147.5 MHz and press function and 10 kHz up, the radio first scans down from 147.5 MHz to 146 MHz! It is not a problem once you know about it, but I wonder whether this is a software bug or whether Icom have some reason for programming this behaviour?

RECEIVER

I measured the receiver sensitivity to be 0.15 μV for 12 dB of quieting (and 0.25 μV for 20 dB) from 144 to 148 MHz, which is exceptionally good. The receiver showed no signs of distress when connected to a base aerial, a half-wave 13 metres above ground level, less than 10 kilometres from, and line-of-sight to, the taller buildings of Sydney on which many commercial VHF and UHF services are located. Note also that the American version of the IC-2GAT receives from 138 to 174 MHz. (The only difference is a diode or two in the microprocessor initialisation matrix). For such a broadband receiver the performance described above is outstanding. Icom have achieved this performance by using four varicap-tuned tracking filters in the receiver front-end. The DC tuning voltage is derived from the VCO voltage of the PLL frequency synthesiser. The same system is used in Yaesu's FT-23, which can receive up to about 163 MHz.

Tight squelch opens at 0.1 μV or a little less. The LCD signal strength indicator has seven bars, which correspond to the following ranges of signal strength: 0.1 - 2.0, 2.0 - 2.3, 2.3 - 2.7, 2.7 - 3.0, 3.0 - 3.4, 3.4 - 3.7 μV, and from 3.7 μV upwards. These ranges correspond to 26 , 1.2, 1.4, 0.9, 1.1 and 0.7 dB respectively for the first six steps. This is hardly the ideal response, but any S-meter is better than none.

Measured current drain on receive was 40 mA at 10 volts, with the receiver squelched, rising to 70 mA unsquelched at moderate audio level. The power saver comes in after 30 seconds of inactivity and has a 0.6 second cycle time. The current then drops to about 11.5 mA (the needle of my multi-meter was dancing between 10 and 13 mA). The power saver does not operate during scanning. You are, in fact, never aware of its presence but you would become aware of the very low current drain if you were monitoring a single channel for long periods. According to Icom, the only reasons for ever turning it off would be for reception of various data modes.

RECEIVER AUDIO

Received audio from the IC-2GAT was excellent. In fact, better than I have heard from a hand-held for some time. The trend with microprocessor controlled hand-helds has been to use smaller and smaller speakers in order to squeeze in all the other features. Icom have finally reversed the trend. There is plenty of audio output and it sounds good through the internal speaker. The audio level is actually acceptable in a not-too-noisy vehicle. This pleasant surprise is reflected in the specifications of the radio: 400 mW output into 8 (at 10 percent distortion) for a total transceiver current of 250 mA. As usual with Icom, you can get the audio out. There is the standard Icom pair of speaker/microphone sockets on the right-hand side of the radio.

For comparison, the IC-2 had 300 mW of audio (at 140 mA) and the IC-02 was rated at 500 mW audio (also at 140 mA). The audio from the IC-2 was quite good and that from the IC-02 was awful, and certainly did not sound like 500 mW even through an external speaker. Readers suffering from this may be pleased to know that the audio quality can be improved dramatically by changing a capacitor in the audio frequency de-emphasis circuit, C117, from 0.22 μF to 0.05 μF. I am grateful to Bob Morrow WB6GTM, for this information. The same cure works for the IC-04. Make sure you get the right capacitor though, C118 is connected to C117, is right alongside it and is also 0.22 μF!

TRANSMITTER

Icom state that typical powers with the BP-70 (11 cells: 13.2 volts at 270 mAh) and BP-3 (seven cells: 8.4 volts at 270 mAh) battery packs and seven watts and 3.5 watts respectively. I measured corresponding powers of 7.5 and 3.9 watts with freshly charged packs. Working through all the figures in the handbook I deduced that the current drains powers and overall

efficiencies for the BP-3, BP-70 and BP-5 (nine cells: 10.8 volts at 450 mAh) are:

	P (W)	I (mA)	Efficiency (%)
BP-3	3.5	1350	34
BP-5	5	1500	32
BP-7	7	1800	30

The efficiency is fairly constant. On low power the IC-2GAT seems to give about about one watt (I measured 0.9 watt for both BP-3 and BP-70 packs) for any battery pack, at a current drain of about 0.9 amps or an efficiency that varies from 13 percent for the BP-3 to eight percent for the BP-70.

It is interesting to compare this performance with that of earlier Icom hand-helds. The IC-2 gave a guaranteed power of 1.5 watts with a BP-3 (8.4 volts) for a current drain of 600 mA, with a corresponding overall efficiency of 30 percent. The IC-02 gave three watts with a BP-3 for a current drain of 1.05 amps, yielding an efficiency of 34 percent. However, well tuned IC-2s gave 2 to 2.5 watts for about the same current drain, or overall efficiencies up to about 50 percent. I suspect that the difference is that the IC-2 used discrete devices whereas the IC-02 and IC-2G use broadband high power chips for RF power generation.

BATTERY PACKS

You need at least two battery packs with a radio like the IC-2GAT and Icom offer a wide variety to choose from:

TYPE	CELLS	VOLTAGE	CAPACITY (mAh)	LENGTH (mm)
BP-2	6	7.2	450	39
BP-3	7	8.4	270	39
BP-5	9	10.8	450	56
BP-5A	9	10.8	450	80
BP-7	11	13.2	450	80
BP-8	7	8.4	800	80
BP-70	11	13.2	270	61

The capacities quoted here are from the handbook supplied with the radio and some are a little higher than quoted by Icom elsewhere. For instance, the BP-3 is usually rated at 250 mAh and the BP-2, BP-5, BP-5A and BP-7 at 425 mAh. I measured the capacity of the BP-70 supplied with the radio to be 280 mAh at a discharge current of 40 mA.

Although the BP-70 is about 20 millimetres longer than the BP-3 supplied with most earlier Icom hand-helds, the shorter body of the IC-2GAT more than compensates for this with the result that, with the BP-70 it is still about 10 millimetres shorter than the IC-2 or IC-02 with a BP-3. To my eye the IC-2GAT looks about the right size with the BP-70 and the BP-3 makes it look short. However, I am not keen on drawing 1.8 amps from 11 270 mAh cells In series — some are bound to end up reverse polarity (and probably short circuited) eventually. My choice for a second battery pack would be the BP-5, which will still give about five watts and has 450 mAh capacity.

However, the BP-70 battery supplied with the IC-2GAT has two good things going for it. At 61 millimetres long it is long enough to fit eight rechargeable penlight cells (AA size) which can be purchased quite reasonably in 500 mAh or even 600 mAh capacity and could be used to replace the original 270 mAh cells. Also the BP-70 has two sockets, one for a one millimetre DC coaxial jack for charging and the other for a two millimetre DC coaxial jack labelled 13.8 volts. At first I thought that the latter socket was to allow external power to the radio. You can even hear an Internal relay click over when you plug a 13.8 volts source into the two millimetres socket. However, I discovered in the handbook (and verified) that both sockets are for charging and the relay clicks over when power is applied to either socket. When being charged, the BP-70 only lets enough current through to the radio for receiving. The relay *must be* responsible for this.

I cannot say any more about this strange behaviour because the circuit of the BP-70 is not supplied with the radio. Quoted charging time for the supplied BC-18 charger, which is a 12 volt 300 mA plug-pack, (17 volts open circuit), is nine hours, so the BP-70 must limit charging current to 45 mA. No time is quoted for charging through the 13.8 volt socket, but I wouldn't recommend using it for charging because 11 nicad cells will rise to about 15.4 volts when fully charged, so current regulation over the charge cycle would vary from difficult to impossible. Current regulation from the BC-18 would not be much better. However, the good thing about the BP-70 here is that, with two sockets and an internal relay included you could easily rewire it to allow external power to the radio through one socket and safe (ie externally regulated/monitored) charging through the other.

SUMMARY

Don't be put off by my fault-finding, I love the IC-2GAT. It has a very sensitive, well-behaved receiver, lovely audio and plenty of RF power it you want it. It has sub-audible encode (optional decode), DTMF and 20 full function memories. All the accessories for the IC-2 and IC-02 series radios still work with the IC-2GAT. The back-lit display is beautiful — I only wish you could leave it switched on for base and mobile use! My review unit was kindly supplied by Practronics, PO Box 47, Peakhurst, NSW, phone (02) 533 2753.

ABOUT THE AUTHOR:

LEW WHITBOURN VK2ZIP was first licenced as VK2ZLB in 1975. While living in Melbourne and Canberra since then he has also had the call signs VK3ZSQ and VK1ZLW, respectively.

His work involves research on long-wavelength lasers and optical techniques (300 GHz to 30 000 GHz) and he has worked for several two to three year terms at a number of universities and laboratories throughout Australia and has also spent a period in France. Currently he works for the CSIRO Division of Exploration Geoscience, at North Ryde, New South Wales, on development of an airborne carbon dioxide laser system for active remote sensing of minerals.

Lew's main interest in amateur radio is in the design and construction of antennas, and analogous optical systems, which present a fascinating combination of mechanical and electrical constraints and are readily tested at VHF and UHF He is also interested in propagation at these frequencies and in the technology of hand-held radios. He operates occasionally on the two metre, 70 centimetre and 477 MHz FM bands.

Other interests include sailing, French, computers and, as a matter of necessity, car maintenance!

OPEN LETTER. . .

AMATEUR OPINION & THE WIA

The following letter was recently written to the Editor of Amateur Radio Action *by a member of the Executive of the WIA. We thought that members of the Institute would also like to read George's excellent comments.*

I would like to thank you for the objectivity and constructive tone found in the July issue. May I offer my thoughts on what appears to revolve around the issue of whether there should be a WIA, and why it should be supported?

Yes, I am also mindful of some operational deficits on the part of some organs of the the WIA, and in my view, the steps needed to correct those deficits are equally as important as loyalty to the Institute.

The critical factors as I see them are:

a) The amateur service depends on permission being granted to us to use the spectrum resource notwithstanding the pressure from government, commercial and broadcasting interests;

b) The only recognisable form of protection from further encroachments into our bands, would appear to be bodies like the WIA which act directly at the national level, and internationally through affiliations like the IARU;

c) The WIA is responsible for a reasonably well co-ordinated band, repeater and beacon plan across Australia, and had it not been for the confidence which the WIA has been able to win with the government, we would not be a self-regulating radio service. We would become a little like the Irish — subject to direct rule by Federal legislation;

d) Whether critics like to admit it or not, the WIA is the body responsible for a host of member services, and it is obvious that many people have allowed personality clashes and disenchantments to intrude, and therefore such personal issues have clouded the more fundamental questions like the need for a strong body representing the amateur population, and where necessary, the promotion of improvements within the WIA;

e) The WIA has not been as effective as it should have been, both Federally and at State level, in letting people know just what it has in fact been doing — in other words, in communicating its achievements to members and non-members.

From the above it can be seen that I am committed to a strong and effective WIA, and it disturbs me greatly to read that there are sections of the amateur community who still assert that they cannot see what they get for their money.

One would have thought that the issue of whether we are to be allowed to retain portions of our bands, or whether there are to be affordable examinations for aspiring entrants to the hobby, were of obvious and critical importance.

I fear that the drop in voluntary membership stems from personal conflicts; from pet peeves that an individual may feel he is unable to raise with the Federal Executive; a feeling that in dealing with a complex multi-level structure, an individual may seem to have little impact.

This sense of remoteness must be fought, and it behoves every member of the WIA to take care in electing their councils, and in giving their representatives accurate and substantial instructions on how they should vote at the annual Federal Conventions, or in conveying members' views on any other occasion.

It must also be recognised that a feeling of remoteness can creep in through one's own apathy — through leaving it to others to make all the decisions.

You see, the problem is not just in the structure, but also in the performance — not just of the elected representatives, but of the membership itself.

Evolution of the WIA is one of the current projects. Evolution at the Federal Executive level has started to be introduced.

Today we see at the Federal Office, an outstanding professional manager in Bill Roper VK3ARZ. The new President, Peter Gamble VK3YRP, is a senior manager within a statutory body, who brings refreshing drive and skills. His deputy, Ron Henderson VK1RH, brings organisational skills and talents which allow a diverse executive body to deal with a daunting workload.

This year the Federal Councillors, who are the Divisional representatives, elected four more non-Melbourne residents, who bring with them experience in finance, local government, public administration and law. That is not to say that the composition of previous executives was not satisfactory, but it is a way of bringing the Federal Executive perceptively closer to the membership. It is to be hoped that not only will quality of service be reflective of the enthusiasm which new people bring, but that those of us who have the privilege of serving on that executive, will be driven by the patent need to communicate with our members.

I see merit in a structure in which individuals may become members of the Federal body called the Wireless Institute of Australia, which would provide member services through clubs. I see nothing wrong with existing Divisions continuing to exist as holding companies, looking after assets acquired by their present members. If members are to belong directly to a central body, then it follows that expressions of opinion could be conveyed through regional (even Divisional) representatives, through either a form of proportional representation, or by delivering results of consultations with numbers "for" and numbers "against" a proposal.

Such a structure could suffer less from personality clashes, as the overall interests of the amateur fraternity would be preserved by people having to make decisions on a nation-wide basis. One could belong to the Institute even if one did not accept the local committee, council or club.

My own portfolio is the Future of Amateur Radio Working Party, and I am interested in hearing proposals from any amateur, whether a member or not, on what amateurs feel about the WIA, in particular what would attract them to join, or what changes would be seen as improvements.

I appreciate I may be inviting a flood of letters, and indeed I hope that will be so, but it is vital that the WIA be retained as the organ, even if in modified form, by which the interests of all VK amateurs will be promoted.

Kindest regards,

(Signed) George Brzostowski VK1GB/VK4UZ
Member of Federal Executive

KNOW YOUR SECONDHAND EQUIPMENT

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

After a gap of several months, *Know your Secondhand Equipment* is back with a new series.

However, before starting on the secondhand equipment story, I would like to pass the column over to Steve Mahony VK5AIM, for some interesting comments on equipment insurance. Steve is the South Australian Division's Disposals Officer and runs "Disposals Corner" on the VK5 Sunday Broadcast. Over to Steve:

"A problem which arises from time to time, is insurance of the equipment in the amateur shack. As amateurs advertise their presence with their antenna systems, and most have some commercial equipment that has some value, it does attract thefts. So, some kind of insurance is necessary. The problem is the value you should insure the equipment for. Do you insure it at its secondhand market value, or at replacement value? With the prices of new equipment going so high, this can escalate to an amazing amount.

"Take, for example, some average amateur equipment:

FT-707 HF Tcvr	cost $600	Replacement	FT-747 cost $1500
FC-707 ATU	cost $200	Replacement	FC-700 cost $400
FP-700 PSU	cost $250	Replacement	FP-700 cost $500
FT-290R 2m Tcvr	cost $400	Replacement	FT-290 Mk2 cost $950
FT-209 2m HT	cost $300	Replacement	FT-23 cost $600
Secondhand value	$1750	Replacement	Cost $3950

"I could add a TH-3 antenna, two-metre 10-element Yagi, rotator with controller, and a 10 metre mast or tower. As you can see, it soon mounts up. Then, when you tell the insurance company the two metre hand-held can be taken anywhere and could be lost or stolen, up goes the risk factor and the premium. If the amateur is really keen and has a linear amplifier, likes VHF and satellites or perhaps packet with a computer, the replacement value can equal the coast of a family car.

"A good many amateurs of long-standing have taken many years to acquire their equipment. Some of it might be more than 10 years old but still working well. Many insurance companies consider electrical and electronic equipment 10 years and older not worth covering. It only takes a neighbour's house to be burgled to make you realise that is could have been you!"

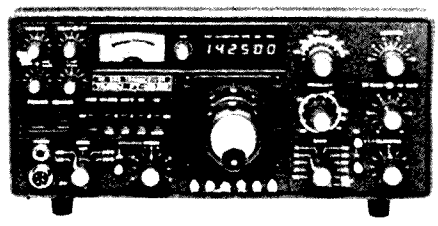
Thanks Steve for those wise words and certainly a phone call to your insurance company to clarify your own situation would be very worthwhile. Whilst on the subject, make a note of what you have, the serial numbers plus any particular distinguishing features and then photograph it. The more information you have, the better the chances you have if something goes wrong.

Now, back to secondhand equipment.

This month, I intend to describe some Yaesu equipment of the late-1970s and early 80s.

YAESU FT-101Z

This HF transceiver was released in early 1979 as a replacement for the aging FT-101E/F series. The cost was just on $800, but the cooling fan was an optional extra. This model covered the pre-WARC bands from 160 to 10 metres and was of conventional design for the times with a full solid-state circuit with the exception of the final and driver stages of the transmitter which used 6146s and a 12BY7. In general, the performance was way ahead of the earlier 101 series with very pleasant sounding received audio. To aid reception, a variable bandwidth control was provided. The clarifier was usable on both transmit and receive — 6 dB of negative feedback was applied across the transmitter final amplifier to give a very clean transmit signal. The AC power supply was built in and an optional 12 volt DC supply was available which bolted onto the rear panel. A reasonably effective RF speech processor was included. I would put the 101Z slightly ahead of its main competitor, the Kenwood TS-520S. Secondhand value for an early model 101Z would be about $500.



YAESU FT-101ZD

Released a few months after the 101Z, the "D" model was the same in all aspects except for the inclusion of a bright orange digital display. The cost was around $900. The digital display was also available as a kit to fit into the standard 101Z. When fitted, the two transceivers were identical except for the name plate.

Secondhand value of an early model 101ZD would be about $625. The general performance of the 101ZD is comparable to the TS-620S.

YAESU FT-101Z/D MkII

These models were updated to include the new WARC bands and came onto the market about September 1980. The retail price was about the same as the earlier models but the secondhand value is slightly higher. The WARC version of the 101Z would be about $550 and the digital version about $650.

YAESU FT-101Z/ZD MkIII

Released in early 1981, the MkIII offered FM in place of the AM operation and also an effective notch filter. This was the last and certainly the best of the series and is comparable to the Kenwood TS-830S. Secondhand value for a good 101ZD MkIII would be about $750.

YAESU FT-901DM

Actually released before the 101Z, the 901 appeared in September 1978. It was dubbed as the "Competition-Grade" transceiver. External appearance was very similar to the later 101Z series, but the internal construction and operating features were more comprehensive. The modes offered as standard were SSB, CW, FSK, AM and FM. In addition to a bandwidth control, a notch filter was included.

Squelch for FM, audio peaking for CW and an automatic microphone control system to minimise background noise transmission. This worked on the basis of an adjustable threshold setting for the microphone amplifier. A digital readout was included as part of the package. However, the readout had to be "calibrated" against the crystal calibrator every time the mode (USB to LSB) or the band was changed, not a very satisfactory system. The "M" in the DM indicated that the memory system was fitted. This allowed one frequency to be memorised for use on either transmit, receive or transceive. A transmitter tune-up mode was coupled to a 10 second timer to help prevent damage to the final tubes.

Like the 101Z, the 901 had a built-in AC power supply with provision for an optional 12 volt DC supply.

Internal construction was indeed high class, with rows of vertical plug-in circuit boards. This looked very nice, but often proved difficult when service was needed unless you happen to have an extender board. These were large and heavy transceivers, weighing 18 kilograms.

New price, when released, was in the vicinity of $1300. Secondhand value today would be abut $675. If I had the choice between one of these and a late 101ZD MkIII, I would take the 101ZD.

Many accessories were available for the 901 and most of these also matched the 101Z series. These included the FTV-901R VHF/UHF OSCAR transverter. This came with 144 MHz installed with optional boards for 50 and 430 MHz. The FV-901M synthesised scanning external VFO was capable of storing up to 40 frequencies, however they were all on the same band or in the same relative positions on other bands.

The YO-901 monitor-scope features a variety of monitoring functions which include an optional "band-scope" for received signal display. The FC-901 antenna coupler was rated at 500 watts PEP with a built-in power meter with scales of 25, 250 and 500 watts.

Secondhand value of these would be about:
FTV-901R $200 (no optional boards fitted).
FV-901DM $125.
YO-901 $325 or $375 with band-scope fitted.
FC-901 ATU $225.

YAESU T-902DM

An updated version of the 901DM, it incorporated the WARC bands. The digital readout was improved and did not need to be calibrated. The calibrate control, next to the display in the 901, became the "DIM" control on the 902. Released in mid-1891, at about the same price as the 901, the secondhand value today would be about.

That's all for this month. Next time we will look at a few more Yaesu HF transceivers.

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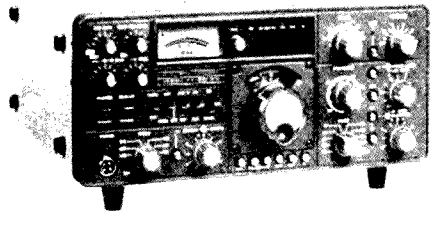

VHF UHF — an expanding world

Eric Jamieson VK5LP
9 West Terrace, Meningie, SA. 5264

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.005	H44HIR	*Honiara*
50.005	ZS2SIX	*South Africa*
50.011	JA2IGY	*Mie*
50.020	JE6ZIH	*Japan*
50.028	JA7ZMA	*Fukushima City*
50.066	VK6RPH	*Perth*
50.075	VS6SIX	*Hong Kong*
50.080	KH6JJK	*Hawaii*
50.110	BY4AA	*China*
50.490	JG1ZGW	*Tokyo* [1]
51.020	ZL1UHF	*Auckland*
52.013	P29BPL	*Port Moresby*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*
52.345	VK4ABP	*Longreach*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.445	VK4HIK	*Cairns*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
52.510	ZL2MHF	*Mount Climie*
144.022	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.445	VK4RIK	*Cairns*
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.600	VK6BTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
144.950	VK3RCW	*Melbourne*
145.000	VK6RPH	*Perth*
432.066	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK1RBC	*Canberra*
432.420	VK2RSY	*Sydney*
432.440	VK4RSD	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*Macleod*
432.540	VK4RAR	*Rockhampton*
1296.198	VK6RBS	*Busselton*
1296.410	VK1RBC	*Canberra* [2]
1296.420	VK2RSY	*Sydney*
1296.440	VK4RSD	*Brisbane*
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
2304.445	VK4RIK	*Cairns*
2306.440	VK4RSD	*Brisbane*
10445.000	VK4RIK	*Cairns*

1. According to the West Australian VHF Group Bulletin, this is a new beacon. It transmits in mode A1A with an output power of 10 watts to a dipole antenna 35 metres high. The location is downtown Tokyo in Grid PM95VP, it has an operating schedule of 24 hours with the message "VVV de JG1CQA Tokyo PM95VR" Reception reports are welcome via the Call Book address or Packet JI1CQA and JA1DGZ.
2. Ron Henderson VK1RH, sends news of this new 1296 MHz beacon at Canberra. Its location is at Melba, ACT, running five watts to crossed dipoles to yield an omni-pattern. Both the 1296 and 432 MHz beacons were constructed by Dik VK1ZAH and Tom VK1BUD.

SATELLITE CONTACTS

Roly VK3KXW, has been amusing himself via the satellites. He was particularly pleased with a contact he had with James G3RUH, on 12/8 on Mode L (1296 MHz up and 70 centimetres down). Calling on CW he received a 529 report with James coming back on SSB. The contact lasted from 1409 to 1427 UTC. The elevation was only three degrees at 1409 with the azimuth 283 degrees. The calculated path distance was 41559 kilometres at the start to 42013 kilometres at the finish. Roly tries each of the 11 day orbits. On 1296 he uses four 28 element *loop* Yagis and *on* 70 centimetres an 88 element J beam. Roly has worked many JA stations, also a 5 x 9 contact on SSB to ZS6AXT. He believes there may only be about five VK stations using mode L.

On 22/7 at 1500 UTC, which was only 15 minutes after the launch of ØSCAR 13 (day 1) Roly worked IV3WLQ on SSB Mode B at two degrees west. At 1540, he called CO on RTTY and worked F3EM 5x7 for the first RTTY heard on the satellite on Mode B. (70 centimetres up and two metres down). Power used was about six watts. So far he has not heard anyone on 1296. There has been quite a lot of activity on JL mode, two metres up and 70 centimetres down.

It appears Roly likes to try those things which are a little different from the ordinary!

50 MHz FROM SINGAPORE

A letter from David Rankin 9V1RH/VK3QV, gives details of some unusual DX workings on six metres within IARU Region III.

Working on 50 MHz from Singapore is a very rare occurrence. That it occurred recently has raised questions whether it is the first time, certainly so since the 9V1 prefix. No one is sure whether it was done previously using 9M4 or VS1.

Following 18 months of discussion between Yoshi JA1UT, Selva 9V1UV and the President of SARTS in Singapore, and the Telecommunications Authority in Singapore, official permission was given for some limited six metre propagation tests to be carried out using the specially allocated call sign 9V1ES. Both the time/dates of the tests and the frequencies were closely specified. Transmissions could only be made between the hours of 0800 to 1700 local time on days between June 3 to 12, 1988. The time was subsequently increased to past 1700 hours if conditions were good and signals could be heard. The dates were also extended to June 16.

The equipment was brought from Japan by JA1UT and consisted of a Yaesu model FTi625D modified to crystal control transmission on the permitted frequencies of 50.075 and 50.125 MHz, using 10 watts CW/SSB to a six element CL6 DX Yagi at 40 metres. The venue was a hotel in the Tanglin area of Singapore. The beam was mounted on the roof of the hotel, with permission, to provide an excellent take-off.

The team consisted of Yoshi JA1UT and his wife Setsuko JA1UPA, Hideo JA4HCK and Aki JM1BDB, amongst others. They considered the tests were moderately successful and 157 stations were worked. All JA districts were worked with the exception of JA5, but unfortunately no other countries were heard. Contacts were mostly on CW, with some on SSB.

CHRISTMAS ISLAND

As an extension to his six metre propagation tests, Yoshi and his wife put six metres on the air from VK4KCW/VK9X from June 27 to 23, 1988. This station ran more power than 9V1ES but conditions were not so good and only 105 stations were worked, all from JA.

Yoshi also activated VK4CEI/VP9X on the HF bands from Christmas Island for more than 6000 stations on all bands. This included 19 stations on 1.9 MHz, 122 on 3.5/3.8 MHz and 123 on 29 MHz FM.

SUMMARY OF SIX METRE DXPEDITIONS IN REGION III

Over the past 10 years, Yoshi JA1UT and his group have carried out the following DXpeditions on 50 MHz.

4/78: VS6HK Hong Kong; 4.78: CR9AJ Macao, the first six metre operation from CR9; 8/78: 4D88UT Philippines; 4/79 and 5/79: YB0X Jakarta, Indonesia, first six metre from YBC; 8/79: C21AA Nauru; 12/79 and 1/80: YB9X Bali, Indonesia; 5/80: HS1WR and HS1YL Bangkok, Thailand; 9/80: C21NI Nauru; 9/80: T3AZ West Kiribati, first six metres from T3; 4/81: 8Q7XX Maldives, first six metres from 8Q7; 8/81: CR9JA Macao; 18/82: KE6RD/KH0 and N7DUU/NH0 Northern Marianas; 8/83: XU1SS Cambodia, first six metres from XU1; 8/84: BT5RA and BY5RA China, first six metres from BT/BY; 5/85: XX9UT Macao; 6/86: BY4RB Zhenjiang, China; 6/87: BV0AE Taiwan, first six metres from BV; 6/88 9V1ES Singapore, believed first six metres from 9V1; 6/88: VK4KCW/VK9X Christmas Island.

The above certainly represents a magnificent effort on the part of JA1UT, the amateur service owes a great debt of gratitude for such dedication and expense. It is unfortunate from the Australian viewpoint, that all the operations have taken place at a time when we could not expect optimum conditions to prevail in the Southern Hemisphere. One presumes it is natural for Yoshi to choose their Summer Es period, giving the most chance for contacts over a wide area, although it is noted that, at the peak of Cycle 21, he did operate during the equinox. It certainly is hoped that all those who worked Yoshi so have some appreciation of the sacrifices made, after all, Yoshi does not work the area concerned, he makes it possible for others to work some rare countries.

David 9V1RH, concludes by saying that; "Bearing in mind the opening of six metres in various European countries within the past 12 months, eg F, G, LA, PA0, 9H, amongst others, amateurs within Region III should take stock of the status of the six metre band within the various countries in the Region and work towards the opening up of a segment in this most interesting part of the frequency spectrum. Such work should and must be done by individual interested amateurs encouraging their national societies to approach their administrations to open the band. IARU and IARU Region III Association must then, in turn, coordinate and liaise with the member societies to hammer out a consistent plan for the Region.

"Cycle 22 has started with a bang. With new countries now being available on six metres it could prove to be an interesting time ahead for the dedicated six metre operators located in Region III." Thanks for the news, David.

EME RECORDS

Six metres seems to be buzzing with EME activity. According to Joe Riesert W1JR, in *ham radio* for

June 1988, Ray WA4NJP, in Georgia, completed a two-way EME contact with Bert KH6HI, Hawaii, on 50.008 MHz using one minute sequencing. The distance was approximately 4530 miles (7289 kilometres). Ray used 1500 watts and Bert 1000 watts. Both stations were using quads of four eight-element Yagis on 35-38 foot booms. Congratulations to Ray and Bert on a great effort.

From the same source comes news that, on October 18, 1987, at 1945, the EME contest expedition to the NRAO Greenbank, West Virginia radio telescope, set a new 13 centimetre (2304 MHz) EME record. As W3IWI/8, they had a two way QSO with John ZL2AQE, in Wellington, New Zealand. The distance is 8658 miles (13 931 kilometres). W3IWI/8 was using a 150 foot dish (!) and 100 watts while ZL2AQE had a 12 foot dish and 18 watts. Congratulations also to these two operators.

With the Americans using 902 MHz, it did not take long for EME to be tried on that band. The first ever EME QSO on that band was on January 29, 1988, between K5JL and WA5ETV for approximately 13 miles (21 kilometres). K5JL used a 28 foot dish and 150 watts while WA5ETV used a 30.5 foot dish and 200 watts.

Joe said he thought that distance would not last long and he was right. On February 7, 1988, Jay K5JL, completed a 902 MHz (33 centimetres) EME QSO with Al WB5LUA, in Texas, over a distance of about 187 miles (301 kilometres). Both stations were running 150 watts and 24-28 foot dishes.

Also, Joe reports 10.368.1 MHz (three centimetres) EME contacts between Rick Fogle in Texas and Lucky Whitaker W7CNK, in Oklahoma, during last February. These attempts are somewhat unusual in that the pair only have one high power amplifier between them! They have a 15 watt TWT amplifier which they mail back and forth to one another. They are trying to obtain another amplifier of course. They have heard each other with Rick using a 10 foot dish and Lucky, a 16 foot dish. Both have their preamplifiers and power amplifiers mounted right at the feed. So far, due to the circumstances outlined, they cannot claim a conventional contact! Good for trying though.

Thanks Joe for the information. It will help to keep the VK boys on their toes.

NOUMEA

Phil FK1TS, from Noumea, has again sent a very interesting letter. The following are his observations on six metres.

"The openings to VK and ZL during early July were quite good and lasted up to two hours, sometimes longer. On 23/7, the band was open all afternoon. At the end of July the band went quiet for a while. On 30/7, I had the rig on 50.110 and thought I could hear some American accents. Not being sure, I went outside and turned the quad around (manual rotation system) to KH6 and signals came up to 5 x 7-9. I then worked KH6JJK, KH6HI and AH6IO. I was listening and calling all night on 31/7 but nothing heard. Early in the evening of 1/8 one could tell something was going to happen, with all sorts of weird noises around the band. I was calling CQ bearing to KH6 on 50.110 from about 0800 to 0850 with no takers. I stopped about 0850 and five minutes later K6MYC/KH6 popped up. He was running one kilowatt to four 50 foot Yagis and was about 5 x 9 +20 dB (he was 5 x 5 when he removed the linear and ran 150 watts). Not long after, AH9AC came up and was talking to Mike K6MYC/KH6 with signals about 2 x 0, in Noumea. Through Mike I asked him to turn his beam and, after about five anxious minutes, he gave me a call, rising out of the noise to about 4 x 1, call signs and signal reports were exchanged and a new country (Wake Island) for me.

"K6MYC/KH6 was still in at 1120 at 5 x 7. We had been talking for about two hours and 20 minutes with little or no QSB. The only reason we finished the contact was that he had to go to bed as he had a moonbounce sched at 1515 and wanted to get three hours sleep. Also, the only reason Mike came on 50.110 was to set up his equipment for his EME sched later that night on 50.005 MHz and heard the H44 beacon 5 x 7; so the call went out on 50.110 MHz." (one more chalk up for the beacons! . . .5LP).

Phil says the current happenings on six metres are a good omen for the next TEP season and the Es period. It will be interesting to see how he got on with his DXpedition to 3D2 in September, ZK1 in October, plus, of course, KH8 and 5W1 August/September.

Some indication of the state of the band (six metres) from Noumea can be gained from the following: 18/5: 0510 VK2XJ; 19/5 0511 VK2XJ, VK2VC, VK2FLI, 1/7: 0656 VK2XJ, VK2FLI; 3/7: 0724 VK2ZXC, VK4ALM, VI88QLD, VK4ZDK, VK4GM, VK4PZ; 6/7: VK2, VK4; 14/7: VK2FLI; 17/7: 0311 VK2, VK4, ZL2TPY; 0429 VK2; 23/7: 0129 to 0252 VK2KAY, ZL2TPY, ZL3NE, ZL2UBG, ZL1BHV, ZL1AKW, ZL1ADP; 0626 VK2, VK4; 24.7: 0115 ZL1BHX, VK2ZXC; 0305 ZL2TPY, ZL3TIC; 25/7: 0522 ZL1ADP, VK4KJL; 30/7: 0744 KH6JJK, 0745 KH6HI, 0749 AH6IO (still audible at 0825 calling CQ); 1/8: 0859 K6MYC/KH6, 0915 AH9AC (Wake Island, 18 watts to three-element quad), 0936 KH6JJK, 0940 K6MYC/KH6 until 1050, and again from 1112 to 1120.

23/7: 0300: Channel 0 Brisbane 51.670 5 x 9; 27/7: VK2RHV 5 x 2 at 0515; 28/7: Channel 0 Brisbane 5 x 9; 1105 weak CW on 50.110 possibly KH6; 30/7: Heard JG2BRI 5 x 0 calling CQ at 0920 on 50.110; 1/8: 0905 heard K6MYC/KH6 working KX6BA; 0906 K6MYC/KH6 hearing H44 beacon 5 x 7 until 0950; 1015 heard K6MYC/KH6 working P29PL.

All this means if we in VK lived 2000 kilometres further east and further north, say with Alice Springs being about where the Solomon Islands are, our whole country could really have a ball on six metres! Oh well, some scientists say we are drifting north. Slowly!

BRISBANE CHANNEL 0

The Brisbane boys are ecstatic now that Channel 0 has disappeared the scene in the Brisbane area. From September 10, Channel 0 became Channel 10, effectively removing the crud which has plagued six metres since Channel 0 commenced operations on July 1, 1965. So now we have TVQ10 instead of TVQ0. Toowoomba, of course, are now the lucky people who will have Channel 0, with DDQ0 instead of DDQ10! Toowoomba is about 160 kilometres west of Brisbane so from a Brisbane viewpoint, is well outside the service area of the station.

John VK4ZJB, sent me an extract from the Brisbane paper *The Brisbane Sunday Mail* which gave details of the changeover and a few hints for people to tune in the station on the new position.

One comment which I found interesting was "With the new Brisbane 10, viewers who have previously suffered from ghosting on Channel 0, will find this problem no longer exists." Phew! That is a wild statement if ever there was one. I have seen more than enough ghosting on Channel 10 in South Australia, after servicing television sets for more than 25 years, to be very wary of making statements like that.

I have many fond memories of the days prior to Channel 0 when we could expect a mass of signals from Brisbane during an Es opening, the distance to VK5 being a prime 1600 kilometres for single hop. As John VK4ZJB says, there will be plenty of stations around this summer; I am very sure there will be, but do remember, 52 MHz can have a fourth harmonic on Channel 10, just like 50 MHz has a fourth harmonic on Channel 9 if you are not careful.

Go to it, have a good time. Thanks John. (By the way, John sent me an 811A valve — he thought I might like it for my six metre linear — very nice thought that, although it is interesting to record that the original bottles are still going strong after 18 years!).

THE UNITED STATES OF AMERICA

Bill Tynan W3XO, of *QST*, and "The World above 50 MHz" reveals that their Summer Es period was very good taken over the whole country. There were pockets of poor conditions at times. Bill cites one occasion when the band was open on six metres to Europe from Canada, whilst it was dead at his QTH.

I reported last month on the huge six metre opening across the Atlantic to Europe. Another good opening was on June 25. Bill said, had it not been for the massive opening of June 6, the one on June 25, would be considered quite monumental. But, it pales by comparison in terms of area covered, the strength of signals and the duration.

A number of stations successfully worked a new country, Finland, with OH1ZAA, on June 25, with reports of 559. Areas covered seem to be VE1, W2, W3 and W4. One 27/6, western USA stations were working JAs around 0500. W6YKM worked about 40, while K7KV worked more than 70.

Bill did comment on what he described as some unusual conditions on 18/6 when "K6QXY observed an interesting effect when, at 1845 he heard KH6HI while his beam was aimed at 100 degrees. Turning it to the normal direction produced nothing. KC9RG reports a similar occurrence. On two occasions, he was able to hear stations to the west while pointed east, but unable to hear them on the direct path. One possibility for such a phenomenon is that reflection takes place off the edge of an E cloud. Does anyone have any other ideas?" Well, Bill, in Australia we refer to that as being backscatter, it being a rather common occurrence, particularly when the conditions are very good.

A new six metre country which has just appeared is called Aruba, being part of the Netherlands Antilles. The station concerned was P40JT (who was actually W6JKV) and he managed to work 216 different stations during a 10 day stay. There is also a local station, P43AS, who will be active using 100 watts and a seven-element beam.

Bill W3XO, also reports quite a few Es two metre openings across the country, particularly on 9/6, 19/6 and 30/6.

THE AUSTRALIAN SCENE ON SIX METRES

From the VK5LP viewpoint, I have sadly missed out on all the Winter time Es openings. Three commitments away from Meningie for nearly two weeks at a time makes a hole in on-air time, particularly when most occurred at peak opportunity time. I did manage to work some VK2s and VK4s on 22 and 23/7, but I was away for the good opening to ZL on 24/7 when, during the middle of the day (0300) ZL1, 2, and 3 were worked. Peter VK8ZLX, from Alice Springs, on a State visit to Col VK5RO, had a ball working the ZLs, again a case of being in the right place at the right time!

TWO METRES

It doesn't often happen, certainly I have never been involved, but Winter time Es on two metres between Adelaide and Brisbane is something of a rarity, but it did happen on Monday, July 25, when at 0435, Col VK5RO and Roger VK5NY worked John VK4KJL, on 144.102 MHz with signals to 5 x 9, with the band open for about 10 minutes. The distance is around 1600 kilometres. Col reported six metres had opened quite early, in fact at 2335, and remained open until at least 0630, during which time very strong signals were available from VK2, 3, 4, 6 and 7, with short skip evident from VK3. Bring old hands at the game, the VK5s naturally kept an ear on two metres whilst working on six metres, with the results the contact was made. Good work. I would not be game to say it has not been done before, but it is indeed an unusual happening, but I am quite sure similar conditions have existed in the past for such contacts to be made had there been someone at both ends at the right time.

Col VK5RO, has also been spending quite a deal of time on OSCAR 13 since it was launched, using mode B and JL, with good results.

NEWS FROM DAVID VK3AUU

David VK3AUU, has written to say that, during July and August on two metres, he worked the following interstate stations: VKs: 1AU, 1BG, 1BUC, 1VP, 2DVZ, 2KWA, 2ZAB, 2ZRE and 7JG. All contacts were on Saturday and Sunday mornings. VK1BG seems to have got on the list of stations who can be worked almost anytime.

David said two metres has been rather quite in the evenings, although one very interesting contact was with VK3KKW in Werribee, who was running SSB with 0.25 watts to an eight-element Yagi, three metres above ground. His signal was 13 dB above noise for the distance of 105 kilometres over fairly flat unobstructed ground. That signal relates at -157 dBW or 0.1 uV. This agrees with the signal predicted by Bray (*QST* November 1961, pages 36 to 41). Would VK3ANY, VK3ANJ or VK3AFW care to comment?

On six metres, David has worked ZL on 21/7, 23/7, 25/7 plus VK1, 3 and 5 on backscatter, and VK4 on Es on 25/7. Other good tropospheric conditions were noted on 11, 12 and 18/7.

A further 10 stations have been worked by VK3AUU on EME, making a total of 32 stations in 16 countries. Best contact was PA0JMV, who runs two 17-element KLMs and a pair of 4CX250Bs, New countries were UG6, I, C3 and PA. He has continued to observe considerable enhancement of echoes at three degrees elevation. David says HF operators should note that this angle is obtained with the centre of the array at a height of five wavelengths.

Thanks for writing again David, always pleased to hear from you. Hopefully, when VK5LP gets into a more settled state, more contacts from Meningie will be available.

CLOSURE

These notes are being prepared a week or more ahead of time to allow me to have one more break! This time it is not associated with commitments, but to enjoy the company of four others when we make a 10 day trip which will include three days at Expo in Brisbane. We will be on a rather tight schedule, so there will be very little opportunity to meet any of the amateur fraternity, that is for another time! I regret any late notes which may need to be held over until next month.

Closing with two thoughts for the month: *A lot of what passes for depression these days is nothing more than a body saying that it needs work;* and *As you go through life you are going to have many opportunities to keep your mouth shut. Take advantage of all of them!* 73. The Voice by the Lake.

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SCHOOL LISTENING POST PROVIDES EDUCATION

A world history — social studies teacher at the Horace Mann School, Beverly Hills, California has motivated his students to explore their world through radio.

Craig Dible KB6LAK, decided three years ago to bring a shortwave radio receiver and his students began eavesdropping on the world.

"My kids can't believe the amount of activity that goes on outside the normal broadcast spectrum," Craig said.

He recognised the enormous potential that shortwave radio would have in his classroom. After obtaining a grant, the school's listening post was upgraded with an Icom R71A and Icom R7000 — fed with a trapped HF dipole and VHF/UHF Discone.

Craig said he encourages students to listen to current events as they happen. They heard, live, the ill-fated launch of the space shuttle *Challenger,* reports from both sides of the Iron Curtain on the Chernobyl nuclear plant disaster — and other news events.

The stimulus of listening to shortwave, and the VHF/UHF utilities, has resulted in at least half a dozen of the Seventh Grade pupils (aged about 12) to study and obtain their Novice licences.

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Pupils at the Horace Mann School, California.

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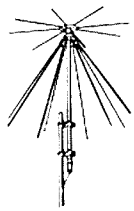

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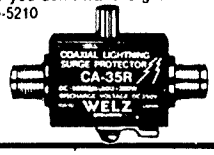

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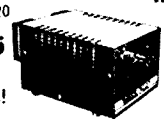

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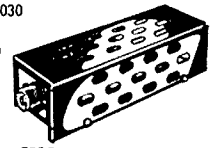

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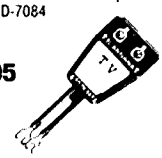

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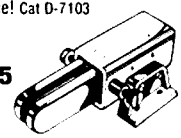

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How's DX?

MONTSERRAT DXPEDITION

A group of amateurs, Ron Marra AA5DX, Bill Carter KM5R and Alan Benolt WQ5W, will be operational from Montserrat in the CW WW DX CW Contest on the fourth weekend of November 1988. The call sign for the contest operation *only* will be VP2NW, however they will be quite active before and after the contest (from November 23 to November 29), using their reciprocal call signs; ie VP2M/AA5DX.

Activity will be on all bands, 160 to 10 metres, on the normal DX frequencies.

QSLs for VP2MW only to KM5R, reciprocal contacts will go to the individual's call book address or via the bureau.

—Contributed by Ron Marra AA5DX via Ken McLachlan VK3AH

SOUTH AMERICA

Rick Dorsch NE8Z/HC1MD, will be active from San Cristobal Island in the Galapagos Islands from November 1 to 4, 1988, as either HC1MD/HC8 or HC8MD. Watch 25 kHz up from the bottom of each band on CW and all regular SSB DXpedition frequencies. QSL via John C Kroll K8LJG, 3528 Craig Drive, Flint, MI 48506. Please include an SASE or IRCs for a direct return.

On November 5, Rick will be operating as HC1MD from Quito.

Rick was also operational from Peru, October 14-22, as NE8Z/OA4, Ecuador from October 23-28 as HC1MD, in the CW WW Phone Contest as HD9OT from Ecuador, October 29-30, and using HC1MD/HC5 in Ecuador on October 31.

—Contributed by Rick Dorsch NE8Z/HC1MD via Ken McLachlan VK3AH

VISITOR MAY STAY!

Recently, well-known Pacific Island DXer, Raj Singh 3D2ER, from Suva, Fiji, visited Sydney and Melbourne for several weeks.

During his stay in Australia he used his recently issued call sign VK2FOI, operating from his brother, Vijay's home in the Sydney suburb of Engadine.

Raj, his wife Carol, and their children are hoping to emigrate to Australia in the near future.

—Contributed by Allan Williams VK2FH

From left: Raj 3D2ER, Stew VK2BFL and Allan VK2FH.

—Photograph courtesy Vijay Singh

ROTUMA

Rotuma is a small island group located in the western South Pacific Ocean and is part of the territory administer by Fiji.

A DXpedition is being mounted to Rotuma, from October 22, 1988 to November 5, 1988, by Eric Scace K3NA/VK9LT, Ed DeYoung VK8XX/3D2XX, Kip Edwards W6SZN, and Toni Zimmer KN3T/VK9NT.

Two stations will be manned by the DXpedition with operations taking place on all HF amateur bands, both CW and SSB, around usual DX frequencies. Anticipated call sign will be 3D2XX, however attempts are being made to obtain a special prefix, as it is hoped that Rotuma may "fit-the-bill" for new DXCC country status.

—Contributed by Ed DeYoung VK8XX

HEARD AND WORKED IN WOODBINE during August

4S7RO (heard) — QSL via DJ9ZB.
K4DEX, JH7PFD, DL3BBV (heard), DK8MZ (heard), UZ0QWJ.
T32AB (heard) — QSL via N7YL.
A2J4XPO (heard) —This was a special call sign in Japan and the JRRL is to issue QSL cards for all contacts. The station was located in Central Japan.
HL9TF (heard), G4PEU/HH2 (heard — QSL home QTH), CO5RCD (heard), 4S7NS (heard), KT7I/KH2 (heard), VU2NR (heard).
YJ8AA (heard) — QSL via JH3DPH.
VQ9XF (heard) — QSL via NG7X.

—Contributed by Bob Demkiw VK2ENU

TUVALU AND BORA-BORA

Jim K8JRK, has just concluded a stint on Tuvalu (from October 28 to November 1) primarily for the CQ WW SSB Contest, and will now be operational from Bora-Bora as FO0SSJ, until late November.

QSL Jim to his home address, 801 South Oxford, Grosse Pointe Woods, Michigan, USA. 48236.

CASEY BASE STATION

Roman (Charlie) Cholawinskyj VK6MP, will be stationed at Casey Base, in the Antarctic, from December 1988 for a period of approximately 13 months as Communications Officer for the Australian National Antarctic Research Expedition (ANARE). During his sojourn to the icy wastes, he hopes to be active on the amateur bands in his spare time using the call sign VK0MP.

QSL Manager is Gil VK6AGC, via VK6RU, PO Box F319, Perth, WA.

—Contributed by Roman Cholawinskyj (Charlie) VK6MP

From left: Raj 3D2ER, Stew VK2BFL and Allan VK2FH.

—Photograph courtesy Vijay Singh

From left: Bob Davison VK9ND, Sue Miller KA9UCK, and Dave Miller VK9LU/NZ9E, taken during Sue and Dave's recent trip to Norfolk Island.

DEADLINE FOR JANUARY IS NOVEMBER 7, 1988

WIA VIDEO TAPE PROGRAM TITLE LISTING as at August 27, 1988

John Ingham VK5KG
FEDERAL VIDEOTAPE CO-ORDINATOR
37 Second Avenue, Sefton Park, SA. 5083

Now *every* radio club can provide their members with quality technical lectures on subjects covering the whole range of amateur radio activities by taking advantage of the WIA Federal Videotape Library. You will find this a boon, particularly if yours is a country club which often has difficulty obtaining a variety of expert lecturers for regular meetings. (Individual amateurs and librarians should take note of the new Duplication Fees at the end of this article.).

For radio clubs affiliated with the WIA, it is inexpensive and easy. Here is how it works:

Except for those titles for which the WIA does not hold a copyright licence, all you have to do is . . .

Supply the Videotape Co-ordinator with a video-cassette in a Video Cassette Box "Postpak", and Enclose address and stamps for return postage.

and the program is free for you to use in support of amateur radio in your area . . . including copying and transmission over the air if you wish.

Those programs which are copyright are available only *on loan*. To obtain any of them send with your request . . .

Information about your preferred VCR format
A statement signed by a responsible officer of your club that "I undertake that while (Program Title) is assigned to me, I will not allow it to be transmitted over the air, nor copied by any means whatsoever, and that I will return the same promptly after showing".
Enclose Address and stamps for postage to you.

The present available formats are as follows . . .

U-MATIC:
Size 260 x 173 x 40 mm, mass 900 grams (to institutions only).
Standard play — one hour maximum only.
Standard sound only on channel 2 (No Dolby).

VHS:
Size 200 x 110 x 30 mm, mass 350 grams.
* Standard play four hours maximum, or long play eight hours maximum as requested.
* Standard Sound — Dolby On or Off as requested.
Hi-Fi FM Sound also present on all VHS cassettes.

BETA:
Size 160 x 100 30 mm, mass 300 grams.
Standard play three and a quarter hours maximum only.
Standard sound only (No Dolby).

VIDEO 8:
Size 103 x 68 x 20 mm, mass 80 grams.
* Standard play one and a half hours maximum, or long play three hours maximum as requested.
Hi-Fi FM sound is standard (No Dolby).

Obviously, the smaller and lighter the cassette, the less postage.
* NOTE: Be sure to request *Standard* or *Long Play, Dolby On* or *Off*.

NOTE TO INDIVIDUAL AMATEURS

Since the inception of the WIA Federal Video Service, cassettes have been made freely available to all comers, especially isolated amateurs. However, recently there has been a rapid rise in the number of requests from individual amateurs, some asking for over 10 hours of programs at one time.

Video duplication is a real-time, one-at-a-time operation for which the costs of maintenance of the equipment is not small. Obviously, the Service is much more economical if, say, one tape is seen by 30 members of a club than if each of the 30 members were to request their own personal copy. If *every* member of the WIA requested just *one* program, it would take about four years at 40 hours a week to service!

So, in an effort to encourage requests from groups of amateurs rather than individuals, from now-on a Duplication Fee of $2 per hour, or part thereof, will be payable in advance for all requests from individuals. All such fees will go towards upkeep of the duplication equipment.

NOTE TO LIBRARIANS

A number of educational institutions have already availed themselves of the technical lecture tapes from the WIA. While this service will continue to be available, from now-on a Duplication Fee of $10 per hour, or part thereof, will be payable in advance by all institutions not affiliated with the WIA. All such fees will go towards the production costs of future Technical Lectures.

NOTE RE TAPE CASSETTE QUALITY

The WIA Videotape Co-ordinator retains the right to refuse to copy onto inferior quality video tape. In the past such tape has caused many hours of wasted time through clogged video heads, and in future only reputable brands of video tape will be accepted. In particular, although not always in itself a guarantee of quality, use only those VHS cassettes which carry the official "VHS" logo.

SEE NOTE	TITLE (In chronological order within each subject grouping)	LECTURER	PROD	APPROX TIME In MINS	COL / B&W	YEAR PROD (19. .)	DESCRIPTION & OTHER INFORMATION
GENERAL PROMOTIONAL FILMS							
—	**The Ham's Wide World**		ARRL	30	Colour	69	*Superseded by "The World of Amateur Radio"*
—	**This is Amateur Radio**		ARRL	15	Colour	70	*Pitched at Teenagers*
—	**Moving up to Amateur Radio**		ARRL	15	Colour	75	*Pitched at CBers*
©	**7JIRL DXpedition**		JARL	60	Colour	76	*General Amateur Radio Interest: LOAN ONLY*
—	**This Week Has Seven Days looks Into Amateur Radio**		HSV7	25	Colour	78	*Pitched at Teenagers: includes some ARRL footage*
—	**Amateur Radio — The National Resource of Every Nation**		VK5KG	6	Colour	79	*Encapsulates AR: good for public exhibition*
—	**The New World of Amateur Radio**		ARRL	30	Colour	82	*Pitched at Adult Level*
HISTORIC INTEREST							
©	**Wireless Telegraphy — circa 1910**		?	10	B&W	10	*Archive Material courtesy David Wardlaw VK3ADW*
©	**Amateur Radio (TV Pilot Program)**		WIA NSW	30	B&W	68	*Archive Material courtesy TEN Channel 10*
—	**Opening of Barley Britten Building — SA HQ**		VK5KG	50	Colour	77	*Archive Material*
—	**History of ATV in South Australia**		VK5KG	30	Colour	80	*Archive Material, still building*
—	**ATV in Australia 1978 — made for British ATV Club**		VK5KG	30	Colour	78	*Archive Material*
—	**ATV in United Kingdom 1978 — reply from BATC**		G8CJS	30	Colour	78	*Archive Material*
—	**Port Macquarie Field Day — 1983**		VK2BFM	25	Colour	83	*Archive Material*
—	**VK2 75th Anniversary Seminar Keynote Speeches**		WIA NSW	135	Colour	83	*Dr David Wardlaw & State Manager DOC*
©	**Heard Island DXpeditions**		Ch 2, 7, 9 & 10	20	Colour	84	*Archive Material: No Loan or Copy Available*
—	**Heard Island DXpedition**	VK2BCC	WIA NSW	60	Colour	86	*Raw Unedited; from 1986 VK2 Seminar*
—	**Opening of Amateur Radio House — NSW HQ**	VK2BCC	WIA NSW	102	Colour	83	*Archive Material*
ANTENNAS AND PROPAGATION							
©	**G6CJ's Aerial Circus**	G6CJ	WIA	90	B&W	77	*The Definitive Antenna Lecture. Loan Only*
—	**Wire Antennas**	VK5RG	VK5KG	40	B&W	78	*Antennas for HF and Antenna Tuners*
—	**Loaded Wire Antennas**	VK5NN	VK5KG	50	Colour	80	*Using Inductive and Capacity Loaded Antennas*
—	**Getting Started in Understanding the Ionosphere**	VK5NX	VK5ZBD	50	Colour	83	*How the Ionosphere Aids HF Communication*
—	**VHF Signal Enhancement by Aircraft**	VK2ZAB	WIA NSW	70	Colour	86	*Raw Unedited; from 1986 VK2 Seminar*
**	**Antennas and Directivity**	VK2BBF	OTC.	73	Colour	85	*Lecture given to a group of radio amateurs*
—	**Antenna Rotator Systems**	VK5AIM	VK5KG	50	Colour	86	*Servicing the several different types*
—	**Broadband Antennas**	VK5RG	VK5KG	62	Colour	86	*Includes terminated antennas*

SPACE — GENERAL INTEREST							
—	**Apollo 13 Disaster**	VK5JM	VK5KG	90	Colour	80	*Australian Tracking Procedure Saved Apollo 13*
—	**SSTV Pictures from Space — Voyager**		VK5KG	15	Colour	83	*SSTV Pictures Converted from Saturn Fly-Past*
—	**AUSSAT — Australia's Domestic Communications Satellite**	VK5JM	VK5KG	62	Colour	84	*Technical Description of Services Offered*
—	**Amateur Radio's Newest Frontier**		ARRL	26	Colour	85	*Amateur Radio in Space; General PR*
—	**Working W5LFL in Orbit from VK10RR**		Richard Elliot	23	Colour	86	*Raw Unedited Actuality Footage*
AMATEUR SATELLITES							
—	**Getting Started in Amateur Satellites**	VK5HI & VK5AGR	VK5KG	60	Colour	S3	*Superseded (see below)*
—	**An Introduction to Amateur Satellites (Part 1)**	VK5AGR	VK5KG	60	Colour	84	*An Overview of Amateur Satellite Operation*
—	**Micro-Computer Aids to Satellite Tracking (Part 2)**	VK5AGR	VK5KG	30	Colour	84	*Programs for Tracking and Decoding Telemetry*
—	**Using Phase 3 Amateur Satellites**	VK5HI	VK5KG	90	Colour	84	*History Construction and Use of High Orbit Satellites*
—	**The AMSAT OSCAR Phase 3 Story Dr Karl Meinzer**	DJ4ZC	VK5KG	80	Colour	85	*"The Father of OSCAR" includes film of the Launch*
—	**Antennas for Satellites**	Dr Trevor Bird	WIA NSW	75	Colour	86	*Raw Unedited from 1986 VK2 Seminar*
DATA TRANSMISSION							
—	**Getting Started in Amateur RTTY**	VK5JM	VK5KG	85	Colour	83	*RTTY using Teleprinters and Micro-Computers*
—	**Amateur Packet Radio**	VK5AGR	VK5KG	60	Colour	84	*Theory and Demonstration*
—	**Packet Radio — 10 months on**	VK2KYJ & VK2AAB	WIA NSW	65	Colour	85	*Raw Unedited from 1986 75th Anniversary VK2 Seminar*
**	**X.25 Protocols and Packet Switching**	VK2ZXB	OTC	47	Colour	88	*Lecture given to a group of radio amateurs*
AMATEUR COMPUTERS							
—	**Demonstration of VK5RTVs Micro-Computer Controller #1**	VK5KG	VK5KG	10	Colour	79	*First Micro-Computer Controlled Repeater in Australia*
—	**Understanding Micro-Processors**	VK5PE	VK5KG	60	Colour	80	*A Somewhat Dated Technical Description*
—	**An ATV Ham Shack Micro-Computer**	VK3AHJ	VK3AHJ	10	Colour	81	*Describes now unavailable Micro-Computer Kit*
—	**Getting Started in Amateur Micro-Computers**	VK5IF	VK5KG	33	Colour	83	*Demonstration of Hard and Software for Amateur Radio*
AMATEUR TELEVISION: Technical							
—	**The Signal to Noise Story**	VK3ATY	VK3AHJ	45	Colour	82	*Superseded by "UHF Preamplifiers" (see below)*
—	**UHF Preamplifiers**	VK3ATY	VK3AHJ	45	Colour	83	*Explanation and Demonstration of Low Noise Preamplifiers*
—	**Getting Started in Amateur Television**	VK5KTV	VK5KG	55	Colour	83	*How to Set-Up an Amateur Television Station*
—	**Testing Amateur Television Transmitters**	VK5KG	VK5KG	50	Colour	83	*How to Correctly Measure Amateur Television Systems*
*	**High Definition Television Tutorial**	Don Fink	WB2LLB	60	B&W	88	*A Look at What is to Come in Broadcast Television*
*	**ATV Hamfest, York Pennsylvania, September 1883**	Various	WB2LLB	360	Colour	83	*Various ATV Technical Lectures from USA*
AMATEUR TELEVISION: Activity							
—	**ATV in Australia 1980/81 — Made for British ATV Club**		VK5KG	60	Colour	80	*Clips from ATV Groups in VKs 2, 3, 4, 5, and 7.*
—	**ATV in United Kingdom 1978/81**		G8CJS	30	Colour	81	*Remake of their Previous Effort*
*	**CQ ATV QX International 1983**		WB2LLB	60	Colour	83	*ATV in USA and Europe*
	ATV in Victoria, 1984		VK3AHJ	54	Colour	84	*Courtesy of "The Roadshow Gang"*
‡	**Hello from America! — Made for British ATV Club**		WB0QCD	100	Colour	88	*Clips from ATV Groups in the USA.*
AMATEUR TELEVISION: General Interest							
—	**Low Definition Television**	Chris Long	VK5KG	25	Colour	82	*Recreation of Television as Transmitted by Baird*
—	**Model Aeronautical Mobile ATV**	VK5GO	VK5KG	6	Colour	83	*Amateur Television Camera and Transmitter Mounted in a Model Aeroplane*
—	**VK5RCN — Australia's First Wind Powered ATV Repeater**	VK5KAU	VK5KG	61	Colour	86	*A Tour In and Around VK5RCN*
‡	**Australian TV History — The Untold Story**	Chris Long	VK5KG	56	Colour	88	*Lecture to Radio Amateurs Old Timers Club*
‡	**Australian TV History — Part 2**	Chris Long	VK5KG	49	Colour	88	*Technical slides not used in the above*
MISCELLANEOUS							
—	**An Auxiliary Battery Charger**	VK5NX	VK5KG	30	Colour	81	*Charging a Second Mobile Battery*
—	**Lecture — Winning Fox Hunts**	VK5TV	VK5KG	45	Colour	81	*How to do it from one who has!*
—	**Getting Started in Amateur Construction**	VK5AIM	VK5KG	50	Colour	83	*Mechanical Hints for Novice Constructors*
—	**Communication Consequences of Nuclear War**	Dr John Coulter	VK5ZBD	60	Colour	83	*Why Your Gear May Not Survive, Even If You Do*
—	**The Far Eastern Broadcasting Company**		VK5KG	60	Colour	84	*How a Shortwave Broadcaster Operates*
—	**The Australian "Over the Horizon Radar"**	Dr Paul Whitham	VK5KG	60	Colour	84	*How the 'Australian Woodpecker" Works*
—	**What to Expect When the Radio Inspector Calls**	Geof Carter DOC	VK5KG	34	Colour	84	*Geof is a Department of Communications Field Officer*
—	**Doppler Direction Finding for Fox Hunters**	VK2BYY	WIA NSW	43	Colour	85	*Raw Unedited from 75th Anniversary VK2 Seminar*
**	**Fitting BNC Connectors**		OTC	7	Colour	85	*Correct Assembly of Crimp Type BNC Plugs*
**	**Handling Static Sensitive PCBs**	Paul Tardent	OTC	6	Colour	86	*Improving Reliability of Printed Circuits*
—	**Extra License Grades**	VK2ZTB	WIA NSW	70	Colour	88	*Raw Unedited; from 1986 VK2 Seminar*
‡	**Thick Film Modules**	VK5DI	VK5KG	45	Colour	88	*Description of modules available from VK5WIA.*
‡	**Where should the WIA be Heading?**	WIA Fed Pres	VK5KG	50	Colour	88	*Lecture given by Peter Gamble at VK5 WIA.*

NOTE:
denotes Copyright: no copy service
‡ denotes New Addition
** denotes Optically Converted to PAL from NTSC by WB2LLB — noticeable flicker*
*** denotes available only to Radio Clubs affiliated with the WIA as per agreement with OTC.*
Standard Formats: Beta; Video 8 St & L Play; Dolby and Hi Fi sound — please specify when ordering

ar

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

Those people who have been following the saga of the recalcitrant transceiver can now relax. I have the rig back and it is working well. Dare I mention that, on receipt of the rig, my almost-new RTTY equipment is now semi-defunct!

Keep reading the column for further gripping episodes of the unexpected!

Statistics for August are as follows:

1050 AM intrusions reported (mostly Asian 28 MHz intruders)

151 CW intrusions (the usual USSR and Vietnam nuisances)

272 intruders were using RTTY

206 other were using different modes of emission

31 intruders identified themselves on air.

Many thanks to the following people for helping out:

VK2EYI.

VK4s — ADY, AKX, BG, BHJ, BTW, BXC, IS, KHZ, OD, YD.

VK5s — GZ, TL.

VK6RO.

VK8s — HA, JF.

DOTC has advised me that they are investigating a large carrier which has been sitting on 14.000 for some time. I fear that it comes from within VK, and is being heard S9 in New Zealand. The IARU Region 3 Conference was held in Seoul, Korea, last month, and the Monitoring System (Intruder Watch) was ably represented by Bob Knowles ZL1BAD, the IARU International Monitoring system co-ordinator. We hope that some good came from the conference as far as the IW is concerned.

So, that is about the story for the moment: will see you next month, for the last time! (More about that later). Take care, and 73 for now.

ar

Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7277

CONTEST CALENDAR

NOVEMBER 1988

11 — 13 *Japan International* DX Contest (Rules August issue)
12 — 13 European RTTY Contest
12 — 13 OK DX Contest Phone and CW (Rules September issue)
— 12 ALARA YL/YL Contest
— 13 BATC SSTV/FSTV Contest
26 — 27 CQ WW DX CW Contest

DECEMBER 1988

— 24 Commencement of the WIA Ross Hull Memorial VHF/UHF Contest (Rules this issue)

January 1989

— 7 Conclusion of the WIA Ross Hull Memorial VHF/UHF Contest (Rules this issue)

ALARA

A note from the Australian Ladies Amateur Radio Association should provide an additional incentive to participate in this 1988 contest which is to be held on November 12. To celebrate the Bicentennial, the following conditions will gain for participants a special award certificate:

For VK YLs and OMs — obtain 200 points including 10 ALARA members.
For DX YLs and OMs — obtain 88 points including five Alara members.

RESULTS OF THE 28th (1987) ALL ASIAN DX CONTEST CW SECTION

Australian scores

— Single band entry.

VK4TT	14 MHz	14916 points*
VK4XA	21 MHz	28980 points*
VK2DID	21 MHz	2535 points
VK2AIC	21 MHz	1452 points

— Multiband entry.

VK5AGX	28000 points*
VK2BQQ	26160 points
VK8AV	26105 points
VK5SW	616 points

— New Zealand entry.

ZL1AIH	3.5 MHz	330 points*
ZL1HV	21 MHz	4998 points*

* Denotes Certificate Winner.

The total number of entries for this contest according to JARL was 1129, It is interesting to note that only three entries, *one for more* than two percent duplications, one for multi-classified entry and one for after deadline, have been disqualified.

RESULTS OF THE 28th (1987) ALL ASIAN DX CONTEST PHONE SECTION

Australian and New Zealand Entries

— Single band entry.

VK2XT	21 MHz	49536 points*
VK2PFQ	28 MHz	20 points*
ZL1BWM	21 MHz	15980 points*

— Multiband entry.

VK2APK	52500 points*
ZL1IM	2223 points*

* Denotes Certificate Winner.

In the phone section of the contest, 13 log have been disqualified, eight of these because of missing the deadline. The phone section attracted 794 entries. From the results, it would appear that the CW operators, with 1129 logs, had only two disqualified for operational errors, whereas in the phone section containing 794 entries, some five logs were disqualified.

RESULTS OF WIA 1988 NOVICE CONTEST

There were 35 entries received for this year's contest and the standard of logs presented, apart from one or two, was very good. Unfortunately, six stations had their entries disqualified, in each case because of incorrect reports being logged or duplicate contacts unrecorded. Please take more care next year.

Section A Novice Winner VK5NOD 628 points
Section A AOCP Winner VK3AJU 683 points
Section B Novice Winner VK1NAS 117 points
Section B AOCP Winner VK8AV 77 points

The Keith Howard VK2AKX Trophy will be awarded this year to VK5NOD for the highest aggregate score.

Individual Scores, Section A, Phone

VK3AJU	683	VK3YH	389	VK4KJD	110
VK5NOD	628	VK5GV	68		
ZL3KR	612	VK6NSH	217	VK4AVR	53
VK2NAN	602	VK8AV	203	VK4IS	45
VK5QX	529	VK6APK	202	AX3XB	30
VK3PTB	453	VK1NAS	216	AX3KS	20
VK4NEF	487	VK7NBC	182	ZL1IM	129
VK2LEE	437	VK3CWT	171	VK6NSH	217
VK4MWZ	322	VK3ZI	146		

Individual Scores, Section B, CW

VK1NAS	117	VK2AZR	37
VK6NAZ	79	VK4NEF	36
VK4MWZ	79	AX3KS	14
VK8AV	77	VK5NOD	51

Westlakes ARC station — VK2ATZ 351 points.
Check log — VK4TT.

Entries from six stations did not comply with the rules of the contest, or had their scores reduced by a figure in excess of that allowed for within the contest disqualification criteria as laid down from time to time in *Amateur Radio.*

Additional Certificates for the contest, issued to the highest novice score for each State not covered by a National Winner.

VK1NAS
VK2ATZ
VK2NAN
VK3PTB
VK3AJU
VK4NEF
VK5NOD
VK6NSH
VK8AV
VK7NBC

Insufficient entries from novice stations in the CW section have resulted in no certificates being issued on a call area basis for this contest.

The number of entries received this year was down again, I have a feeling that it is due to the reduced rate of novice newcomers to the hobby, plus the rather poor conditions on 10 metres, and the winning certificates not being issued on a State by State basis could have a bearing on the resultant decline in this contest.

Now for some comments that accompanied the entries.

Thanks for the contest, most enjoyable and very pleased to work the lower power stations, especially the VK6 and P29s . . . ZL1IM.

A most enjoyable contest again this year. Pity that 28 MHz was dead . . . ZL3KR.

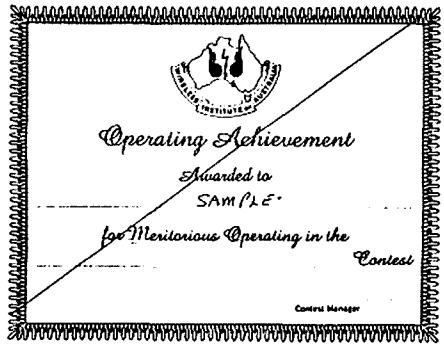
I would expect two metres to be included in the rules for 1989. Perhaps on a one hour between contacts basis like the RD Contest used to be . . . VK4AVR.

Many thanks for the Novice Contest. I enjoyed it although it seemed to be a little dull. Almost all operators were very pleasant and friendly which seemed to help the time pass. CW contacts were a little thin although the standard was excellent. All in all, a good contest. Possible changes — repeat contacts after two hours . . . VK4MWZ.

A very enjoyable contest. Pity 10 metres wasn't open. Next year propagation may be better. See you then . . . VK6APK.

I enjoyed the 1988 VK Novice Contest quite a lot, even though I spent 15 to 20 minutes trying to get my call sign across to VK2, 3, 4, etc. Had a bad antenna — an end fed quarter wave. I hope you enjoyed checking my log and I hope to participate in the contest next year . . . James McBride VK6NFJ, aged 13 years.

Thanks for running the contest which seemed to be fairly well patronised. I did perceive a lack of club stations however. Whilst not joining in the CW section, I also noted a very poor showing by stations in this section . . . Ian VK5QX. Yes Ian, I will be writing to you shortly. FCM.



Sample Participation Certificate.

RULES FOR THE 1988 ROSS HULL MEMORIAL VHF/UHF CONTEST

Objects: Australian amateurs will endeavour to contact as many other amateurs as possible using the contest bands.

Period: From 0001 UTC, December 24, 1988 until 2359 UTC, January 7, 1989 (fourth Saturday of December until first Saturday of January 1989).

Bands: 52, 144 and 432 MHz.

Modes: SSB, CW, FM.

No terrestrial repeaters are to be used for scoring.

No cross-band contacts *unless* via an orbiting satellite.

Satellite contacts permitted if the *uplink* is in the contest band.

Contacts within ones own *Maidenhead Locator Square* will not count.

CONTEST EXCHANGE: Report, serial number and Maidenhead Locator Square cipher. (The serial number will commence with 01 and increase by one for each QSO until 99 is reached, when the number returns to 01 again) each UTC day. Note that only four character level of locator system is used; ie QE38, PH57, RG30, etc.

Score: One point per contact, per band, per UTC day.
Total Score: The total score will equal the number of valid contacts, plus 50 times the number of different locator squares worked, irrespective of bands.
Operator: Single operator only. One transmission only at one time.
Log Sheets: The following details must be shown: Date and Time in UTC, Band used, Mode, Station Worked, Report Sent, Serial Number, Locator Square, Report Received, Serial Number Received, Locator Square Received.
Cover Sheet — Operator's name and call sign, address and a signed statement that the station has been operated within the contest and licence rules and spirit of the contest.
Overseas Stations: Rules similar to those for Australian stations.
Awards — Certificates will be awarded to the highest scoring station in each Maidenhead Locator Field. The locator Fields will also be used to determine the winners outside Australia.
A perpetual trophy is awarded annually for competition between members of the Wireless Institute of Australia. The winners name is engraved on the trophy and the winner also receives a suitable certificate.
The entrant with the highest overall score for the contest will be the winner and their Division will hold the trophy for one year.
Participation Certificates: Indicate on the entry sheet and enclose a SASE (At least 180 x 150 mm) if a participation certificate is required.
Entries: Cover sheet and your total score set out to show the number of points claimed throughout the contest, plus 50 times the number of different locator squares worked. NOTE: For the purpose of this contest a separate log for each band is not necessary.
Post ***your Entry to:*** The Federal Contest Manager, C F Beech VK7BC, 37 Nobelius Drive, Legana, Tas. 7277. Entries must be postmarked no later than February 1, 1989.

For those amateurs who are unfamiliar with the Maidenhead Locator System, the data on how to find the locator square that you operate from may be found in my contest column of November 1987. The NZART Call Book contains more detail and the WIA Divisional Bookshops should stock the *Radio Amateurs World Atlas* containing all 32400 Maidenhead Locator Squares in the world.

It should be noted further that the contest is open to all licenced amateurs whether or not they are members of the WIA.

Last year, I became aware that a number of amateurs thought that this contest was for members of the WIA only. I do not know how this occurred as the rules, as printed, are quite specific.

The Trophy is held by the State Divisional of the WIA irrespective of the allegiance of the owner of the winning call sign, and due to the geographical location of the Maidenhead Locator Fields, it is quite possible that the trophy will reside in a State with a different prefix than that used by the winning entry.

PLEASE DO NOT CONFUSE MAIDENHEAD LOCATOR SQUARES WITH *FIELDS.*

VHF FIELD DAY 1989

A VHF/UHF National Field Day Contest will be arranged for a weekend early in the new year. More details will follow next month when the dates have been finalised, the contest will be held over a 24-hour period. VHF/UHF only with the emphasis on portable field day style operation both single operator and club efforts.

The rules will not be complicated, will embrace the locator square system, and, if the response is satisfactory, could perhaps replace the controversial VHF section of the John Moyle Memorial Field Day Contest.

LETTERS

I have received a number of letters over the past few months complaining about the rule changes that I have made to some contests. The main complaint is that I have reintroduced the requirement for contesting stations to exchange signal reports!

Some of the suggested reasons that I have used are quite colourful, however I will keep my comments to those of a more serious nature. It has been stated that the exchange of a signal report is irrelevant to the contest as all signal reports are either 5 x 9 or 599. Are they? Well, don't be too sure! It has also been stated that the report is basically meaningless in most contests. Perhaps, but it is a numerical exchange that is required by almost all radio contests world-wide and only a very few use another figure such as the operator's age or number of years "on the air".

Another complaint was that I have caused a lot of contesters to modify the sacred computer program that will only accept so many characters per line. This is something that I must admit was not taken into consideration when the decision was taken to reintroduce the requirement. However, as the vast majority of amateurs do not own computers, I think that the programs could be modified by the operators.

Two amateurs who obviously had a good old ragchew before writing to me both state that the Regulatory Authority does not require us to exchange signal reports. This is so, but ever since amateur radio began in the early days, signal reports have been exchanged as a matter of course. It would seem to me that to drop the requirement is to really make the exchange totally meaningless.

Many of the amateurs who enter the WIA sponsored contests also spend a great deal of time and effort in the many and various contests that are held world-wide and I would like to think that they do not complain to the organisers of these overseas events!

"Exchanging signal reports only confuses the issue" was a comment by one amateur. I must apologise for making the contest too difficult, however, please try a little harder next year, you will get used to it!

The multi-station operator rule has been introduced to eliminate a distortion that creeps into the compilation of the results of the Remembrance Day Contest. The results become distorted when the formula, which was introduced by a previous contest manager, included a participation factor. Despite this, one amateur has entered seven logs for the 1988 RD Contest. These seven logs are for four stations operating at two addresses, three different VHF stations and three different HF stations on the air from the same address. Yet, the operator who signed the logs has entered a contest log for another station at a different address some kilometres away. This, you can see, has distorted the participation factor. If the method of determining the winning State is to remain as it is, then the distortions must be removed.

I have also received some flak from the same sources for allowing CW entrants to claim double points for the contacts in the RD Contest. This has been done to try and encourage the use of this mode of transmission for two reasons. One, it requires more skill and should therefore be encouraged. Two, to endeavour to increase the number of participants using this mode.

Most of those who complained about the changes suggested that the contest should be made easier, but if they are too easy, they become worthless and offer no training at all!

The Remembrance Day logs are coming in steadily with 246 received so far (September 1, 1988). All are well presented and all sections, apart from the SWL section, are represented. Please make the effort to join in the Ross Hull Memorial Contest next month, the ZL operators will be looking for you with more interest this year.

HF CONTEST CHAMPIONSHIP — 1987 RESULTS

Having received the results of the 1987 VK/ZL Oceania Contest, I am now able to announce the results of the 1987 HF Contest Championship Competition.

PHONE SECTION

CALL SIGN	JMFD	RD	NOV	VK/ZL	PTS
VK1RJ	0	7	0	10	17
VK1RH	0	1	0	8	9
VK2BQS	0	0	5	1	6
VK3YH	10	9	9	9	37
VK3AJU	9	8	10	0	27
VK4NEF	0	0	9	9	18
VK5QX*	10	10	10	10	40

Insufficient entries. VK6 — VK7 — VK8 — VK9

CW SECTION

Insufficient entries. VK1 — VK2

VK3CQ*	10	10	10	10	40
VK3XB	0	5	2	9	16

Insufficient entries. VK4 — VK5 — VK6 — VK7 — VK8 — VK9

Congratulations and a trophy go to Ian Hunt VK5QX and Gil Griffiths VK3CQ, for the perfect scores, and being the trophy winners for 1987.

IAN VK5QX

Gil VK3CQ.

NATIONAL SPRINTS

The Third National Sprint, jointly sponsored by the Adelaide Hills Amateur Radio Society, and the South Australian Division of the Wireless Institute of Australia, was again enjoyed by VK, P29 and ZL amateurs during July 1988.

The sponsors, in their continuing endeavours to improve this "quickie" contest, have looked at the name "National Sprint" and consider that this does not fully indicate inclusion of P29 and ZL amateur operators, although the rules, as published, invite interaction of P29, ZL and VK operators.

Consequently, to be effective at the next timing of this contest, currently July 1989, the contest will be known as the Australasian Sprint.

In assuming this name, it is felt that amateurs both inside and particularly outside Australia, who have a personal objection to the word National, may sense a bond between the three countries in the New name, and thereby the contest may find wider acceptance in future years.

It is understood that there is a move in VK4 and VK7 to run Sprints of this nature and, while it is flattering to think that the idea, which had its birth at the Adelaide Hills Amateur Radio Society, is held in sufficiently good stead by VK4 and VK7 to instigate their own contests under Sprint conditions, the Adelaide Hills Amateur Radio Society wishes them well, but move to ensure that his Sprint Contest is maintained as the original Australasian Sprint embracing P29, ZL and VK operators.

—Contributed by Gordon Welsh VK5KGS, Secretary, Adelaide Hills Amateur Radio Society Inc

1988 JACK FILES SUNSHINE STATE MEMORIAL CONTEST RESULTS

The WIAQ Contest Manager, Ted Mulholland VK4AEM, reports:

SECTION 1(a) TRANSMITTING ALL BANDS

CALL	PTS	CALL	PTS
VK4VR	1703	VK4NMA	1363
VK4BRG	1235	VK4ACC	738
VK4MWZ	479	VK4NFE	417
VK4QI	380	VK4MAU	345

SECTION 1(b) TRANSMITTING HF ONLY

VK4LT	1442	VK4NLV	1442
VK4AOD	784	VK4FNE	754
VK4IS	510	VK4SF	419
VK4KEL	392	VK4LOW	392
VK4CAG	342	VK4BRZ	262
VK4PJ	251	VK4XX‡	224
VK4RM	217	VK4KB	120
VK4JCS	91		

SECTION 1(c) TRANSMITTING UHF/VHF ONLY

VK4YPB*	651

SECTION 1(d) CLUB STATIONS

VK4RC	1402	VK4WIE	1221
VK4WIS	1105	VK4WIM	1096
VK4WIR	1056	VK4WIX	1015
VK4BPA	982	VK4WIG	904
VK4WIZ	763	VK4WIN	646

SECTION 2 OUTSIDE VK STATIONS

ZL3KR	760	AX3PJB	374
VK7KC	340	AX3XB	294
AX3KS	150	VK3CFI	118

CHECK LOGS

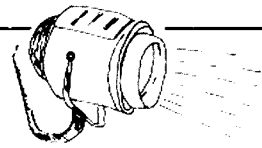
VK4s RX, XW, OD, BAW and ZML/P.

‡ denotes Solar Power.

* As only one entry was received in the VHF/UHF Section, it is recommended no trophy but a Certificate of Commendation be awarded instead.

Congratulations to the winners and participants. NOTE: Where were the VK2 logs? Quite a few points were given to VK2 stations!

—Contributed by John Aarsse VK4QA, VK4 Divisional Secretary



Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Well, conditions on the higher frequencies have made a dramatic improvement during Spring. The 16-metre broadcasting allocation has proved particularly interesting in out late afternoons, with many European signals coming over the Long Path. In fact, it is getting rather crowded down there, as more international broadcasters seek to take advantage of the very improved propagation.

The 13-metre allocation is slowly picking up and I do expect that more stations will take advantage of these frequencies very rapidly. I have also noted that, at least, one broadcaster has made it back to the 11-metre allocation an that is Radio Denmark on 25.655 MHz at 1200 UTC. I do expect that the few broadcasters such as the BBC, Radio France International, VOA and Swiss Radio International, who have been some of the very few to utilise this very high allocation could return very soon.

Recently, important reorganisation of the broadcasting structure of Radio New Zealand was announced. The two networks, National and Commercial, were going to be made into separate entities, with the latter being responsible for their own financing. As well, the external service of Radio New Zealand was going to come under the Ministry of Foreign Affairs, who would fund the service and RNZ are likely to produce programming under contract to the MFA. The antique 7.5 kW senders will be retired and a more realistic sender acquired along with a new transmitting site, possibly on the east coast of the North Island. Target date for commencement of the new service is the middle of next year.

Recent speculation that the VOA was going to decommission the Bethany, Ohio site, has been refuted by a VOA executive. There are no plans to take the site out of service, despite the closure of the AFRTS Network on shortwave at the end of September. It will continue with VOA and probably BBC programming into Latin America. Also, there has been no word yet when Radio Australia's Pacific Island service from near Townsville is to commence. I've heard of a mid-October date but time will tell. RA is going to use three 10 kW senders formerly located at Lyndhurst, Victoria.

And, while Lyndhurst is on my mind, many of us well remember VNG, the standard frequency and time station operated by Telecom, which abruptly went QRT on September 30, 1987. A private consortium of VNG users was formed late last year to reactivate VNG. They were indeed fortunate in obtaining the three 10 kW senders that were formerly at Lyndhurst and also a site was found at Llandino, New South Wales, which has been used as the main aviation HF transmitting site for many years. In early August, VNG came back briefly on the air on 4.500 MHz for test transmissions. Unfortunately, the senders had to be shut down as they were causing severe interference to other HF spectrum users, particularly around Sydney and Tasmania. It apparently was an antenna mismatch and the feedline has to be altered to the HF dipoles at Llandino, as well as the senders checked for spurious emissions before VNG will again be heard on 4.5, 7.5 and 12 MHz.

Another new station has appeared on 9.765 MHz at 0600 UTC with the call sign of the *Voice of the Mediterranean!*

It is located in Malta and is a joint operation of the Maltese and the Libyans. From 0600 to 0700 UTC it is English and the last hour is in Arabic. Signals here in Launceston are quite clear. They are apparently using the Cyclops site that has carried DW programming for many years. A MW channel is announced as broadcasting simultaneously. The station also is on from 1400 to 1600 UTC on 11.925 MHz. The address given is PO Box 143, Valetta, Malta. This used to be the address of English transmissions of the Voice of Libya.

For those interested, there are some amateur nets with SWL and DX updates, where information and loggings are exchanged. There is a weekly sched at 0600 UTC on 7.110 MHz, +/- QRM on Tuesdays. Also, on the second Saturday of the month, DXers in New South Wales are linked up also on 7.110 MHz at 0500 UTC.

That is all for this month. Until December, the very best of DXing and good listening! —Robin VK7RH.

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MORSEWORD 21

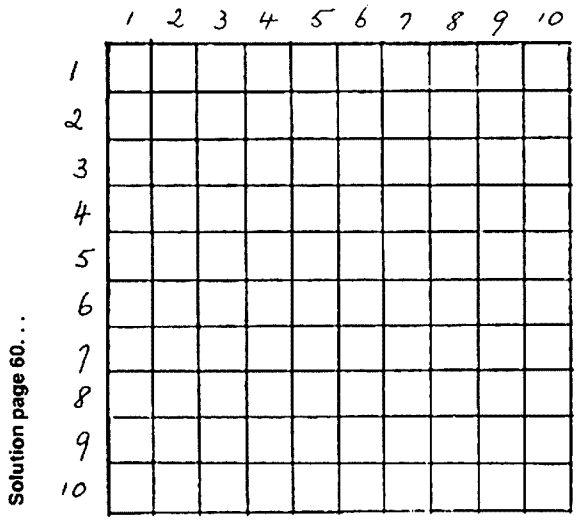
Audrey Ryan
30 Starling Street, Montmorency, Vic. 3094

ACROSS

1. Sign of infection
2. Beginning
3. Lease
4. Howl
5. Used with a hammer
6. Expression of disgust
7. Fat cat's initials!
8. Brand of petrol
9. Hurries
10. Consumer

DOWN

1. Part of a church
2. Mode of address
3. A blast
4. Sheep
5. Layers
6. Contends
7. Ocean movements
8. Egg on
9. Performance
10. Very dry



Solution page 60. . .

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

ALARA CONTEST

The ALARA Contest will be held on Saturday, November 12, from 0001 to 2359 UTC, this year.

As well as the usual certificates, special Bicentennial certificates may be gained as set out in last months *Amateur Radio*, and the Florence McKenzie Trophy will once more be awarded to the novice YL (not necessarily an ALARA member) who gains the highest CW score. (Minimum score — 50 points).

As usual, we are hoping for good participation on the part of the OMs, and this is a golden opportunity to gain points for the attractive ALARA Award (this year with Bicentennial Sticker), the Mavis Stafford Trophy, or any of the YL awards available in 1988.

With improved propagation we are hoping some of our DX members may be on air during the contest, and look forward to catching up with them.

Let us see if we can make this contest the most successful yet!

Logs should be posted to: The Contest Manager, Marlene Perry VK3JAW, 218 Ninth Street, Mildura, Vic. 3500, no later than December 31, 1988.

AWARD UPDATE

No 74 — 3.6.88 — Marilyn Syme VK3DMS,
1 endorsement sticker
1 Bicentennial sticker

The Bicentennial stickers will only be available until the end of December, so don't delay much longer, get your application in to: The Awards Custodian, 16 Byron Street, Box Hill South, Vic. 3128. Remember, the only contacts not counted for the award are those made on the *Official ALARA 80 metre Net* on Monday evenings. Contacts made on any other net, contest, etc, will be counted.

Cost of the award is $3 or seven IRCs.

Endorsement stickers are issued for 10 additional ALARA members, (including DX members), cost $1.

VI88WIA

ALARA will be using the Bicentennial call sign, VI88WIA, once again from October 31 to November 13. It will be used during the ALARA Contest.

QSL via the VK5 Bureau.

Marlene Brown VK3FML.

VK3 BROADCAST

On Sunday, September 4, the WIA VK3 Divisional Broadcast was handled by four ALARA members, Mavis VK3KS, Mavis VK3BIR, Marlene VK3FML, and Cathy VK3XBA. From all accounts the whole thing was very professionally handled. Congratulations to the ladies concerned.

The VK3 ALARA Birthday Luncheon was held on July 31, 1988. From left: Jessie VK3VAN, Gwen VK3DYL, Bron VK3DYF, Raedie, Phil VK3PYL, Marlene VK3FML, Bonnie VK3PBL and Margaret VK3CWA.

Christine Taylor VK5KTY, using the VI88WIA call sign during July 1988.

YLRL 50TH ANNIVERSARY AWARD

The Young Ladies Radio League would like to invite readers to join in the celebration of their 50th Anniversary in 1989. They are offering a special award in recognition of the event.

The YLRL 50th Anniversary Award is available to any licensed amateur world-wide.

Two-way communications must be established on the amateur radio bands with 50 YLRL members during the calendar year 1989. Any and all amateur radio bands may be used. Cross-band, repeater or net contacts ***do not*** count.

Applications must be received no later than December 31, 1990, and should include a list of contacts, including date, call sign, time, RS/T, band and mode. Please indicate and sign your log that you have operated consistent with the rules of the award and your license privileges. Include your name, call sign and mailing address. Applications should be accompanied by US$4 in the form of an International Money Order or five IRCs. Any proceeds over and above the cost of printing and distributing the certificates (should there be any) will be transferred to the YLRL Scholarship Fund.

Decisions of the Certificate Custodian regarding interpretations of these rules as here stated or later amended shall be final. All inquiries regarding applications or the certificate should be addressed to the Custodian: Joan M Gibson KG1F, RR1, Box 1465, Waterbury, VT 05676, USA.

—Compiled from *YL Harmonics*, July/August, 1988

BITS AND PIECES

Congratulations to Mavis VK3KS, who won the gold cup in the CW and SSB sections of the 1988 DX-YL to NA-YL Contest as DX winner. The North American YLs who won gold cups were Shirley WD8MEV (SSB) and Elizabeth VE7YL (CW), both ALARA members.

Congratulations also to Marlene VK3FML, who managed to pass all the examinations, NAOCP, Regulations, AOCP and CW in the one day. A great effort.

Also on the list for congratulations are Noela VK4ANJ (ex-VK4KCU) and Joanne VK4CYL (ex-VK4LCD). Good to hear you have upgraded.

NEW MEMBERS

New members for ALARA are Maggie VK3CFI and Mary ZS5V. A very warm welcome to you both.

Until next month, 73/33. Joy VK2EBX.

ar

HELP WANTED

A notice was placed in August 1988 issue of AR asking for the assistance of amateurs who would be prepared to peruse several of the foreign language amateur radio magazines we receive in the Federal Office, with a view to keeping us informed of events and interesting technical articles.

The response was gratifying, and I thank all those amateurs who wrote to the Federal Office.

Only one language was not covered, Italian!

We regularly receive the Italian amateur radio magazine, *Radio Rivista* and it looks to be a most interesting magazine.

Is there an Italian literate amateur who would like to be sent this magazine each month, in return for keeping us informed of any news items and technical articles that would be of interest to Australian amateurs?

If so, please write to: Foreign Publications, WIA Federal Office, PO Box 300, Caulfield South, Vic. 3162.

ar

SWEDISH STUDENT IN GEELONG

A year in Australia as an exchange student for 17-year old Christian Viebke, has seen him make many friends, particularly through the hobby of amateur radio.

Christian comes from Sodra-Sandby in the southern province of Skane, Sweden, and is proud to a member of the Geelong Amateur Radio Club in Victoria, Australia.

He is in Australia as a "Youth for Understanding" (YFU) exchange student attending Geelong High School and has spent the year living at Leopold, a suburb of Geelong on Corio Bay. A keen interest in amateur radio and shortwave listening brought him into contact with the Geelong Amateur Radio Club.

Among his many friends at GARC is Russell Walker VK3CM, who has helped Christian operate on the DX bands, including working several Swedish stations.

High on his priorities list upon his return to Sweden is to obtain an amateur radio station licence so he may keep in touch with his GARC and Australian friends.

At the conclusion of his schooling, Christian hopes to be accepted into the Swedish Navy for training as a radio operator.

He is also a keen medium wave listener and has been busy sending comprehensive reports to Australian stations which he has heard on a borrowed FRG-7. One of these reception reports found its way to the desk of Bob Girdo VK2RG, Chief Engineer of Radio 2UW, Sydney. Bob happens to be an Area Co-ordinator with YFU and invited Christian to visit Sydney for a few days.

During the visit in late-August, Christian received a specially engraved Morse key as a memento of his visit.

When asked about his Australian exchange experience, Christian indicated he felt that amateur radio and the YFU scheme has common aims, both promoting international friendship and understanding.

Christian is one of 432 YFU exchange students from 16 countries in Australia for a year.

Apart from Geelong and Sydney, he has travelled to the Alice Springs outback and the rugged south-coast of Victoria.

He returns to Sweden in December.

ar

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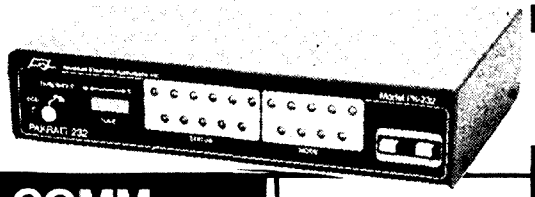
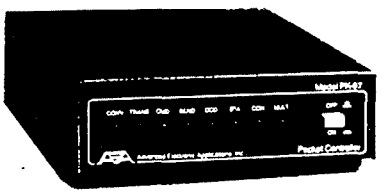


PRICE $649 WITH FAX



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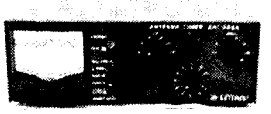

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- KR 2000 in stock
- KR 500 in stock
- KR 5400 in stock
- KR 050 stay bearing
- KR 065 stay bearing
- DIAWA MR 750 due Sept
- DIAWA MR 7504 motor in stock

8 core Rotator Cable in stock

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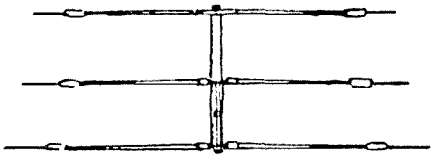
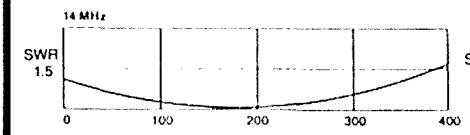
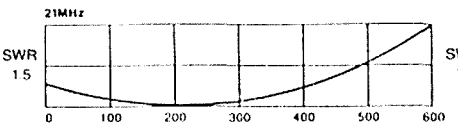
The late Dr. MAC TANIGUCHI of TET, Japan improved his already famous "Phase-feed" matching system based on the "HB9CV" concept. This new matching system provides an increses in gain, roughly comparable to adding another element to the antenna, while significantly improving the front to back ratio. The performance exceeds even conventional YAGI-UDA design *and these new TET-EMTRON multiband beams exhibit extremely flat VSWR over a wide frequency range.*

Our new antenna factory "TET-EMTRON" a division of EMONA ELECTRONICS is now producing a range of antennas aiming specially at the export markets of Japan, U.S.A. and Europe.



SPECIFICATIONS:	HB33DX	HB43DX
Frequency	14/21/28 MHz	14/21/28
No of Elements	3/3/3	4/4/4
Gain (dBd)	8.5/8.7/8.3	9.4/9.5/9.8
F/B Ratio (dB)	22/24/21.5	24/24.7/22
VSWR	1.5 or better	1.5 or better
Power Rating	2 kW	2 kW
Impedance (ohm)	50	50
Element Length (metre)	8.25m	8.25m
Boom Length (metre)	4.0m	6.0m
Turning Radius (metre)	4.54m	5.1m
Wind Surface Area (m^2)	0.58m^2	0.74m^2
Wind Load (EIA STD 80 MPH)	56.7 kg	72.7 kg
Weight (kg)	15 kg	19.2 kg
Price	$480	$580





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Vic. 3000
Entrance from Lt. Lonsdale St.
Ph: (03) 67 8551 or 670 0330
FAX: (03) 670 0671

QUEENSLAND:
416 Logan Road, Stones Corner
Qld. 4120
Ph: (07) 394 2555
FAX: (07) 394 4316

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

During a recent discussion at a club meeting, the suggestion was made that amateur radio is something of a "secret society". Although we talk radio extensively and endlessly within our known groups — clubs, on air, at conventions — we do not bring our hobby into the conversation at the work place or in our social activities.

I wonder how true this is for the majority of amateurs. Was this a representative group? I have taken the idea a little further since then, and have, from a limited sample, had more encouragement than disagreement.

The further point has been made that listing amateur radio as a hobby or interest in a job application could actually disadvantage the applicant, as it has overtones of fanaticism, and arouses suspicions of instability!

I would be very interested to hear members' opinions on these suggestions, and in particular, if anyone has actual experience of discrimination on the basis of being an amateur.

There are two points here:

1. Are we ashamed of our hobby, or unwilling to share it, if we do not discuss it outside the known circle?

2. What is the 'average' employer's view of amateur operators?

On point 1, we are quite happy to advertise our amateur activities to the neighbours and passers-by when we erect towers and antennas, yet we hesitate to bring radio into the conversation in a non-amateur group. Perhaps we feel that our audience will not understand technical terms, and will think of us as 'mad CBers'.

On point 2, if the employers generally hold a poor opinion of amateurs, perhaps we should be doing something about our 'image'.

By now you have no doubt guessed that this article is back on the old track of *how do we recruit new operators into the hobby?*

It is becoming apparent that we have an 'image' problem, and that the average non-amateur has a rather distorted view of our interests and activities. We tend to be blamed for any or all the TVI and BCI, or at least the towers are blamed.

The publicity we get is more often unfavourable than favourable, due frequently to the medias inability to distinguish between us and the aforesaid CBers.

Please do not conclude that I am anti-CB in general. I am not, and I make the point that many of the amateurs who are now giving selfless service to the hobby and the Institute first became interested in radio through CB.

But, CB probably still has a worse 'image' than the amateur service, so if the public cannot tell us apart we all go down together.

We should put in a good word for the CBers when we can, as enlightened self-interest, at least.

Two approaches have been suggested, (there are others also). We may be able to educate the public about our activities if we take whatever opportunities offered to explain to non-amateurs what we do and what we achieve, and to publicise better the community services and international goodwill we provide. It is, after all, the only hobby where private individuals of different nations can communicate directly with one another.

The other approach is to welcome and encourage more CB operators to join our ranks. One of our number has undertaken to tour his area and drop a leaflet into each letter box where an antenna is in evidence. The leaflet will invite the operator to the nearest club meeting, and explain the increased privileges acquired on gaining an amateur licence.

If any readers would like to carry our a similar exercise, let me know and I will arrange a supply of leaflets.

My best wishes to those sitting for the November examinations. May you all get nice new licences for Christmas.

Have you thought about giving a friend a WIA membership for Christmas? Why not do so?

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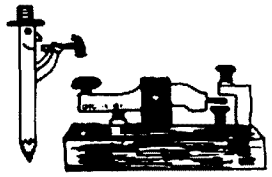

Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright. Vic. 3741

A belated thanks to all who have written to me over the last few months. It is sometimes difficult for me when I realise that it will be six weeks or so until you read this, when I would like to thank correspondents a little sooner. Some of the letters ask for information and some send it. Thanks Graeme VK6GZ for the regulations. And I hope Marlene VK3FML, has her new Bencher paddle by now. Don't let Jim have it Marlene! I hope Phil VK3CDU keeps in touch too.

Going back through my log I see only a few dozen contacts (apart from contests) these past months. I managed to work Gary ZL1AN, who writes the "Morseman" column for *Break In*. But I haven't had time to fire up the QRP unit at work.

In the RD contest this year, I made 168 contacts of which only one was a novice (VK7NRV) and he was my second last contact. Where are all the novice operators? Other amateurs in the contest mentioned the dearth of novices, so what is the matter? Is it our fault for going too fast? Or just for not passing on our enthusiasm?

Novice candidates are required to pass a simple examination in Morse code at five words per minute. As many a full call holder knows, even a pass at 10 words per minute is not much good when attempting one's first on-air contacts. Do you remember?

Okay Morslacs, what are we going to do about it? Better still, what are you personally going to do . . . to help both novices and AOCP phone operators find out how much fun and interest they can get from Morse, without the expense involved in experiments with packet, moonbounce, and other exotic modes. Are you guilty of saying to yourself, "It's only the Novice Contest, I won't waste my time" or " I can't be bothered slowing down to 10 words per minute"? Do you despair at poor Morse and only work stations that are easy to copy? Rather than give them a go and maybe point out to them that they need to improve their (say) spacing.

I realise that there are a few Morsiacs out there who are busily conducting teaching and practice sessions on most nights of the week and good on them. But what about the other couple of hundred regular Morse enthusiasts, it is to you that I am pointing, do you acknowledge any of the above? You have discovered the joys of the mode and were probably helped in some way, so are you going to help others in turn?

"So what can I do" you say.

And I say, here are some ideas. Some I have used and many I just don't have time for, even though I could make time for some if I really wanted.

1. Write a monthly column in a magazine.
   (But not Pounding Brass . . . unless you want to try and take over from me!).
2. Do something on-air.
   a) Give lessons.
   b) Criticise.
   c) Enter the Novice Contest next time.
   d) Work a Novice a day — or a week.
   e) Be nice (and understanding) when you do.
3. Take your keyer and paddle, or key and oscillator, to the next convention or field day and put it on display for people to play with.
4. Mount your key collection on a display board and take that. You might even sell it! But at least you will have many people to talk to about it.
5. Put all your awards (for Morse, of course) on a board and display it at a meeting or a convention — or even at the local school.
6. Give a talk at your local:
   a) Service club.
   b) School.
   c) Scouts and/or Guides.
   d) Church group.
7. If you discover a circuit or modification or kit that you have put some time and effort into to improve your shack, publish it in AR. Even if it doesn't work or you make a mistake, it will generate plenty of interest. And you may get some advise on more improvements. (You may even win one of the AR awards!).
8. If you see a new piece of Morse related equipment here or overseas, write up the details and send it to AR so that others can find out about it. Or tell me and I will follow it up, as I love playing with new equipment.
9. Organise a CW-only award through your local club. It seems to me that many awards cater to the SSBers only.
10. Make cassette tapes of Morse code at different speeds and run a competition at your next convention. (A great way to meet all the Morsiacs at a convention). Maybe you could run a test for *accuracy* at five or 10 words per minute for novices and K-calls, ie not a speed event.
11. Organise an on-air net where the people sending are taped by you and the next night (or week) you send their Morse back to them to see if they can read it. Then have a discussion to see where they made mistakes and how to correct them.

NOTE: I have a recorder permanently connected to my rig, it comes in handy for intruder watch reports.

12. Build a torch with a Morse key for a switch and have fun making contacts by eyeball at night. (Is this ultra-SHF?).

    Build a circuit that buzzes when lit from the light from the torch above, and use it until you can read the code visually. If the children see you playing with this sort of equipment you will have to fight them off!
13. How about a "Critical Net" where members rubbish each others sending, hopefully to everyone's benefit. QLF? would be sure to get a lot of use in a net like that.
14. Apply to be an "Official Examiner" of Morse code.
15. Connect a Morse key to your car horn. Great for visiting amateurs.
16. See how many different keys or keyers you can connect to your rig at once and have them all working. Great for sorting out a poorly set-up shack as the RF gets into the connecting leads and eventually locks the transmitter on.
17. Organise a swap night of keyers or keys to find out if your key is as good as you think, and whether another type suits you better.

Whew!

As you can see I have more ideas than I have time to try them.

I usually take a few boxes of junk (goodies to you) to conventions to sell or swap and it is no trouble to set up a keyer and paddle on the table for people to play with, it is a good talking-point too! And yes folks, I too usually end up taking more junk home that I brought with me! This year I hope to set up my QRP station as a display, so see you there.

Giving a talk at Rotary or Apex club dinners can be lots of fun. After a few times, the stage-fright wears off. Guaranteed.

Taping Morse from your rig is easy, especially if you can pick up an old recorder at the tip for free. Many circuits have been published from time to time to convert the audio to drive a relay to key your rig and the simplest is a step-up transformer and rectifier driving a relay direct. That way you don't need a power supply. You can tape Intruders and send the tape to your intruder watch co-ordinator. Or slow down the speed enough to copy yourself.

As the *Handbook for Operators of Radio Stations in the Amateur Service* states:

"Ability to send correctly, and to receive correctly by ear, in Morse code, a message in plain language (English) — including figures — at a speed of 10 words per minute . . ."

It is plain that this rule is not going to be enforced as most of the amateurs in Australia wouldn't have a chance of passing a re-test even if they owned a key! It is therefore up to us alone, to keep Morse code alive. Even if it means going well out of our way in demonstrating how much fun the mode can be, and helping to show how easy it really is after the admitted initial difficulties of learning to use the new language on-air. All amateurs have to learn the language so it seems a pity to waste that learning in the belief that the mode is difficult to master. Clubs such as the CW Operators QRP Club would benefit if they had a list of newly licensed amateurs to send literature to in the hope of attracting them to Morse code.

On closing for this month, I will mention that if you need a circuit for a tape to rig interface, drop me a line (with a stamped addressed envelope please if you want a reply) and I will be glad to help. I will not be ordering any more Curtis 8044 chips and those who asked should have theirs by now. It is just too easy to order directly from overseas and I did not get the quantity orders to make it worthwhile, ie buy bulk. I hope to have a report on a locally designed keyer with memory in the near future, just as soon as I build it, if not sooner. So keep your ears on!

I am still waiting for details of an 80 metre receiver kit from Dick Smiths so I hope to be able to report on that also early in the new year.

73 Gil.

"I gotta keep an eye on him all the time or he's down at the radio shop spending money."

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

CASE NO 1 — THE VE3SR CASE

Reprinted from *QST* March 1988

Comment:

What we may learn from this case.

1. The Government makes the laws.
2. The judges can only interpret existing laws, if they think there is a law which fits the assumed crime.
3. Inadequate outdated laws may result in unfair verdicts.
4. It would be desirable if cases which require expertise in an area not usually taught at law-school could be left to radio inspectors and their departments to decide who is actually responsible and who should do what to resolve the problem.
5. It is regrettable that the defendant may have to be very rich to afford legal representation in order to get a fair trial.
6. It is well-known that, in the majority of EMC collision cases, design deficiency of the affected equipment causes the problem. In countries with no legally binding EMC standards the judges do not seem to be properly equipped "to fit the punishment to the crime". The result can be, that one Government department checks the legality of a transmitter operation, whilst another government agency calls the transmission a "punishable nuisance". The defendant (innocent in countries with logically and technically correct EMC standards) is driven bankrupt, unless legal or financial aid comes to the rescue.
7. This very unsatisfactory situation explains why the manufacturers of the affected equipment were apparently not involved in the legal process. They would be the best equipped to improve their products, saving all concerned much frustration and money.

THE JACK RAVENSCROFT DECISION

Reprinted from *QST* March 1988

The appeal in the Jack Ravenscroft case has been partly successful. For those unfamiliar with the case, Jack VE3SR, an Ottawa-area amateur, was taken off the air and ordered to pay costs and damages to a neighbour who had complained that Jack's amateur radio transmissions had interfered with the operation of electrical and electronic equipment in her home. That decision was reviewed by three justices of the Ontario Court of Appeals in Toronto on January 28-29. Here is their judgment:

1. The injunction banning Jack from transmitting is lifted and Jack may return to the air.
2. However, within 90 days, Jack must arrange for modifications to his neighbour's equipment, modifications that will suppress interference resulting from his transmissions, *to a standard approved by DOC.* Failing this, upon application to a district court judge, the injunction is reinstated.
3. If Jack's neighbour refuses to allow such modifications, the injunction is lifted permanently.
4. The award to Jack's neighbour is increased from $2500 to $5000. The increase is to compensate Jack's neighbour for inconveniences she will suffer while her equipment is being modified. Jack continues to be responsible for approximately 60 percent of the costs incurred by his neighbour prior to the original trial. No additional costs are awarded, either to Jack or to his neighbour. This basically leaves Jack and his neighbour responsible for their own costs.

It is probably dangerous to speculate on what this judgment means for the Canadian amateur radio community. However, the judgment seems to imply that:

1. Solving an amateur radio interference problem is a responsibility that must be shared by both the radio amateur and those experiencing interference. The amateur must be prepared to arrange for modifications to susceptible equipment, modifications that will suppress the interference. Those experiencing the interference must be prepared to accept these modifications. If they refuse, the amateur may continue operating.
2. DOC must become involved in these matters, even if the interference is to non-radio equipment. In fact, they must become an arbitrator and determine when the amateur has done all that can be reasonably expected and when those experiencing the interference must take responsibility for the susceptible nature of their equipment.

The appeal was condycted by a team of lawyers from the Toronto firm of Borden and Elliot. Each lawyer worked in his own area of expertise: constitutional law, law of nuisance or the principle of statutory authority. Those who attended the appeal found the lawyers well prepared and persuasive. They agreed that Jack probably had the best representation possible.

At press time, the judgment appeared to be acceptable, both to Jack and Jack's neighbour.

CASE NO 2 — JUSTICE FREE OF CHARGE!

This reporter is grateful to Wilfried Hercher DL8MX, (Hochstadt/Main) for permission to publish his 14th EMC collision case:

A neighbour complained about television interference. His latest television set, VCR use and satellite television reception was affected, all channels were gone, even when DL8MX was only transmitting with 100 watts output. The neighbour was advised to obtain a complaint form from the post office (standard practice in West Germany), fill in all details describing his installation (antenna) and all equipment details (manufacturer, model, serial number, date of purchase, address of dealer, etc) and send this to the local radio inspector (post office). The radio inspector will only attend to a complaint after all relevant questions have been answered like: Which FTZ-EMC approval number does the equipment carry?

Soon after, two radio inspectors arrived. One went to the neighbour with a FTZ approved and tested television set (immunity rating of 3 V/m field strength) connecting this receiver to the complainant's television antenna (which had to be installed above the roof and use a coaxial feeder, otherwise the inspectors would not come!). The other radio Inspectors went to the shack of DL8MX. Both inspectors maintained contact via hand-held transceivers. All receiver operation combinations, like television channels, VCR, Hi Fi receiver, and satellite television was tried. There was now not a single case of reception disturbance, as long as the correctly designed television set was used.

This demonstration convinced the neighbour that only his new television receiver was to be blamed for the disturbance, not the transmitter operation of the radio amateur. DL8MX could even run 800 to 900 watts of power on any shortwave band with his beam and the television antenna only 10 metres apart and pointing at each other. The radio inspectors wrote a detailed report, giving a copy to the neighbour, and another to the dealer, who would also inform the manufacturer.

A few days later the television set was exchanged for a model which had honestly earned the FTZ-EMC approval number. This solved another EMC collision case without cost to the neighbour and the innocent radio amateur. This was achieved without frustration, long delay and high cost of a legal process with technically ill-equipped legal representatives. The radio inspectors stated that more customers should complain to force all manufacturers "to do the right thing", as others did years ago economically.

Who says it can't be done?

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WICEN News

A short time ago I received a copy of the recently compiled WICEN Victorian Region Co-ordinator's Manual. Leigh Baker VK3CDP, the Victorian Co-ordinator and his colleagues, are to be congratulated for such a fine document. In addition to the routine, yet necessary, registration forms and administrative records, Leigh includes very useful sections on the State DISPLAN, compensation procedures for volunteers under the Victorian Emergency Management Act, and some very helpful briefs for specific operating sites.

These last named are set out as installation reports *showing where* WICEN is to set up at, for example SES Headquarters or Red Cross, what equipment is permanently installed, how access is obtained and the observed repeater coverage from each site. Indeed, they provide very useful instructions for a WICEN team to go to one of the specified sites and set up with minimal confusion and maximum efficiency.

It certainly beats often vague verbal briefs on "how we did it last time (and got it wrong!)" from an old hand.

Leigh notes the manual is available on floppy disc, IBM formatted in Wordstar 3.3. Any WICEN group interested in obtaining a copy should contact leigh at the Victorian Divisional address or Victorian WICEN at, PO Box 106, Mitcham, Vic. 3132.

Well done Leigh, and VK3.

—Contributed by Bill Roper VK3ARZ

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AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

SATELLITE ACTIVITY FOR JULY/AUGUST 1988

1. LAUNCHES

The following launching announcements have been received:

INT'L NO 1988	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INC deg
056A	Okean 1	Jul 05	USSR	97.8	680	651	82.5
057A	Cosmos 1957	Jul 07	USSR	88.7	256	194	82.6
058A	Phobos 1	Jul 07	USSR	See		note	
059A	Phobos 2	Jul 12	USSR	See		note	
060A	Cosmos 1958	Jul 14	USSR	92.4	417	375	65.8
061A	Progress 37	Jul 18	USSR	88.8	273	194	51.6
062A	Cosmos 1959	Jul 18	USSR	104.6	1019	975	83.0
063A	INSAT 1C	Jul 21	India	1445.7	35989	35959	0.2
063A	ECS 5	Jul 21	Europe	1429.1	35883	35418	0.1
064A	Meteor 3-2	Jul 26	USSR	109.4	1221	1198	82.5
065A	Cosmos 1960	Jul 28	USSR	94.5	518	475	65.9
066A	Cosmos 1961	Aug 01	USSR	24h23m	36312		1.4
067A	PRC 23	Aug 05	China	89.5	296	204	63.0
068A	Cosmos 1962	Aug 08	USSR	89.4	297	215	70.0
069A	Molniya 1-73	Aug 12	USSR	12h18m	40754	617	62.9
070A	Cosmos 1963	Aug 16	USSR	89.8	376	181	64.8
071A	Gorizont 16	Aug 18	USSR	23h55m	35772		1.3
072A	Cosmos 1964	Aug 24	USSR	89.4	297	216	70.0
073A	Cosmos 1965	Aug 23	USSR	88.7	265	195	82.3

2. RETURNS

During the period 115 objects decayed including the following satellites:

1974-102A	Molniya 2-11	Jul 07
1985-089A	Cosmos 1688	Jul 02
1988-037A	Cosmos 1942	Jul 04
1988-049A	Cosmos 1952	Jun 25
1988-055A	Cosmos 1956	Jul 07
1988-054A	Cosmos 1955	Aug 20
1988-061A	Progress 37	Aug 12
1988-067A	PRC 23	Aug 13
1988-068A	Cosmos 1962	Aug 22

3. NOTES

1988-058A Phobos 1:
1988-059A Phobos 2:

These two spacecraft will probe Mars and its moon, the Sun and interplanatery space.

The on-board equipment has been developed by scientists of 13 countries and the European Space Agency. The main task is to obtain a chart of temperatures of the martian surface; to study the daily and seasonal dynamics of its thermal regime; the measurement of thermal inertia of martian soil; the quest for the areas of heat emission and perma frost zones and mineralogical composition of the martian surface.

1988-061A Progress 37:

The spacecraft docked with space station MIR on July 20, 1988.

1988-062A INSAT 1C:
1988-063B ECS 5:

These spacecraft were launched from Kourou, French Guiana by the European Space Agency.

1988-067A PRC 23

This retrievable satellite with experiemtal devices from the Federal Republic of Germany on board, conducted scientific exploration and technological experiments and then returned to earth after eight days in orbit.

—Contributed by Bob Arnold VK3ZBB

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DEADLINE FOR JANUARY IS NOVEMBER 7, 1988

QSLs from the WIA Collection

Ken Matchett VK3TL
776 Warburton Highway, Seville, Vic. 3139

The QSLs this month are from a King, a Prime-Minister and a US Senator. The fact that such eminent persons prefer to use their first names rather than their titles, emphasises the friendship that extends throughout the world of amateur radio.

JY1

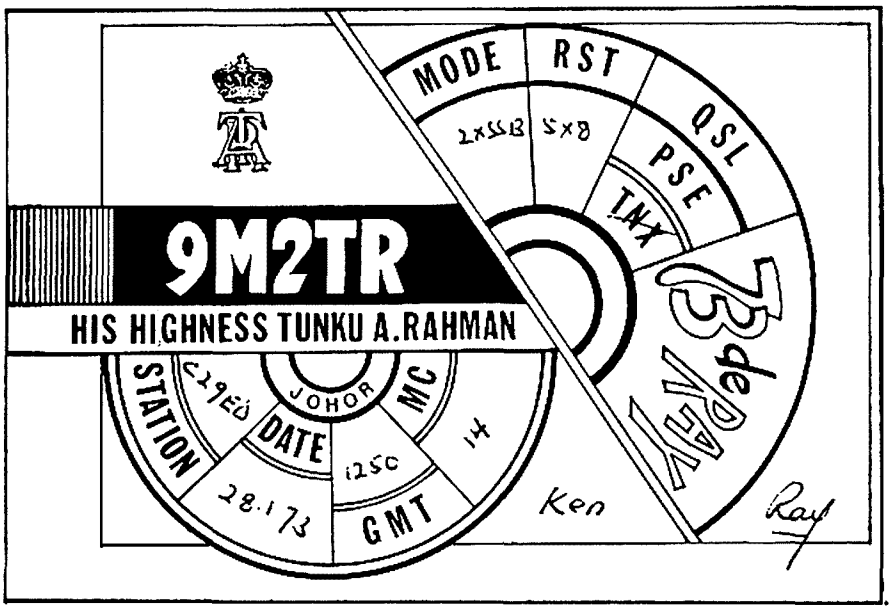
This QSL from Jordan must be one of the few (possibly the only modern one) that lacks letters in its suffix. Normally, of course, an allocated call sign has one or two letters following the numeral — this one has none. It is the QSL of the King of Jordan, Hussein ibn Talal. Born on November 14, 1935 in Amman, he has been ruler since 1953 when he was crowned as a 17-year-old. Throughout his reign he has augmented the military establishment effectively asserting royal authority over that of Parliament. In 1979, Hussein's Government abandoned its traditionally pro-western orientation in favour of non-alignment. (The country was first under British mandate, but became independent in March 1946). The QSL is signed simply "Hussein I".

The reverse side of the QSL shows an outline of the country. However, the territory to the north-west of the map has been occupied by Israeli forces since the six-day war of 1967.

The date of the QSO is shown as November 1970, two months after the start of a Jordanian army offensive against Palestinian refugees who had fled the West Bank and occupied the East Bank (of the Jordan River).

In the centre of the outline map are the Royal Arms, a crown on top of a shield in the centre of which is an eagle. These symbols were the emblems of Saladin, the great Sultan of Egypt and Syria whose military successes led to the third Crusade in the 12th Century.

Several members of the royal household are radio amateurs including Hussein's wife.



9M2TR

His Highness, Tunku Abdul Rahman, was born on February 8, 1903. After studies in England, he returned to what was then known as Malaya, and entered the Kedah Civil Service.

He led a mission to London in January 1956 for the purpose of negotiating independence for his country. This mission secured immediate internal self-government and the pledge of independence by August 1957. Popular sentiment for independence had swelled during and after World War II, which led to the Federation of Malaya established from the British-ruled territories of peninsula Malaya in 1948.

The colonies of Singapore, Sarawak and Sabah joined this Federation on September 16, 1963 to form Malaysia. (Singapore withdrew in August 1965).

The Tunku (the word means Prince) became the first Prime-Minister of independent Malaya (1957-63) and then of Malaysia from 1963-70, when he stepped down from this position, handing over to Tun Abdul Razak.

The QSL shows the Royal Crown over the initials of His Highness. The QSL acknowledged a QSO between His Highness and the writer (when active from Nauru as C29ED), the former signing with an informal "Ray".

Malaya became a deleted country on the ARRL DXCC Country List after September 16, 1963 when Malaysia was formed, being replaced by territories making up the new Federation of Malaysia.

AMATEUR RADIO STATION JY1

CONFIRMS CONTACT WITH:

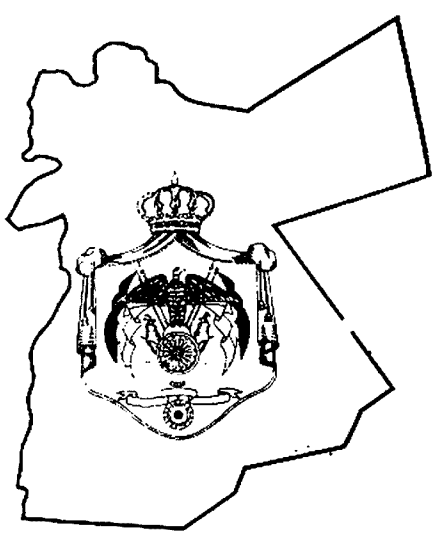
RADIO	DATE	GMT	MC	RST	2 WAY
AX3?G	21 Nov 70	2244	(14) 21 28	5-9	CW (SSB)

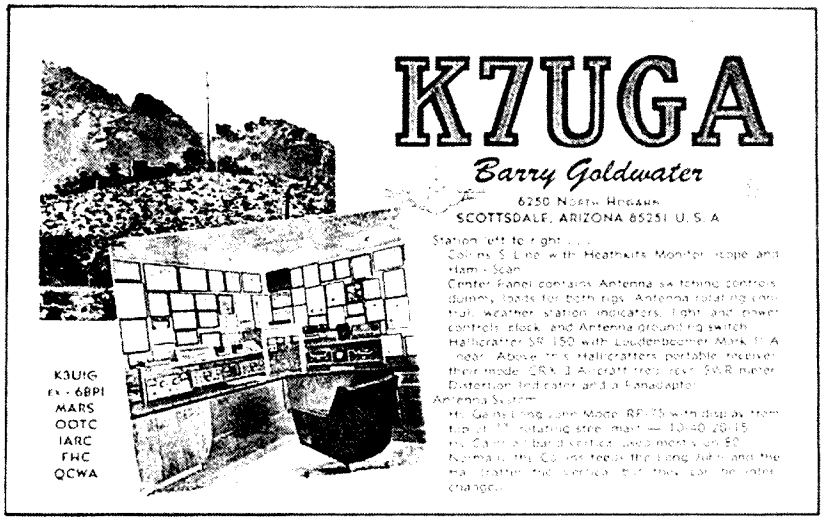
OP. HUSSEIN I
P.O. BOX 1055
AMMAN
JORDAN

PSE QSL TNX Stan

73 Hussein I

Via WA3HUP





K7UGA

It would be difficult indeed to find a politician of any political colour who has done more for the cause of amateur radio than Senator Barry Goldwater, of Arizona.

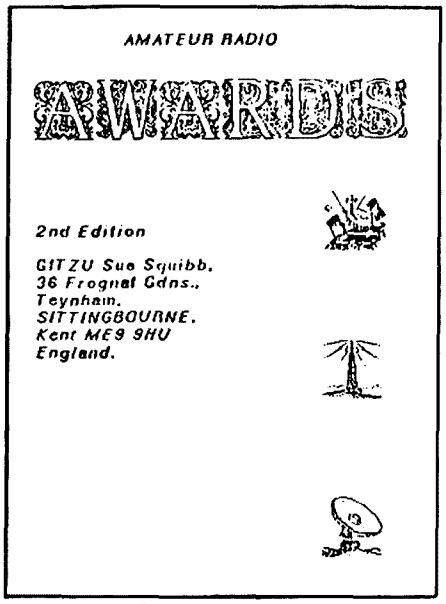
As a youngster in the 1920s he held the call sign 6BPI (there was no W prefix then) using a five watt tube and a spark transmitter made from an old Ford automobile HT ignition coil. Known by most people as a former candidate for the US Presidency, the Senator will be best remembered by the amateur radio fraternity for the encouragement given to the introduction of reciprocal licensing. The Senator introduced and guided through both Houses of Congress the Bill which was later to become law. This was a new concept in amateur radio which proposed that foreign amateurs licenced by certain countries would be permitted to use their own call signs (with suitable portable designator) in the US. A similar arrangement was to operate for American amateurs visiting other countries. The idea spread throughout the world until today there are few countries that do not offer this privilege to licenced amateurs.

It was President L B Johnson who signed the relative Senate Bill on May 28, 1964, which amended the (US) Communications Act of 1934. The Senator's own QSL card is shown here, the QTH being Scottsdale, Arizona.

BV0BG

During the first week of January 1986, Senator Barry Goldwater led a group of Washington DC amateurs to Taiwan. The information on the reverse side of the QSL states that the station BV0BG (no prizes for working out the significance of the call sign suffix) was established in Taipei, the capital city with a population of over two million. Amongst the 7000 QSOs made world-wide in seven days were the first ever from Taiwan on 80 and 160 metres. The DXpedition was conducted with the help of the China Radio Association (CRA). The prefix BV0 is quite unusual and is used for a special purpose. In 1954 the Chinese Nationalist Ministry of Communications allocated the BV prefix for amateur use with a number indicating the particular 'hsein' or county. Previously the C3 prefix had been used for Taiwan (formerly called Formosa) and for a short time these call signs were both monitored and tolerated by the authorities.

The Senator is seen in the photograph making a phone contact. The flags of both nations side by side symbolise the close ties existing between the Nationalist Chinese Government and the US.



AWARDS BOOKLET

News comes from England of the publication of the second edition of *The Amateur Radio Awards* booklet by Sue Squibb G1TZU.

There are over 350 awards in the 90 page booklet, which is available at a cost of £5, US$10 or 20 IRCs from Mrs Sue Squibb G1TZU, 36 Frognal Gardens, Teynham, Sittingourne, Kent, ME9 9HU. England.

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A R Showcase

inches, distance from board to cover of 0.400 inches, and an overall height of 0.5 inches. Currently, strips are available in lengths of 12 inches or less, with continuous lengths available on special order.

The material normally is supplied with tin plating to facilitate soldering, but can be plated with other materials if required. The shield is preferably used on boards with two or more layers, so that a ground plane is available to serve as the bottom of the enclosure. For ease of installation, round mounting holes are used, so no special milling is required to create locating slots.

Test results indicate that the shield exhibits attenuation characteristics as great as 34 dB at 1 GHz.

For more information, a sample kit (containing a six inch strip plus a sample lid), and additional technical specifications, write to RFI Industries Pty Limited, 54 Holloway Drive, Bayswater, Vic. 3153 or 50-56 Barry Avenue, Mortdale, NSW. 2223. Also, request the free Guide to Interference Control, describing the complete line of Instrument Specialties RFI/EMI shielding strips.

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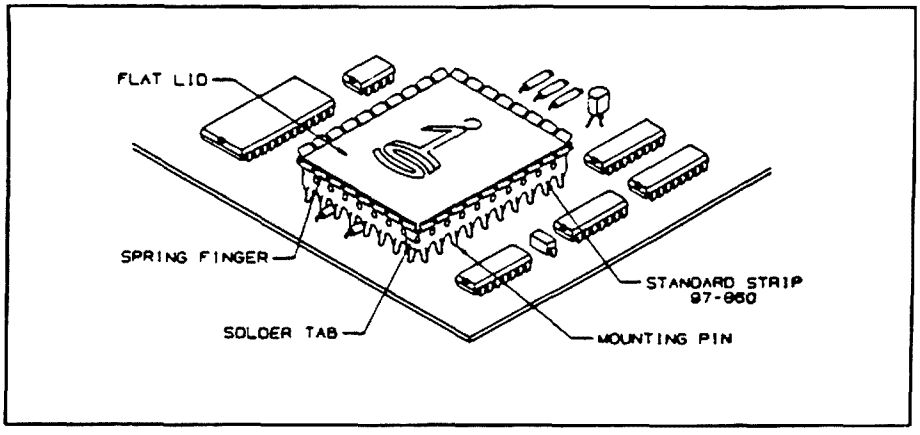

PCB SHIELDS

New PCB shields permit shielding of selected PCB components, without the expense and time-consuming effort of forming complicated punches and dies to create specially-shaped boxes. The new shield can be readily shaped to specific requirements and solder-mounted on a PCB. The shield controls EMI emissions, susceptibility, and cross-talk and can be used on any through-pin, multi-layer board designed to accept it.

To form a shield, a strip of phosphor bronze, a conductive spring material, is bent to the appropriate shape to form a "fence" around the components to be shielded. A flat metal lid is then cut to shape, using a simple tool such as shears, and is snapped into place. The lid is held by the spring force of the "fence" material.

A unique advantage of the PCB shields is that the cover can be removed, without special tools, for access to the components under the shield. (Common solder-mounted boxes generally prevent access to the shielded components inside).

The shield can conform to any shape or size. The current version has pin spacing of 0.200

ICOM IC-A20

With the IC-A20, the sky is the limit!

You might think it is good enough to offer a precision engineered VHF transceiver with 16 user-programmable memory channels and a full 108-136 MHz band coverage.

Put it in a weatherproof, dust-tight, rugged case to stand up to rough weather and some not so delicate handling, add 720 communication and 200 navigation channels and you are starting to talk of something just a little out of the ordinary.

Include VHF Omni-directional Range (VOR) reception for point to point navigation and put it all in a case just 65 x 198 x 35 millimetres (WHD) and capable of operating in an aircraft or on your belt, and you have the IC-A20.

The Icom IC-A20 is a compact, light-weight, hand-held VHF air band transceiver with full transmit and receive coverage of the 720 communication and 200 navigation channels between 108-136 MHz plus VOR reception.

The 16 memory channels store the COM, NAV and VOR frequencies required for a particular flight plan or, if you are just riding the thermals,

your nearest control tower or ground communications channel.

Front panel push-button frequency entry via a soft-touch keypad finds that next wanted frequency instantly. A large liquid crystal display (LCD) ensures you always know which channel you are on. A keyboard locking switch ensures there are no sudden, unwanted channel changes.

The 121.5 MHz air band emergency frequency can be called up instantly at the touch of a single button for crisis situations.

Up/down scanning from the front panel allows constant scanning of all frequencies within the IC-A20's operating range, or just those stored in the 16 memory channels. Unwanted memories can be "locked-out" at the touch of a button.

VOR readings can be taken directly from the front panel display, displaying both the frequency of the VOR station being received and the bearing TO or FROM the station. Flight path deviation can also be read at the touch of a button in increments of two degrees.

With full duplex (split frequency) operation, multiple NAV and COM or NAV and VOR channel combinations can be stored in the memory bank with instant recall for position cross-checking. The display even indicates when a localised signal is encountered from a VOR station.

(**VHF Omni-directional Range (VOR) is a navigation system using radio transmitters that emit a synchronisation signal equally strong in all directions, followed by a circular, sweeping, directional signal. The VOR circuitry in the IC-a20 decodes these signals to determine what angle your receiver is from the VOR station; ie, what 'radial' you are on. Radials are like directional beams radiating outward from the VOR station like the spokes of a wheel.).

See the Icom IC-A20 at your nearest authorised Icom dealer or contact Icom Australia Pty Ltd, 7 Duke Street, Windsor, Vic. 3181, phone (03) 529 7582 or toll-free (008) 33 8915, for more information.

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any memory channel or even all memory channels in succession, while you operate.

Add pocket beep with the optional UT-40 Tone Squelch Unit, and the IC-3210A becomes a mobile pager, sounding a 30 second alarm when the correct tone frequency is received.

See the Icom IC-3210A at your nearest authorised Icom dealer or contact Icom Australia Pty Ltd, 7 Duke Street, Windsor, Vic. 3181, phone (03) 529 7582 or toll-free (008) 33 8915, for more information.

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DUAL BAND TO HAND

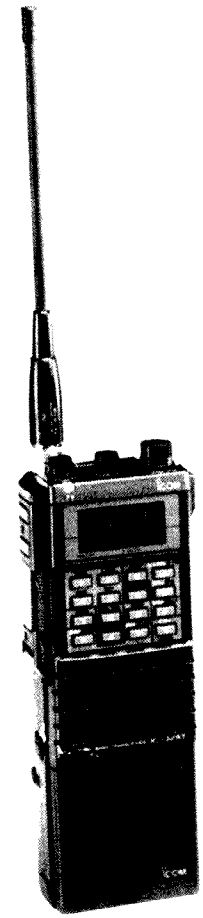
With the release of the Icom IC-32AT hand-held FM transceiver, roving amateurs now have a convenient, compact dual band transceiver in the palm of their hand.

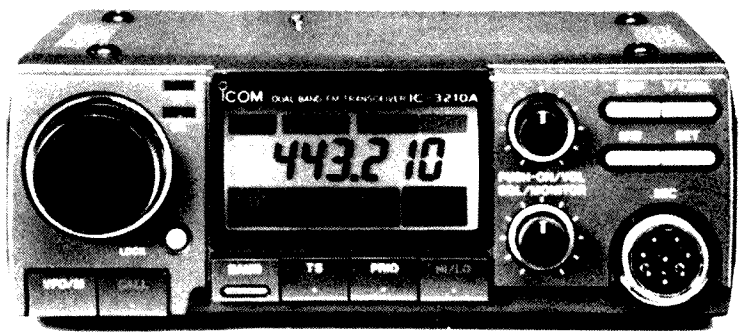
Not only can the IC-32AT operate over the entire 144-148 and 430-440 MHz bands, it can transmit on one band and simultaneously receive on the other — true duplex operation with telephone convenience.

Store one frequency from each band in each of 20 dual storage memory channels for simplex or instant duplex operation, and scan all 40 memories, all two metre memories or all 70 centimetre memories with the versatile Programmed Scan facility.

An advanced Priority Watch function allows monitoring the Call Channel memory, any selected memory channel or all memory channels every five seconds, even whilst operating!

The "Quick QSY" facility allows fast frequency changes, using the main dial to change the 1 MHz or 100 kHz digits, or the memory channel, directly, at the push of a button.





DUAL BAND MOBILE

What do QSK CW, talking on the twin pair and Icom's new IC-3210A have in common? They all let you hold a *real* conversation without having to wait for the button to drop!

The new IC-3210A dual band VHF/UHF mobile transceiver allows transmission on one band and simultaneous reception on another band.

With a frequency range covering (transceive) 144-148 MHz and 430-440 MHz, (receive) 138-174 MHz and 430-440 MHz, and two sets of 20 memory channels, one for each band, storing frequency, offset and tone data, the IC-3210A is very much two transceivers for the price of one.

It can be set to scan from band edge to band edge or between preset limits, over all memory channels relevant to a particular band.

A generous 25 watts of output power on two metres and 70 centimetres, generated by a custom-designed final amplifier power module, is coupled with sensitivity of less than 0.18 uV for 12 dB SINAD to stretch your operating limits.

Other features of the elegant IC-3210A include a bright colour LCD display, instant input frequency check via the front-panel monitor switch, programmable priority watch on the call channel memory,

Using a custom-designed dual-band final amplifier power module, the tiny IC-32AT generates a full 5.5 watts output on two metres and five watts on 70 centimetres.

Water-resistant rubber seals on all joints make the IC-32AT safe to operate even in rough marine environments.

The optional UT-40 Tone Squelch unit turns the IC-32AT into a personal pocket pager, emitting a 30second alarm when the selected tone frequency is received.

With features like these, and a bright colour LCD display, can you afford not to take a closer look at the feature-packed IC-3210AT?

See the Icom IC-32AT at your nearest authorised Icom dealer or contact Icom Australia Pty Ltd, 7 Duke Street, Windsor, Vic. 3181, phone (03) 529 7582 or toll-free (008) 33 8915, for more information.

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Club Corner

GOLD COAST RADIO & ELECTRONICS HAMFEST

The 11th Annual Gold Coast Hamfest will be held on November 19, at the Albert Waterways Community Centre, on the corner of Hooker and Sunshine Boulevards, in Mermaid Waters.

The exhibition will include commercial and hobby displays in the field of radio and electronics — introducing such areas as amateur radio, satellite television, computer communications over radio, Tesla coils, radio teletype, receiving weather satellite pictures, vintage radio displays, computer graphics, amateur television, trade displays, scanners and much more.

Doors will be open from 9 am to 6 pm.

For further information contact Andrew Chantler VK4TAA on (075) 91 1723 (BH) or (075) 39 6609 (AH).

—Contributed by Andrew Chantler VK4TAA, Chairman Organising Committee

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SUMMERLAND AMATEUR RADIO CLUB

The club welcomes 10 new members who have joined recently. They are: Hugh VK2KHH, Ross VK2NUD, Phil, Richard, Terry, Paul, Neil, Harry (all SWLs), A Taylor VK4BE and Bill VK2NZ.

Hopefully they will enjoy and benefit from their association with the club and the SWLs will soon get their own call signs.

The Hamfest event was a huge success with perfect weather, good attendance and an enjoyable day for all.

The club's digipeaters on Mount Nardi (145.050 and 147.575 MHz) continues to give good service without presenting any obvious operational difficulties.

In preparation for UHF linking of the digipeater network to increase data through-put using higher speed modems and greater bandwidths than available on VHF, it is proposed that a packet subband will be established on 421 to 424 MHz and 441 to 444 MHz.

Prior to the establishment of this facility, the club has been requested to apply for a UHF working frequency on 440.050 MHz. This will offer the dual benefit of helping to populate the higher end of this amateur band and also enable local amateurs to experiment with packeting on the under-utilised band.

A permanent Summerland Packet Bulletin Board VK2YDN-1, has been established by Dave VK2YDN. This service is normally available 24 hours on 5050, and is compatible with the nationally and internationally established auto-forwarding networks.

By this time, the VK2AGE mailbox should have converted to "Aplink" — a dual mode software which allows the system to run in either AMTOR or Packet. The modes may be run independently or both simultaneously. VK2AGE has been running an AMTOR mailbox for the last six years and during that time it has seen several changes. However, this will be the first attempt to run two modes from a single microprocessor.

—Contributed by Jim Cunningham VK2ESI, Publicity Officer, Summerland Amateur Radio Club

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PACKET RADIO BULLETIN BOARDS

September *Amateur Radio* pages eight and nine, contained an article on Packet Radio Bulletin Boards. This article was prepared in January this year for the Federal Convention by the Australian Amateur Packet Radio Association (AAPRA).

Since preparation of that article, AAPRA have been advised that the networking software METRON proposed for test does not meet the requirement DOC 71, Paragraph 9.4 with regards to identification of the sender, receiver and any intermediate transmissions. DOTC have advised TEXNET appears to meet their identification criteria and AAPRA are negotiating the use of ROSY, another networking software which also appears to contain the necessary identification requirements.

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Forward Bias

Norm Gomm VK1GN
GPO Box 600, Canberra, ACT. 2601

MONTHLY MEETINGS

The August monthly meeting included a presentation by Lieutenant Colonel Graham Barnard and Major Andy Haddock on *Project Raven*. The objective of Project Raven is to develop a single channel combat radio system to replace the existing range of HF and VHF single channel radios currently used by the Australian Defence Force.

Colonel Barnard explained that the new equipment will replace 12 different radios acquired on a piece-meal basis over a long period of time. The previous approach gave rise to several problems such as vastly different spares and maintenance requirements, complexity in training, lack of compatibility and declining reliability.

Project Raven will provide a fully integrated HF and VHF system with improved performance, including communications and ECCM capability, to replace all ground-based radios in the Defence Force. An important feature of Raven is Australian industry involvement in the development and manufacture of the radios.

The presentation included a display of equipment for those who "don't believe it until they see it".

The November meeting is the end of the year social function. Spouses and friends are all welcome. As we go to press, Ian Coleman VK1IC, is slated to show some slides on his dive on a newly discovered wreck off the Northern Queensland coast.

DICKSON COLLEGE RADIO CLUB

Dickson College, in Canberra, runs a registered course in amateur radio as part of its curriculum. The main purpose of the course is to give students an understanding of electronics through the medium of amateur radio.

The school runs its own station, VK1NAT. To use the station without supervision, a person needs at least the Novice Amateur Radio Operators Certificate of Proficiency. The College's equipment includes a modified TS-520S transceiver driving a five band trap vertical ground plane antenna mounted on the roof of the building. This equipment has been Installed and is operated by an enthusiastic group of students within the terms of their licence.

One of the long term aims of the group is to become involved in AMSAT amateur satellites. Anyone interested in the Dickson College activities should contact Terry Bevan at the college.

ESANDA FINANCE RALLY OF AUSTRALIA

August saw the Division providing support to the ESANDA Finance Rally. Ken VK1KEN, will report separately on this activity.

COAXIAL CABLE

A limited amount of RG-58 cable is now in stock. Please contact Norm VK1GN, if you are interested.

Unfortunately, due to circumstances which are too unbelievable to explain, we still do not have the RG-213 we hoped to get in July. Oh well, such is life!

BARRY BENNETT

I just don't understand it. Another "old and bold", Barry Bennett VK1BB, has deserted this beautiful climate of Canberra, to go and live on the north coast of New South Wales. Must be a horrible way to go; sun, beaches and a laid-back lifestyle. On behalf of all in VK1-land, good luck Barry and his new wife in their exile to Byron Bay.

ARMY RESERVE

The Canberra-based squadron of 8 Divisional Signal Regiment, an Army Reserve (CMF) unit is looking for recruits interested in part-time military communications.

After initial recruit and trade training, soldiers are posted to positions as radio, com-centre and line operators. Tax-free pay is available for one two-week camp and 28 days made up from evenings and weekends parades. A good opportunity to get paid for operating radios!

The Squadron parades at Allara Street Depot on Thursday nights at 7 pm local time. The contact is Warrant Officer John Pruskocki on telephone number (062) 48 9777 during business hours.

JOHN MOYLE MEMORIAL FIELD DAY 1989

A further reminder that, if you have any suggestions, or wish to participate in the John Moyle Memorial Field Day Contest, please contact Norm VK1GN, phone 54 8412.

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VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

VI88NSW — PARRAMATTA BICENTENARY AWARD

To celebrate the 200th anniversary of the founding of Parramatta, the special event station, VI88NSW, will be operating throughout November from 8 am to 8 pm local time on various HF and VHF bands as conditions permit. Details of the operation were given last month in AR as well as on the broadcasts.

Time slots in the final four weeks during December for VI88NSW operation are still available for clubs and individuals. Check with the Divisional Office if you wish to use it. Don't forget to submit your claim for the Fisk Award which operated under the call sign of VI88WIA on September 22. Details were in September AR.

WAGGA WAGGA ARC

The Field Day is the first weekend of November, the fourth to sixth. See details in previous ARs. Contact John VK2JGK, direct or via the club address, PO Box 294, Wagga Wagga, NSW. 2650.

CONFERENCE OF CLUBS

This is being hosted this month by the Illawarra ARS. The date is expected to be Saturday November 12, which is moved from the previous weekend due to the clash with the Wagga Field Day.

TWO-METRE HAND-HELDS

There may be a few of the Alinco ALX-2T handhelds left. Check details on the broadcasts. These units are available as a service to Institute members for $325 plus $7.50 post and packaging. Applications only accepted if your AR address label is included. See the recent review in *Amateur Radio*.

TRASH AND TREASURE

The last Trash and Treasure for the year will be on Sunday afternoon, November 27, in the Parramatta car park.

The Postcode Contest for this month is two metres simplex FM on Friday, November 25, from 9 pm to 11 pm.

The December Postcode Contest is on six metres on December 20, as part of the Ross Hull Contest. This year is the 50th Anniversary of the death of Ross Hull on September 13, 1938.

VK2 AWARDS

After several drafts, the design has been selected. As usual, further details will be given on the broadcasts. There have been some minor changes to the number of contacts required for the Parks Award. Don't forget the VK2 Bicentenary Award — 200 contacts are required between January 1, 1988 and December 31, 1988. Check you logs, you may already qualify.

NEW MEMBERS

A warm welcome is extended to the following who were in the September intake.

J D Apel Assoc	Orange
B A Clarke Assoc	Birchgrove
G A Coller Assoc	Epping
H C Davison VK2NHD	Wagga Wagga
D W Dawson Assoc	Liverpool
N Deitch VK2ZXC	Port Kembla
C V de Plater VK2PCD	Narrawallee
D Georgievski Assoc	Rockdale
B J Hammond VK2DOM	Mortdale
B J Holmquist VK2BDX	Seven Hills
J D Lodding Assoc	Helensburgh
J M McAlister VK2XFQ	Tamworth
F W Murphy VK2PGS	Chester Hill

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VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

SALE OF VK3 HEADQUARTERS

The WIA Victorian Division's Headquarters building at 412 Brunswick Street, Fitzroy, is to be sold.

This decision, which was made at the Victorian Division Council meeting on September 1, follows more than five years of deliberations on how to make the best use of the Division's biggest asset for the benefit of the members.

The decision is a consequence of the recommendations made by a special finance committee set up last year to consider the various options regarding the Division's property.

Part of the minute from the meeting reads: "...the net proceeds be invested in a Capital Guaranteed Security in trust for the Division members,..." and "... access to the principal be subject to the wishes of a Special Meeting of Division members called specifically for that purpose."

SUNDAY MORNING BROADCAST

VK3BWI broadcasts a news and information presentation at 10.30 am (local time) every Sunday. Several frequencies and locations are used simultaneously; they are as follows:

1.840 MHz AM from Lyndhurst
3.615 MHz LSB from Lyndhurst
7.085 kHz LSB via VK3RC near Seymour, and via repeaters
VK3RMM Mount Macedon
VK3RWG Mount Baw Baw
VK3RMA Mildura
VK3RMU Mount Saint Leonard

A broadcast Listeners' Survey was conducted on August 28, and the results have now been processed.

The content and presentation of the broadcast has widespread support, but there have been several suggestions of additional topics that some listeners would like.

The return of "DX News" was requested. This matter was already in hand, and it may, in fact, be back on air before you read this.

The possibility of presenting propagation reports is being carefully considered.

Some readers felt that the broadcast was too long, others were pleased to hear so much interesting news.

A few felt that the broadcast promoted the WIA Victorian Division and its services too vigourously. This will be toned down a little.

HF signal reports are encouraging.

Transmission through a multiplicity of repeaters seems to be appreciated and plans have already been finalised to extend this network.

As time and resources permit, the broadcast will also appear on six metres and on two metres SSB.

—Contributed by Bill Trigg VK3PTW, VK3 Council

NEW MEMBERS

The following applications were received for the month of August and accepted by council on September 1, 1988. A warm welcome is extended to you all.

Leif Andersen	Mulgrave
David Archer* VK3DVB	Glenhuntly
Allan Burcher* VK3NET	Anakie
Robert Burdett* VK3YQR	
Leslie Burr	Montmorency
Trevor D'Ambrosio* VK3TEG	Greensborough
Egbert Ekkel*	Nunawading
Walter Ellingham VK3CWE	Pascoe Vale
Kerry Finn	Sorrento
Brian Gray VK3KMZ	Bundoora
Harold Hardy* VK3EHH	Churchill
Daryl Hughes* VK3VXQ	Delacombe
William Little VK3TAJ	Mount Beauty
Trevor McManus* VK3NHF	Shepparton
Allan Marsland* VK3NY	Mount Beauty
Simon Osborne	Croydon South
Michael Paul* VK3VTA	Lilydale
C A Prasek VK3TDQ	Ardeer
Kris Ross-Soden* VK3IEF	Strathmerton
G P Tremellen VK3TGP	Healesville
Frank Ruzzene	Preston

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MURPHY'S CORNER Nov 88

There were five small errors in the "20 Amp Power Supply" article by the Moorabbin and District Radio Club on page 4 of the August 1988 issue of AR.

These are:

1. In paragraph 3, the Mark 3 supply was actually introduced eight years ago, not three.
2. At the bottom of column 1, the resistor is 200 ohm 10 watt, and comprises two 100 ohm 5 watt units in series.
3. The capacitor across the 2k2 resistor from pin 10 of the 723 to ground, is 1.0 microfarad.
4. The capacitor from pins 11 and 12 of the 723 to ground is 1.0 nanofarad (0.001 microfarad).
5. The un-numbered pin, shown grounded on the 723, is pin 7.

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Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

SPEAKER PROBLEM SOLVED

Perhaps it is because we are so close to the source that we don't see the "wood for the trees" (if you will excuse the mixed metaphors). I am one of the first to sing the praises of John Ingham VK5KG and the Video Tape Library Service and yet, when we needed a "fill-in" speaker when Peter Gamble VK3YRP, was unable to be with us in July, it was John who gently pointed out to me that this is exactly what the VTL is here for. We are exceptionally lucky in Adelaide, not only to have John able to advise us on the latest tapes "hot off the press" (ours didn't even have a title when John suggested it) but also to have John to volunteer to come and show it and borrow a large screen monitor for us.

However, I would like to hastily point out, that the system works just as well for those of you in the country-areas of South Australia, or interstate. Elsewhere in this issue of AR is a list of videos that are available through John and information on how you may make use of this service. There are over 70 titles now available and if you can't decide on one or more, ask John's advice. I am sure you will not be disappointed.

FEDERAL PRESIDENT NOW AVAILABLE ON TAPE!

At our Club's Convention last April, the guest speaker was our, now Federal President, Peter Gamble VK3YRP. Peter spoke on the WIA, how it works, and where it looked like heading in the 1990s. It was said at the time that it should have been recorded so that it could be shown to the clubs and Peter, agreed to come back later in the year and speak to a general meeting which, at the same time, could be video taped. As I said in the preceding paragraph, we had hoped to have Peter with us in July but this didn't quite work out with his schedule, so we were delighted to have him with us in August. Once again John Ingham was there, but this time it was to record Peter's talk on video. Peter pulls no punches (although there may be a word or two edited!) and the news is not all "rosy" unless we all work towards changing the course in which the WIA and amateur radio seemed to be headed. I hope all clubs and as many individuals as possible, will see this tape. Those of us who care about the WIA (as Peter obviously does) will gain a lot from it. Our grateful thanks to both John and Peter for their time and efforts.

DIARY DATES

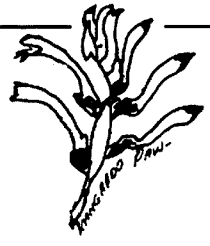
Thursday, November 17: Old Timers' Luncheon (also Ladies Luncheon for any interested YLs, whether 'attached' to an Old Timer or not). Contact George Luxon VK5RX or Ray Deane VK5RK for further details.

Sunday, November 20: WIA Picnic (probably at Bridgewater Oval — listen to the Sunday Morning Broadcast for any changes of venue or date). Bring the family for a great day out. Bring your own lunch and the WIA will provide ice creams and soft drinks for all. There will be races for all age groups, doughnut eating contests, water-filled balloons, transformer tossing, fox hunts and a gate prize. In fact, all the activities just mentioned have prizes for the winners.

Tuesday, November 29: Buy and Sell night. 7.30 pm at BGB, West Thebarton Road. (no ESC, QSL Bureau or Pubs on this night).

Tuesday, December 6: WIA Christmas Social at Woodville Community Hall, 64c Woodville Road, Woodville. Speaker will be Dr Mike Tyler, Reader in Zoology at Adelaide University. "Frog is a Four Letter Word". I understand Dr Tyler is a very funny and entertaining speaker, so don't miss it. We would also welcome any spouses or friends. Please bring a plate of supper to augment the salad platters, pies, pasties, sausage rolls, etc that the WIA provides. Tea, coffee, soft drinks, etc, are also provided.

PLEASE NOTE:
As there are five Tuesdays in January 1989, and we normally have a Buy and Sell meeting in January anyway, there will be no meeting on January 31. January 24 will be a Buy and Sell night preceded by business. ESC, Pubs and the QSL Bureau will all be available on this night. (But we will endeavour to start at 7.30 pm).



WA Bulletin

John Sparkes VK6JX
VK6 PUBLICITY OFFICER
83 Anemone Way, Mullaloo, WA. 6025

The Western Australia Repeater Group was founded in August 1975, and accepted for club membership into the WIA in April 1976.

The group was incorporated in 1983, and currently has around 150 members.

The aim of the group is to provide and maintain repeaters for the amateur service in West Australia, including the provision of assistance to country amateur groups in repeater ventures. Examples of the latter are the Cataby and Busselton repeaters.

The group also strives to further technology and systems development in all aspects of repeater design, construction and installation.

The group currently holds 13 licenses, comprising nine operational repeaters, some on "soon to be completed" status, and VK6RRG, the group's own club call sign.

Meetings are held on the third Sunday of every odd-numbered month at the QTH of Gill VK6YL, 47 Belvedaire Way, Lynwood, at 1 pm.

There is also an informal "on-air" meeting on Channel 3 repeater every Sunday morning at 10.30 am — straight after the WIA News Broadcast on the Channel 2 Repeater.

Maintenance or installation work is generally carried out by "working bees" and any assistance provided by any amateurs or friends, other than the very hardworking core members of the Group itself, will be gratefully received.

Subscriptions for the group are minimal, and the committee and members are very proud of the excellent service provided for so many (largely at no cost) by so few.

The Committee is comprised of the following amateurs:
VK6s: MS, YL, LZ, UP, KEG, ZLT, CC, BMW, CU, with VK6MM as patron.

The group planned a much improved AUSSAT/ repeater performance for JOTA this year — no more mute tails and delay problems confusing operators. Despite these problems, last year's performance was so good, that the group linked the Perth repeater (Channel 2) to the Mount William repeater (Channel 6) to extend the coverage of JOTA deeper into the south-west of the State.

The Cataby repeater is now back on the air with new solar panels to replace the cranky-old wind generator. This provides extended coverage north of Perth.

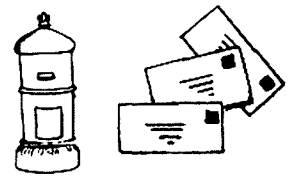
One of the new projects is a repeater destined for Mount Saddleback, near Boddington. This repeater should be accessible from all major south-west centres thereby making WA seem a little smaller! This repeater will also house a digipeater operating on 147.575 MHz — WA's exclusive digipeat frequency.

The group currently has a license for a 29 MHz FM repeater, VK6RHF which is awaiting construction.

Discussion of the group would not be complete without mention of Will VK6UU, who, with a few others, has traditionally provided technical expertise and ideas for the group. However, Will is always looking for assistance from interested people.

Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.



NEW GROUP FORMED

A group of amateur astronomers and space enthusiasts in Sydney have recently formed a group called DAWESSAT (the Lt William Dawes Amateur Space Telescope Project), a group which promises to take Australian amateur astronomy into the Space Age. The group intend to build a small amateur space telescope.

The current design calls for a Cassegrain telescope between 25 to 30 centimetres aperture. It will have two instruments, a black and white television camera and an infrared photometer. The information will transmitted on the amateur radio bands.

Proposed launch date is 1992, The International Space Year, and it is hoped to launch it piggy-back, similar to the way AMSAT satellites are launched.

For this project to succeed, the support of the amateur radio community is needed. Any radio amateurs who are interested In this project are asked to please contact the writer.

Yours sincerely,
Ralph Buttigieg
Secretary,
DAWESSAT
Inside Mail Box 1788
Seven Hills West, NSW. 2147

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TECHNICAL CORRESPONDENCE

I would like to correct a number of statements made by Ron Mills VK5XW, in his article on page 23, in August AR.

The other article he refers to as having appeared in "a local radio magazine" was, In fact, written by me and appeared in *Amateur Radio Action* Vol 9 No 8, pages 32 and 33. Ron states that the FL-2100 model was not specified — it was. The model referred to in the article was simply the Yaesu FL-2100, the first of the 2100 series and the article was very clearly titled "Improving the FL-2100 on 21 and 28 MHz". No claims were made for the FL-2100B or FL-2100Z as I did not have access to those models. Changes were made during the production run as Ron has found out himself.

Ron states "The author claimed that by replacing the silver-plated wire with coaxial cable the problem had been solved." At no point was any such statement made. To my knowledge the only silver-plated wire used in the FL-2100 is in the pi-coupler coil and I did not mention silver-plated wire. I did mention 16 gauge TC wire which is something totally different (and a lot cheaper!).

After failing to get the results I mentioned, Ron then says "I retraced my steps gradually replacing the SWR bridge and the wiring with coaxial cable only to fin it made no difference to the FL-2100B". I made no mention of replacing the internal SWR bridge with coaxial cable and would not have suggested that under any circumstances. I did mention placing a wire bridge (not an SWR bridge) between two coaxial connectors during tests I made which was something quite different.

Having read the text as printed in AR, I can only conclude that Ron did not get the desired result because he either did not follow my description of the modification as I made it or he misinterpreted what was said in the article. My unit operated perfectly satisfactorily after modification. Another VK3 operator made the same changes to his FL-2100B and achieved even more spectacular improvement in output then I did. I would suggest that Ron reads my original text again carefully to ensure he understands exactly what I said.

Yours faithfully,
Geoff Wilson VK3AMK
7 Norman Avenue
Frankston, Vic. 3199

ar

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ADDED BALANCE. . .

"There are still amateurs who use balanced feeders" states Dean VK5LB, in his *Discussion on Open Wire Feeders and Balanced Output Antenna Matchers.*

With this assertain I agree wholeheartedly. I am one of many who have weighed the benefits to be had from using such a system and have embraced it. Most of the features Dean reviews are correct, especially the very low losses associated with parallel lines but he errs somewhat when he strays from the pronouncements of M Walter Maxwells' W2DU/W8KHK, *Another Look at Reflections.*

VK5LB states. . .

1. Conjugate matching — So, even with high VSWR figures, there need be no loss of any power if the antenna system is tuned to the impedance required by the transmitter.

This may be the case if 'Superconductors' are used in the transmission line, however, precluding this, there must be IR losses. These losses are more pronounced the greater the VSWR existing as the result of impedance mismatch between the line and the antenna. The conjugate match serves only to send back to the antenna the reflected power resulting from the previously mentioned mismatch. An oscillation of reflected and re-reflected power continues indefinitely until part of the power is eventually radiated and the rest is consumed as heat as it travels to and fro.

2. Dean's G5RV antenna uses ladder line from the centre insulator right down inside the shack to a balanced output matcher.

His G5RV ceased to be a G5RV the moment he fed it with anything but coaxial line! The theory behind the G5RV is that the dipole section functions as three halfwaves in phase on 20 metres and the 300 ohm section acts as a halfwave current phasing stub, the impedance at the end of which should approximate 75 ohms. What VK5LB has is a simple dipole fed with balanced line. As he states by quoting the *ARRL Handbook*, "A wire antenna, fed at the centre with open wire line is the most efficient multiband antenna devised to date."

3. Rotatable beams are more conveniently fed with coaxial line for obvious reasons.

I have fed both Yagi and quad beams with balanced lines for over 20 years and I am yet to discover any obvious reasons for doing otherwise.

4. The open wire line at VK5LB is simply laid out in the same way as coaxial cable.

This practice can cause public relations problems. Balanced lines must be isolated from large metal objects such as spouting, towers, etc, by about 15 centimetres (six inches) if imbalance is to be avoided. Imbalance on parallel feeders causes them to radiate.

This will almost certainly unbalance your neighbour's temper when you interfere with his television viewing . . . ditto your spouse! ! !

5. For open wire lines to be used to feed rotatable beams, a halfwave section of coaxial cable may be used as a balun to provide 1:1 or 4:1 ratios. Coaxial baluns are frequency sensitive ad respond mainly to the frequency for which they are cut, attenuating all others.

Earlier in his article, Dean dismisses the use of broadband baluns for several erroneous reasons, one of which was that their bandwidth was too restricted. Now he praises the very feature he previously rejected. The line matching network and balanced lines will exhibit low losses compared to coaxial cable despite quite high VSWRs but there is no excuse for beginning further behind the starting blocks than is necessary. A broadband transformer wound on a toroidal ferrite core, (see *RF Impedance Matching Using Ferrite Toroidal Cores* by VK3HK, AR August to December 1988) will provide ratios of 9:1 and 16:1 easily over a range from 14 MHz to 30 MHz which will more closely match the feed impedances of 35 ohms and less of multi-element Yagis when fed with 300, 450 or 600 ohm lines. They will be far less expensive and a good deal less cumbersome at the top of the tower.

From this, it would appear I am knocking Dean and his suggestion of using balanced feeders: I am not! I look forward to his project on the Z-match and I thoroughly recommend members of the Institute take advantage of our library and read Maxwells' *Another Look At Reflections, QST,* 1973, 1974 and 1976.

Stephen Bushell VK3HK
74 King Parade
Knoxfield, Vic. 3180

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WHAT IS THIS AMATEUR RADIO BUSINESS?

The other day I stopped at a service station for fuel. The service station attendant noticed my commercially-built HF transceiver in the rear of the car. I answered his query with the comment "That's just a bit of amateur radio gear". He replied "Doesn't look too amateurish to me!". In an instant he had highlighted one of the fundamental problems facing our hobby.

In the "amateur radio" context the word amateur is often interpreted as inferior-unskilled. The range of skills our members possess is no less than that found amongst athletes, and yet, who would describe Olympic athletes as unskilled? They are most certainly amateur only in the unpaid sense — not in the skill sense. What about those unpaid pilots who share the skies with their commercial counterparts? They are not called amateurs, theirs is a "private" pilot's licence.

Do we need to change either our name or our image? The answer is undoubtedly *yes.* As the term "*amateur* radio" is well established we had best look at out image. Whenever others think of amateur radio they should be able to associate it with an image of operational or technical skill. Others not only means the public but also those organisations we deal with. Does the Department of Transport and Communications regard us in a more or less favourable light than our commercial counterparts? What about the Police and SES? Are we a resource to be relied on in an emergency or do they think of us as a "*bunch of amateurs*"?

If amateur radio is to survive into the next century we had best ensure that those who can influence our survival think favourably of us.

73,
Duncan Raymont VK2DLR
Booyong, NSW. 2480.

ar

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TOWERS

The letters of David VK2PGE (April 88 AR) and Neil VK6NE (August 88 AR), regarding tower problems, are interesting.

Living away from urban areas has advantages when it comes to erecting radio towers. But we have not escaped humbug.

As application to establish a community communications facility on the only viable site in this area has been stifled by the environment lobby. Talk to any communications planning engineer and you will hear similar tales of woe. Government recognises our more obvious and pleasing natural

resources but no such recognition applies to the identification and development of superior communications sites. Radio-users are, as yet, a disorganised lot.

On the urban scene, our WA Division is locked in battle with Local Government. The outcome will depend heavily on the quality of evidence and legal precedents. I am unaware of any serious attempt by our Federal body to co-ordinate and document evidence justifying amateur radio, and in particular, explaining the need for the physical character of antennas and their supporting structures. The published report of the Victorian Parliamentary Committee on Radio Masts, containing the VK3 submission, is a good attempt, but needs considerable improvement.

Despite all of this, it seems unlikely that legal challenges of Local Government actions will do more than line the pockets of lawyers. The less costly complaint to the Ombudsman, may also be unrewarding. The fact is, that to non-radio-users, towers are not a thing of beauty. We should look for an alternative solution.

David's wind-up tower has possibilities but the non-linear rate of feed needed to keep the guy wires taut as the tower rises poses daunting engineering problems. A hydraulically operated tower with a rotatable base would have several advantages. Whatever method is used, it is certain that changing times and attitudes will condemn those permanent residential area towers. Fighting your neighbour and not your problem is no way to negotiate.

I support David's plea for WIA encouragement of resourcefulness in this area.

Yours faithfully,
Graham Dun VK2DMA
"Bonnie Braes"
Wattamondara, NSW. 2794

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PACKET NETS [1]

AR August 1988, arrived today and I noted the WA Bulletin paragraph headed *Packet Radio — Harmful interference was experienced by the Travellers' Net from unmanned (mostly) packet radio stations . . .*

Could the opposite case be considered? I believe that no one person or group has a prior right to any frequency in the amateur service except WIA Official Broadcasts plus Beacons and Repeaters.

It is considered gentlemanly to listen — and/or inquire if the frequency is being used before transmitting. This inquiry is heard frequently on many frequencies used by the amateur service.

You may wonder why I write from New Zealand on this matter — Twice in the last two weeks I have been listening to Packet and try and see how it operates, while working on the car. (Saves spending money on repairs!). The particular frequency was in use when lo and behold, the "Travellers' Net" appeared on the frequency without a hint of the usual courtesies or regard for the then present users. Would this too be classed as harmful interference, particularly by the Packet stations?

I am not a Packeteer at the moment — the only digital modes here are CW and RTTY on VHF, so one day I may join the race.

Yours faithfully,
Ian Henry ZL1BKZ
27 McRae Road
Mount Wellington, Auckland 6, NZ.

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PACKET NETS [2]

After reading the continual barrage of mail on Packet Radio and the Travellers' Net, published in *Amateur Radio*, I am totally "fed up" with reading most of the childish nonsense sent in by the perhaps ill-informed Travellers' Net supporters.

They give the impression that they are going to make all stations, regardless of mode of operation, move to other frequencies so they can run their precious net. What a hide! What is more, they had been operating their net in what was until recently a narrow band and wide band modes section of the 20 metre band without giving a hoot about RTTY or Packet operators, (the Gentlemen's' Agreement was changed in 1987). In fact, they have even lobbied the WIA Federal Executive to approach DOTC about stopping the interference. What cheek! Also in the WA Bulletin (August 1988 AR) they refer to the "harmful interference" from "unmanned (mostly) packet radio stations" and the "ungentlemanly behaviour of the Packeteers" (tarring us all with the same brush). Well that was the last straw as far as I am concerned.

Perhaps one of the Travellers' Net types can give answers to the following:

1. How is it that if packet signals are heard on a certain frequency it can then be declared by SSB operators to be not in use allowing them to use it?
2. How is it that if packet signals interfere with SSB signals that it becomes "harmful interference" but if SSB interferes with packet that is just hard luck?
3. How is it that a packet station operating on 14.103 MHz USB (the common frequency for unattended bulletin boards and for world-wide auto-forwarding) can interfere with SSB stations on 14.106 or .107 MHz USB?
4. If the world-wide packet auto-forwarding network operated on a particular frequency, why is it that Australian amateurs providing the same service (to ALL AMATEURS) shouldn't be permitted to use that frequency?
5. If 20 metre SSTV and FAX operators (many of who are packeteers) can have specific call frequencies, why can't packeteers?
6. How is it that a minority group, running a small net for one hour a day, seems to overshadow the 24 hour a day world-wide auto-forwarding of: details of transceiver modifications, computer programs, satellite information, astronomy information, propagation reports, antenna designs, requests for help, reference projects and modifications, etc, personal messages, ARRL news, WIA news, NZART news, RSGB news, AMSAT news, details of the latest amateur discoveries, educational material, data collected by schools related to satellites etc, details of emergency procedures, welfare messages to and from disaster areas, DX news (SSB, CW, RTTY and Packet), moonbounce details and even amateur jokes for the education of *all amateurs*? Much of this information is used in amateur news broadcasts and newsletters, too.

So, you see, there is another side to the argument. Yes, I do operate packet, (so I am biased), and AMTOR, RTTY, SSB and CW and I am getting sick of having my intelligence insulted by the utter rubbish contained in some letters of recent times. The amateur radio spectrum is meant to be shared, not fought over or carved up and certainly not to be controlled by a small group of indignant net operators.

We are supposed to be an adult, self-governing (well almost) democratic body (the WIA) presenting a united front to all opposition towards amateur radio but, instead we are squabbling like spoiled children who don't know how well off we are in this modern world. Stop all this childish nonsense that is degrading our standing with Government bodies and the electronics industry and start working together for the good of our hobby.

Peter McAdam VK2EVB
14 Grant Close
Coffs Harbour, NSW. 2450

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PACKET FEEDBACK

We have read with interest the paper from Barry VK2AAB, concerning Packet Radio Bulletin Boards. At the outset, we would like to commend Barry for the comprehensive and factual presentation of the realities of the Packet Bulletin Board scene in Australia today. The Publications Committee should also be commended for publication of the paper and thus encouraging discussion on this topic.

The ACT Packet Group is in agreement with the recommendations made by Barry and wishes to contribute the following thoughts to discussion on this subject.

In the matter of message forwarding on HF, we see merit in greater use of the 10 MHz band. This band is ideally suited for regional distribution and has been designated a narrow modes only band by the IARU. Transfer of traffic to this band reduces demand for 14 MHz band space. Because of its general narrow band nature, this band is ideally suited for experimentation with PSK and other techniques for reliable 1200 Baud HF operation which can further reduce demand for spectrum requirements.

Analysis of VHF Packet traffic in the Canberra region shows a large number of Bulletin Board connect attempts via several repeaters. Thus it is apparent that a proportion of Packet operator are "BBS DXing" and this leads to congestion on the few designated Packet frequencies. One wonders why this practice continues when the same information is frequently available on Bulletin Boards closer to the Operator.

We would recommend that BBS Sysops restrict access to their BBSs to connects via no more than three digipeaters. This should adequately accommodate those operators who are geographically isolated from a BBS. Many BBSs, especially those in large population areas, could provide an appropriate level of service through two digipeaters or less.

Of the BBS traffic which is observed from the Canberra area, very little is Packet orientated. This creates the question, why aren't BBSs being used for the dissemination of technical and news items relating to packet radio. They would seem to be ideally suited for this purpose. Furthermore, the quantity of material appearing on these BBSs which is not even amateur radio orientated is disturbing. We would recommend that originators of Packet Radio messages take greater care with the addressing and content of messages to ensure that they are distributed no further than is necessary and that their content has some relevance to amateur radio. We would further recommend that Sysops be encouraged to cull inappropriate messages from their systems.

We observe with regret the marked decline in OSOs between people. We surmise that among the causes of this are:

— Inappropriate usage of Bulletin Boards leading to congestion of packet channels.
— Inappropriate usage of length beacons, often digipeated, as a CQ call while the station is unattended. In the mature state of the Australian Packet Network, beaconing is entirely inappropriate.

Are there too many BBSs in Australia? A quick count reveals over 30 BBSs for an estimated population of less than 1000 packet operators. Compare this with a typical computer club with 500 paying members which will have one telephone BBS. Obviously a number of geographically dispersed BBSs are needed to cater for the packet population. However, is there a need for more than one general BBS in the larger population centres? We heartily endorse Barry's recommendation for State co-ordination of the BBS network.

In discussion the Group asked itself, what was the purpose of Packet Radio BBS Services? Is it to:

1. Disseminate information to amateurs, or
2. Promote part of the growing area of our hobby, packet radio?

If it is the former then could this be better achieved by an open access telephone based BBS

network which could reach a much greater proportion of the amateur population. If it is the latter then an examination of the content of BBS messages indicates that this is not being achieved.

The ACT Packet Radio Group will shortly be disturbing a survey to determine where the amateur population thinks packet radio is heading. We undertake to publish the results in AR and welcome your involvement in this survey.

Carl Makin
On behalf of the ACT Packet Group
5 Lockwood Street
McKellor, ACT. 2617

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WE NEED A STANDARD

I regret to have to write and complain about the following ongoing problem in the operation of contests conducted by various States.

It would appear that the people conducting these contests cannot get their act together. In particular, I quote the recent Remembrance Day Contest.

In last year's contest the numbers required were of three digits such as "001". Many people with computers went to much trouble to type-up a computer program published in AR before the contest last year. Although almost unreadable, due to the poor quality printing, they eventually had excellent results. But, this year the rule-makers decided to include an extra RS/T number before the score number. With my limited knowledge o programming, it was not until 3.30 am on the Saturday morning that I was able to get the complicated program to comply with the new rules. The organisers apparently had no thought for the inconvenience caused to many who use their computer to keep track of the entries and print them out legibly for checking.

It is requested that the WIA lay down a standard for these Australian contests so that the many people why use computers to assist them in compiling and reprinting their logs, may not be inconvenienced in this way again!

Yours faithfully,
Alf Hansen VK4OL
161 Raymont Road
Aderley, Old. 4051

ar

Solution to Morseword 21

Across: 1. pus 2 onset 3 hire 4 bay 5 nail 6 ugh 7 VIP 8 ESSO 9 hies 10 user
Down: 1 apse 2 miss 3 gust 4 rams 5 hens 6 vies 7 tides 8 urge 9 stunt 10 arid

	1	2	3	4	5	6	7	8	9	10
1	•	—	—	•	•	•	—	•	•	•
2	—	—	—	—	•	•	•	•	•	—
3	•	•	•	•	•	•	•	—	•	•
4	—	•	•	•	•	—	—	•	—	—
5	—	•	•	—	•	•	•	—	•	•
6	•	•	—	—	—	•	•	•	•	•
7	•	•	•	—	•	•	•	—	—	•
8	•	•	•	•	•	•	•	—	—	—
9	•	•	•	•	•	•	•	•	•	•
10	•	•	—	•	•	•	•	•	—	•

FAULTY BATTERY CHARGERS COULD KILL

A fault in a certain type of battery charger could result in severe shock causing death.

The State Electricity Commission of Victoria (SECV) said a middle-aged man died while using a 40 amp Vane battery charger, model 2200, Power King.

An SECV investigation found the internal mains voltage connections to the charger's transformer had contacted part of the metal rectifier that was connected to the battery charging circuit.

This fault causes 240 volts mains potential to appear on the battery charging leads.

The charger had been made between 25 and 30 years ago by the Vane Electrical Instruments Company, Sydney, which is no longer in business.

The SECV said the charger should not be used until inspected and if necessary, repaired by a qualified electrical serviceman.

Details on the modifications required to ensure safety may be obtained from the SECV by telephoning (03) 691 4470.

—Photograph courtesy State Electricity Commission of Victoria

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SUBSCRIPTION REMINDER NOTICES

As from now, only one membership subscription notice will be forwarded to members each year.

A reminder notice will not be sent!

As from now, only one additional issue of *Amateur Radio* magazine will be sent to you if your renewal subscription is not received.

Not two additional issues as in the past!

Only a small number of *Amateur Radio* magazines are now being printed each month surplus to members requirements. This means that if you do not renew your subscription on time, you may not be able to get your missing copies of AR!

WHEN YOUR MEMBERSHIP RENEWAL IS DUE, PLEASE PAY PROMPTLY AND ENSURE CONTINUAL RECEIPT OF *AMATEUR RADIO* MAGAZINE!

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Silent Key

It is with deep regret we record the passing of:

MR KEN KELLY VK2MJ

Obituaries

MELVILLE JACK DEW VK5JX

It is with deep regret that I inform all amateurs of the passing of my father Jack VK5JX, on July 23, 1988, aged 77 years. He will be sadly missed by all.

The year 1923 saw Jack building his first crystal set at the age of 11, having left school the previous year. Parts for this crystal set were purchased from the local chemist, who displayed radio parts in the window of his shop. During these early years, Jack was tutored in radio theory and Morse by Merve Brown VK5MB, but due to his lack of formal education, Jack was not able to pass the examinations and so lost interest in amateur radio.

He was self-employed for most of his life, starting as a self-taught cobbler, who later manufactured children's shoes. When television appeared Jack gradually changed over from shoe manufacturing to television repairs and again studied for his amateur licence. He gained a pass in June 1959 and was issued with the call sign VK5JX.

An active interest was taken in the SA Division functions and for some years Jack helped put the SA Division Sunday Broadcast to air. A major heart operation in 1979 stopped him from continuing this task.

One of Jack's hopes was to see me (his son) become an amateur and this must have been one of the highlights of his life. Many happy contacts over the last three years were made.

Vale Jack, loving husband, father and friend.

Robert Dew VK1DE
ar

HAROLD L WRIGHT VK2AWH

Harold was tragically killed in Sydney on July 13, 1988, when he was struck by a motor cycle whilst crossing the road.

Harold was born in 1929 and grew up in the Grafton area. He gained his early trade training in civil aviation and then joined the technical side of the PMG's Department. He moved to Lismore in 1962 to become Maintenance Technical Officer on the then new Broadband Radio Communications link system. He remained there, changing with and usually ahead of the technology of the systems. He was often involved in the setting up and development of new equipment and systems.

He was a very caring family man with four children who were always his prime concern. Family and electronics were Harold's life!

In 1970, he was seconded to the Australian Antarctic Division and was at Heard Island for a year. It was natural that amateur radio would become an interest. Harold gained the call sign VK2AWH and was very active in the experimental and construction side of radio. He joined the Summerland Amateur Radio Club in 1962 being Secretary from 1974 to 1979 and involved in framing the Club's new Constitution in 1975. For many years club meetings were held in Harold's garage-cum-shack until growing numbers made it impracticable. He was also an active member of the WIA.

Harold coached many budding amateurs. He supported the establishment of the Lismore repeater VK2RIC, which he worked on for several years prior to its inauguration in 1977. Although assisted by others, he was mainly responsible for its construction and maintenance until his death. He also principally built and serviced the UHF repeater, VK2RSC.

Harold was very active in WIA matters, especially if he thought that things were not as correct as possible. He represented the club at conferences and AGMs and always returned with a very detailed report of the proceedings for members.

A keen and meticulous constructor, Harold made much of his equipment. When computers appeared Harold built his own which is still in operation. He also made ancillary bits, drives and modems, etc. He was equally involved in his church and civic affairs. He was awarded a Telecom award for work done during the April floods only two days before his untimely death. Amateur and civil radio communications in the area will be the poorer for his passing.

Sincere condolences are extended to his wife Nola, and family.

John Alcorn VK2JWA, on behalf of Summerland Amateur Radio Club
ar

SIDNEY JOHN MONTGOMERY VK2CSM

Sid passed away on June 17, 1988. He was well-known and had many friends amongst the amateurs with whom he had regular scheds over a wide area.

His interest in radio went back to the war years when he was trained in Canada as a Flying Wireless/Navigator. From a class of 180 he graduated third. He was promoted to the rank of Flying Officer. Sid saw service in Malta, Italy, Algiers, Gibraltar and the middle East in a variety of aircraft including Wellingtons, Beaufighters, Liberators, Beauforts and Dakotas. He was discharged, with a mention in dispatches in 1946.

With a young family, and resident near the city, friends introduced him to sailing. After a succession of sail boats, they moved into power boating. This brought out his knowledge of radio when he joined the Pittwater Coastal Patrol. They supplied an amateur, radio-based marine emergency service for the area at a time when 27 MHz was not yet popular.

Moving to Evans Head 16 years ago, it came to Sid's attention that the North Coast of New South Wales was not covered by an integrated marine radio service. His son Geoffrey said: "It was his vision to see the entire coast made "safe" with comprehensive radio cover. He realised has vision through contact with the Coast Guard in Sydney along with many trips, phone calls and letters. His energy was rewarded with the founding of Flotillas at Yamba, Evans Head and Ballina."

"Amateur radio became prominent in his life at this time also. The interest to get into "real radio" was kindled through his friendship with Doug Bowie VK2DU. The novice call came easily, especially the Morse. Three tries at the full call theory realised another dream for him. When he finally got this, there was no doubt, many "radio coaches" gave a sigh of relief! They would be able to get back to higher frequencies not VK2CSM could join them. The antenna farm grew, the world came in and friendship grew in radio." Geoff said.

Sid joined the Summerland Amateur Radio Club in 1986 and enjoyed the support and friendship. He also supported the Club and donated surplus equipment for use and sale.

Deepest sympathy is extended to his wife Sheila, and sons Kenneth and Geoffrey.

Max Reid VK2KJR, on behalf of the Summerlands Amateur Radio Club
ar

IONOSPHERIC SUMMARY

The IPS and Radio Space Services summary for July contains the following details.

Monthly values were:
10 cm flux — 153.4
Sunspot number — 112.6
A Index — 10.7
I Index — 48.8
Flares — 13

Solar activity was moderate in July with 13 M Class Flares being observed. The main periods of increased activity were July 7-13, 24 and 25, and 29 and 31. Despite the frequent solar flares, most were small and would have little effect on HF communications. The largest flares during the month were the M4 flares observed on July 8 and 31.

The daily 10 cm flux values during the month were consistently high, the highest value for the month being 193 on July 1. This is the highest daily value since the start of the new solar cycle. The lowest values of the flux during the month was 133 reached on July 9, and again on 12. The monthly averaged 10 cm flux and the monthly sunspot number were both the highest this solar cycle. The high sunspot numbers during the last two months caused the yearly average sunspot number for January 1988 to surge to 58.2.

Flares and fadeouts for the month occurred on July 2, 7, 8, 9, 11, 13, 24, 25, 29, 30, and 31. On July 7 and 8, there were two flares.

On July 11, the geomagnetic field was at active to minor storm levels during the middle part of the day. On July 16, the field was at active storm levels during the day. July 21 to 23, the field became disturbed after 0300 UTC on July 21, and was at storm levels throughout the rest of the day. The period 0600 to 1200 UTC was especially disturbed. The storm continued into July 22, and weakened on July 23. On July 26, the field was active to minor storm levels from around 0900 UTC. Geomagnetic activity was again low in July with only three days on which the magnetic A index exceeded a value of 20. These were July 11, 16 and 21, with July 21 the most disturbed was an A index of 27 and a very disturbed period between 0600 and 1200 UTC.

Levels of magnetic disturbance are as follows:
0-7 quiet; 8-15 unsettled; 16-24 active; 25-35 minor storm; 36 and above major storm level.

The ionospheric I index is a measure of the average level of the ionospheric critical frequencies available on a particular day, the higher the value of the I index, the higher the ionospheric critical frequencies, and MUF on HF circuits, for that day. The I index is most applicable to HF circuits with reflection points in the Australian region. The higher the I index, the higher the ionospheric critical for that day.

FLARES AND FADEOUTS

Solar Flares

The most spectacular causes of geomagnetic effects are solar flares. These emit electromagnetic radiation over a wide band of wavelengths ranging from the Xray region of the spectrum right down to the radio region. Visible flares are routinely observed by solar optical observatories and also by solar radio observatories. These observations are usually made from ground-based observatories. However, fares can also be observed by satellite-borne instruments, particularly those sensitive to Xrays which do not penetrate the atmosphere of the Earth. It is very convenient to class flares by their brightness at Xray wavelengths. Two classes of energetic flares are defined. These are:

1. *Class M Flares:* have an Xray power between 0.01 and 0.1 ergs/sqcm/sec.

2. *Class X Flares:* have an Xray power of greater than 0.1 ergs/sqcm/sec.

In general, X class flares are quite likely to have a geomagnetic effect on the Earth. M class flares might have a geomagnetic effect, depending on other factors.

Shortwave Fadeout

A solar flare can, if it is energetic enough, indirectly cause an attenuation of shortwave radio signals in the sunlit hemisphere of the Earth. This is known as a fadeout and is caused by increased ionisation of the Earth's ionosphere by the Xrays associated with the solar flare. Because the Xrays travel from the sun to the Earth at the speed of light, the shortwave fadeout will occur at the same time as the flare is observed. Normally, fadeouts will occur for any M or X class flares, although the range of frequencies affected by the fadeout depends on the energy of the flare and the position of the sun in the sky at the reflection point of the shortwave signal. Very energetic flares, such as X class flares, may "produce" a fadeout at all frequencies in the shortwave band. Flares of lesser energy may produce a fadeout at the lower frequencies only. During a flare, the lower shortwave frequencies are the first to be affected and the last to recover. Fadeouts are observed only on circuits which have a reflection point in the daylight hemisphere of the Earth at the time of the flare. The most severe fadeouts are likely to occur when the sun is close to vertically overhead at the reflection point of the signal. No fadeout is observed for circuits which have reflection points only in the night hemisphere of the Earth, even during the most energetic flares.

GEOMAGNETIC DISTURBANCES

In addition to the emission of electromagnetic radiation, a significant solar flare will also cause a large number of charged particles to be ejected from the surface of the sun. If these reach the Earth they can cause a disturbance to the ionosphere. This can have the effect of both disrupting shortwave communications and also causing a geomagnetic storm. Those storms which are caused by an impulsive event such as a solar flare often begin with a sudden commencement. This is an abrupt change in the magnetic field of the Earth. The field which was previously steady becomes quite variable after the sudden commencement. The magnetic storm this initiated usually last 1-2 days.

Because the charged particles which produce the storm take some time to travel from the sun to the Earth, a geomagnetic storm produced by a flare will start well after the flare. This delay is usually 1-2 days.

Geomagnetic storms may be produced by effects other than solar flares. The most important other source are coronal holes, which are extended regions of low density and temperature in the solar corona. These are sources of fast solar wind (ie, streams of charged particles). If the coronal hole is favourably located on the sun, these charged particles can reach the Earth and cause a geomagnetic storm. Coronal holes can be long-lived, often lasting several rotations of the sun (each rotation is 27 days). This regularity makes it often possible to forecast coronal hole-induced storms with a reasonable degree of accuracy up to 27 days in advance.

IONOSPHERIC DISTURBANCES

A geomagnetic disturbance can be accompanied by a disturbance to the ionosphere of the Earth (an ionospheric storm). Long distance shortwave communications rely on the ability of the ionosphere to reflect these radio waves back to the Earth and so any disturbance to the ionosphere will probably alter the range of frequencies in the shortwave band which will be reflected on a particular communications circuit. A convenient manner by which disturbances to the ionosphere may be classed is to consider the effect of the disturbance on the maximum usable frequency (MUF) on any particular circuit. The MUF is the highest frequency on the circuit which will be reflected by the ionosphere and during a disturbance the MUF can be higher than the normal values or, the MUF can be lower than the normal value. The Solar Geophysical Summary lists those days for which typical MUFs differed from the IPS predicted values (either the monthly prediction or the weekly predictions). The effects of a disturbance can depend significantly on the location of the reflection point in the ionosphere, particularly on the latitude of this point. In general, circuits using reflection points at higher latitude are more likely to be significantly affected by disturbances then circuits using low latitude reflection points only. The comments in the Solar Geophysical Summary pertain to ionospheric reflections over Sydney and will not be completely applicable to other locations. Nevertheless, a disturbance in Sydney indicates that other circuits are also likely to be disturbed, particularly higher latitude circuits.

IPS WARNINGS AND ALERTS

IPS issues warnings of impending geomagnetic activity, ionospheric disturbances, likely shortwave fadeouts, etc. The Solar Geophysical Summary lists all IPS warnings issued during the month and the time at which the warning was issued. IPS occasionally issues separate warnings to communications customers and to geophysics customers. Most warnings however go to all customers. If a separate warning was issued, this fact is noted in the Solar Geophysical Summary.

IPS also issues alerts of large solar flares or of disturbances to the geomagnetic field or the ionosphere. The type of alert, together with the date to which the alert was applicable, is listed in this section.

SOLAR FORECAST

This is a brief prediction of solar activity for the month ahead. The prediction is made by examining the past history and likely evolution of solar sunspot groups. Because of the difficulty of making this type of prediction it is usually expressed in general terms, eg, "low", "moderate", "high", etc.

GEOMAGNETIC FORECAST

This is a prediction of the dates in the month ahead on which geomagnetic disturbances can be expected. A prediction is also made of the most likely quiet periods during the month. These predictions are based on an examination of any recurrent storms present during the last few months.

FURTHER INFORMATION

A recorded telephone message giving the latest Solar Geophysical information can be reached by telephoning (02) 269 8614.

—Compiled from data material supplied by IPS Radio and Space Services
ar

HOW TO JOIN THE WIA

Fill out the following form and send to:

THE MEMBERSHIP SECRETARY
WIRELESS INSTITUTE OF AUSTRALIA
PO BOX 300
CAULFIELD SOUTH, VIC. 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms: .....

Call Sign (if applicable): .....

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DEADLINE FOR JANUARY IS NOVEMBER 7, 1988

HAMADS

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 millimetre SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No inquiries at office please . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

RADFAX2: Hi-Res radio facsimile Morse & RTTY program for IBM PC/XT on 360K 5.25" floppy + full Doc. Need CGA, input port, SSBhf FSK/Tone decoder. Has re-align auto-start view save print. Also "RF2HERC" same as above but suitable for Hercules card and "RF2EGA" for EGA card (640X350 mode). Programs are $30 each + $3 postage ONLY from **M Delahunty,** 42 Villiers Street, New Farm, Old. 4005. Ph: (07) 358 2785.

WANTED — ACT

MORSE KEYS: Straight & Semi-automatic bug. John VK1AK. Ph: (062) 86 2538 AH, (062) 70 2802 BH.

POWER TRANSFORMER: Type T6GM for Uniden tcvr Model 2020. Price & condition. All expenses paid. Radio Service Manuals or Circuits early Aust sets 1940-1970s for my collection. All expenses paid. Jock VK1LF, QTHR. Ph: (062) 86 6920.

WANTED — NSW

ANY INFORMATION: on a signal generator ADVANCE made by Advance Components, type no B4, B5, 100 kHz to 30 MHz, handbook or photocopy or any information. Pay all costs. A Walsh L20181, 22 Ascot Road, Bowrat, NSW. 2576.

HANDBOOK & CIRCUIT DIAGRAM: for Icom IC-22A. Will pay photocopy & postage costs. Also repeater channel crystals for IC-22A. Peter VK2TE, PO Box 562, Artarmon, NSW. 2064. Ph: (02) 887 2709.

LINEAR AMPLIFIER: suitable for use with TS-520S. Also large HF beam & rotator. W Senior VK2WS, QTHR. Ph: (067) 75 2158.

TOWER: to 40 feet to suit Hy-Gain beam antenna. Please call Tony. Ph: (02) 698 6566 BH, (02) 489 3312 AH.

WANTED — VIC

COLLINS KWM2 ACCESSORIES: 312B4 or 312B5 consoles, 302C-3 watt-meter, DL-1 load, 351R-1 & 2 racks, MM-1 & SM-3 microphones, valves & handbooks (incl KWM2/2A). David VK3BFB. Ph: (03) 587 1593.

COMPLETE MANUALS & CIRCUIT DIAGRAMS: for Ken TR2200, Carphone 25M/22, and A510 (Z1/TSE(W) 8522 2-10 MHz ex DTD. Copying & Freight charges gladly paid. Simon Osborne. Ph: (03) 725 5969.

HANDBOOK FOR PATON ET4a VALVE TESTER: including details of valve testing conditions, etc. Peter VK3KAU, QTHR. Ph: (03) 744 2570 AH, (3) 338 3300 BH.

WIRING DIAGRAM: for Yaesu receiver FR-50. Will pay for copying. A Luciani, Lot 1. Stanley Road, Stanley, Vic. 3747. Ph: (057) 28 6540.

WANTED — QLD

ANY OLD WIRE & WIRELESS TELEGRAPHY EQUIPMENT: & old handbooks or instruction manuals for the above. Private collector. Fred VK4NMA, QTHR. Ph: (07) 396 3521.

AR-7 RECEIVER COIL BOXES: Also Model 14 typing reperforator with keyboard. State price, condition. VK4CB, QTHR. Ph: (07) 202 6566 AH, (07) 377 9474.

CW FILTER FOR FT-101Z: Also following new valves. 12BY7A & 6146B. Contact Jim VK4CBU, 10 Courageous Court, Scarborough, Qld. 4020. Ph: (07) 203 4355.

WANTED — WA

SELSYN MOTORS: Master & Slave for beam direction indication. VK6ED, QTHR. Ph: (097) 52 1173.

FOR SALE — ACT

ICOM IC-4E 70CM H/H: $250. Yaesu FT-203R 2m h/h $300. Microwave modules MMT 28/144 2m to 10m xvtr $100. Tokyo Hy-Power HL-200E HF RF amp $200. AEA Isopole 144Jr $50. DSE VZ-200 with RTTY module — offers? Two packet modems, suit Commodore 64 user port — offers? Colin VK1COL. Ph: (062) 96 1232.

FOR SALE — NSW

BRIDGESTONE 25 WATT 144 MHz TCVR: C/W with folded dipole ant, AC power supply, mic. $400 or reasonable offer. John VK2ANX, QTHR. Ph: (02) 638 4191.

COMPLETE YAESU STATION: comprising FT-902DM tcvr, YO-901 multiscope, FC-902 antenna tuner, YP-150 dummy load-wattmeter, SP-901P phone-patch loudspeaker, FRG-7700 receiver, original cartons & operating manuals, operating table & chair, 18AVT Hy-Gain vertical antenna, 60 feet coaxial lead-in cable, Leo Cohen Simplex Auto-key, Simpson voltmeter. All in good condition. $3000 ONO the lot. Harry VK2HV, QTHR. Ph: (02) 958 6567.

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.

* Eight lines free to all WIA members, ninth line for name and address. Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.
* Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment. (A courtesy note will be forwarded that the ad has been received and will appear in . . . . . issue of AR.
* Copy in typescript, or block letters to PO Box 300, Caulfield South, Vic. 3162
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

Hamads

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HEATHKIT HP-10 MOBILE POWER SUPPLY: 120 watt power (600V/300V/125V bias/12V heater from car battery, for HW12/HW32/FT-200 etc. $50 with manual. Konrad VK2DFM. Ph: (02) 452 4125 BH only.

ICOM 04A H/H: excellent cond. $390. Marconi FM/AM sig gen $200. Marconi FM dev meter. $25. Hewlett Packard audio osc $60. Peter VK2CIM. Ph: (060) 25 1843.

KENWOOD TS-680S: HF + 6m multimode transceiver. As new $1500. Kenwood TR-9500 UHF multimode transceiver with BO-9 base. Mint condition $850. Kenwood R820 amateur band receiver. Excellent condition $450. (All Kenwood items complete with original packing, cables & manuals). 11 element 70 cm ATN Yagi complete with balun. New, unused. $100. Mini-quad HQ-1 20, 15, 10 & 6 metre 2 element beam. Fair condition. $150. Paul VK2ATR, QTHR. Ph: (049) 59 1788 BH, (049) 59 3748 AH.

KENWOOD TS-820: tcvr with digital readout, matching Kenwood speaker, desk mic, manual. Absolute mint condition. $900 ONO. VK2BCA. Ph: (043) 90 8463 or (047) 39 6255.

MICROLOG AIR-1: CW, RTTY & AMTOR interface for Commodore C-64 computer & any tcvr. $50. Les VK2PBY, QTHR. Ph: (02) 624 4926.

POWER SUPPLY: Kenwood PS-430. Excellent condition. $350. VK2DYW, QTHR. Ph: (02) 44 3279.

SENDATA: "Multi-Speed" modem with "Supercom III" software & cables for IBM PC, never connected. $215. RAM pack 32K for Toshiba T-100, in sealed package with instructions. $25. Unused boxed radio valves, eg 807 $10. EF50 & 6SJ7 $5. Many other types. Send SAE for list. W Senior VK2WS, QTHR. Ph: (067) 75 2158.

YAESU FL-2100Z LINEAR AMP: WARC bands, unmarked condition, packing & manual. $1000. Also, Werner Wulf 6 element 10/15 metre duo-band antenna. $140. Pat VK2RZ. Ph: (043) 62 1235 (Goslord) until 9.00 pm.

YAESU EQUIPMENT: FT-107M HF 9 band all mode tcvr, scan & memory. $700. FP-107E power supply, 20 amp. $225. FC-902 ant tuner. Range 25-250-500 watts $350. FT-225RD 2m all mode tcvr. 10W FM 25W SSB $480. Accu keyer CMOS complete with power supply. $80. Toyo thru-line SWR-PWR meter 144-435 MHz to 120 watts $150. 8 el J-beam 2m $75. Ben VK2DZD. Ph: (047) 54 2299 after 7 pm.

FOR SALE — VIC

IC-2A: 2m hand-held. Brand new cond. $300. FM-321 Philips 70 cm Mobile. Excel cond. $250. Osker SWR 200 SWR & power meters 20/200W HF to VHF. Brand new. $75. Dentron jnr Monitor antenna tuner. $50. K V Scott VK3SS, 34 Henry Street, Malfra, Vic. 3860.

ICOM 505 6M TRANSCEIVER: inc FM option. Mint condition, mic — accessories & original packing. $675. Roger VK3XRS, QTHR. Ph: (051) 56 8291.

ICOM-02A VHF FM H/HELD TRANSCEIVER: in perfect condition. Includes protective case & extra BP-3 batt pack, & external speaker/microphone. Also includes Icom Nicad batt charger for BP-3 pack. $490. Evan VK3EJV. Ph: (03) 438 2878 AH.

MODEL 100 TELEPRINTER: C/w 240V power supply. Very good working condition. $150 ONO. Model 100 teleprinter as above but no keyboard, offers? STS model 191 UHF mobile inc crystals & 16 el Yagi. Good condition $110. 2metre 16 element Yagi 16 dBi gain 4m boom with Icom low noise preamp. As new. $250. Sagem dot matrix teleprinter. C/w punch & reader. New ribbon excellent condition. $400 ONO. Contact Gil VK3CQ, QTHR. Ph: (057) 55 1158.

MORSE KEYS: Clipsal model 610A with double contacts. New and unused, still in carton. $55. Contact Maurie VK3CWB, QTHR. Ph: (050) 22 2120.

RF SPEECH PROCESSOR: NFJ-525, original condition. $50. David VK3BFB. Ph: (03) 587 1593.

FOR SALE — QLD

AR MAGAZINES: 1983 through 88. Mint condition. Reasonable offers. VK4WR. Ph: 41 1315.

FOR SALE OR SWAP: for HF transceiver-signal generators Marconi TF995B/5 220 kHz/220 MHz FM/AM/CW mint condition with handbook $650. Marconi TF144H/4 $100. Metrix 931H Standard $100. Ratcliffe 205, Gertsch, Schomandl, Airmec CT221 $50 ea. Tx rx valves, transformers, meters, etc. Want to clear & get on the air again. Bob VK4OY, QTHR. Ph: (07) 396 0886.

SWAN VHF 150: 2m all mode amplifier with 2 spare QQE 06/40 valves. $200. All offers to Fred VK4NMA, QTHR. Ph: (07) 396 3521.

Advertiser's Index

KENWOOD

TWO IN ONE

TM-721A DUAL BANDER

Standard microphone included.
DTMF microphone optional extra.

ANNOUNCING the new TM-721A 144/440MHz FM dual band transceiver

We've redefined the term "dual bander" with our brilliant new TM-721A. Using Kenwood's new Hybrid IC, the TM-721A packs more performance into its compact 1.8kg package than ever before. And it's built to take rough treatment with a solid die-cast chassis.

Specs are state-of-the-art. The receiver uses the latest GaAs FETs which together with an improved antenna switching circuit provide superb sensitivity and wide dynamic range. Power output is a punchy 45W (2m).

Other innovative features include:

- Dual watch function. The TM-721A may receive both VHF and UHF bands at the same time.
- Selectable full duplex operation across bands.
- Automatic band change. Change between main-band and sub-band when a signal is present.
- Call channel function. A front panel "Call Channel" key allows instant recall of frequency, repeater offset and sub-tone on each band (UHF and VHF).
- 30 memory channels. Functions include alert, frequency storage, repeater offset, sub-tone, limits of band scan, transmit and receive frequency, allowing for standard and odd offsets.
- Dual LCD displays
- Programmable scanning
- Optional multi-function remote handset (model RC-10)

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.

4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W., 2066. Ph. (02) 428 1455.

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Further, beware of dealers not listed in this advertisement who are selling Kenwood communications equipment. All Kenwood products offered by them are not supplied by Kenwood Australia Pty. Ltd and have no guarantees applicable.

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THE NEW ICOM IC32AT, OVER. WITH ITS DUPLEX FACILITY, OVER. MEANS YOU WON'T HAVE TO TALK LIKE THIS, OVER AND OUT.

The IC32AT is the newest dual band handheld transceiver by Icom.

It has been designed with the most advanced VHF technology the electronics industry can offer.

And this little 2 metres and 70cm compact handheld offers full duplex facility.

Which means instead of a broken conversation, you can now simultaneously transmit on one band and receive on the other. Just like a telephone conversation.

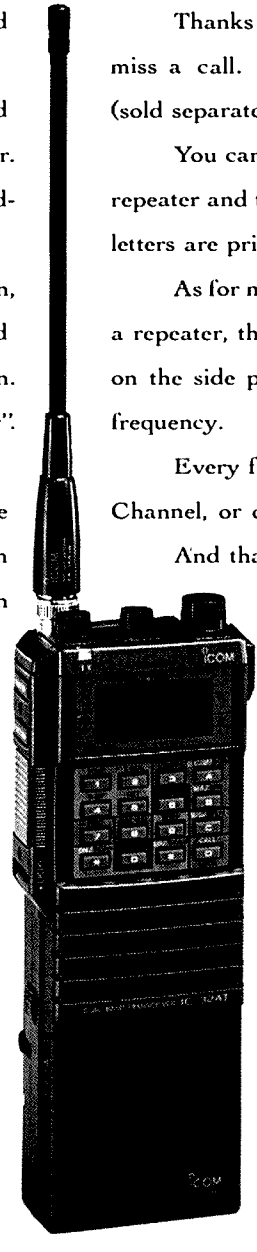
No longer do you have to wait for a long "Over". It's full "Break in".

And with its high output power, you can be sure your words are heard. The IC32AT uses a custom designed power module as the final amplifier. Which means this transceiver puts out 5.5W on 2 metres and 5W on 70cm.

So you will never be at a loss to make that repeater.

What's even more incredible, each of the twenty memory channels can store two frequencies: operating frequency and offset frequency are just a couple of examples.

The Programmed Scan function scans all the frequencies between two programmable scan edge frequencies, while the Memory Scan function scans all memory channels in succession, except, of course, those you lock out. In short, you can scan 2 metres, 70cm or all channels.



Thanks to the handy little pocket beep, you'll never miss a call. By installing the UT-40 Tone Squelch Unit (sold separately) the transceiver functions as a pager.

You can use the built-in DTMF keyboard to access a repeater and to make a phone patch. The key numbers and letters are printed large for quick and easy reading.

As for monitoring the input frequency when you work a repeater, that's as simple as pushing the Monitor switch on the side panel to open the squelch and check the frequency.

Every five seconds, Priority Watch monitors the Call Channel, or one or all the memory channels in succession.

And that's while you operate!

When you want to change the frequency or the memory channel fast, the Dial Select changes the 1MHz, 100kHz digit or the memory channel directly. One push of the button does it.

All these functions not only make the Icom IC32AT the most advanced dual band handheld transceiver available, but also very easy to use.

Call (008) 338 915 for your nearest Icom stockist today.

The telephone conversation in itself will be a very good demonstration of the IC32AT's duplex facility.

Over and out.

ICOM

The Ball Partnership ICO 0024

Only STEWART ELECTRONICS has the full range of AMIDON Associates Iron Powder and Ferrite cores available from stock

This catalogue shows only a very small part of our range of RF related components which includes some of the best known names in the industry.

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- **Attenuators to 1000W & 26GHz**
- **Terminations to 500W & 26GHZ**
- **Adaptors, precision & low cost**
- **Semi-Rigid co-axial cable**
- **Flexible TEELON coax cable**
- **SMA, SMB & SMC coax connectors**
- **N, BNC, TNC coax connectors**
- **Shielded boxes and enclosures**
- **Mica & Ceramic capacitors Ceramic & Porcelain Chip caps**
- **Air, Teflon, Ceramic & Piston trimmer caps**
- **Chip resistors**

And A Full Range OF RF Semiconductors from :

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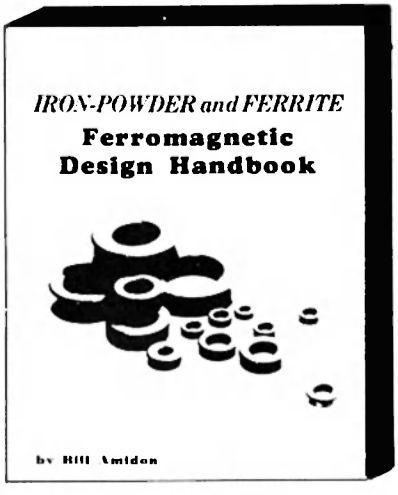
- **Motorola**
- **Avantek**
- **Hewlett Packard**
- **Unitrode**
- **Mitsubishi**
- **Siliconix**
- **N T E**

For a complete, current, FREE and POST FREE price list covering all the items listed in this catalogue please send your Name & Address in writing or by FAX, we cannot handle these requests by phone.

The complete range of components stocked by Stewart Electronics is available by mail order. For your convenience we accept Bankcard, Mastercard and Visa credit cards by phone or mail. Please include your Name, Card Number, Type of Card and Dates shown on your card with your Signature. Our sales staff are only too happy to assist you by Mail, Phone or FAX if you have any queries.

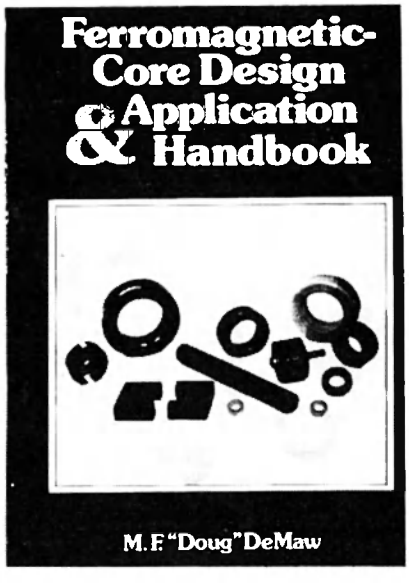
All items shown here are available normally from stock, but we ask your forebearance if the items you require are temporarily unavailable. If what you want isn't show here don't worry, we will possibly have it (this catalogue only shows a very small part of our stock range). Just drop us a line, a FAX or a Phone call, give us as much information as you have about what you need, we will then see what we can do for you.

Some Books on Designing With Ferrite Materials



If you require more data and design information than is contained in this catalogue, we have good stocks of the AMIDON " Ferromagnetic Design Handbook " *(Stock Number BX44)* for only $6.50 post free.
This book contains 73 pages (8½" x 11") of technical and design information on the complete AMIDON range.

STOCK NUMBER BX44 . . . . . Post Free $6-50



The author of this book, the inimitable Doug deMaw, has compiled a complete pratical and theoretical reference on **Ferromagnetic Materials**. Included are chapters on RF chokes, Tuned Circuits, Switch Mode Power Supplies and Permanent Magnet data.

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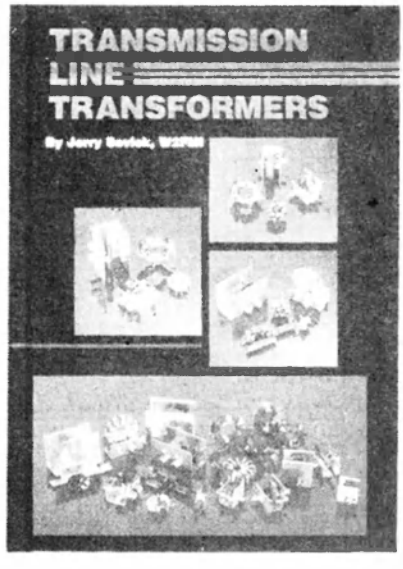

This book provides a solid foundation on the design and construction of transmission line transformers. Before this book very little of practical value has been published about this immensely useful broadband RF transformer. This prompted the author to prepare a very extensive and well documented study of this most useful impedance transforming structure.

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Iron-Powder And Ferrite Cores

POWER CAPABILITIES

The power handling capability of a core is affected by numerous factors. Ultimately, however, these factors will reduce to one of two basic limitations: saturation of the core material or temperature rise of the wound unit.

Strictly from the saturation consideration, a core's power handling capability is proportional to:

$$\text{Power} \sim \frac{V_e \, f \, B\text{max}^2}{\mu_{eff}}$$

V_e = Core volume; f = Frequency; Bmax = Maximum flux density; μ_{eff} = Permeability at Bmax.

With Bmax in gauss given by Faraday's Law:

$$B\text{max} = \frac{E \times 10^8}{4.44 \, A_e \, N \, f}$$

E = RMS Voltage drop (volts); A_e = Cross-sectional area (cm^2); N = Number of turns; f = Frequency (Hertz)

For the ferrite materials below u 1000, Bmax ~ 1500 gauss; while those above u 1000 have Bmax ~ 3000 gauss. The Bmax for the iron powder materials is generally in excess of 10,000 gauss.

From the above formulas it can be seen that for a given frequency and operating flux density, lower permeability materials can handle more power. In the manufacturing process of iron powder, minute air gaps are distributed throughout the material accounting for the lower permeabilities and greater power capabilities prior to saturation.

As earlier stated, the other limiting factor in power handling capability is the temperature rise of the wound unit. This temperature rise is a direct result of both copper and core loss. Temperature rise can be approximated using the following formula:

$$\text{Temperature Rise } (°C) = \left[\frac{\text{Total Power Dissipation (Milliwatts)}}{\text{Available Surface Area } (cm^2)}\right]^{.833}$$

While for saturation limited cases power handling varies with core volume, it can be seen that when temperature rise is the limiting factor, surface area becomes the primary concern.

In DC and low frequency applications, determination of copper loss is quite straightforward. The power loss = I^2R where I is current in amps and R is the DC resistivity of the winding in ohms. In high frequency applications, skin effect must also be taken into account when determining the effective resistivity of the winding. For example, at 20 KHz #18 wire will begin to have skin effect, while at 2 MHz #38 wire will begin to exhibit increased resistivity.

Core loss information is typically presented in terms of loss per unit volume as a function of AC flux density. (DC flux does not generate noticeable core loss.) For both ferrites and iron powder, at a given AC flux density, losses increase with frequency quite linearly. While for a given frequency, losses increase squared with AC flux density. This information is available upto 100 KHz for #77, F, and J ferrite materials and upto 300 KHz for #26 iron powder material.

At the present time core loss information is not available for the RF frequencies or the other materials. However, it can generally be considered that in RF applications, ferrites will be saturation limited, while iron powder will be temperature rise limited. Based on rough estimates, the RF iron powders will generally be limited to operation below 1000 gauss.

For years the iron powder T-200-2 has been used to handle 1000 watts when used as an antenna balun or 100 watts when used in a properly tuned LC tank circuit.

AMIDON CATALOGUE and DATA BOOK

For more data and applications of ferrite materials oredr your copy of the AMIDON Catalogue from Stewart Electronics Catalogue contains 74 pages of data graphs on the full range of AMIDON listed in this catalogue. Order Stock No. **BX44**

For an in-depth discussion of all kinds of noise problems we highly recommend the following book by William Nelson

INTERFERENCE HANDBOOK
by W. Nelson Edited by William Orr

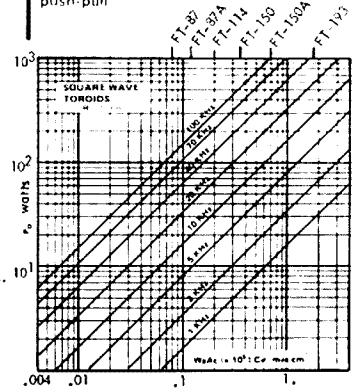
We also recommend the following valuable book for the Electronic Technician and Engineer

Ferromagnetic-Core Design and Application Handbook
by M.F. (Doug) DeMaw

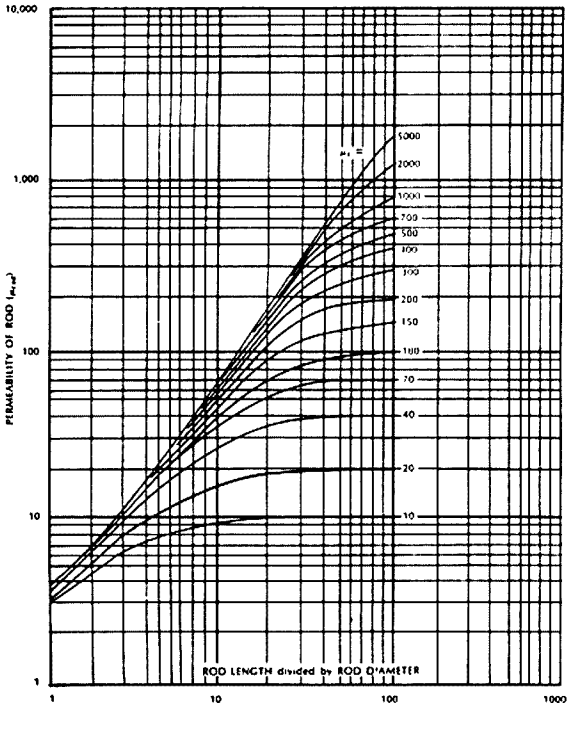
Ferrite Toroidal Cores for Power App.

GUIDE TO SELECT PROPER SIZE CORE for a GIVEN POWER

For a given power, choose a core size which has a WaAc equal to, or greater than the value obtained from the graph. If the frequency is variable, use the lowest operating frequency. The power handling capacity of a given core is directly proportional to the flux level (B), the frequency (f) and the density (1.C). Thus the WaAc needed for your operating conditions may be readily obtained from the graphs below. For saturating square wave inverters, divide the WaAc by 1.8 for the F material; the J material is not recommended for this type of application. Saturating inverters with power levels of more than 50 watts, or frequencies of more than 10KHz, are not recommended due to excessively high ΔT values. For push-pull transformers, the wire size may be reduced 30% (one wire size), but the WaAc value should be increased 20% if the primary is push-pull, and 40% if both the primary and secondary are push-pull.



AMIDON Ferrite Rods



Permeability of Rod vs. Rod Length Divided by Rod Dia. for Various Materials—; This family of curves shows the value of the effective permeability of a ferrite rod as a function of its length to diameter ratio, as well as a function of the material permeability of the rod. It illustrates that generally, a great difference exists between the material permeability and the effective permeability of a rod. It also illustrates how, in some instances, the effective permeability of a rod can be influenced by changing its mechanical dimensions, more than by changing its material permeability, while in some other cases, the reverse is true.

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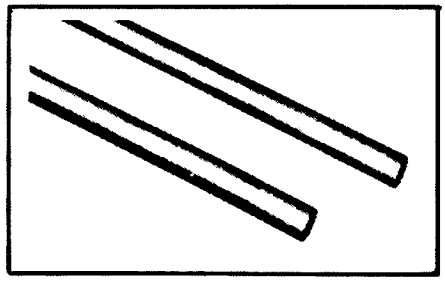

Ferrite rods are available in two standard stock materials (Mix 33 & Mix 61) in a variety of sizes. Both materials may be used for antenna and choke applications

ANTENNAS: Mix 61 Material would normally be used for applications in the range 500KHz to 10MHz. For lower frequencies and the VLF range the **Mix 33** materials are more suitable.

CHOKES: For applications in the range up to 7MHz the **Mix 33** material would normally be the most appropriate, for applications in the range 5 to 30MHz the **Mix 61** material would be more suitable. The **Mix 33** materials are also suitable for audio use such as speaker cross-over inductors. Due to the open magnetic circuit of the rod configuration considerable current can be tolerated before saturation.

Further information on designing with ferrite rods is available in the "AMIDON Iron Power and Ferrite Coil Forms" handbook (order from Stewart Electronics) and in the book "Ferro-Magnetic Core Design and Application Handbook" by M.F. DeMaw.

Amidon No.	Stock No. A_l Value	Ampere Turns	Dimensions OD(mm)	Dimensions L(mm)
Mix 61 — 0.5MHz to 30MHz — Permeability 125 —				
R-61-050-400	FC570 Al 43	260	12.7	100
R-61-050-750	FC571 Al 40	575	12.7	190
Mix 33 — 0.1MHz to 1MHz — Permeability 800 —				
R-33-050-200	FC572 Al 485	455	12.7	50
R-33-050-400	FC573 Al 59	300	12.7	100
R-33-050-750	FC574 Al 64	200	12.7	100
R-33-075-1200	FC575 Al 115	330	19.0	305

A_l values are in mH/1000 turns

AMIDON Iron-Powder Toroidal Cores

Physical Dimensions — Iron-Power Toroidal Cores

CORE SIZE	Outer Diam. (mm)	Inner Diam. (mm)	Height (mm)	Mean Path L (cm)	Cross Sect. A (cm²)	Volume V (cm³)
T12	3.18	1.57	1.27	0.75	0.01	0.0075
T16	4.06	1.98	1.52	0.95	0.016	0.015
T20	5.08	2.24	1.78	1.15	0.025	0.029
T25	6.48	3.05	2.44	1.50	0.042	0.063
T30	7.80	3.84	3.25	1.83	0.065	0.115
T37	9.53	5.21	3.25	2.32	0.07	0.153
T44	11.20	6.62	4.04	2.67	0.107	0.284
T50	12.7	7.70	4.83	3.20	0.121	0.374
T68	17.50	9.40	4.83	4.24	0.193	0.803
T80	20.20	12.60	6.35	5.15	0.242	1.25
T94	23.90	14.20	7.92	6.00	0.385	2.27
T106	26.90	14.50	11.10	6.50	0.69	4.56
T130	33.00	19.60	11.10	6.29	0.733	6.08
T157	34.90	24.10	14.50	10.05	1.14	11.30
T184	46.70	24.10	18.00	11.12	2.04	21.90
T200	50.80	31.80	14.00	12.97	1.33	17.30
T200A	50.80	31.80	25.40	12.97	2.42	31.40
T225	57.20	35.60	14.00	14.59	1.50	21.80
T225A	57.20	35.60	25.40	14.59	2.73	39.80
T300	77.20	49.00	12.70	19.82	1.79	35.50
T300A	77.20	49.00	25.40	19.62	3.56	71.00
T400	102.00	57.20	16.50	24.94	3.66	91.30
T400A	102.00	57.20	33.00	24.94	7.32	183.00

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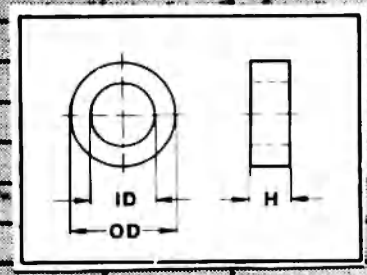
Number of Turns vs. Wire Size and Core Size

Approximate maximum number of turns-single layer wound-enamelled wire

Wire Size AWG	Core Size									
	T200	T130	T106	T94	T80	T68	T50	T37	T25	T12
10	33	20	12	12	10	6	4	1	—	—
12	43	25	16	16	14	9	6	3	—	—
14	54	32	21	21	18	13	8	5	1	—
16	69	41	28	28	24	17	13	7	2	—
18	88	53	37	37	32	23	18	10	4	1
20	111	67	47	47	41	29	23	14	6	1
22	140	66	60	60	53	38	30	19	9	2
24	177	109	77	77	67	49	39	25	13	4
26	223	137	97	97	85	63	50	33	17	7
28	261	173	123	123	108	80	6	42	23	9
30	357	217	154	154	136	101	81	54	29	13
32	439	272	194	194	171	127	103	68	36	17
34	557	346	247	247	218	162	132	88	49	23
36	683	424	304	304	268	199	162	108	62	30
38	875	544	389	389	344	256	209	140	80	39
40	1103	687	492	492	434	324	264	178	102	51

HOW TO ORDER —:

Core Size	26-mix yl/wh μ = 75 0 -1.0 MHz	3-mix grey μ = 35 .05 - 0.5 MHz	15-mix rd/wh μ = 25 0.1 - 2 MHz	1-mix blue μ = 20 0.5 - 5 MHz	2-mix red μ = 10 1 - 30 MHz	6-mix yellow μ = 8 2 - 50 MHz	10-mix black μ = 6 10 - 100 MHz	12-mix gr/wh μ = 3 20 - 200 MHz	0-mix tan μ = 1 50 - 300 MHz
T400A—	FC300 *Al 2600*				FC301 *Al 360*				
T400—	FC302 *Al 1320*				FC303 *Al 185*				
T300A—	FC304 *Al 1600*				FC305 *Al 228*				
T300—	FC306 *Al 825*				FC307 *Al 115*				
T225A—	FC308 *Al 1600*				FC309 *Al 215*				
T225—	FC310 *Al 950*	FC311 *Al 425*			FC312 *Al 120*	FC313 *Al 100*			
T200A—	FC314 *Al 1550*	FC442 *Al 460*		FC443 *Al 455*	FC315 *Al 218*	FC316 *Al 180*			
T200—	FC317 *Al 895*	FC318 *Al 425*		FC319 *Al 250*	FC320 *Al120*	FC321 *Al100*			
T184—	FC322 *Al 1640*	FC323 *Al 720*		FC324 *Al 500*	FC325 *Al 240*	FC326 *Al 195*			
T157—	FC327 *Al 970*	FC328 *Al 420*	FC329 *Al 360*	FC330 *Al 320*	FC331 *Al 140*	FC332 *Al 115*			
T130—	FC333 *Al 785*	FC334 *Al 350*	FC335 *Al 250*	FC336 *Al 200*	FC337 *Al 110*	FC38 *Al 96*			FC339 *Al 15*
T106—	FC340 *Al 900*	FC341 *Al 450*	FC342 *Al 345*	FC343 *Al 325*	FC344 *Al 135*	FC345 *Al 118*			FC 346 *Al 19*
T94—	FC347 *Al 590*	FC348 *Al 248*	FC349 *Al 200*	FC350 *Al 160*	FC351 *Al 84*	FC352 *Al 70*	FC353 *Al 58*	FC354 *Al 32*	FC355 *Al 10.6*
T80—	FC356 *Al 450*	FC357 *Al 180*	FC358 *Al 170*	FC359 *Al 115*	FC360 *Al 55*	FC361 *Al 45*	FC362 *Al 32*	FC363 *Al 22*	FC364 *Al 8.5*
T68—	FC365 *Al 420*	FC366 *Al 195*	FC367 *Al 180*	FC368 *Al 115*	FC369 *Al 57*	FC370 *Al 47*	FC371 *Al 32*	FC372 *Al 21*	FC373 *Al 7.5*
T50—	FC374 *Al 320*	FC375 *Al 175*	FC376 *Al 135*	FC377 *Al 100*	FC378 *Al 49*	FC379 *Al 40*	FC380 *Al 31*	FC381 *Al 18*	FC382 *Al 6.4*
T44—	FC383 *Al 360*	FC384 *Al 180*	FC385 *Al 160*	FC386 *Al 105*	FC387 *Al 52*	FC388 *Al 42*	FC389 *Al 33*	FC390 *Al 19*	FC391 *Al 6.5*
T37—	FC392 *Al 275*	FC393 *Al 120*	FC394 *Al 90*	FC395 *Al 80*	FC396 *Al 40*	FC397 *Al 30*	FC398 *Al 25*	FC399 *AL 15*	FC400 *Al 4.9*
T30—	FC401 *Al 325*	FC402 *Al 140*	FC403 *Al 93*	FC404 *Al 85*	FC405 *Al 43*	FC406 *Al 36*	FC407 *Al 25*	FC408 *Al 16*	FC409 *Al 6.0*
T25—		FC410 *Al 100*	FC411 *Al 100*	FC412 *Al 70*	FC413 *Al 34*	FC414 *Al 27*	FC415 *Al 19*	FC416 *Al 12*	FC417 *Al 4.5*
T20—		FC418 *Al 90*	FC419 *Al 65*	FC420 *Al 52*	FC421 *Al 27*	FC422 *Al 22*	FC423 *Al 16*	FC424 *Al 10*	FC425 *Al 3.5*
T16—		FC426 *Al 61*	FC427 *Al 55*	FC428 *Al 44*	FC429 *Al 22*	FC430 *Al 19*	FC431 *Al 13*	FC432 *Al 8*	FC433 *Al 3.0*
T12—		FC434 *Al 60*	FC435 *Al 50*	FC436 *Al 48*	FC437 *Al 20*	FC438 *Al 17*	FC439 *Al 12*	FC440 *Al 7*	FC441 *Al 3.0*



Number shown in reverse STEWART stock number. —always order by this number only—
To obtain AMIDON part number add mix number to core size i.e. T400A-26
***Al* value shown under stock number (μH / 100 turns)**

$$\text{Turns} = 100\sqrt{\frac{\text{desired L (uh)}}{A_L\ (\text{uh}/100\text{t})}}$$

AMIDON Iron-Powder Toroidal Cores Con't

MATERIALS

Mix 3 (35 permeability) A carbonyl 'HP' iron-powder material having excellent stability and good 'Q' for the lower frequencies from 50 KHz.

Mix 15 (25 permeability) A carbonyl 'GS6' iron-powder material offering good stability for commercial broadcast frequencies where good 'Q' and high order of permeability must be maintained.

Mix 1 (20 permeability) A carbonyl 'C' iron-powder material very similar to the **mix 3** material, but has a higher volume resistivity and offers beter stability than the **mix 3** material.

Mix 2 (10 permeability) A carbonyl 'E' iron-powder material having high volume resistivity and offers high 'Q' for the 1 MHz to 30 MHz frequency band. Most widely used of all iron-powder materials.

Mix 6 (8 permeability) A carbonyl 'SF' iron-powder material very similar to the **mix 2** material, but has an improved 'Q' for the higher frequencies to 50 MHz. Higher cost than **mix 2** material.

Mix 10 (6 permeability) A carbonyl material offering high 'Q' for frequencies to 100 MHZ.

Mix 12 (3 permeability) A synthetic oxide material (Irn. 8) haveing moderate 'Q' above 100 MHz.

Mix 0 (1 permeability) This material has a permeability of 1. Most commonly used for frequencies above 200 MHz.

Mix 26 (75 permeability) A hydrogen reduced material very similar to **mix 41** material, but offers extended frequency range.

Iron-Powder toroidal cores are available in numerous sizes rangeing from 0.05" to more than 5" in outer diameter. There are two basic material groups -

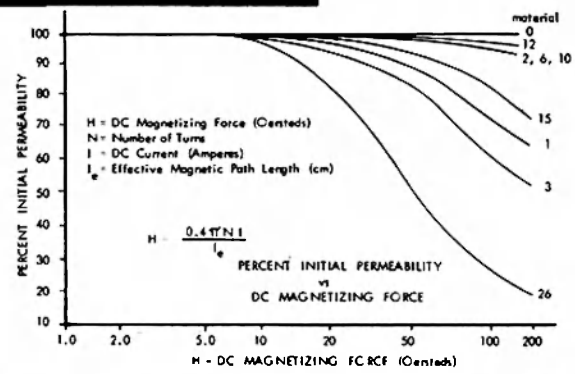
The Carbonyl Irons and the Hydrogen Reduced Irons. The Carbonyl types are especially noted for there excellent stability over a wide range of temperatures and flux levels. Their permeability range is from less than 3mu to 35 mu and can offer excellent 'Q' factors for the 50 KHz to 200 MHz frequency range. They are ideally suited for a variety of RF applications.

The frequency range specified for each material mix is especially important for tuned circuits where high 'Q' is essential. These same materials can also be used in broad-band applications where 'Q' is no longer a primary concern, therefore, be usefull to considerably higher frequencies.

The Hydrogen Reduced Irons have permeabilities ranging from 35 mu to 90 mu. Some-what lower 'Q' values should be expected from this group of cores. They are mainly used for **EMI** filters and low frequency chokes. In recent years they have been very much in demand for use in both input and output filters for **switch-mode** power supplies.

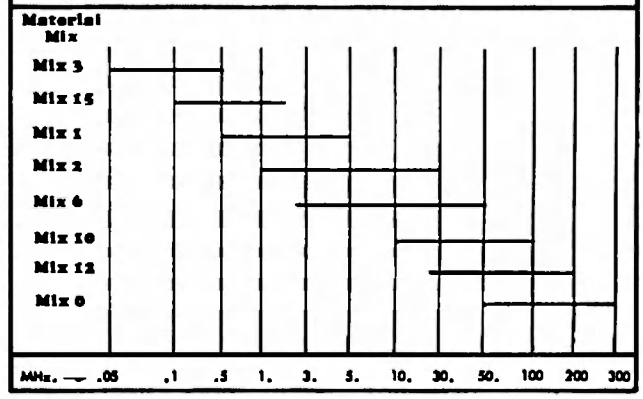
Toroidal cores, in general, are the most efficient of any core configuration. They are highly self-shielding since most of the flux lines are contained within the toroidal form. The flux lines are essentially uniform over the entire magnetic path length and consequently stay magnetic fields will have very little effect on a toroidal inductor. It is seldom necessary to shield or isolate a toroidal inductor to prevent feedback or cross-talk. Toroidal inductors simply do not like to talk to each other.

The number of turns required for a specific inductance may be calculated by using the Al value for the selected core and the formula at the botom of the HOW TO ORDER chart.

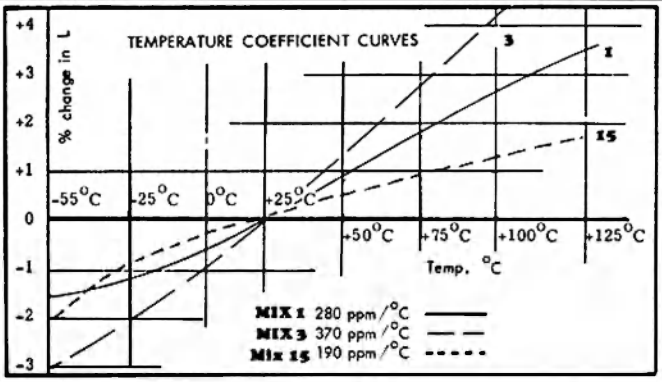


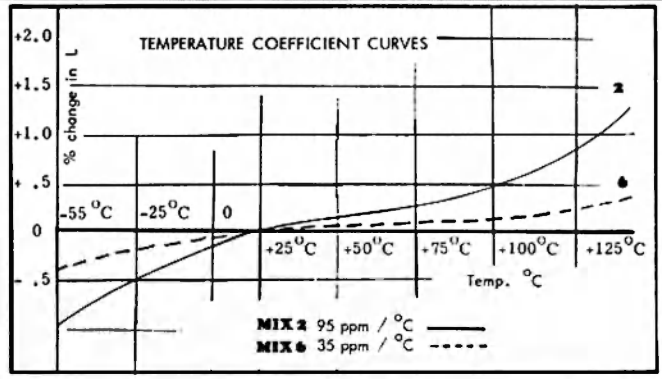
IRON—POWDER MATERIAL vs. FREQUENCY RANGE

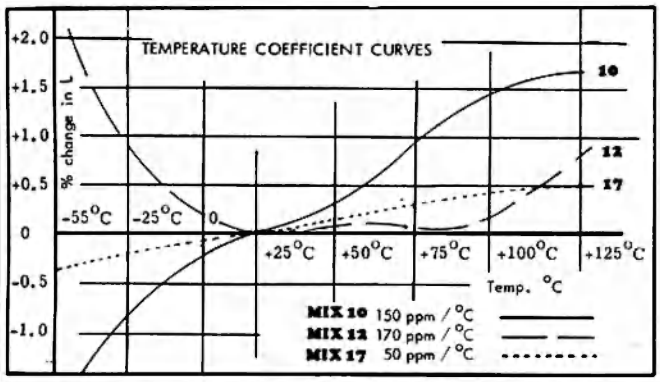
For best 'Q', Select larger cores from the lower portion of the material range, and the smaller cores from the upper portion of the frequency range.

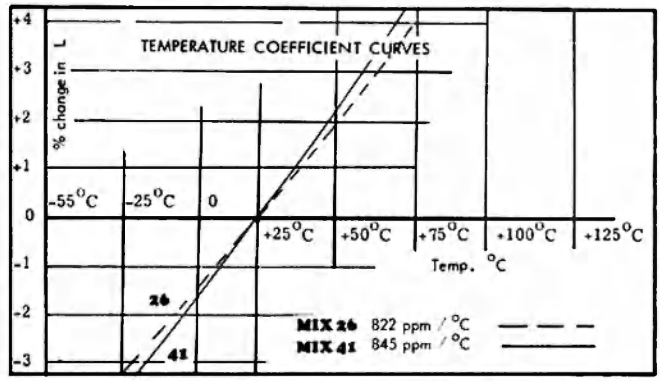


Temperature Coefficient Charts for Iron-Power Toroidal Cores









AMiDON Ferrite Toroidal Cores for Resonant Circuits and Power Applications

MATERIALS

Mix 68 (20 permeability) A Nickel-Zinc material having high resistivity and excellent temperature stability. High 'Q' for the frequency range 80 MHz to 180 MHz. Used for high frequency inductors, antennas and wide-band amplifiers, as well well as liner power amplifiers.

Mix 63 (40 permeability) A nickel-Zinc ferrite material having low permeability and high volume resistivity. A high 'Q' material for the frequency range 15 MHz to 25 MHz. Used extensively in toroidal form for high 'Q' inductors.

Mix 67 (40 permeability) A nickel-Zinc material very similar to the **mix 63** material. It has good temperature stability, a higher saturation flux density than **mix 63** material, and a somewhat lower volume resistivity. Very usefull for high 'Q' applications from 10 to 80 MHz. Very much in demand for wide-band linear power amplifiers from 50 to 500 MHz.

Mix 61 (125 permeability) A nickel-Zinc material which offers moderate temperature stability and high 'Q' for the 0.2 to 15 MHz frequency range. Also commonly used for wide-band transformers up to 299 MHz.

Mix 43 (850 permeability) A Nickel-Zinc ferrite material having high volume resistivity. Widely used for medium frequency toroidal inductors and wide band transformers up to 50 MHz.

Mix 77 (2000 permeability) A Manganese-Zinc material. High saturation flux density at high temperatures. Low core losses in the 1 KHz to 1 MHz frequency range. Ideally suited for power conversion transformers, wide-band transformers up to 30 MHz, and high flux density noise suppression applications in the 2 to 40 MHz region.

Mix 72 (2000 permeability) A Manganese material. Has low volume resistivity. A high 'Q' product for low frequencies. Has good saturation properties. Widely used in toroidal form for high 'Q' inductors from 1 KHz to 500 KHz.

Mix F (3000 permeability) A Manganese Zinc ferrite material similar to the **mix 77** material yet haveing a somewhat higher initial permeability. High saturation flux density at high temperatures. Usefull for power conversion transformers. Available in the larger toroidal configurations.

Mix 75 (5000 permeability) A Manganese-Zinc ferrite material haveing low volume resistivity and low core losses from 1 KHz to 1 MHz. Used for low level power conversion transformers, wide-band transformers and pulse transformers.

Mix J (5000 permeability) A Manganese-Zinc ferrite materal similar to the **mix 75** material. Commonly used for both power conversion transformers and common-mode line filter balums. Available in the larger toroidal configurations.

AMIDON Associates, INC.

Physical Dimensions — Ferrite Toroidal Cores

CORE SIZE	Outer Diam. (mm)	Inner Diam. (mm)	Height H (mm)	Mean Path L (cm)	Cross Sect. A (cm²)	Volume V (cm³)
FT23	5.85	3.05	1.53	1.34	0.021	0.029
FT37	9.53	4.75	3.18	2.15	0.076	0.163
FT50	12.70	7.14	4.78	3.02	0.133	0.401
FT50A	12.70	7.93	6.35	3.68	0.152	0.559
FT50B	12.70	7.93	12.70	3.18	0.303	0.964
FT62	20.96	13.11	6.35	5.26	0.246	1.29
FT87A	22.10	13.72	12.70	5.42	0.522	NA
FT114	29.01	19.05	7.50	7.42	0.375	2.79
FT114F-J	29.01	7.50	7.50	7.32	0.369	NA
FT114A	29.01	19.01	13.85	7.42	0.69	5.13
FT140	35.56	22.86	12.70	9.02	0.806	7.28
FT150	38.10	19.05	6.35	8.30	0.561	NA
FT150A	38.10	19.05	12.70	6.30	1.11	NA
FT193	49.03	31.75	15.88	12.31	1.19	NA
FT193A	49.03	31.75	19.05	12.31	1.19	NA
FT240	60.96	35.56	12.70	14.80	1.61	23.90

FERRITE MAGNETIC PROPERTIES

PROPERTY	Mix 68	Mix 63	Mix 67	Mix 61	Mix 43	Mix 77	Mix 72	Mix F	Mix 75	Mix J
Permeability (μ)	20	40	40	125	850	1800	2000	3000	5000	5000
Saturation Flux (Gauss)	2000	1650	3000	2350	2750	4600	3500	4700	3900	4300
Curie Temp. °C	500	450	500	350	130	200	150	250	160	140
Temp.Coef. % / °C	0.06	0.10	0.13	0.15	1.0	0.60	0.60	0.60	0.90	0.90
Tuned Circuit Frequency (MHZ)	80-180	15-25	10-80	0.2-10	0.01-1	0.001-1	0.001-1	0.001-1	0.001-1	0.001-1
Wide-Band Frequency (MHz)	200-1000	25-200	50-500	10-200	1-50	0.5-30	0.5-30	0.5-30	0.2-15	0.2-15

HOW TO ORDER —

CORE SIZE	MIX 68 μ = 20	MIX 63 μ = 40	MIX 67 μ = 40	MIX 61 μ = 125	MIX 43 μ = 850	MIX 77 μ = 1800	MIX 72 μ = 2000	MIX F μ = 3000	MIX 75 μ = 5000	MIX J μ = 5000
FT-23	FC450 *Al 40*	FC451 *Al 79*	FC452 *Al 79*	FC453 *Al 248*	FC454 *Al 188*	FC455 *Al 396*	FC456 *Al 396*		FC457 *Al 990*	
FT-37	FC458 *Al 88*	FC459 *Al 177*	FC460 *Al 177*	FC461 *Al 553*	FC462 *Al 420*	FC463 *Al 884*	FC464 *Al 884*		*Al 2210*	
FT-50	FC465 *Al 1100*	FC466 *Al 2200*	FC467 *Al 2200*	FC468 *Al 6800*	FC469 *Al 523*	FC470 *Al 1100*	FC471 *Al 1100*		FC472 *Al 2750*	
FT-50A	FC473 *Al 1200*	FC474 *Al 2400*	FC475 *Al 2400*	FC476 *Al 7500*	FC477 *Al 570*	FC478 *Al 1200*	FC479 *Al 1200*		FC480 *Al 2990*	
FT-50B		FC481 *Al 4800*	FC482 *Al 4800*	FC483 *Al 15000*	FC484 *Al 1140*	FC485 *Al 2400*	FC486 *Al 2400*			
FT-82	FC487 *Al 1170*	FC488 *Al 2240*	FC489 *Al 2240*	FC490 *Al 7330*	FC491 *Al 557*	FC492 *Al 1170*	FC493 *Al 1170*		FC494 *Al 2930*	
FT-87A								FC495 *Al 3620*		FC496 *Al 6040*
FT-114	FC497 *Al 1270*	FC498 *Al 2540*	FC499 *Al 2540*	FC500 *Al 7930*	FC501 *Al 603*	FC502 *Al 1270*	FC503 *Al 1270*	FC504 *Al 1900*	FC505 *Al 3170*	FC506 *Al 3170*
FT-114A				FC507 *Al 146*			FC508 *Al 2340*			
FT-140			FC562 *Al 4500*	FC563 *Al 140*	FC564 *Al 952*	FC565 *Al 2340*	FC566 *Al 2340*			
FT-150								FC509 *Al 2640*		FC510 *Al 4400*
FT-150A								FC511 *Al 5020*		FC512 *Al 8370*
FT-193										FC514 *Al 6065*
FT-193A								FC513 *Al 4460*		
FT-240		FC515 *Al 5300*		FC516 *Al 173*	FC517 *Al 1240*	*Al 2740*	*Al 2740*			

Number shown in reverse STEWART stock number. —always order by this number only—

To obtain AMIDONpart number add mix number to core size I.e. FT23-72

***Al* value shown under stock number (mH / 1000 turns)**

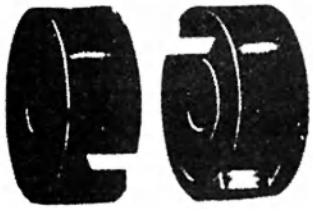
AMIDON Ferrite Pot Cores

AMIDON Associates Inc.

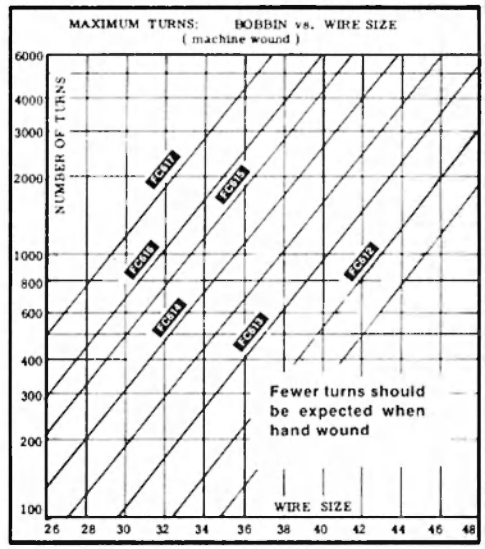
The Pot Cores listed here are of the #77 Manganese-Zinc Ferrite material which has a permeability of 2000. This material has a high saturation flux density at high temperatures. Core losses are very low in the 1KHz to 1MHz frequency range. For further specifications of #77 material see the AMIDON "Iron Powder and Ferrite data book" which can be ordered form Stewart Electronics.

Here are some of the advantages Pot Cores can offer — (1) A large amount of inductance can be obtained with a relatively small core size. (2) They are completely self-shielding which will eliminate all interference from adjacent RF fields. (3) Pot cores are very easily and speedily wound, thereby reducing assembly time to a minimum.

The pot core assembly is supplied complete with two Pot Core halves — a nylon mounting bolt — and a single section bobbin.

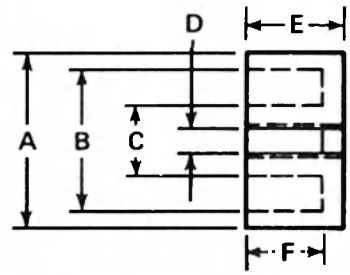


$$\text{Turns} = \sqrt{\frac{\text{desired L (mh)}}{A_l \text{ (mh/1000t}}} \times 1000$$

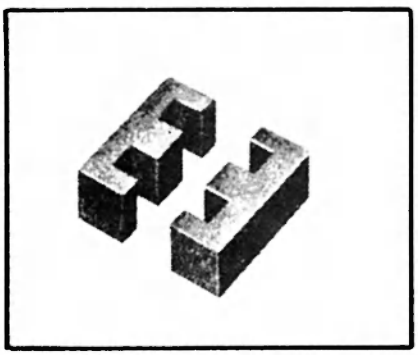


All "Pot Cores" are supplied as a kit of " Two Halves, one Coil Former and a Nylon nut and bolt for mounting"

STOCK No.	AMIDON No.	Physical Dimensions (mm)						Mag Properties		
		A	B	C	D	E	F	l_e(mm)	A_e(mm)²	$A_l$mh/1000t
FC612	PC-1107-77	11.10	9.20	4.60	2.10	3.12	2.27	15.9	15.9	1420
FC613	PC-1408-77	14.05	11.80	5.90	3.10	4.18	2.90	20.00	25.00	1960
FC614	PC-2213-77	21.60	18.70	9.25	4.55	6.70	4.70	31.60	63.00	3660
FC615	PC-2616-77	25.50	21.60	11.30	5.55	8.05	5.60	37.20	93.00	4700
FC616	PC-3019-77	30.00	25.40	13.30	5.55	9.40	6.60	45.00	136.00	5900
FC617	PC-3622-77	35.60	30.40	15.90	5.55	10.85	7.40	52.00	202.00	7680



AMIDON Ferrite 'E' Cores



AMIDON Associates Inc.

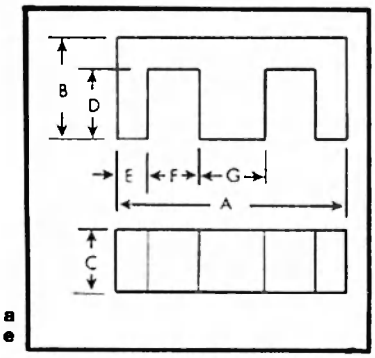
Type 77 Ferrite Material
Permeability 2000

These cores are ideally suited for low power applications up to 200 watts.

Cores are supplied as a kit comprising —: two core halves and a nylon bobbin for easy winding.

For more complete data on type '77' ferrite material see AMIDON "Iron-Powder and Ferrite Coil Forms" data book which may be ordered from Stewart Electronics.

All "E" cores are supplied as a kit of "Two E cores and one Coil Former"



STOCK No.	AMIDON No.	E-Core Physical Dimensions (mm)							
		A	B	C	D	E	F	G	Power
FC618	EA-77-188	19.3	8.10	4.75	5.72	2.38	4.89	4.76	10 watts
FC619	EA-77-250	25.4	10.00	6.35	6.48	3.18	6.35	6.35	20 watts
FC620	EA-77-375	35.00	14.28	9.53	9.53	4.75	7.93	9.53	70 watts
FC621	EA-77-500	41.28	16.51	12.70	10.29	6.35	7.93	12.70	100 watts
FC622	EA-77-625	42.68	20.96	15.37	15.07	5.85	9.53	11.69	200 watts

$$\text{Turns} = \sqrt{\frac{\text{desired L (mh)}}{A_l \text{ (mh/1000t}}} \times 1000$$

STOCK No.	E-Core Magnetic Properties						
	A_e (mm)²	l_e mm	V_e (mm)³	A_e (mm)²	A_w (mm)²	$A_c \times A_w$ (mm)⁴	A_l value mh/1000t
FC618	22.50	40.10	900	1050	55.70	1250	1290
FC619	40.40	46.00	1930	1700	60.60	325	1520
FC620	90.30	68.80	6240	3830	151.00	13,700	2540
FC621	160.00	76.70	12,300	5410	163.00	26,100	4090
FC622	184.00	96.00	18,000	7500	267.00	52,900	5210

MAGNETIC PROPERTIES of #77 MATERIAL

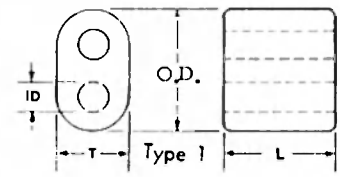
Initial permeability (U_o) = 2000 typical
Curie temperature (T_c) = 200° C
Saturation flux density (B_g) = 4600 gauss @ 10 oer.
Amplitude permeability —
4500 @ 2000 gauss, room temperature
7000 @ 1000 gauss, 125°C
Core Losses: 12mW/cm³ @ 1000 gauss, 10KHz

AMIDON Ferrite Balun and Wide-Band Transformer Cores

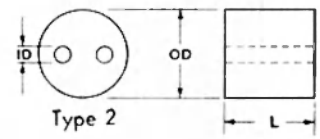
This extended range of 2 hole balun and wide-band transformer cores are suitable for a range of applications in communications, television, data transmission, instrumentation and similar areas.
Whilst toroidal cores can be used for wide-band applications these 2 hole cores will provide higher inductance-per-turn with lower leakage inductance and lower distributed capacitance, thus over-coming two of the major causes of lack of bandwidth when using other core styles.
These materials are offered to cover a large frequency range with a large range of sizes for applications from very low power up to cores suitable for 1 kW use at HF frequencies.
These cores are also suitable for matching transformers in broad-band HF power amplifiers. The primary concern when designing a wide-band transformer is to extend the band-width with minimum loss. The factors which limit the band-width are inductive reactance and core loss which will limit operation at the lower frequencies, also leakage inductance and distributed capacitance which will limit operation at the higher frequencies.
The 2 hole balun may wound through both holes or through one hole and around the outside. Winding through both holes will produce a higher inductance per turn. Ferrite toroides and ferrite beads may also be used for winding wide-band transformers, however these configurations will produce a narrower band-width than the 2 hole balum core.

F Range	MIX 43 20—80MHz	MIX 61 > 50MHz	MIX 73 < 30MHz	Dimensions (mm) OD	ID	L	T	Drawing
Core Size BN-*-202	FC580 *Al 2890*	FC581 *Al 425*	FC 582 *Al 8500*	13.34	3.81	13.97	7.5	A
BN-*-1702		FC584 *Al 420*		6.35	1.27	11.94	NA	B
BN-*-1802		FC583 *Al 310*		6.35	1.27	6.10	NA	B
BN-*-2302	FC585 *Al 680*	FC586 *Al 100*		3.46	0.89	6.10	2.04	A
BN-*-2402	FC587 *Al 1275*	FC588 *Al 150*	FC589 *Al 3750*	7.12	1.78	6.10	4.07	A
BN-*-3312	FC590 *Al 5400*			19.44	4.75	25.40	9.53	A
BN-*-7051	FC591 *Al 6000*			28.71	6.35	28.71	14.23	B

No. shown in Reverse is STEWART stock number — please order by this number only —
To obtain AMIDON part number ; add mix number to core size number in place of * i.e. BN-43-202
***Al* values are (mH / per 1000turn)**



Drawing 'A'



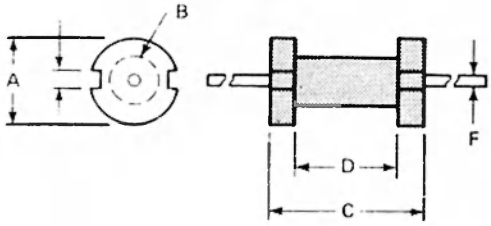
Drawing 'B'

AMIDON Ferrite Bobbin Cores

Ferrite bobbins provide a convenient means of winding RF chokes. Because of there open magnetic path, they can handle more current than toroids of a similar size. To aid in the design of such chokes, we have provided A_l values, a winding tableand ampere-turn ratings for each bobbin.

Size *AMIDON Number*	Mix # number	Stock No.	Al mH/1000 turns	NI Ampere/ turns	F number (AWG)	Dimensions (mm) A	B	C	D
B-72-1111	72	FC592	17	60	#22	4.98	2.72	12.70	10.16
B-72-1011	72	FC593	39	130	#22	9.45	4.75	19.05	12.70

AMIDON Associates



Winding table: number of turns to completely fill bobbin.									
wire size	20	22	24	26	28	30	32	34	36
FC592	9	14	23	35	56	88	164	205	400
wire size	20	22	24	26	28	30	32	34	36
FC593	24	39	60	93	148	230	425	535	1050

FC592 # B-72-1111 A_L = 17 NI = 60

Inductance	wire turns	wire size	I (max)
10 uh	24	24	2.50
25 uh	38	26	1.60
50 uh	54	28	1.10
100 uh	77	30	.78
250 uh	121	31	.50
500 uh	171	32	.35
1.0 mh	243	34	.25
2.5 mh	383	36	.16
5.0 mh	542	37	.11
10.0 mh	762	38	.08

FC593 # B-72-1011 A_L = 39 NI = 130

Inductance	wire turns	wire size	I (max)
25 uh	25	20	5.20
50 uh	36	22	3.60
100 uh	50	24	2.60
250 uh	80	26	1.60
500 uh	113	27	1.10
1.0 mh	160	28	.80
2.5 mh	253	30	.50
5.0 mh	358	32	.36
10.0 mh	506	34	.25
25.0 mh	800	36	.16

Mix 43 material (850 permeability) is a NICKEL—ZINC ferrite material haveing high volume resistivity. Widely used for medium frequency inductors and wide band transformers up to 50MHz. Extensively used in the shielding bead form for the suppression of unwanted RF signals from 50MHz to 200MHz.

Mix 61 a NICKEL—ZINC (125 permeability) which offers moderate temperature stability and high 'Q' for the 0.2MHZ to 15MHz frequency range. Primarily use in toroidal form for high 'Q' inductors. Also stocked in cores for wide-band balum use.

Mix 72 (2000 permeability) a MANGANESE—ZINC material haveing a low volume resistivity. A high 'Q' product for low frequencies. Has good saturation properties. Widely used in the toroidal form for high 'Q' inductors from 1KHz to 500KHz.

Mix 73 (2500 permeability) MANGANESE—ZINC ferrite material haveing low volume resistivity. Frequency range from 1KHz to 1MHz, but for shielded bead applications offers high impedance to frequencies from 5MHZ to 50MHz. Widely used for wide-band and shielded shielded bead applications. Also stocked in shielded-bead form and balum core configuration.

AMIDON Multi-Hole Ferrite Beads

A Ferrite Bead is a small 'dowel-like' device composed of ferromagnetic material. It has a center hole (also 2 & 6 hole) and when slipped on to a current carrying conductor it will act as a tiny RF choke. Ferrite Beads are available in many sizes and also several different types of ferromagnetic materials. This device offers a simple, convenient, inexpensive and yet a very effective means of RF shielding, RF decoupling and parasitic suppression.

The most common noise generating suspects in high frequency circuits are power supply leads, ground leads connections and connections and interstage connections. Adjacent leads and unshielded conductors can also provide a convenient path for the transfer of energy from one circuit to another. A few Ferrite Beads of the appropriat material placed on these leads can greatly diminish, or completely eliminate the unwanted noise frequencies. Best of all Ferrite Beads can be added to most any existing electronic circuit.

The Ferrite Bead offers very little, or no impedance to the lower frequencies and to DC. At the higher frequencies the permeability and losses of the Ferrite material will vary with frequency. As the frequency increases the permeability will decline, while the (desired) losses will rise to a peak. With a rise in frequency the bead will presend a series resistance with very little reactance. Since the resistance is a function of the losses in the material, it truly is a dissapative device. Futher more, since the reactance is very low there is little chance of resonance which could destroy the suppression effect.

Depedance is directly proportional to the length of the bead, therefore the impedance can be increased either by using a longer bead, or by stringing several beads on the conductor. Since the magnetic field is totally contained within, it does not matter whether the beads are touching or seperated.

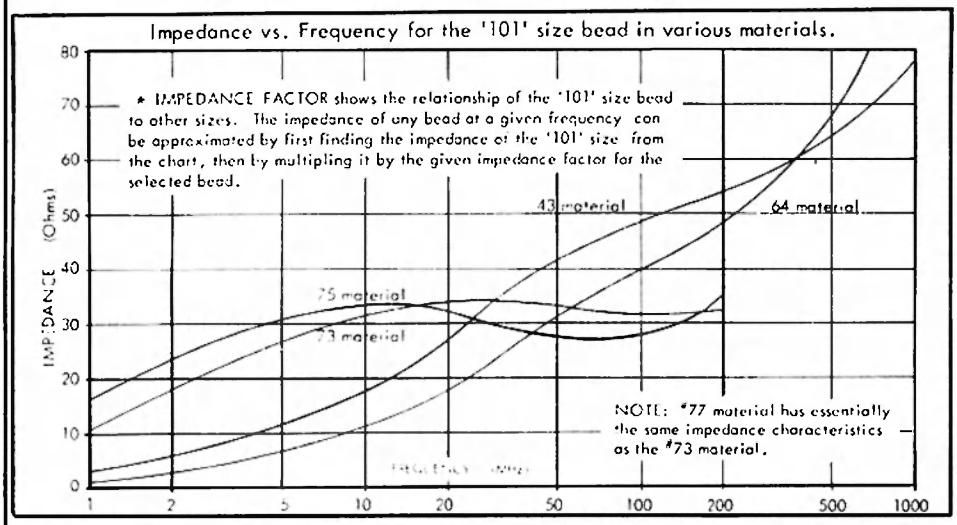
They do not have to be grounded and they cannot be detuned by external magnetic fields. Impedance can also be increased with multiple turns through a single bead.

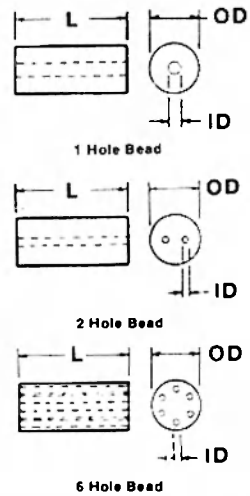
The impedance will be proportional to the numberof turns squared, since the attenuation is a function of both the bead impedance and the circuit impedance, the bead will be most effective in low impedance circuits.

Fairly high current can be tolerated before saturation begins to occur. If saturation does occur, the impedance will drop to a very pow level and the bead will become in-effictive as a noise suppression device. Once the cause of saturation has been removed, the bead will return to normal operation with no ill effects.

Temperature rise above the the Curie point will cause the bead to become non-magnetic, rendering it useless as a noise supressing device. As soon as the cause of the temperature rise has been corrected, and the bead has been allowed to cool, normal operation will be regained. A Ferrite Bead can tolerate several hundered degres of temperature rise with out per menant damage.

Ferrite Beads composed of the **mix 73** or **mix 75** material are semi-conductive and care should be taken not to position them in such a maner that they would be able to short un-insulated leads together or to ground. Most other materials with higher resistivity are non-conductive and this precaution is not necessary.

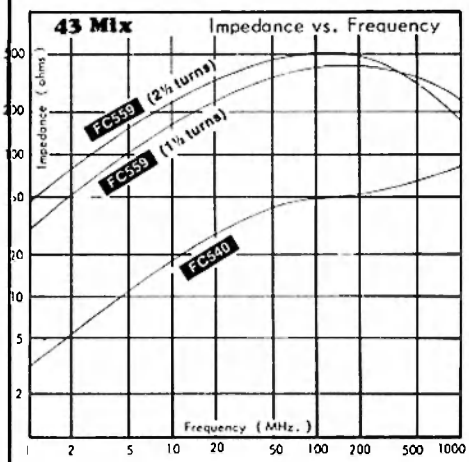


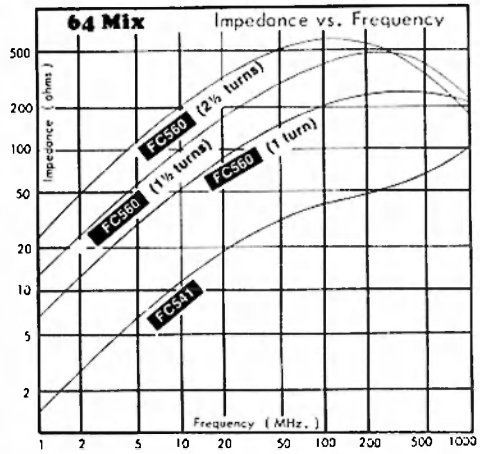


	MIX 43	MIX 64	MIX 73	MIX 75	MIX 77		Dimensions (mm)		
Ur	*850*	*250*	*250*	*500*	*2000*				
Rv (ohms-cm)	*10(5)*	*10(8)*	*10(2)*	*10(2)*	*10(3)*	Impedance			
F (MHz)	*30—600MHz*	*0.2—2GHz*	*10—50MHz*	*5—15MHz*	*10—50MHz*	Factor	OD	ID	L
Single Hole Beads —									
Core Size FB-101	FC540 *Al 510*	FC541 *Al 150*	FC542 *Al 1500*	FC543 *Al 3000*		1.00	3.15	1.3	3.00
FB-201	FC544 *Al 360*	FC545 *Al 110*	FC546 *Al 1100*			0.7	1.93	1.10	3.81
FB-801	FC547 *Al 1300*	FC548 *Al 390*	FC549 *Al 3900*			2.2	7.52	2.39	7.55
FB-1801	FC550 *Al 2000*		FC551 *Al 5900*			4.0	5.08	1.58	11.10
FB-2401	FC576 *Al 520*					1.1	9.66	5.01	4.83
FB-5621	FC552 *Al 3800*				FC553 *Al 9600*	7.0	14.28	6.35	28.58
FB-6301	FC554 *Al 1100*				FC555 *Al 2600*	2.2	9.53	4.93	10.42
FB-1020	FC556 *Al 3210*					6.3	25.4	12.70	28.45
FB-1024					FC557 *Al 5590*	4.6	25.4	12.70	20.96
Two Hole Choke Bead —									
FB-901		FC561				NA	6.35	2x1.27	10.60
Six Hole Choke Bead —									
FB-5111	FC559	FC560				NA	6.00	6x0.82	10.01

No. shown in [ ] is STEWART stock number — please order by this number only —
***Ui* — Initial Permeability : *Rv* — Volume Resistivity (ohms-cm) : *F* — Frequency Range (MHz)**
To obtain AMIDON part number ; add mix number to core size number i.e. FB-201 43
***Al* values are (nanohenerles / turn ²)**

AMIDON Multi-Hole Ferrite Beads con't





For 2 hole and 6 hole chokes using the generally accepted winding patterns we have included the two graphs above of impedance versus frequency. To allow a comparison these curves also show the values for the **FB 101** size bead in the same materials. The winding of the Stock number **FC 561** two hole core is a single horse-shoe utilising both holes.

Pre-wound chokes of 2½ turns turns are available as detailed below.

1½ turns

2½ turns

When wire is wound onto a toroidal core, or a single-hole bead, the number of turns is identified by the number of times the conductor passes through the center hole. Because of its geometry, all wire-turns must be completed around the outside of the core or the bead.

On the previous page we have given both the *Al* and *Z* factors for single hole beads. The *Al*—value is proportional to the *Z*—factor and the permeability of the bead. The *Z*—factor is directly proportional to the ratio of the effective cross-sectional area and the mean magnetic path length. (A_e / l_e)

The above values are easily determined for toroidal cores and single-hole beads, but when a multi-hole bead is involved these values depend upon the exact winding pattern. Therefore it is impractical to provide this data without clearly identifying the type of winding.

For example a 6 hole bead is wound progressively from hole to hole in either a clockwise or a counter-clockwise direction, the result will be considerably different than if it were wound in a criss-wise fashion as shown below. Again the result will be significantly different if each wire-turn should be completed around the outside of the bead, rather than through another hole.

The industry has standardized on the 1½ and 2½ turn criss-cross winding for the 6 hole bead as shown below. Curves for both these windings are shown at the left. Pre-wound 6 hole beads are available as shown below. All the data shown is based on the accepted winding patterns shown. From the charts notice that an extra wire-turn is very effective at the lower frequencies, but the higher frequencies tend to "roll-off" due to the increased capacity of the extra turn. The curve for the **FC561** 2 hole bead is based on a "horseshoe-like" single turn utilizing both holes.

Wide Band HF Chokes (prewound)

Ferroxcube wide-band chokes offer even better performance than do shielding beads for a given space, as Figure 6 below indicates. Above 60 megacycles, the impedance is substantially resistive, and constant. The chokes consist of rod-type bodies with axial holes through which wire is threaded to form a 1½-or-2½-turn coil. The chokes may be used in conjunction with small ceramic capacitors in "damping" circuits to provide additional rejection at the self-resonant frequency of the capacitor. (see fig 7 below)

Damping is defined as

$$20 \log_{10} \frac{V_1}{V_2} = 20 \log_{10} \omega C Z_\omega \quad \text{where } Z_\omega \gg \frac{1}{\omega C} \text{ and } R_L \gg \frac{1}{\omega C}$$

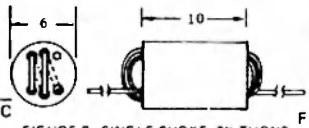


FIGURE 8. SINGLE CHOKE. 2½ TURNS

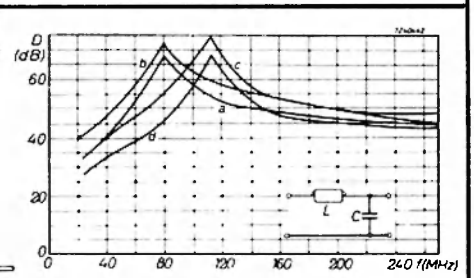
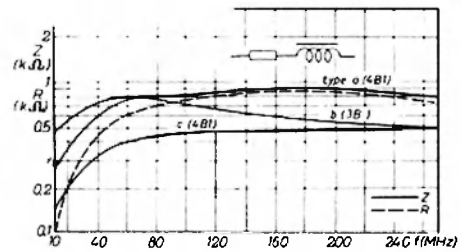


Fig. 7 Damping in an LC circuit consisting of a Ferroxcube choke and a ceramic disc capacitor.

b. L = 4312 020 36700, C = 1500 pF
c. L = 4312 020 36700, C = 550 pF

Compared with the conventional air-core suppressor chokes, a ferrite choke offers an extremely wide operating bandwidth, avoiding the sharp fall-off in impedance with slight detuning, and the vulnerability to detuning by variations in stray circuit capacitance, inherent in the wire-wound choke; the need for a parallel resistor to damp out spurious resonances is avoided as well.

STOCK No.	Philips Number	MATERIAL Grade	# of Turns	Z max K ohms	f at Zmax	Decrease of impedance in Frequency Range	
FC98	4312 020 36700	4B1	2½	0.7	180mHz	50 - 300mHz 80 - 220mHz	6dB 3dB



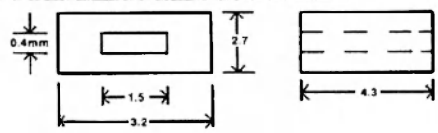
6 Performance of three single chokes.

Figure 6 shows some performance details of three single chokes. It will be noted that above approx. 80 MHz the impedance is substantially resistive and tends to be constant. Double chokes are used for twin leads, in which case the advantages of mutual inductance can be utilized. Figure 7 compares the typical obtainable performance.

Amidon Surface Mount Ferrite Bead Choke

43 Mix Actual Size

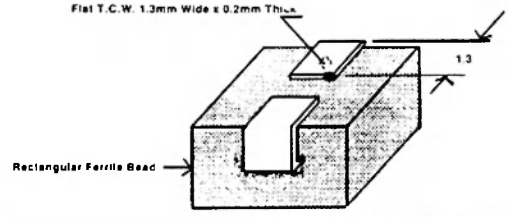
AMIDON Associates



For compactness and ease of handling wherever a head type choke is called for the **STOCK NO. FC627** Surface Mount Ferrite Bead Choke is the answer. Its compact size makes it ideal for modern compact circuitry and its conventional head construction make it far cheaper than chip inductors with the added benefit of superior high frequency performance.

Applications for which the **FC627** has been succesfully used include DC feed chokes for MOSFET bias and MMIC amplifier supplies, bias chokes for UHF microwave amplifiers, noise suppression on computer PCB's and it is potentially usefull wherever a ferrite bead would be used.

Typical Impedance is 42 ohms at 100MHz (measured on a HP 4191A RF Impedance Analyzer



AMIDON R.F.I. Suppression Ferrites

On this page we have listed a range of Ferrite Beads, Ferrite Toroidal Cores, Split Ferrite Beads and Split Ferrite Bars, all of which are extensively used for RFI problems. Most of these items are also listed elsewhere in this catalogue.

The large Ferrite Beads and Toroidal Cores can be used to reduce RF some-times found on the outer shield of coaxial cable and microphone cables. Also they are of considerable value for the suppression of unwanted RF in unshielded wire bundles, speaker leads, AC wireing leads, etc.

In many applications only one pass of the wire through the core will provide sufficient attenuation of the unwanted RF although in other cases, such as AC leads, multiple turns will be necessary.

Split Ferrite Beads are now available for use on computer ribbon-cable. Because of the two section feature of these bars, they can easily be applied to a bibbon-cable without removing the end plug.

Ferrite Toriodal Cores, Ferrite Beads and Ferrite Split Cores can be very usefull in the suppression of unwanted RFI but they are not a cure-all. There are several types of noise and the methods used to help combat them are quite different.

In some cases it is difficult to determine the spectral content of the noise, in equipment such as computers, diathermy, flashing signs, etc. square waves are common and much of the energy is in the very high frequency ranges. For these applications material **Mix 43** is generally the most suitable.

For interference in the range up to 30MHz the material **Mix 72** is generally the most effective, however in some applications below 1MHz material **Mix 75** (see Ferrite Toroid page) may be more suitable. With **Mix 72** cores, use a maximum of 15 turns for most effective results. Reduce the number of turns as the frequencies increase.

Material **Mix 43** will generally provide best results in the range 30MHz to 100MHz.

We suggest you try 5 - 9 turns as a starting point in this range. Above 100MHz **Mix 43** is probably still the best. Above 200MHz we suggest you use only one turn. Several suppression chokes may be used in cascade to increase suppression at any given range of frequencies or to provide broader coverage.

When computers are the offenders generating the noise a variety of possible solutions offer themselves. The power cord can be wound several times through an **FC517** core to prevent noise travelling down the power lines. Terminal cables etc can be fed through a standard bead or a Split Bead clamped around them. Ribbon cables may be fed through the new Split Slab materials designed specifically for that application.

But remember that although use of ferromagnetic materials to suppress noise can be very effective if your equipment or computer has ineffective shielding, all these efforts may be in vain.

It should be noted that Ferrite Cores will **NOT** be effective in suppressing ignition noise or noise from light dimmers. Light dimmers seem to respond best to individual filtering of power lines with high-saturation materials such as **Mix 26** Iron Power Material.

Pi Section EMI Filters

Ceramic πFilters are chosen to suppress undesired **EMI** in those applications where space is limited and small size is critical. Popular applications include telecommunications, CATV, telemetry, radar and other transmission equipment.

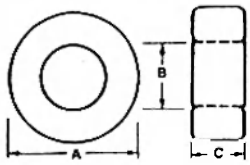
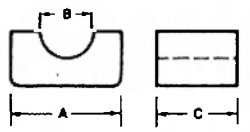
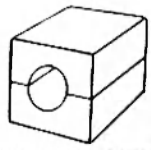
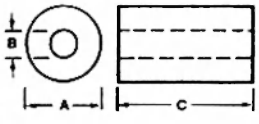
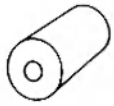
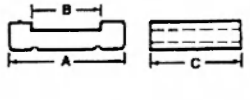
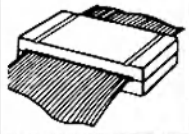
Dielectric Withstand Voltage two times the DC working voltage applied between either terminal and case ; **Insulation Resistance** Measured at 25°C ± 2°C with 100VDC and charging current limited to 50mA max. The IR after 2 minutes max. shall be a minimum of 10,000 mΩ. **Insertion Loss** Listed is a measurement of filter performance in a matched 50Ω ft is recommended to verify performance under actual circuit conditions ; **Environmental Tests** filters meet all applicable environmantal requirements of MIL-F-15733 ; **Current Idc** 10 ampers

π FILTER

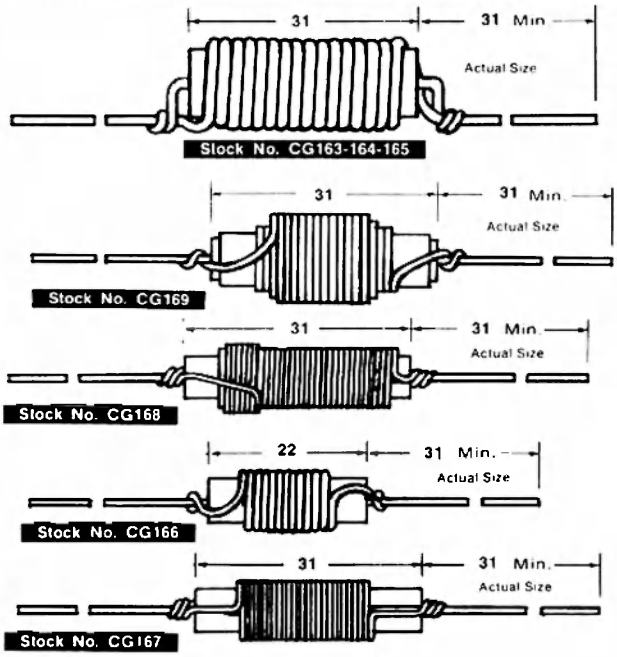
This range of feed-thru Capacitors with built in Ferrite beads forming a Pi-Section is listed in more detail in the resistor-capacitor section of this catalogue.

HOW TO ORDER

Stock No.	Min. Cap. (pF)	Working Voltage (WVDC) 85°C	125°C	Current Idc(A)	Minimum No load Insertion Loss (db) at 25°C per MIL-Std-220 10 MHz	100 MHz	1 GHz	10 GHz
CC01	1500	350	200	10	5	45	70	70
CC02	2500	250	125	10	5	50	60	60
CC03	3000	350	200	10	8	55	65	65
CC04	5000	350	200	10	5	45	70	70
CC05	5000	200	100	10	20	65	70	70

	STOCK No.	AMIDON No	MATERIAL Mix No.	DIMENSIONS (mm) A outer diam.	B inner diam.	C height	TYPICAL IMPEDANCE (ohms) for one pass of conductor through core For total 'Z' x by turns ² 25MHz	100MHz	
	FC501	FT-114-43	43	29.01	19.05	7.50	27	47	
	FC504	FT-114-72	72	29.01	19.05	7.50	35	29	
	FC564	FT-140-43	43	35.56	22.86	12.70	47	75	
	FC566	FT-140-72	72	35.56	22.86	12.70	62	50	
	FT517	FT-240-43	43	60.96	35.56	12.70	58	108	
	FC519	FT-240-72	72	60.96	35.56	12.70	76	66	
	FC523	2x-43-251	43	14.99	6.35	28.58	171	275	
	FC524	2x-43-151	43	25.91	12.70	28.58	159	245	
	FC484	FT-50B-43	43	12.70	7.93	12.7	56	90	
	FC486	FT-50B-72	72	12.70	7.93	12.70	74	60	
	FC516	FB-43-1020	43	25.40	12.70	28.45	155	235	
	FC557	FB-77-1024	77	25.40	12.70	20.96	166	135	
	FC552	FB-43-5621	43	14.26	6.35	28.58	171	250	
	FC553	FB-77-5621	77	14.26	6.35	28.58	270	215	
	FC554	FB-43-6301	43	9.53	4.93	10.42	55	48	
	FC555	FB-77-6301	77	8.53	4.93	10.42	73	59	
	FC625	2x-43-951	43	for 2" flat ribbon cable			105	285	
	FC626	2x-43-051	43	for 2.5" flat ribbon cable			90	250	

J.W.Miller HASH Chokes



J.W.Miller 52 Series axial leaded Hash chokes are a series of inductors designed for **RFI/EMI** suppression applications, but may also be used for SWITCH—MODE power (SMPS) Energy storage applications. Their conservative design and large size coupled within an open magnetic path makes them suitable for any design where high DC currents will be encountered. All 52 Series hash chokes are varnished impregnated.
Core Material CG163-164-165 Iron, CG166-167-168-169 Ferrite

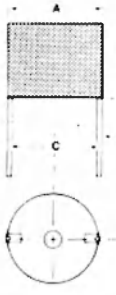
52 Series —

STOCK No	*Miller Number*	L ± 20%	R,dc Ohms MAX.	I,dc Amp. MAX	DIA. MAX.(mm)	WIRE SIZE
L measured on Q-meter at 7.90 MHz —						
CG163	*5218*	3.35 µH	0.01	20	15	AWG 12
CG164	*5219*	4.9 µH	0.018	15	15	AWG 14
CG165	*5220*	8.8 µH	0.021	10	14	AWG 16
CG166	*5230*	4.0 µH	0.012	8	10	AWG 20
L measured on 1 kHz bridge —						
CG167	*5240*	40 µH	0.082	3	8	AWG 20
CG168	*5250*	100 µH	0.218	2	10	AWG 20
CG169	*5254*	250 µH	0.17	2.5	11	AWG 20

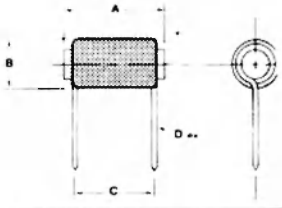
High-Flux-Density Ferrite Rods & Bobbins

J.W.Miller Series 5500/5600 high saturation density inductors for **RFI/EMI** filtering and energy storage inductors in Switching Power Supplies (SMPS) applications. With an open magnetic circuit they offer higher current densities than similar toroidal inductors but without the inherent shielding of toroidal construction. All series 5500/5600 inductors are covered with heat-shrink tubing and are varnish impregnated. Suitable for PCB mounting. — The inductance is measured at 1 kHz with no DC current applied. — Inductance change is typically 5% at twice maximun rated current. Leads are 25.40mm long and are tinned to within 3mm of the body.

Series 5600



Series 5500



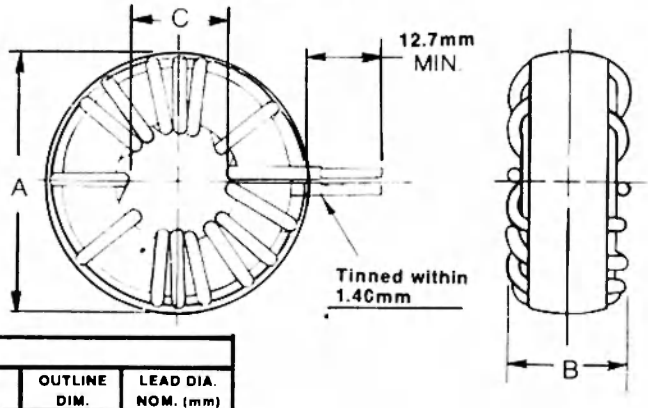
5500 Series — Ferrite Rod Style —

STOCK No	*Miller Number*	L ± 10%	SRF (Fo) MHz MIN.	R,dc Ohms MAX	I,dc Amp MAX	DIM. A	DIM. B	DIM. C	DIM D
	5501	5	32.4	0.013	10	22.35	16	12.7	1.06
	5502	10	21.6	0.017	9	28.50	16	17.5	
	5503	27	5.6	0.030	7	22.35	20.50	11.00	
	5504	50	3.44	0.045	5.6	28.5		19.05	
CG174	*5505*	100	2.08	0.081	4.9	28.5		24.00	
	5506	150	1.84	0.089	4.6	35.00		27.00	
	5507	250	1.1	0.089	4	41		32	
5600 Series — Ferrite Bobbin Style —									
	5601	5	24.7	0.007	15	21	23	15	1.65
	5602	10	11.4	0.008	14				
	5603	25	6.2	0.023	8			14.5	1.06
CG180	*5604*	50	4.1	0.034	6.6			16.5	
CG181	*5605*	100	2.4	0.072	4.5			17.5	
CG182	*5606*	250	1.6	0.173	2.9			16.5	

J.W.Miller 5700 Series High Current Toroid Inductors

Miller

J.W.Miller Series 5700 High current toroidal inductors have the advantage of providing inherent magnetic field containment in any **RFI/EMI** or as energy storage inductors in **Switch Mode Power Supply (SMPS)** applications. Unfortunately they are not able to offer the same current density or low inductance change as the open magnetic circuit types shown above. Care should be taken when designing with these inductors to allow for inductance variation with high current.
They are covered with heat-shrink tubing and are varnish impregnated.



5700 — Series — High Current Toroids —

STOCK No	*Miller Number*	L_o at 0 ADC µH · 15%	RATED DC Amps	DC Res. at RATED DC	MIN Ind.µ H Ohms MAX	DC Amp for 0.8 L_o	OUTLINE DIM.	LEAD DIA. NOM. (mm)
	5701	10	11.00	5	0.003	7.50	1	1.6
	5702	25	5.50	12	0.012	3.25	1	1.00
	5706	25	9.00	15	0.012	5.50	2	1.6
	5707	75	5.00	40	0.03	3.00	2	0.9
	5703	125	2.75	70	0.12	1.50	1	0.80
CG188	*5704*	275	2.00	150	0.24	1.30	1	0.40
CG189	*5708*	400	2.25	225	0.33	1.40	2	0.45
	5705	450	1.50	250	0.49	0.80	1	0.30
	5710	1000	1.50	575	0.98	0.90	2	0.30

OUTLINE DIM. (mm)	MAX. A	MAX. B	MIN. C
"1"	22	11	5
"2"	28	14	8

AMIDON L33 Series Shielded Coil Form Assemblies

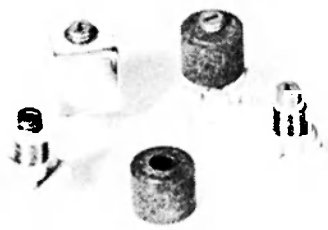
Sub-Miniature Adjustable Inductors easly Wound on Shielded Coil Form Assemblies.

The AMIDON L33 series tunes from both top and bottom and is supplied as a kit comprising — Shielding can (copper tin plated) - Cup core for magnetic shielding of same material as core for maximum efficiency at operating frequency - Core to provide adjustment of inductance - Nylon winding bobbin - Moulded plastic base with 5 contacts to accommodate centre tapped coil ON one winding only — Five pieces in all

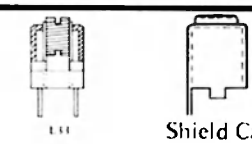
They are most efficient when tuning slug is set at maximum L For tuning flexibility calculate so that slug will be about 90% maximum L when at operating frequency

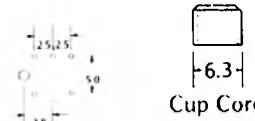
Solid magnet wire may be substituted for Litz wire, but somewhat lower Q may result

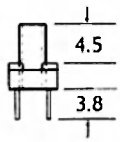
Frequency Range 10kHz to 200mHz Inductance Range 08 to 180uH



$$\text{Turns} = 100\sqrt{\frac{\text{desired 'L' (uh)}}{90\%\ A_L\ (\text{uh}/100\ \text{turns})}}$$







Actual Size

STOCK No.	AMIDON No.	Iron Grade & Colour Code	Frequency Range	A_L(μH/100t) at Max. L	L ratio Max. to Min.	Typical Winding (mid-freq.) Wire	Turns	LμH	Q Max.
FC600	L33-1	1 — Blue	300kHz - 1mHz	76	1.7 / 1	3/44	75	42.5	80
FC601	L33-2	2 — Red	1 - 10mHz	68	1.5 / 1	9/44	40	10 9	90
FC602	L33-3	3 — Gray	100 - 500kHz	80	1.8 / 1	3/44	150	180	70
FC603	L33-6	6 — Yellow	10 — 50mHz	60	1.5/1	26	7	0.36	100
FC604	L33-10	10 — Black	25 — 100mHz	54	1.4/1	26	5	0.18	120
FC605	L33-12	12 — Green	50 — 200mHz	48	1.3/1	26	3	0.08	130

AMIDON L43 Series Shielded Coil Form Assemblies

Miniature Adjustable Inductors easly Wound on Shielded Coil Form Assemblies.

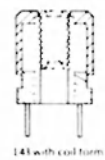
The AMIDON L43 series tunes from both top and bottom and is supplied as a kit comprising — Shielding can (copper tin plated) -Cup core for magnetic shielding of same material as core for maximum efficiency at operating frequency - Core to provide adjustment of inductance - Nylon winding bobbin -Moulded plastic base with 5 contacts to accommodate centre tapped coil ON one winding only — Five pieces in all

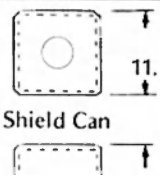
They are most efficient when tuning slug is set at maximum L For tuning flexibility calculate so that slug will be about 90% maximum L when at operating frequency

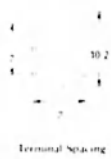
Solid magnet wire may be substituted for Litz wire, but somewhat lower 'Q' may result

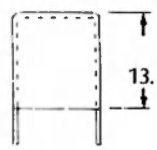
Frequency Range - 200kHz to 200mHz — Inductance Range 0 02 to 700 uH

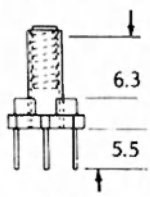
$$\text{Turns} = 100\sqrt{\frac{\text{desired 'L' (uh)}}{90\%\ A_L\ (\text{uh}/100\ \text{turns})}}$$

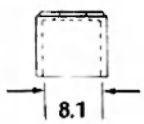












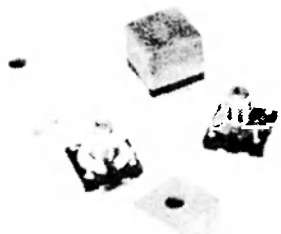
STOCK No.	AMIDON No.	Iron Grade & Colour Code	Frequency Range	A_L(μH/100t) at Max. L	L ratio Max. to Min.	Typical Winding (mid-freq.) Wire	Turns	LμH	Q Max.
FC594	L43-1	1 — Blue	300kHz - 1mHz	115	1.6/1	5/44	149	230	110
FC595	L43-2	2 — Red	1 - 10mHz	98	1.6/1	9 44	21	4	120
FC596	L43-3	3 — Gray	100 - 500kHz	133	1.8/1	3/44	223	600	90
FC597	L43-6	6 — Yellow	10 - 50mHz	85	1.4/1	26	6	.30	130
	L43-10	10 — Black	25 - 100mHz	72	1.3/1	24	5	0.14	150

AMIDON L57 Series Shielded Coil Form Assemblies

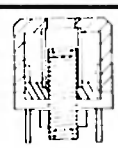
Adjustable Inductors easly Wound on Shielded Coil Form Assemblies.

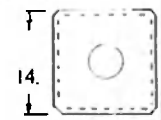
The AMIDON L57 series tunes from both top and bottom and is supplied as a kit comprising — Shielding can (copper tin plated) - Cup core for magnetic shielding of same material as core for maximum efficiency at operating frequency - Core to provide adjustment of inductance - Nylon winding bobbin -Moulded plastic base with 6 contacts to accommodate centre tapped coils — five pieces in all

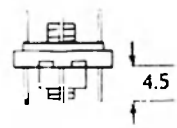
They are most efficient when tuning slug is set at maximum L For tuning flexibility calculate so that slug will be about 90% maximum L when at operating frequency

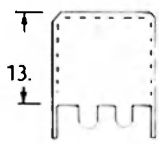


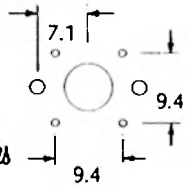
$$\text{Turns} = 100\sqrt{\frac{\text{desired 'L' (uh)}}{90\%\ A_L\ (\text{uh}/100\ \text{turns})}}$$

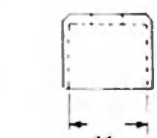


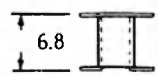






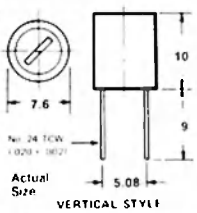






STOCK No.	AMIDON No.	Frequency Range	A_L (μ/100t) at Max. L	Iron Grade & Colour Code	Tuning Range
FC606	L57-1	300kHz - 1mHz	175μ½H	1 — Blue	3 / 1
FC607	L57-2	1 - 10mHz	125μH	2 — Red	2 / 1
FC608	L57-3	10 - 500kHz	204μH	3 — Gray	3 / 1
FC609	L57-6	10 - 50mHz	115μH	6 — Yellow	2 / 1
FC610	L57-10	25 - 100mHz	100μH	10 — Black	2 / 1
FC611	L57-12	50 - 150mHz	67μH	12 — Green	1.5 / 1

J.W.Miller Variable Inductors (RF Coils)



VERTICAL STYLE

Shielded — Adjustable — Inductors
Referance: MIL-C-15305
MS 21381, MS 21402

J.W.Miller VLS Series Variable Inductors Subminiature, shielded for high density circuits. PCB mounting on standard 0.1" (5.08mm) lead spacing. Leads are #20 TCW (0.5mm) tinned copper wire with a length of 9mm. Terminal pull strength of 1.3kG. **Tunable Range** CG200 & CG201 ± 5% — all other values ± 10% : **Q & Fo** Not less than 80% tabled value **L Nom** : **Working Voltage** 300 Vdc **Incerementat Current** to cause 5% inductance reduction maximun **Operating Temperature** —55°C to +125°C :

STOCK No.	MILLER No	L Nom. µH	TEST Freq MHz	Q Nom.	Fo Nom. HMZ	R,dc 25°C,Max Ohms	I,dc Max mA	Incr I,dc mA
CG200	VLSR10	0.1µH	25MHz	70	>250	0.03	2500	2500
CG201	VLSR12	0.12µH	25	70	>250	0.03	2500	2500
	VLSR15	0.15µH	25	70	>250	0.03	2500	2500
	VLSR18	0.18µH	25	70	>250	0.035	2400	2400
CG204	VLSR22	0.22µH	25	70	>250	0.038	2300	2300
	VLSR27	0.27µH	25	80	>250	0.04	2200	2200
	VLSR33	0.33µH	25	80	>250	0.04	2200	2200
CG207	VLSR39	0.39µH	25	80	250	0.045	2100	2100
	VLSR47	0.47µH	25	80	230	0.045	2100	2100
	VLSR56	0.56µH	25	80	220	0.05	2000	2000
CG210	VLSR60	0.68µH	25	80	190	0.055	1900	1900
CG211	VLSR82	0.82µH	25	85	180	0.06	1800	1800
CG212	VLS1R0	1.0µH	25	85	180	0.07	1700	1700
CG213	VLS1R2	1.2µH	7.9	90	170	0.085	16700	16700
CG214	VLS1R5	1.5µH	7.9	100	155	0.1	1540	1540
CG215	VLS1R8	1.8µH	7.9	115	135	0.11	1470	1470
CG216	VLS2R2	2.2µH	7.9	110	120	0.12	1410	1410
CG217	VLS2R7	2.7µH	7.9	110	104	0.125	1380	1380
CG218	VLS3R3	3.3µH	7.9	90	93	0.156	1200	1200
CG219	VLS3R9	3.9µH	7.9	90	87	0.18	1135	1135
CG220	VLS4R7	4.7µH	7.9	95	79	0.245	985	986
CG221	VLS5R6	5.6µH	7.9	95	72	0.265	950	950
CG222	VLS6R8	6.8µH	7.9	85	63	0.33	853	853
	VLS8R2	8.2µH	7.9	95	60	0.46	720	720
CG224	VLS100	10µH	2.5	120	37	0.8	545	545
CG225	VLS120	12µH	2.5	120	37	0.8	545	545
CG226	VLS150	15µH	2.5	120	28.8	0.865	520	520
	VLS180	18µH	2.5	115	23.6	0.94	504	504
	VLS220	22µH	2.5	125	21.3	1.03	480	460
CG229	VLS270	27µH	2.5	115	20.8	1.16	418	418
CG230	VLS330	33µH	2.5	120	18.6	1.3	398	398
CG231	VLS390	39µH	2.5	120	17.7	1.41	385	385
CG232	VLS470	47µH	2.5	110	14.9	1.61	350	350
CG233	VLS560	56µH	2.5	115	13.9	2.08	330	330
CG234	VLS680	68µH	2.5	105	12.9	2.2	320	320
CG235	VLS820	82µH	2.5	105	11.7	2.42	300	300
CG236	VLS101	100µH	2.5	95	10.5	2.15	333	333
CG237	VLS121	120µH	0.79	95	5.6	2.38	316	190
	VLS151	150µH	0.79	90	5.2	2.52	308	178
CG239	VLS181	180µH	0.79	95	4.9	2.88	268	150
	VLS221	220µH	0.79	95	4.6	3.18	237	125
CG241	VLS271	270µH	0.79	100	4.2	3.5	260	120
CG242	VLS331	330µH	0.79	100	3.55	4.8	222	110
CG243	VLS391	390µH	0.79	100	3.45	5.44	209	105
CG244	VLS471	470µH	0.79	100	3.2	5.9	201	100
CG245	VLS561	560µH	0.79	95	2.9	6.3	194	90
CG246	VLS681	680µH	0.79	100	2.7	7.2	181	90
	VLS821	820µH	0.79	90	2.5	8	172	70
CG248	VLS102	1,000µH	0.79	100	2.35	12	141	65
CG249	VLS122	1,200µH	0.25	95	2.2	13.5	132	60
CG250	VLS152	1,500µH	0.25	90	1.9	16.5	119	55
CG251	VLS182	1,800µH	0.25	100	1.8	18	114	47
CG252	VLS222	2,200µH	0.25	100	1.7	20.5	107	43
CG253	VLS272	2700µH	0.25	95	1.5	22.5	102	39
CG254	VLS332	3,300µH	0.25	90	1.4	42	76	36
CG255	VLS392	3,900µH	0.25	85	1.27	47.5	71	35
CG256	VLS472	4,700µH	0.25	85	1.24	53	67	34
CG257	VLS562	5,600µH	0.25	85	0.93	62.5	65	31
CG258	VLS682	6,800µH	0.25	75	0.79	69.5	58	27
CG259	VLS822	8,200µH	0.25	80	0.75	75	56	26
CG260	VLS103	10,000µH	0.25	70	0.70	100	46	24
CG261	VLS123	12,000µH	0.079	70	0.60	64	60	40
CG262	VLS153	15,000µH	0.079	70	0.36	84	52	34
CG263	VLS183	18,000µH	0.079	70	0.36	93	50	30
CG264	VLS223	22,000µH	0.079	70	0.32	104	45	28
CG265	VLS273	27,000µH	0.079	70	0.30	173	35	26
CG266	VLS333	33,000µH	0.079	70	0.27	187	32	24
CG267	VLS393	39,000µH	0.079	70	0.26	220	30	22
CG268	VLS473	47,000µH	0.079	70	0.25	253	28	20
CG269	VLS563	56,000µH	0.079	70	0.24	285	26	19
CG270	VLS683	68,000µH	0.079	60	0.20	311	24	18
CG271	VLS823	82,000µH	0.079	60	0.19	365	22	16
CG272	VLS104	100,000µH	0.79	60	0.17	420	20	15

J.W.Miller Adjustable RF Coils

Actual Size

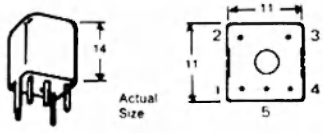
J.W.Miller 48A Series adjustable RF coils are intended for operation from 10 — 450 MHz. The construction of the coils is unusual in that the former of Polypropylene is actually moulded within a prewound coil, this relives the stress on the winding and reduces the ability of the winding to move. Thus these coils have unsurpassed stability, uniformity of electrical parameters and are very low in microphonics. They may easily be tapped if required.
Frequency Range 10 to 450 MHz : **Form Length** 18.50mm : **OD at Base** 16.00mm : **Lead Spacing (PCB)** 10.36mm : **Wire Size** AWG 20 tined copper : **Core** 10-32 x 9.5mm Carbonyl J : **Current (I) DC MAX** 2 Amp

48A Series —

STOCK No	Miller Number	L µH MIN.	L µH NOM.	L µH MAX.	Q MIN.	No. of TUTNS
	48A518MPC	0.046	0.015	0.055	100	1½
	48A778MPC	0.071	0.077	0.082	100	2½
CG102	48A117MPC	0.099	0.111	0.122	100	3½
	48A147MPC	0.118	0.138	0.157	100	4½
	48A187MPC	0.16	0.179	0.207	100	5½
	48A227MPC	0.181	0.215	0.278	100	6½
	48A257MPC	0.209	0.248	0.283	100	7½
	48A287MPC	0.241	0.284	0.316	100	8½
	48A317MPC	0.270	0.311	0.351	100	9½

J.W.Miller Shielded Adjustable RF Coils

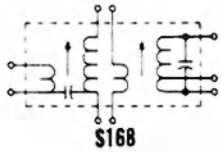
J.W.Miller 9100 Series ultra-compact adjustable coils provide a compact, well shielded slug tuned coil in larger inductance values than can be realised with the 48A or 75F types. They are wound on an **Amidon** L43 coil former set. These inductors may have windings added but the existing winding cannot be tapped. Magnetic shielding is provided by cup cores in the assembly and a copper shield can provides electrostatic shielding.
—See **Amidon** L43 series in the ferrite section of this catalogue for mechanical dimensions—
Tuning is accessible from either the top or bottom of the assembly. These coils are suitable for aplications between 10 kHz and 200 MHz.



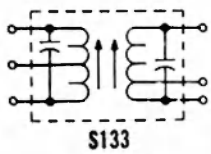
9100 Shielded Series —

STOCK No	Miller Number	L µH MIN.	L µH MAX	Q L MIN.	Q L MAX.	I,MAX. DC mA	DC res. OHMS	SRF MHz
CG132	9108	1.44	2.94	34	64	417	1.36	64
	9109	2.52	5.7	40	77	366	1.78	60
CG134	9110	5.36	13.5	60	60	286	2.92	37
CG135	9111	12.5	29.4	31	60	225	4.72	9.7
CG136	9112	26.3	71.25	35	54	165	6.97	5.1

J.W.Miller Transistor Radio Transformers



S168



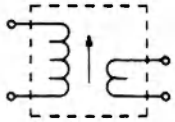
S133

Radio IF Transformers —

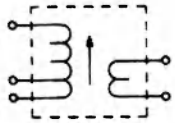
STOCK No.	MILLER No.	Frequency	Specifications	Dimensions (mm)	PIN OUT
CG137	2066	455kHz	50K - 800Ω	10 x 13	S57
CG138	2068	455kHz	20K - 5KΩ	10 x 13	S57
CG139	8807	455kHz	6dB - 20kHz	10 x 20 x 12	S188
CG140	8851	10.7MHz	6dB - 300kHz	10 x 20 x 13	S133
CG141	8852	10.7mHz	100k - 300Ω	10 x 13	S41
CG142	8853	10.7mHz	20K - 500Ω	10 x 13	S52

Oscillator Coils — 540 — 1650 kHz Broadcast Band

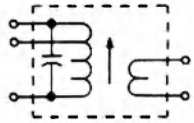
STOCK No.	MILLER No.	Frequency IF	L µH	Tuning Cap (pF)	Dimensions (mm)	PIN OUT
	2065	455kHz	220-300	78-110pF	10 x 13	S52



S41



S52



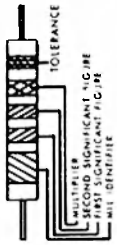
S57

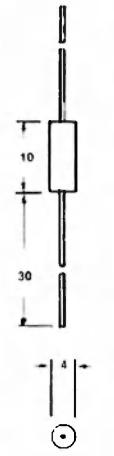
J.W. Miller Axial Lead RF Chokes

J.W.Miller Series 9310 are general purpose moulded RF chokes in standard axial lead bodies with tinned copper leads 0.70mm (22AWG) DIA. **Temperature Range** -55°C to +125°C for values 0.15 µH to 0.47 µH and -55°C to +105°C for 5.6 µH to 33 µH. **Reference:** MIL-C 15305, MS14046, MS18130, MS16225.
Series 9210 is an extended value range of the **9310** family. **Temperature Range** -55°C to +100°C. **Reference:** MIL-C-15305, MS90583.

9310 — 9210 Series —

STOCK No	Miller Number	L ± 20%	SRF (Fo) MHz MIN.	R.dc Ohms MAX.	I.dc mA MAX
CG01	9310-00	0.15µH	525	0.03	2450
CG02	9310-02	0.22µH	450	0.055	1900
CG03	9310-04	0.33µH	360	0.09	1400
CG04	9310-06	0.47µH	310	0.12	1225
		L ± 10%			
CG05	9310-07	0.56µH	280	0.135	1220
CG06	9310-08	0.68µH	250	0.15	1100
CG07	9310-10	0.82µH	220	0.22	900
CG08	9310-12	1.0µH	200	0.29	830
CG09	9310-14	1.2µH	180	0.42	680
CG10	9310-16	1.5µH	160	0.5	600
CG11	9310-18	1.8µH	150	0.66	525
CG12	9310-20	2.2µH	135	0.95	435
CG13	9310-22	2.7µH	120	1.20	365
CG14	9310-24	3.3µH	110	2.0	300
CG15	9310-26	3.9µH	100	2.3	280
CG16	9310-28	4.7µH	90	2.6	260
CG17	9310-30	5.6µH	80	0.32	750
CG18	9310-32	6.8µH	55	0.8	600
CG19	9310-34	8.2µH	50	0.8	545
CG20	9310-36	10µH	46	0.9	448
CG21	9310-38	12µH	42	1.1	404
CG22	9310-40	15µH	40	1.4	370
CG23	9310-42	18µH	34	2.25	280
CG24	9310-44	22µH	30	2.5	265
CG25	9310-46	27µH	28	2.5	265
CG26	9310-48	33µH	25	2.6	260
		L ± 20%			
CG27	9210-56	39µH	14.5	2.8	176
CG28	9210-60	47µH	13.0	2.75	170
CG29	9210-64	56µH	12.0	3.0	164
CG30	9210-68	68µH	11.0	3.3	156
CG31	9210-72	82µH	10.3	3.9	143
CG32	9210-76	100µH	9.5	4.5	133
CG33	9210-80	120µH	8.7	5.2	124
CG34	9210-84	150µH	8.0	6.05	114
CG35	9210-88	180µH	7.0	6.75	108
CG36	9210-92	220µH	6.2	7.45	103

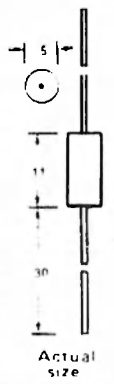




Series **9220** moulded RF chokes are larger in physical size than the 9310, 9210 series with tinned copper leads 0.70mm (22AWG) DIA. They offer values from 270 µH to 1000 µH. **Reference:** MIL-C-15305, MS90539, MS90540, MS90541.

9220 Series —

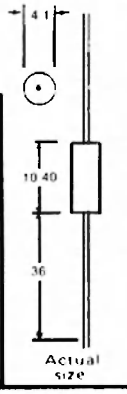
STOCK No	Miller Number	L ± 20%	SRF (Fo) MHz MIN.	R.dc Ohms MAX.	I.dc mA MAX
CG37	9220-00	270µH	5.6	8.2	110
CG38	9220-04	330µH	5.0	9.1	105
CG39	9220-08	390µH	4.5	10.0	100
CG40	9220-12	470µH	3.6	12.3	91
CG42	9220-20	660µH	3.4	13.7	85
CG43	9220-24	820µH	3.1	15.1	81
CG44	9220-28	1000µH	2.8	16.5	78



J.W.Miller 9250 series RF chokes. This range of axial leaded RF chokes offers a range of high value inductors a standard moulded housing. This range extendes and supplement the standard moulded RF choke range giving values up to 100 mH. They are electricaly equivalent 9310 & 9220 choke range listed above. They are wound on a Ferrite core for small size. **Dielectric Strength** 1000 Vac per MIL-STD-202 method 302. **Insulation resistance** 1000 Megohms minimum per MIL-STD-202 method 302. **Coating** Flame retardant epoxy. **Lead** Tinned copper 0.70mm DIA.

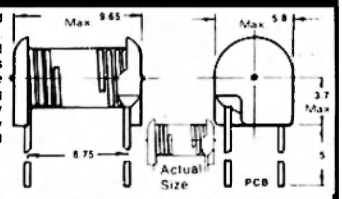
9250 Series —

STOCK No	Miller Number	L ± 10%	SRF (Fo) MHz MIN.	R.dc Ohms MAX.	I.dc mA MAX
	8250-155	1.5mH	1.2	26.5	55
CG121	8250-225	2.2mH	0.97	33.8	50
CG122	8250-335	3.3mH	0.84	53.0	40
CG123	8250-475	4.7mH	0.74	81.6	31
CG124	8250-685	6.6mH	0.66	111.0	27
CG125	8250-106	10mH	0.47	137	24
CG126	8250-156	15mH	0.29	157	22
CG127	8250-226	22mH	0.25	274	17
CG128	8250-336	33mH	0.19	343	15
	8250-476	47mH	0.16	473	13
	8250-686	68mH	0.13	580	12
	8250-107	100mH	0.11	678	11



J.W.Miller Air-Core RF-Inductors

J.W.Miller 75F series of inductors have unsurpassed stability and uniformity of electrical parameters. A plastic form of Polypropylene is moulded around an accurately positioned winding. this form of construction relieves the stress on the winding and reduces the ability of the winding to move. Thus these coils are exceptionally stable and low in microphonics. They are especially useful for equipment operation in the 50—450 MHz range.

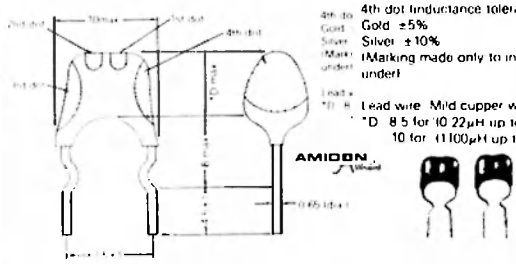


75F Series —

STOCK No	Miller Number	L ± 20%	Q MIN.	I.dc mA MAX	WIRE SIZE	PCB(mm)	No. TURNS
	75F230MPC	0.023 µH	110	1.000	AWG 22	3.75	2½
	75F328MPC	0.032 µH	110	1.000	AWG 22	3.75	3½
	75F518MPC	0.051 µH	110	1.000	AWG 22	3.75	4½
	75F117MPC	0.11 µH	110	1.000	AWG 22	3.75	8½
	75F157MPC	0.15 µH	110	1.000	AWG 22	3.75	10½
	75F277MPC	0.27 µH	110	500	AWG 26	4	14½
CG115	75F397MPC	0.39 µH	110	500	AWG 26	4	15½
	75F477MPC	0.47 µH	110	500	AWG 26	4	17½
	75F597MPC	0.59 µH	110	500	AWG 26	4	19½

Radial Lead Epoxy-Dipped RF Chokes

AMIDON Radial series fixed inductors use ferrite cores and are designed to take advantage of the magnetic characteristics of these cores for small size. Stringent quality controll is upheld in Amidon's automated fixed inductor production for assuring the uniformity of product quality and reliablity. They are high in cost perforamce. Large inductance for small size. **Temperature Rise** 20°C ; **Ambient Temperature** 80°C ; **Rated Voltage 250 volts DC** ; **Minimum "Q"** 30.
Features Moulded, epoxy-coated, radial lead wires. Minimum distributed capacitance with good moisture resistant properties. High dielectric strength and insulation resistance.



4th dot Inductance tolerance
Gold ±5%
Silver ±10%
(Marking made only to inductance 10µH and under)

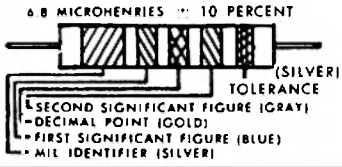
Lead wire Mild cupper wire, solder plated
"D" 8.5 for (0.22µH up to 1000µH)
10 for (1100µH up to 2200µH)

Part No	Inductance (µH)	Rated DC Current (mA)	DC Resistance Max. (ohms)	SRF min. (MHz)
CG58	0.22µH		0.5	175
CG59	0.47µH		0.5	175
CG60	1.0µH	330	0.201	96
CG61	1.2µH	320	0.218	84
CG62	1.5µH	315	0.240	71
CG63	1.8µH	310	0.267	62
CG64	2.2µH	300	0.290	53
CG65	2.7µH	295	0.318	46
CG66	3.3µH	285	0.353	40
CG67	3.9µH	280	0.378	35
CG68	4.7µH	275	0.420	31
CG69	5.6µH	270	0.450	27
CG70	6.8µH	260	0.488	23
CG96	8.2µH	255	0.540	22
CG71	10µH	250	1.14	20
CG72	15µH	235	1.40	13
CG73	18µH	225	1.55	12
CG74	22µH	220	1.73	10
CG75	27µH	215	1.95	9
CG76	33µH	205	2.15	8
CG77	39µH	200	2.36	7
CG78	47µH	190	1.94	9
CG79	56µH	180	1.95	9
CG80	68µH	170	2.12	8
CG97	82µH	160	2.40	8
CG81	100µH	150	2.85	7
CG82	120µH	145	4.35	6
CG83	150µH	130	3.60	5
CG84	180µH	120	4.02	4
CG85	220µH	115	4.70	4
CG86	270µH	105	5.40	3
CG87	330µH	100	7.50	3
CG88	390µH	90	8.55	3
CG89	470µH	85	9.90	2.8
CG90	560µH	80	11.4	2.5
CG91	680µH	68	10.8	2.3
CG98	820µH	58	12.3	2.1
CG92	1,000µH	56	14.1	1.9
CG93	1,200µH	50	17	2.2
CG94	1,500µH	50	16	1.8
CG99	1,800µH			
CG95	2,200µH	50	16	1.8

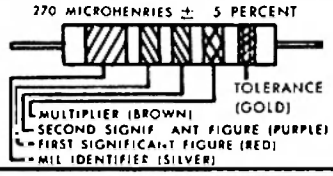
COLOR CODING for MOLDED CHOKES per MIL-C-15305

For cylindrical choke coils Cylindrical choke coils shall be marked with five colored bands. A silver band MIL identifier of double the width of the other four bands, located near one end of the coil, identifies military radio-frequency coils; four other bands of equal width, three indicating the inductance in microhenries and the fourth band indicating the tolerance in percent. Color coding shall be in accordance with the color code of table. When either the first or second band of the three bands is gold, this band shall represent the decimal point for inductance values less than 10, and the other two bands shall represent significant figures. For inductance values of 10 or more, the first two bands shall represent significant figures, and the third band shall represent the multiplier. For small units, dots may be used instead of bands, when specified. The diameter of the MIL-identifier dot shall be larger than the other dots. Typical color coding examples are shown above.

Example A For L values less than 10 uH.



Example B For L values 10 uH or greater.



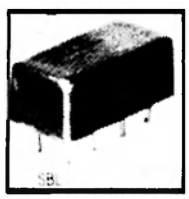
COLOR CODE TABLE

Color	Significant Figure	(1) Multiplier	Inductance Tolerance (Percent)
BLACK	0	1	
BROWN	1	10	
RED	2	100	
ORANGE	3	1,000	
YELLOW	4		
GREEN	5		
BLUE	6		
VIOLET	7		
GRAY	8		
WHITE	9		
NONE (2)			± 20
SILVER			± 10
GOLD	DECIMAL POINT		± 5

(1) The multiplier is the factor by which the two significant figures are multiplied to yield the nominal inductance value.
(2) Indicates body color.

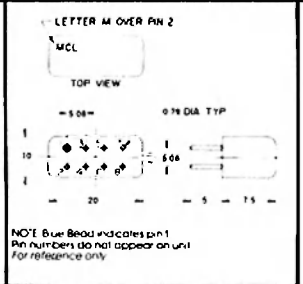
Double Balanced Diode Mixers

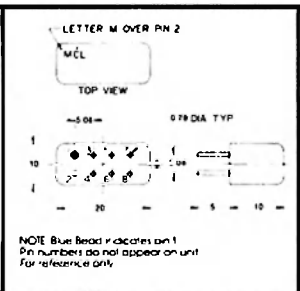
Mini-Circuits

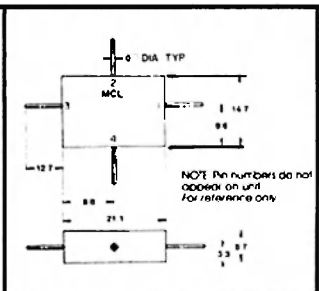


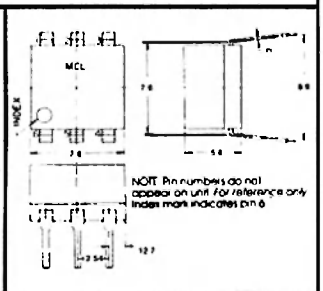
Pin Out's	TC05, TC12	TC06	TC13	TC14	TC16
Lo	8	8	8	3	1
RF	1	3,4*	1	1	4
IF	3,4*	1	1	1	4
GND.	2,5,6,7	2,5,6,7	2,5,6,7	2	2,3,6
Case Ground	Isolated	2,5,6,7	2,5,6,7	2	Insulated

* Must be connected Externally





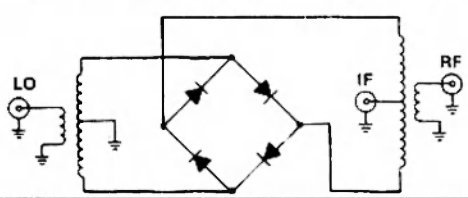




STOCK NO.	MODEL NO.	FREQUENCY MHz LO/RF f_L-f_U	FREQUENCY MHz IF	CONVERSION LOSS dB Mid-Band m Typ	Mid-Band m Max	Total Range Typ	Total Range Max	LO-RF ISOLATION, dB L Typ	L Min	M Typ	M Min	U Typ	U Min	LO-IF ISOLATION, dB L Typ	L Min	M Typ	M Min	U Typ	U Min	L O INJECTION
TC05	SBL-1	1-500	DC-500	5.5	7.0	6.5	8.0	60	45	45	35	40	25	45	35	40	25	30	20	
TC06	SBL-1X	10-1000	5-500	6.0	7.5	7.0	8.0	50	40	40	30	30	20	50	45	40	35	35	25	
TC12	SBL-3	025-200	DC-200	5.5	7.5	6.0	8.5	55	50	45	30	35	25	45	35	40	30	30	20	+7dBm
TC13	PAM-42	2.0-4.2GHz	DC-1.3GHz	–	–	7.0	8.5	25 (typ) 17 (min)						18 (typ) 10 (min)						
TC14	SRA-220	05-2000	05-500	6.0	8.0	7.0	9.0	25	20	40	30	30	20	25	20	40	30	25	15	+10dBm
TC16	ASK-1	1-600	DC-600	5.5	7.0	6.0	8.5	50	30	35	25	30	20	45	35	30	20	25	15	+7dBm

These low cost double-balanced mixers have been selected as being the most popular and widely used types. Designed for injection levels of +7dBm (5mW) these mixers offer good conversion loss performance with a 1dB signal compression point of +1dBm. Conversion loss performance is maintained within reasonable limits over the range of injection levels from +4dBm to +10dBm.

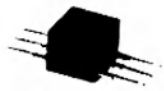
ABSOLUTE MAXIMUM RATINGS— Operating & storage temperature —55°C to +100°C ; Pin temperature +260°C ; RF power 50 mW ; Peak IF current 40 mA



RF Transformers Plastic Case T-series

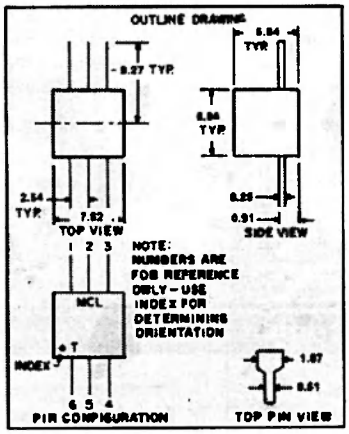
Mini-Circuits

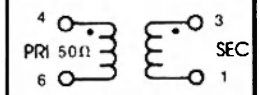
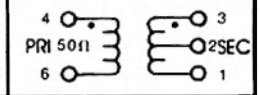
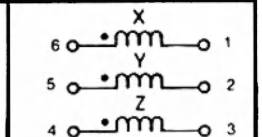
Obtain 180° phase reversal of signals
Amplifier interstage impedance matching
Input matching amplifiers for optimum noise figure
Vectorially combining two signals
Broadband impedance matching of equipment or components — Signal sampling



The T-series of micro-miniature wide-band RF Transformers cover the frequency range from 10 KHz to 800 MHz. They operate with impedence levels from 12.5 ohms to 800 ohms and provide very low insertion loss, typically less than 0.5db. The T series, although specified for a 50 ohm primary impedance, may be operated with a primary impedance as low as 12.5 ohms. The impedance matching ratio is essentially constant over the primary impedance range. The frequency response may change somewhat.

Absolute power ratings: Total input power 0.25 watts. **Operating and storage temperature** —20°C to +85°C. **Pin temperature** 260°C for 10 seconds. **Weight** 0.04 grams.



STOCK NO.	MODEL NO.	IMP. RATIO	FREQ for Insertion Loss 1db	2db	3db	
TC01	T1-1	1 : 1	2-50mHz	0.35-200mHz	0.15-400mHz	
TC02	T4-6	4 : 1	0.1-100	0.05-150	0.02-200	
TC03	T9-1	9 : 1	2-40	0.3-150	0.15-200	
TC04	T16-1	16 : 1	5-20	0.7-80	0.3-120	
TC10	T1-1T	1 : 1	0.2-80	0.08-150	0.05-200	
TC09	T2-1T	2 : 1	0.5-50	0.1-100	0.07-200	
TC08	T4-1	4 : 1	2-100	0.35-300	0.2-350	
TC11	T-622	1	5-80	0.5-100	0.1-200	

Broadband Directional Coupler Series PDC

Mini-Circuits

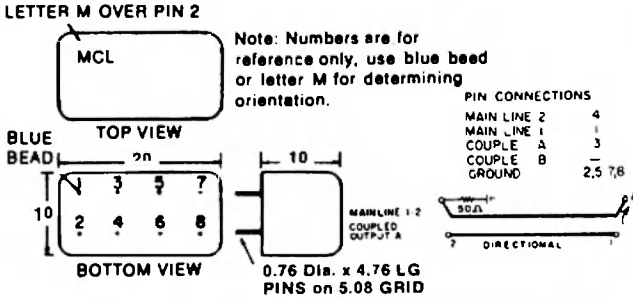
Measure incident and reflected power to determine VSWR
Signal sampling — S Parameter measurement
Signal injection — Signal generator/Oscillator leveling
Power flow monitoring

The PDC series directional couplers are economically priced while covering the frequency range 0.5 to 500 MHz. They offer main line losses as 0.1 dB and high directivity of up to 35dB. Packaged within an RFI shielded metal enclosure and hermetically-sealed header, these high performance units have there pins oriented on a 0.2" (5.08mm) grid. Ruggedness and durability are built into the PDC series. Only well matched and ruggedly constructed trasmission line transformers are used. Internally every component is bonded to the header and case with silicone rubber to provide super reliable protection against shock, vibration and acceleration.

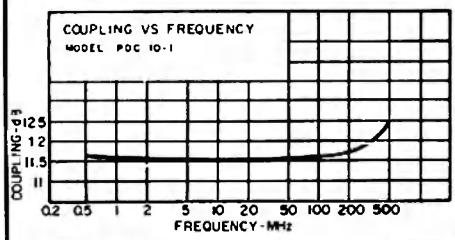
This unit has become an industry standard thoughout the world and is belived to be the number one volume leader. Used by all branches of the department of defence, NASA, FAA and every major communications company.

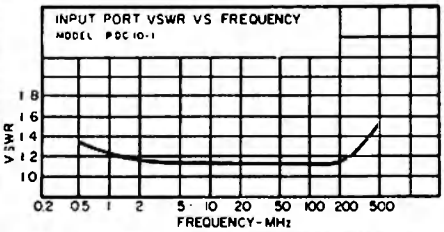
High reliability is associated with every PDC series directional coupler. Every production unit is 100% tested and every unit must pass our rigid inspection and high quality standards. Our one year guarantee applies to these units.

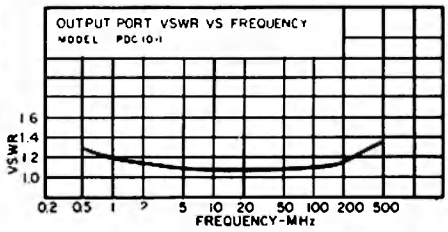
Made in the USA by MINI-CIRCUITS Laboratory. **Weight** 5.2 grams; **Operating and Storage Temperature** —55°C to +100°C; **Pin Temperature** 266°C for 10 seconds.

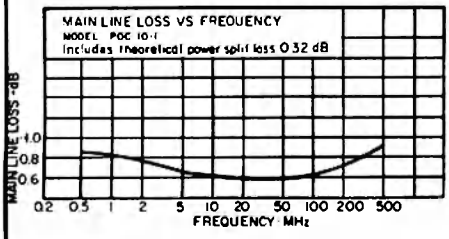


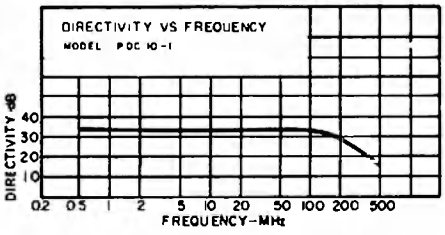
STOCK NO.	MODEL NO.	FREQUENCY MHz f_L–f_U	COUPLING dB Nom	Flatness	MAINLINE LOSS dB L Typ Max	M Typ Max	U Typ Max	DIRECTIVITY dB L Typ Min	M Typ Min	U Typ Min	VSWR Typ	POWER INPUT, W L Max	MU Max
TC07	PDC-10-1	0.5—500	11.5±0.5	±0.6	.85 1.3	.65 1.0	1.2 1.5	35 25	32 25	22 15	1.2	1.5	3

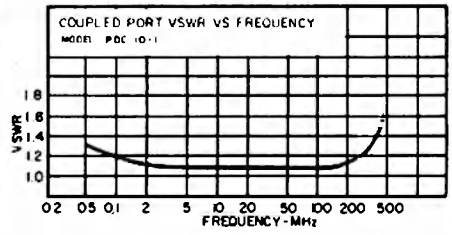












Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL. 56, No 12, DECEMBER 1988

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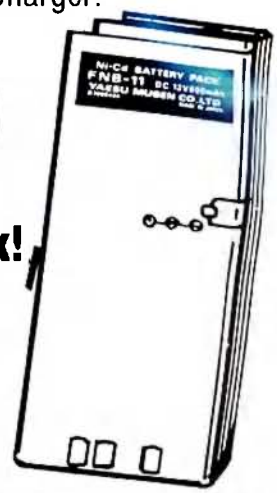

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EDITOR
Bill RICE* VK3ABP

NEWS EDITOR
JIM LINTON VK3PC

TECHNICAL EDITING CO-ORDINATOR
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TECHNICAL EDITORS
EVAN JARMAN* VK3ANI
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Inquiries and material to:
The Editor,
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Caulfield South, Vic. 3162.

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Editor's Comment

BICENTENNIAL, BYE-BYE

There is less than one month left of Australia's Bicentennial Year. From the viewpoint of the Australian radio amateur, how has it gone, and what did it mean to us! Let me try to recapitulate some of the amateur features of 1988, although some, unavoidably, may be more from the viewpoint of VK3ABP! Well, there I go for a start! The year isn't over yet, but what happened to my Bicentennial AX prefix? Perhaps I've been listening on the wrong bands at the wrong time (and certainly not for long enough!) but few of us seem to have taken advantage of the special prefix. I think only about one percent of those I worked in the Remembrance Day Contest back in August were using AX. Still, it may have stirred up a little more interest on the DX bands. It is (was after December 31) a significant privilege, so let's not knock it.

The year certainly began with a bang! The fireworks involved on New Year's Day and then on Australia Day, January 26, were probably more spectacular than anything seen before in this country. Even if we had not spent January in New Zealand we would probably have seen them only in the way we eventually did, though, via the television screen aided in out case by the magic of video-recording. Much of the spectacle of 1988 has been centred in Sydney. Which I guess is fair enough; that's where it all began in 1788! Of course there was the Royal opening of the new Parliament House in Canberra, the Bicentennial Yacht Race around the continent, the Great Camel Race across half of it. Television enabled millions to see at least some of these events. But generally they had no greater appeal for us radio amateurs than for the population at large, although without the large number of amateurs who are professionally employed in television the networks might have been seriously embarrassed!

Visits around the country (but obviously only to coastal centres) by tall ships and warships brought some of the pageantry to those of us who do not live in Sydney. And probably the most impressive single event of the Bicentennial has been Expo in Brisbane; a mind-blowing technological tour de force, visited in the six months to October 30 by almost as many people as the population of Australia (16 million). Many were the same faces time after time, of course, but probably more than half Australia "made it" to Expo. This was something which demanded personal attendance; even though some aspects had coverage in many television programs, there was no substitute for "being there". From the amateur viewpoint it is a pity there was so little official co-operation in setting up VI88XPO on-site, in spite of the best efforts of the VK4 Division. But VI88ACT was on-air for the Parliament House opening, and use of the VI88 call signs by clubs and Divisions seems to have been very successful.

So now, it's "Bicentennial, bye-bye". Most of us have enjoyed at least some of it; some may have enjoyed most of it; and many now know more about organising activities than they did before. We will never have another Bicentennial in which to participate, and none of us will be here for the Tricentennial, so I do hope we have all gained or learned something from 1988. Season's Greetings to all!

Bill Rice AX3ABP
Editor
ar

QUITE AN OFFENCE

Local Mooroolbark Police Officer, Senior Constable Keith Lumsden, asked an offending driver: "Do you realise it is an offence not to exchange names and addresses with someone when you have an accident?" The driver replied: "What fence? I not see any fence, I hit a trailer, not a fence."

One way of admitting to an offence!

—Snippet and cartoon courtesy of *Police Life* (Victoria) October 1988 and contributed by Ken McLachlan VK3AH
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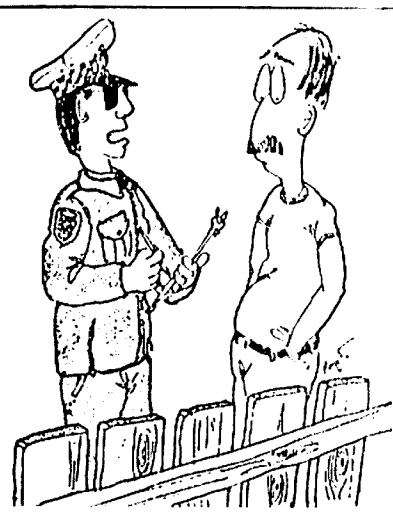
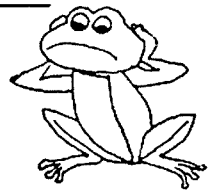




Main QSP

SEASONS GREETINGS

Australia's Bicentennial year is now drawing to a close. It started with a televised 'communications extravaganza' and has continued with many varied celebrations and events. One of the results of this activity has been to make many people stop and think about our nation — where we have come from and where we are going.

So too with amateur radio. It has been a year of celebration — the VI88 call signs and lots of special events and also a year of changes — novices on two metres, examination devolvement — to name but a few. In a similar vein to the varied opinions about our nationhood, so there are varied opinions about the amateur radio service. Amateurs have taken many opportunities to raise these issues and the 'Future of Amateur Radio Working Party' has been sifting and collating these opinions.

One of the characteristics of amateur radio that I have enjoyed is the variation. It is a hobby where we can easily express our individuality, from the bands and modes we prefer, to our equipment and our level of participation. I hope that this diversity allows us to see the other operators point of view, even though we may not always agree with it!

1988 has seen a number of changes take place in the WIA Federal Office. There has been the appointment of a new general manager and the development of a number of office systems designed to improve the efficiency of the office. These changes aim to make the office more responsive to the needs and views of the amateurs in Australia. In addition, a 'corporate planning' process has been started. This will help identify the key issues to be addressed by the WIA and develop strategies to carry them out. Part of the input to this process was the survey that appeared in October AR.

As I write these notes, the IARU Region 3 Conference in Seoul has just concluded. It was an excellent opportunity for amateurs to meet and examine many issues of mutual concern. This conference was also important in setting the groundwork for the approaching World Administrative Radio Conference that will be held in 1992 or 1993.

The effects from Seoul will be far reaching as the process of change continues through the amateur ranks.

Everywhere we look these days we see change and the changes seem to be coming faster and faster! However, I don't believe we can hide our heads in the sand, and pretend nothing is happening. Instead, we should take our part in the process and help to build a better society. How? One way is being involved — whether at a club level, a Divisional level or a federal level — and not leaving it to 'someone else'!

Perhaps you can think of other ways. Hopefully one of the things that won't change is our ability to be interested in, and care for, our neighbour.

So, as 1988 draws to a close, spend a moment thinking about what you can do to make this world a better place. Amateur radio, with its ability to communicate across all sorts of boundaries, is uniquely placed to achieve this aim.

On behalf of the Executive and the staff of the Federal Office, I would like to extend Seasons Greetings to you all and may 1989 be a challenging and exciting year for you.

Peter Gamble VK3YRP
Federal President

WIA REPORT OF THE SEVENTH IARU REGION 3 REGIONAL CONFERENCE

The setting for the Seventh Conference of the IARU Region 3 Association was the 22nd Floor Meeting Hall of the Seoul Plaza Hotel, opposite the Seoul City Hall. The Conference ran from Monday, October 10, to Friday, October 14, 1988.

The Conference was attended by the following Societies:
ARRL (representing USA Pacific Island members), CRSA (China), JARL (Japan) KARL (Korea, the host society), MARTS (Malaysia), NZART (New Zealand), ORARI (Indonesia), RAST (Thailand), RSGB (representing British members in the region), SARTS (Singapore) and the WIA (Australia). Three other societies, SIRS (Solomon Islands), PARA (Philippines) and PARS (Pakistan) appointed proxies to represent them.

Also present were the Directors and Secretary of Region 3, the President, Vice-President and Secretary of the IARU and officials from Regions 1 and 2.

The Conference was opened by the Korean Minister of Communications, Dr Oh Myang, who later that day hosted a formal welcoming dinner.

The Conference working-style was a mixture of plenary sessions, working group meetings and social evenings, often followed by further working group sessions. An agenda of 17 items, containing in all 104 papers, was considered. Four working groups were convened, they deliberated and reported on their designated topics which were:

* Band Planning
* Packet
* Preparation for the next WARC
* Finance

HIGHLIGHTS

Some of the highlights of the Conference included a band plan review which acknowledged the need for increased data communications more band space on some bands to accommodate increased data activity. Regional band plans were produced for the first time for 1.8 MHz and 3.5 MHz, although differing allocations across the Region made it rather difficult to provide plans which completely satisfied everyone.

The future development of the IARU was debated and possible alternative means to assist in financing the International Secretariat examined.

Preparation for the next WARC, including a Region 3 position on frequency bands, the problems facing us prior to and during the WARC, funding and representation at the WARC and possible approaches to clarify third party applications, were all discussed and a number of recommendations adopted.

Delegations exchanged their views and requirements as regards third party communications and agreed on approaches to achieve more liberal and uniform privileges.

The Conference felt Electromagnetic Compatibility was not receiving adequate attention and believed it should be considered before problems develop as precautionary rather than as palliative measures.

Satellite communications posed some problems, satellite funding measures will be examined by the Administrative Council as costs were becoming beyond the resources of individual groups. Interference to satellites and satellite frequency selections were other aspects requiring some attention and co-ordination.

The IARU Monitoring Service received an impetus in its ability to convey reports of intrusions to positively identified stations, and the need to continue this valuable service was emphasised.

Consideration of constitutional matters relating to the Association led to minor changes, however a new set of General Regulations, which the Directors were required to prepare for the Conference, were adopted. These regulations delineate more clearly the operating procedures of the Association, particularly with respect to conferences.

Finally, a budget for the next three years was adopted. It contains a build-up of funds for WARC representations whilst maintaining the Region's operating commitments and expenses. Members will be pleased to hear a small increase in general reserves is planned, within the current IARU subscription rate (which is contained in your Federal subscription component).

MEMBER SOCIETY REPORTS

An important part of the Conference is the reviewing of member societies reports. Some highlights from these reports included:

* A non-terminating novice licence in New Zealand.
* Interference problems; on two metres from Singapore, on 10 metres from Hong Kong and more generally from Indonesia.
* Amateur radio is advancing after restructuring in Thailand. Indeed, the WIA is actively seeking reciprocal licencing rights with Thailand.
* The WIA reported the allocation of a common band for all amateur licence holders, the USA reported on the success and high popularity of

their volunteer examiner scheme and Korea reported on the success of a special third party traffic station established for the Olympic Games.

* The Region 3 Directors reports emphasised the need to hold IARU activities in countries throughout the Region to obtain maximum benefit from exposure of national officials to amateur radio.

* Of note to Australia was Director Michael Owen's last report as a Region 3 Office Bearer. Michael was involved in the formation of the Association in Sydney in 1968, and has continuously served since that date. We wish him well in his future involvement in amateur radio as Vice-President of IARU, the first non-North American to be nominated to that high office.

BAND PLANS

There are few surprises in the revised Region 3 band plans, the major changes being the recognition of the need for more data communications spectrum and the revision of narrow band mode segments to achieve that aim.

Band plans were produced for the first time for 1.8 and 3.5 MHz, however the differing allocations across Region 3 do not permit a large degree of co-ordination. For Australia, some care will be required on 1.8 MHz, however the lower limit for SSB on 3.5 MHz remains unchanged at 3.535 MHz, which will please novice operators.

Feeling was evident at the Conference to increase activity on the WARC bands — 10 MHz was seen as a suitable alternative for HF packet message forwarding and there was agreement for limited award credits on 18 and 24 MHz to increase occupancy. It was agreed contests should remain excluded from all three WARC bands.

The Conference heard there were some instances of interference to satellite communications and less than effective co-ordination of satellite frequency selection. Satellite organisations were encouraged to co-ordinate their requirements, both uplinks and downlinks with their Regions. The Region 3 Band Plans will be published in a later edition of *Amateur Radio*.

PACKET RADIO

The Packet Working Group identified activities which warranted further investigation by packet researchers and developers.

They recommended increases to the narrow band segments to accommodate the increase in data communications on 7 and 14 MHz. In particular, the 14 MHz narrow band modes segment has been extended to 14.070 to 14.112 MHz, with a recommendation RTTY and AMTOR continue below 14.095 MHz.

Note was made of the CW beacons on 14.100 MHz, with a ±500 Hz guard band and "narrow band modes" were re-defined as having an occupied bandwidth of less than 2 kHz.

Attention is to be devoted to societies understanding of third party communications. Indeed, it was discovered that throughout the Region, amateur to amateur communications via amateurs was not considered third party in nearly all countries. The WIA should now seek this interpretation for Australia from DOTC.

It was agreed the growth of Bulletin Board Services should be co-ordinated to provide an efficient service without over proliferation. This has a particular emphasis on HF where societies agreed to attempt to limit the numbers to the minimum necessary.

In keeping packet available to newcomers, it was agreed access to packet networks be achievable using relatively unsophisticated stations.

Because of the interest in this topic, the full working group report will be published in a later edition of AR.

PREPARATION FOR NEXT WARC

It was agreed that the prediction that a WARC with frequency allocation on its agenda will occur in 1992 or 1993, and that amateur bands around 7 MHz and 1 GHz will very likely be involved with possible extensions.

As time is getting short, urgent action is needed.

On the frequency table the need to improve our family of frequencies below 30 MHz was decided.

To that end, we should press for access to a narrow band for experimentation in the vicinity of 190 kHz. And, also shared primary world-wide allocation at 5.005 to 5.060 MHz.

Proposals are also made to improve the allocations at 7, 10, 14, 18 and 24 MHz.

Above 30 MHz, a number of changes were suggested to give all regions access to bands presently allocated in only one or two regions. Also, the proposal was made to establish 430 to 440 MHz as a world-wide exclusive amateur satellite band and that the Amateur Satellite Band, 1260 to 1270 MHz becomes bi-directional (not limited to uplink).

The full proposals will be published in a later issue of *Amateur Radio*.

On regulatory matters, it was seen that 2733 of the International Radio Regulations may inhibit packet radio. It was suggested that the best course of action was for 2733 not to be interpreted by administrations as an inhibition of communications between amateur stations whether directly or through intermediate stations.

If this fails, possible amendments to the radio regulations have been suggested.

All member societies are urged to submit proposals advancing the objectives outlined at the Conference to their administrations, and work towards having a representative of the amateur service on their national delegation, and to this end, must look at means of raising funds.

FINANCE

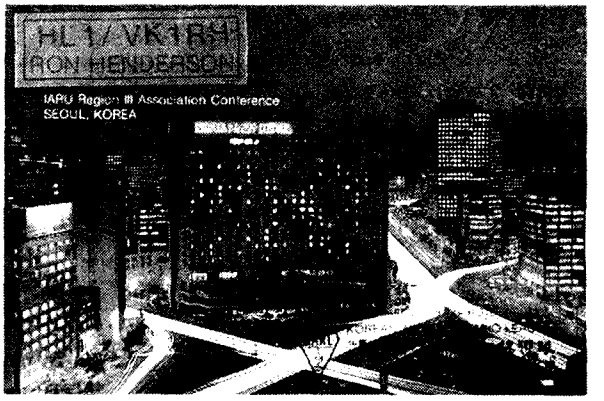
The Conference adopted a budget for the next three years which contains provisions for all the major forecasted Region 3 activities, plus the progressive build up of the WARC fund, to a level to permit two people to each cover half of the next WARC. At the end of the period, the general reserves are increased by a small amount providing some contingency funds.

All this is being achieved at the current IARU subscription rate (a component of your Federal subscription). However, it does make the assumption membership of each society will remain the same as at January 1988. For the WIA, this means we cannot ease up in seeking new members.

The Region 3 Directors elected for the next three years are:

David Rankin 9V1RH, from Singapore as Chairman.
D D Devan 9M2DD, from Malaysia
Keigo Komaro JA1KAB, from Japan
Fred Johnson ZL2AMJ, from New Zealand, and the only new Director,
David Wardlaw VK3ADW, from Australia.

The next Region 3 Conference will be held in Indonesia during September, 1991, and will be hosted by ORARI.



REVIEW

The Conference was a resounding success with all contentious issues being resolved through consensus and without any confrontation. The host society, KARL, managed everything exceedingly well and did delegations proud. Temporary HL1/. . . call signs were issued to the Conference Delegates and a special event station, 6K3IARU, was freely available for use by all. Regrettably, Conference demands on time limited its use by delegates early in the week.

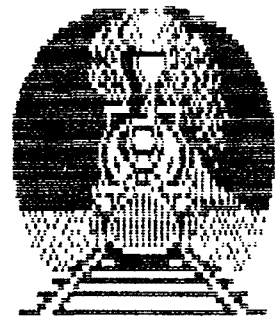
For KARL, the Conference closed on a high point with their Minister advising reciprocal licence approaches could now be initiated with other countries. We in Australia will follow this lead with a formal request shortly.

Compiled by:
David Wardlaw VK3ADW
Ron Henderson VK1RH
ar

THE UNATTENDED RESIDENCE AND YOUR HOLIDAYS

Ken McLachlan VK3AH
PO Box 39, Mooroolbark, Vic, 3138

The much awaited annual holidays are nearly upon us. It is planned to be a very happy event for you and your family to take a rest from the usual 'grind' of every day life and seek pleasure at the beach, the mountains, interstate or in some cases for the very fortunate readers, a trip abroad.



You have planned every detail meticulously for the ensuing weeks ahead but have you left your home to be the prey of the unscrupulous burglar, who would take delight in removing hard earned and treasured amateur transmitting and receiving equipment, computer hardware with the software and other valuables from the sanctuary of the premises you own, in your absence. You are probably having a chuckle if you have read this far, thinking that this would not and could not happen to me. Nevertheless you are a predictable statistic to be added to the already massive 1988 figures or be at the starting barrier to commence the figures for 1989.

THE BURGLAR

Would you be able to describe what a burglar looks like? Is he or she a highly skilled calculating person? Generally the answer is no to both questions. The 20th century burglar is more than probably unskilled, under the age of 18 years and selects their victims, in their own neighbourhoods by the opportunities you leave for them. Incidentally, many intruders gain entry through an unlocked door or window, or by defeating an inferior or poorly installed locking device, generally in daylight hours between mid-morning to mid-afternoon. If your home looks more likely and easier to gain entry too than your neighbours, you are the victim! So firstly make your residence look difficult to enter and occupied.

Do you have all my serial numbers?

LOCK IT UP OR LOSE IT

Sounds ludicrous doesn't it? But it is unfortunately a reality of life. Here are a few suggestions to assist you and your family, keep your valued possessions. You may be insured, but will it recompense you for loss? Probably yes, though it cannot replace sentimental value, anguish, frustration and the loss of your privacy. No insurance company in the world can do that.

Some of the following basic hints, it is hoped will prevent you from the anguish of being burgled at any time during the year and during your holidays, also the hours of defining and remembering what you had? How can I describe it? What make was it? What colour was it? Where was it? And on it goes. These are basics which it is recommended you may adapt to suit your individual situation, when you are absent from your property and/or vehicle.

SERIAL NUMBERS

Note the make, model and serial number of all electronic and electrical equipment in your residence and adjuncts to vehicles registered at that address.

Engrave your driver's licence number (prefixed by the State ie V for Victoria, T for Tasmania, etc) on as many items as possible. If you do not hold a current drivers licence, seek the permission of a close relative to use theirs. An engraved number is unobtrusive when placed near a serial number and as a surety. Place it inside the unit if possible (noting its location on your list). If actual engraving is not practical, special felt pens are obtainable for indelible writing which is practically invisible to the human eye though clearly discernible under Ultra Violet light (These indelible pens are frequently available from local Lions International Clubs and engravers are available from Neighbourhood Watch groups if one is operating in your area). All valuable jewelry, ornaments and such items should be photographed, preferably in colour and beside a ruler to determine size.

Keep the prints and negatives apart and in safe places. Whilst you have the camera out take photographs of the room, so you may identify what was where.

Place your master list in a safe place such as a bank and copies in various safe areas which are easily personally accessible at any time of the day or night, if required. Your precise inventory complete with photographs and locations will

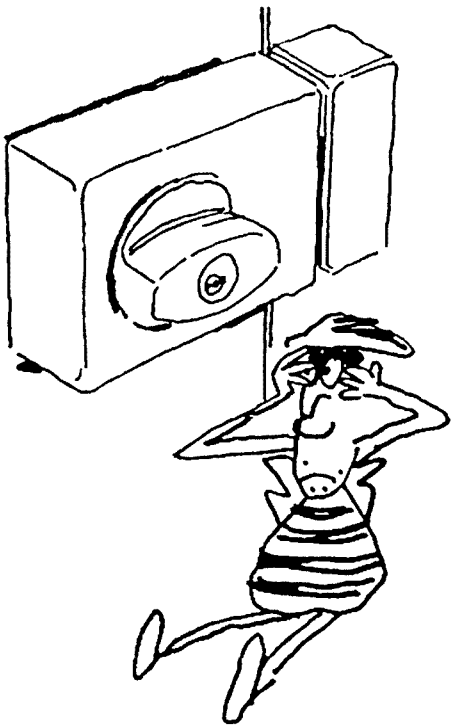
Guard Against This.

Oh Boy! ***What a Break.***

greatly assist all concerned, if you unfortunately become the victim of a crime of theft or willful damage.

If you have "Security Doors" fitted, keep them locked at all times, making sure that the key is removed. It is quite easy to cut the mesh and remove a key from the inside of a 'locked' door.

Under no circumstances allow any representative of any authority onto your premises without first seeing their credentials. All Telecom/Electricity Authority and such like personnel have accredited identification and will readily present it for perusal. No identification, no entry — accompanied with a quick call to the Police with a description. You may save someone else from the predator.



This is a double cylinder automatic deadlatch (screwed to the inside of the door) and is a cost effective fortification.

WHEN THE RESIDENCE IS NOT ATTENDED

1. Lock all doors/windows/entrances.
2. Keep all ladders and tools in a locked area. If you cannot secure your ladder, use a chain with a hefty lock to a immovable object such as a fence.
3. Don't leave messages on your door as they are an open invitation to the opportunist.
4. Keep garage doors closed, an open door with no vehicle is a 'dead' giveaway, that the residence is unoccupied.
5. Don't have packages delivered whilst being absent from the premises and being personally unable to remove them to a safe place.
6. Don't let the mail box give you away. Make sure it is always cleared of 'junk' mail and large enough to store one days filling. Near Christmas, this means a big 'box'.
7. Don't leave a key in a special spot (under the flower pot at the back door), so that Aunt Agatha can use it if she visits. If you are so keen on Auntie's welfare then give her a key, she is more trustworthy than an intruder.
8. Always separate your keys when you leave your car at a parking lot or for service. Remember to also disable a transceiver to comply with the terms of your amateur licence.
9. Don't give keys to workmen, no matter how long you have known them or had them working for you.
10. Placing advertisements of social events, obituaries, etc, give the predator a marvellous opportunity to gain entry and remain in your property for a considerable uninterrupted period. Also beware of whom you discuss your intentions of being absent from the premises with and in whose hearing. You may be unwittingly writing an open invitation to an 'eavesdropper'.

YOUR HOLIDAY

The time has come to commence the journey, the car is packed and your family is getting anxious to be *underway* but please consult the following check-list which is only printed as a guide of the major items that should be attended to.

- Place any valuables not required, in a bank or other safe place.
- Make sure your garage and all outbuildings are securely locked.
- Is someone able to get under the house? If so, secure all entry points.
- Is someone able to gain entry through the roof? Sounds ludicrous, nevertheless a considerable number of unlawful access to premises occurs, due to this oversight.
- Have you cancelled, milk, papers, mail, ice and other regular deliveries?
- All electric appliances should be switched off and plugs removed from all wall sockets, except any automatic timers connected (programmed in a random mode) to lighting and/or radios in the home.
- Have you turned gas appliances and the feed taps to the Hot Water System and washing machine off? Heaters and hoses have the nasty habit of developing faults causing flooding at the most inopportune moment and this holiday may be just that occasion.
- Checked that all doors and windows are securely closed?
- Have you informed a trusty neighbour of your absence and acquainted them of your itinerary should the need arise to contact you.

Remember, Prevention is better than Cure!

- Ask your trusty neighbours to be 'nosey' all the time during *your* absence. If they have a second car, suggest that they may use your driveway during your absence. (Don't arrive home at 3 am in the morning and expect them to shift it though).
- Hide your garbage bins.
- Hang out some washing such as old towels etc to give the residence a lived in look. Your friendly neighbour may be persuaded to change the layout occasionally during your absence.
- Have you made adequate arrangements for your pets?
- If you are going to be absent, with no one residing in the residence, have you read your insurance policy? Many policies have a 28 day non-occupation clause.
- Have you considered having your telephone disconnected temporarily? Telecom will temporarily disconnect and reconnect on your return. You may save in rental which would cover the fees involved for this service. Remember you are responsible for the charges on all calls made from your phone. Telecom will give one an alternative number if someone is going to caretake for you. They are then responsible for all the calls they make in your absence.

These are only a few of many pertinent points written in a booklet entitled *Secure Living* A Victoria Police Guide. The preface to the publication is written by Chief Commissioner of Police Kelvin Glare. Mr Glare in the opening paragraph states "Crime prevention is not just a police responsibility — It is everyone's responsibility".

Police Officers are human beings as you and I are. They have the dutiful task of upholding and enforcing legislation. Most readers will, I am sure, agree that this is an unenviable, dangerous and at times unfortunately a thankless task, nevertheless if you approach your local Police Station seeking specific advice on security, considering the workload at the time, residents will be given expert assistance and suggestions.

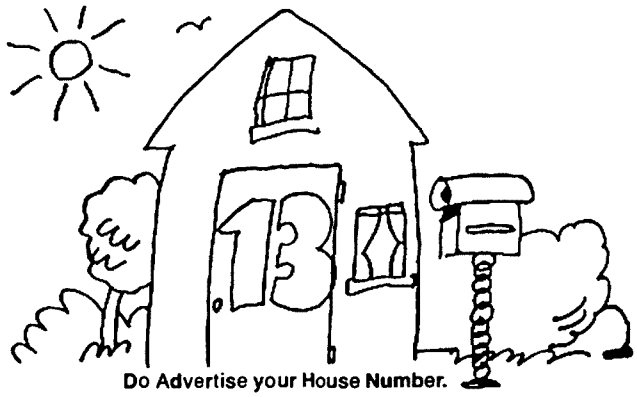
In Victoria over the last few years a Neighbourhood Watch program has been instituted and found to be quite successful in dramatically deterring unwanted visitors. It is basically a self-help, locally formed facility of reporting unusual occurrences to the authorities, as and at the time they are seen.

Police Number ? ? ? ?

Incidentally do you know the telephone number for the police in your city or town without having to look it up? Please memorise it and /or place it in a prominent location near all telephones on your premises — one day you may need it!

The booklet *Secure Living* mentioned above, is recommended reading and well worth the price of $3.20 postage paid, being obtainable from the Publishers, Marsec Marketing Security, 405 Clarendon Street, South Melbourne, Vic. 3205. If you apply for it, please send your remittance by cheque or Money Order and mention that you saw it in *Amateur Radio*.

Don't Leave Messages on Your Door.



Do Advertise your House Number.

HOLIDAY MOTORING

It would remiss of me not to mention to holiday motorists the necessity of road safety. Speed restraints, seat belts, safety harnesses and such regulations, legislated for your safety, differ from State to State and every licenced driver is obliged to make them self aware of all the regulations of their home State as well as those that they may visit.

One little known act concerns *Communication* Equipment and it is printed directly from the Victorian Road Safety (Traffic) Regulations 1988[2], for your benefit.

Make this a happy and safe Christmas, so that next Christmas will be a happy one too! Seasons Greetings from this QTH to your QTH.

REFERENCES

1. *Secure Living* — A Victoria Police Guide (C) 1987 Victoria Police.
2. Victoria Road Safety (Traffic) Regulations 1988.

I am indebted to the Chief Commissioner's immediate staff, Inspector Noel De Sair, Inspector Chris Coster and other senior officers for their time, advice, patience and assistance in preparing this article and the permission to quote and use material from *Secure Living*.

Communications Equipment

1505. (1) Except with the approval of the Road Traffic Authority and as provided by sub-regulation (2), the driver of a vehicle must not, while driving a vehicle, use a hand held—

(a) telephone; or
(b) microphone; or
(c) similar instrument or apparatus—

in the vehicle.

Penalty: 2 penalty units.

(2) Sub-regulation (1) does not apply to the driver of a vehicle that can be used as an emergency vehicle.

(3) Except with the approval of the Road Traffic Authority—

(a) a television screen; or
(b) any other means of visually receiving a television broadcast, telecast or other signal—

must not be installed or used in a motor vehicle if all or part of its viewer or screen—

(c) is visible directly or indirectly to the driver whilst in the driving seat of the vehicle; or
(d) is likely to distract the driver of any other vehicle.

Penalty: 2 penalty units.

(4) Sub-regulation (3) does not apply to or in respect of a device designed to aid the driver of a vehicle to manoeuvre the vehicle.

Seat Belts to be Worn

1506. (1) A person must not be seated in a motor vehicle that is in motion in a seat for which a seat belt is provided unless—

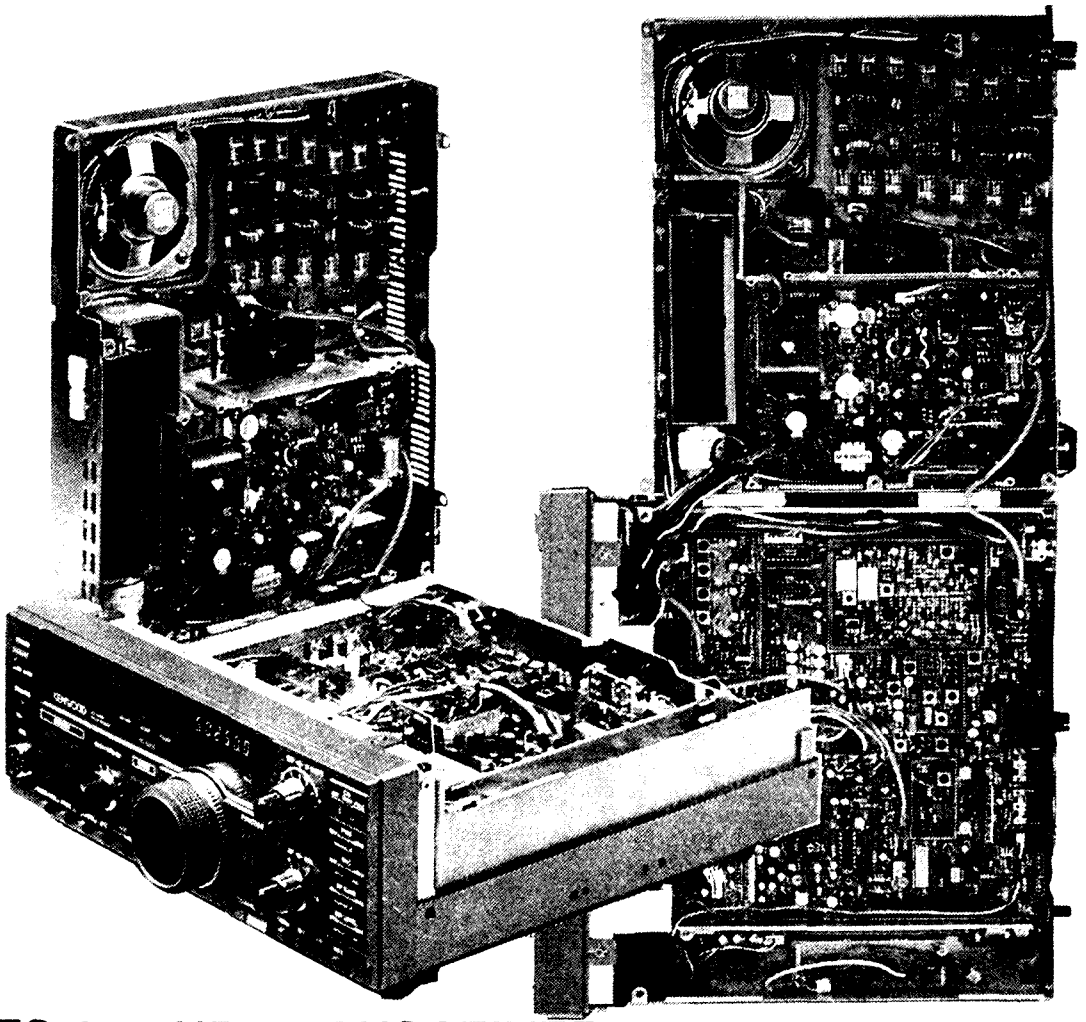
(a) the person is wearing a seat belt; and
(b) the seat belt is properly adjusted and securely fastened.

Penalty: 5 penalty units

(2) Sub-regulation (1) does not apply to—

(a) a person who the Road Traffic Authority has certified is a person to whom it is impracticable, undesirable or inexpedient that sub-regulation (1) should apply; or
(b) a person engaged in driving a motor vehicle in reverse; or ...

KENWOOD



TS-680 HF TRANSCEIVER

100 WATTS OUTPUT ON 160 to 10 METRES
10 WATTS OUTPUT ON 6 METRES

The TS-680 is a high-performance HF transceiver designed for SSB, CW, AM and FM modes of operation on all Amateur bands. Covers Amateur bands 160 metres to 6 metres, combining the ultimate in compact size with advanced technology.

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Try This!

J Heath VK2DVH
2 Barclay Street, Quakers Hill, NSW. 2763

A SIMPLE ALARM

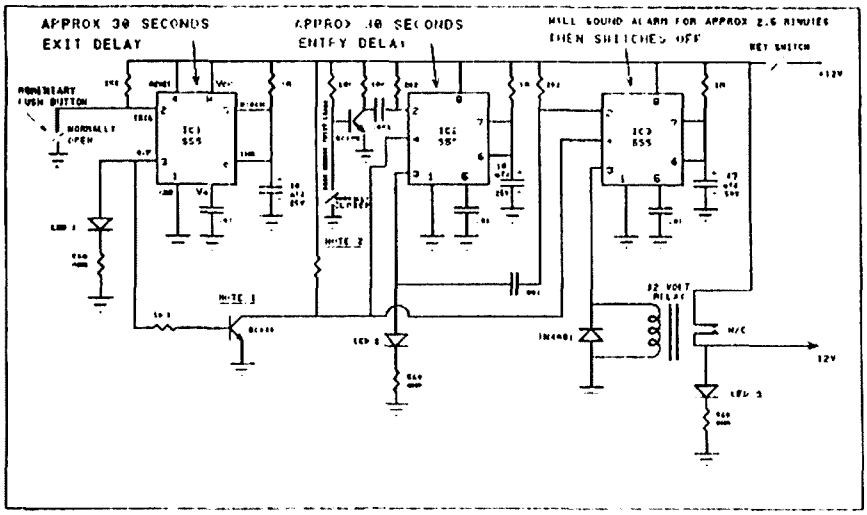


Figure 1.
NOTES:
1. This transistor disables the reset line so that the alarm does not falsely trigger when power is switched on. It also acts as an inverter.
2: Twist the sensor leads to minimise RF pick-up. In severe cases, also thread through ferrite beads.

Here is a circuit for a simple alarm incorporating exit and entry delays along with a lixed alarm operation period. Whilst making no claims for originality, it has been lound to be reliable over a period of some months.

Power to the circuit is controlled by a key operated switch. The circuit consists of three parts. The first part is the exit delay, comprising IC1 and its associated circuitry. The normally open push button is operated to start the exit delay timer. LED1 lights to indicate this and the operation of the alarm is inhibited for the selected time delay. Once the time has expired, the alarm is armed.

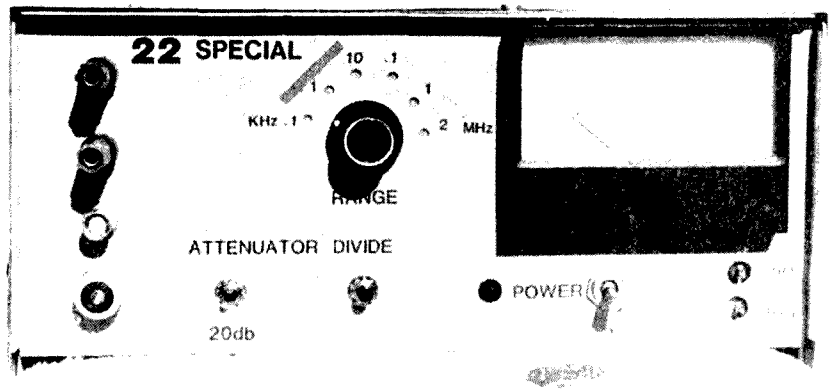
If the normally closed contacts of the door sensor are opened, the entry delay timer (IC2) is activated. LED2 lights to indicate this condition. If the alarm has not been turned off, or otherwise disabled, by the time this timer has expired, IC3 is triggered, activating the alarm relay. The alarm will operate for the period set by the timing components of IC3. After this period, it will reset.

ar

THE "22" SPECIAL

Ken Kimberley VK2PY
21 Nicoll Street, Roselands, NSW. 2196

This article features a two transistor two megahertz frequency meter specially designed to use a moving coil meter as the readout — hence the "The 22 Special" appellation!



This handy little device owes its birth to an idea developed for use in a new square wave generator which will be presented in the near future. This instrument will be continuously variable over a range from about **10** Hz up to **2** MHz, hence some form of dial was required. Suitable mechanical ones are about as common as "hens' teeth" today, and are also difficult to calibrate neatly.

It seemed feasible that some electronic method could well be employed here. Yes, dedicated chips and digitised (LED and LCD, etc) readouts are available at a cost. However, to keep the project simple, it was decided that the added complexity and expense was not warranted. A simple method was found in the analogue world.

The idea, which will be explained shortly, worked very well. The correct selection of components, and a little care, enabled the matching of the meter markings with that of the oscillator frequency, ie a **0** to 100 scale represents a range of **0** to **100** Hz, **0** to 1 kHz, etc. Likewise, a 0 to **30** scale could be calibrated for ranges of 0 to **300** Hz, etc.

Note the term used in this article is "Frequency Meter" and not the more common "Counter". This is because this instrument is purely analogue, and there are none of today's digital techniques used.

The accuracy and definition of this instrument cannot match that of the usual "Digital Frequency Counter". However, at around ± three percent FSD it is more than adequate for general-type audio measurements.

Having pointed out a major disadvantage, let us look at the advantages. This device has some decided advantages over its big brothers — some of which are:

a) Being analogue, it does not require a time base and therefore a warm-up period is not really necessary.
b) Unlike the counter type, this meter will follow a changing frequency; ie it does not have to wait for the next complete time base gate period.
c) It does not produce a myriad of spurious signals which may interfere with your measurements.
d) Simple construction, no PCB required, and it is very inexpensive. If the author can build it, so can you!

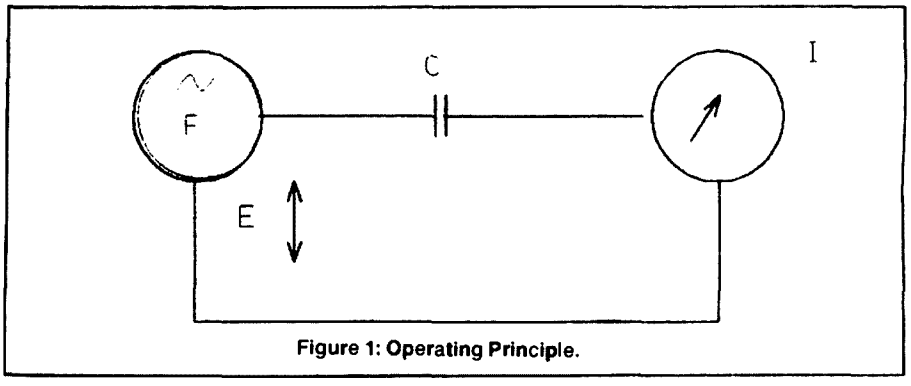


Figure 1: Operating Principle.

HOW DOES IT WORK?

Readers are referred to articles published in *Amateur Radio,* October **1987** and June **1988**. These were written by this author and dealt with direct reading *capacitance* meters.

The **"22"** Special works in a similar manner, hence the following will be kept brief.

Now, for the purpose of this explanation. Assume the applied voltage (E) (see Figure 1) remains constant, then it can be shown that:

a) At a fixed frequency (F) the current (I) is directly proportional to the capacitance (C) after the manner of the "C" meters mentioned previously.
b) For a given C, the I will be directly proportional to F

C = 0.1 uF E = 1.5916 V

FREQUENCY Hz	Xc ohms	CALCULATED I microamps
1000	1591.6	1000
900	1768	900
800	1989	800
700	2274	699.9
600	2653	599.9
500	3183	500
400	3979	400
300	5305	300
200	7958	200
100	15916	100

Table 1: Frequency Versus Current.

PROOF

Refer to Table 1. Here, E has been set at 1.5916 volts. A very old choice one would think. However, by doing so makes the I come out in round figures, thus making for clearer understanding of the results. A value of 0.1 uF was selected for C.

Column 1 lists F in 100 Hz increments (remember the 0 to 100 or 0 to 1 meter). Number **2**, the calculated Xc in ohms and 3, the I in microamps.

Now, look to Columns one and three — the numbers are identical. This proves statement B, thus forming a firm basis to the design of a direct reading frequency meter. Of course, there are other effects, which to some degree, control the total circuit impedance. For practical purposes, these have been ignored in this explanation. However, these parameters will be mentioned again further into this article.

Having established the feasibility of such a design, attention was then directed towards developing a practical circuit. This was accomplished within simplicity concepts.

Only two active devices were required and were of the common-variety transistors.

It was a little difficult to find enough blocks, (See Figure 2) however one was drawn as an aid to the reader's comprehension of this project.

The signal to be measured is coupled, via the input network, to the amplifier TR1 and thence is fed to the *waveform* shaper TR2. From here, the square wave, so formed, goes to the "Frequency to Voltage" converter. The frequency related

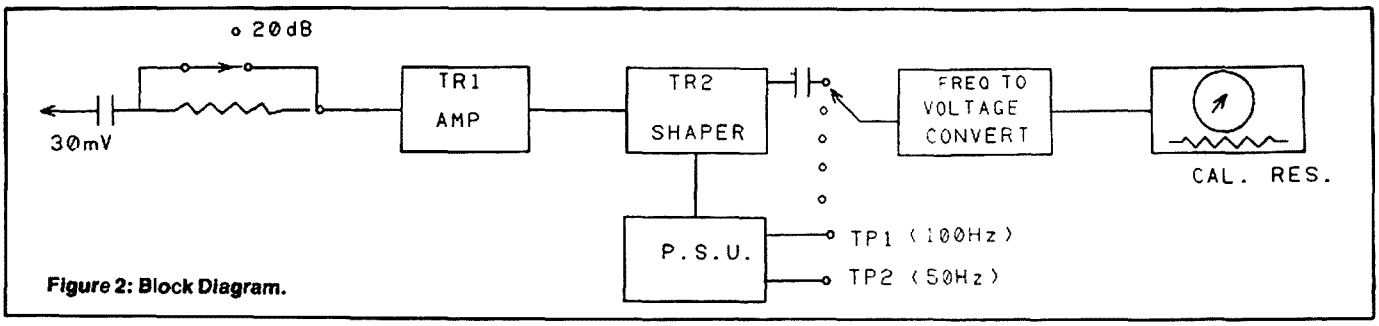


Figure 2: Block Diagram.

voltage (E) is then indicated by the meter which is shown in the next block. This also contains the calibrating and meter protection circuits. Lastly, there is the power supply — this is quite standard and does not require regulation.

TP1 and TP2 provide a reference source of 100 and 50Hz respectively. Both frequencies are derived from the power supply.

CIRCUIT DESCRIPTION

The circuit is quite basic and contains only two bipolar transistors. It is difficult to imagine a design so simple in concept and execution.

INPUT CIRCUITRY

Although the "22" can handle signal levels up to at least 25 volts (74 peak-to-peak) with comparative ease, it was decided to add a 10:1 (20 dB) attenuator. This pad is used on those rare occasions when it is necessary to measure higher level signals.

The input impedance (Z) of the amplifier itself was measured and is about 500 ohms. With the addition of R1 (5.6 k) this becomes 6 kohms direct and 62 kohms looking into the attenuator.

Note, overload protection diodes have not been used in this design, the reason being that bipolar transistors themselves act as diodes for large signals; ie the base emitter junction as an efficient diode in the forward direction and usually zenner at around eight volts in the reverse. It is only necessary to limit overload current and this is the task of R1 assisted by the 470 ohm emitter resistor.

AMPLIFIER — SHAPER

TR1 and TR2 are both type 2N2222A. However, almost any small signal high gain transistor would do. TR1 has been somewhat over-biased to assist in the wave shaping process.

The amplifier, and slightly clipped, signal now goes to TR2 via a current limiter. The use of relatively low resistances in both the base and collector circuits, 680 and 180 ohms respectively, ensures that this stage is grossly overdriven. The amplitude of the resulting output square wave is almost constant regardless of the input level and frequency for signals above about 0.05 volts (50 mW).

FREQUENCY TO VOLTAGE CONVERTER

The highly processed signal now passes to the F/V converter via the range selector switch S1. Six basic ranges are provided. Five in decade steps from 0 to 100 Hz through to one megahertz and the last 0 to 2 MHz. A divide by two facility on the meter affords better accuracy at the lower end of each scale, and, additionally provides a full scale calibration point; ie 50 Hz by courtesy of the mains transformer.

Earlier in this article mention was made of other parameters which might cause unwanted aberrations. (Some bother was encountered in early development work). These other parameters are *inductance* "L" and *resistance* "R".

At the frequencies being used, the inductive reactance is low enough to be neglected, but "R" is a different story. The total circuit "R" must be considered and consists of:

1. Source Impedance.
2. Metering Resistances.
3. Capacitor Dielectric and Wiring Losses.

The value of (3) is small in comparison to the 400 ohms total of (1) and (2), hence it will be omitted from this explanation.

We all know that $Z = \sqrt{X^2 + R^2}$

Substituting values (refer Table 1)

(a)

$$\text{FSD} \quad Z = \sqrt{1592^2 + 400^2} = 1641$$

(b)

$$50\ \%\ \text{FSD} \quad = \sqrt{3183^2 + 400^2} = 3208$$

In the above worked examples it will be noticed that the "R" effect of 400 ohms has increased the circuit "Z" by 49 ohms for (a) and 25 ohms for (b). This represents a difference or error as a percentage of three *percent and 0.8* percent respectively.

Now, if "R" is made 1000 ohms, then the errors become 18 percent and 40 percent, thus making the circuit useless. Conversely, if "R" is only 100 ohms, the new figures are 0.2 percent and 0.05 percent.

Therefore, it certainly is obvious that "R" must be kept to a minimum and that 400 ohms appears to be about the upper limit.

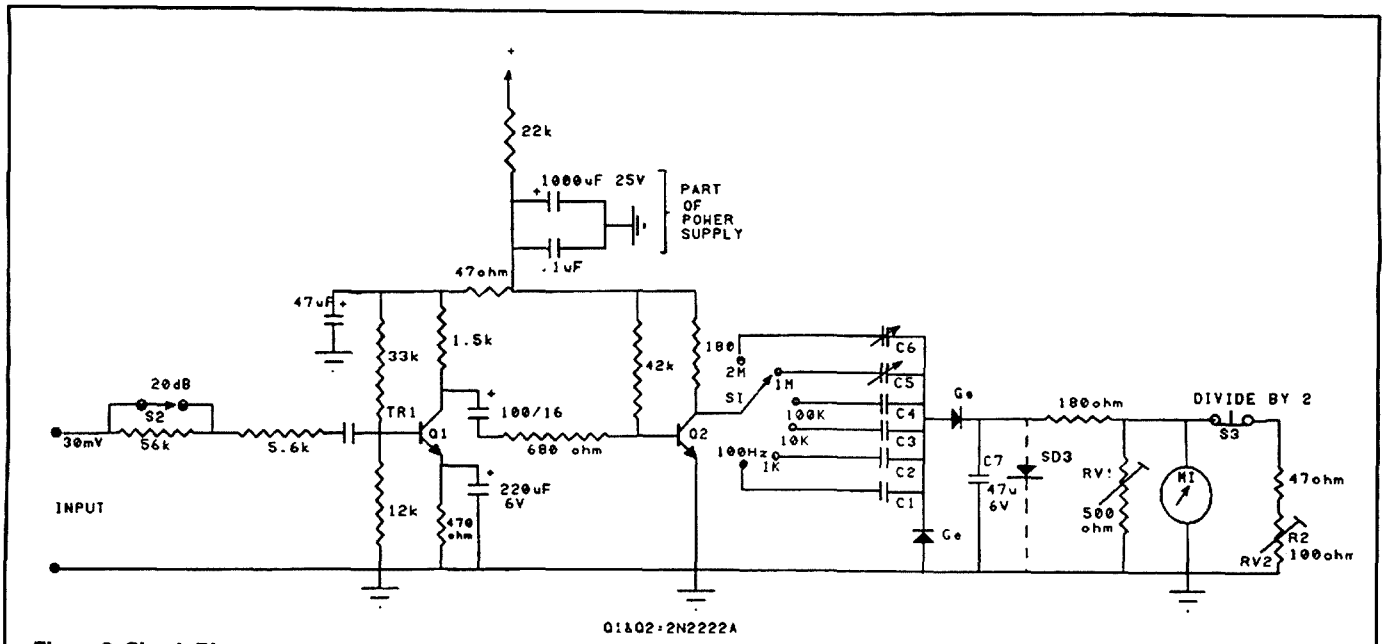


Figure 3: Circuit Diagram.

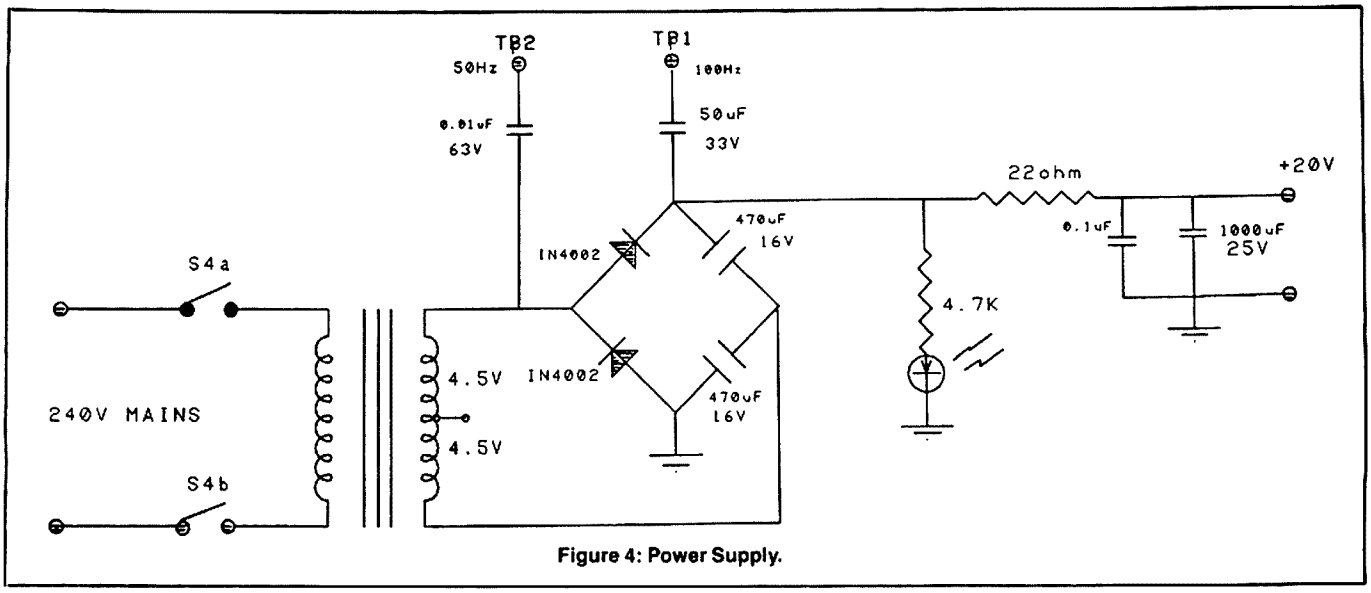


Figure 4: Power Supply.

METERING

The amplified signal is presented to one of the range setting capacitors, C1 through to C6. The resulting current is then rectified by two Germanium diodes (not Silicon) connected in doubler configuration, which in turn, charges C7.

This voltage is proportional to the frequency and is displayed by the meter M1, the FSD (Full Scale Deflection) of which is adjusted by RV1 and RV2. A one kilohertz input signal and C2 (0.1 uF) selected produces some 420 mV at C7 when the calibrating potentiometers are set correctly.

METER PROTECTION

The main overload protection is via diode SD3. It is well-known that silicon devices have a turn on voltage of around 0.6 volts. It is this parameter which forms the basis of this function.

The explanation goes like this:

As the applied frequency is increased towards full scale, so does the voltage across C7. However, little current is passed by SD3 until about 450 mV is approached. From here on up it increases dramatically and at 600 mV is such that a clamp condition is established. Thus the maximum overload will be around 50 percent and will not damage the movement.

Secondary protection is afforded by damping. This takes two forms, one is the meter itself. Most 100 microamp, 1000 ohm meters use an aluminium coil former, thus forming a closely coupled short circuit turn. This provides an effective damping medium as defined in *Lenze's Law*.

An additional method is to add large value electrolytics across the movement. This is an adjust-on-test exercise and is to personal preference.

POWER SUPPLY

This is a straight forward affair, nothing particularly unusual except the use of a voltage doubler instead of the ubiquitous bridge. Why? Well, for two reasons — firstly the author had the 4.5-0-4.5 volt transformer (DSE 2840) in the junk box and secondly, the cost factor.

One point of interest is the use of rather low value capacitors in the storage circuitry. This was done to enhance the 100 Hz content so that a fixed full-scale calibration point could be established, and is available from TP1. The resulting ripple (≈ 500 mV 100 Hz) was kept out of the supply line by a simple "RC" filter network (22 ohm/100 uF) inserted in series with the positive bus and doubler.

A "motor-boating" problem, which only appeared in the final version, was cured by the insertion of a decoupling circuit in the supply feed to TR1.

A low power 50 Hz signal was derived from the transformer secondary and is available at TP2.

METAL-WORK

The final layout will be mainly dictated by the reader's choice of components, in particular the meter and cabinet size. However, a suggested front panel layout is given in Figure 5.

A larger meter will make for easier reading and better accuracy. A 100 by 80 millimetre model would be about optimum, but it still takes up quite a lot of front panel space as compared to the internal components. Perhaps the 58 by 52 millimetre size may be preferred, thus making use of a smaller cabinet possible and a saving of about $5.

The use of a metal cabinet to house this unit is almost mandatory. The two stage input amplifier has a rather high gain, hence precautions must be taken to eliminate extraneous pick-up. At this QTH, a finger brought near the input terminals produced a significant response from the local broadcast stations.

To commence, refer to the diagram and photograph. Observe that the mains wiring and direct current metering have been kept well removed from the front end arrangement.

Firstly, collect all major parts together and move them around on a sheet of paper until a satisfactory layout is found. When you are happy with this layout ensure that the front panel components do not interfere with those to be mounted internally.

Next drill and cut out necessary holes. Proceed carefully as a hole drilled in the wrong place is an embarrassment! Deburr the edges and temporarily mount all components. Any omissions will become apparent and should be corrected at this time.

When all is correct, dismantle and prepare the case and front panel for spraying. It is strongly recommended that the spray pack manufacturer's instructions be strictly adhered to otherwise you may not be satisfied with the results. It is also a good idea to paint a small scrap of metal at the same time.

Neatly letter the front panel. Try to keep all legends parallel with the top edge. It is worth the extra effort as a neat finish is something of which to be proud. The scrap piece of metal is the control sample as sometimes a clear lacquer finish may not be compatible with the colour coat. The idea here is to try the lacquer on the scrap and only proceed when satisfied with the results.

WIRING

A "Blob-type" board was used and proved quite handy. It measured 180 by 110 millimetres and was large enough to carry all of the components, including those of the power supply, metering resistors, etc, as well as the F/V converter calibrating.

Blob Board is probably not now commercially available, however a Dick Smith Electronics Type H5610 could be used. There will not be sufficient space for the power supply and a second board could be used, or alternatively, it could be built directly onto the metal work with the assistance of a couple of tag strips, etc.

A number of circuit pins (Cat No H5590) will be required if employing the H5610 board. It is recommended that these be used at the following points. signal and power supply inputs, transistor connections, metering outputs and the calibrating capacitors, etc.

The actual wiring is simple and minimal. Of course, the main circuit board will have been mounted so that the C1. . .C6 pins are immediately adjacent to the range selector switch. This arrangement will enable these connections to be kept short and rigid.

WARNING

This instrument derives its power from the mains, hence certain safety precautions should be observed.

In the author's model, all of the associated mains wiring was kept off the electronics board. Also, no terminal block was provided for the three core flex, instead, the active and neutral wires connect direct to the back of the DPST toggle switch (S4). The earth wire connects to the metal work via a solderless tag, screw, washer, lock washer, and nut.

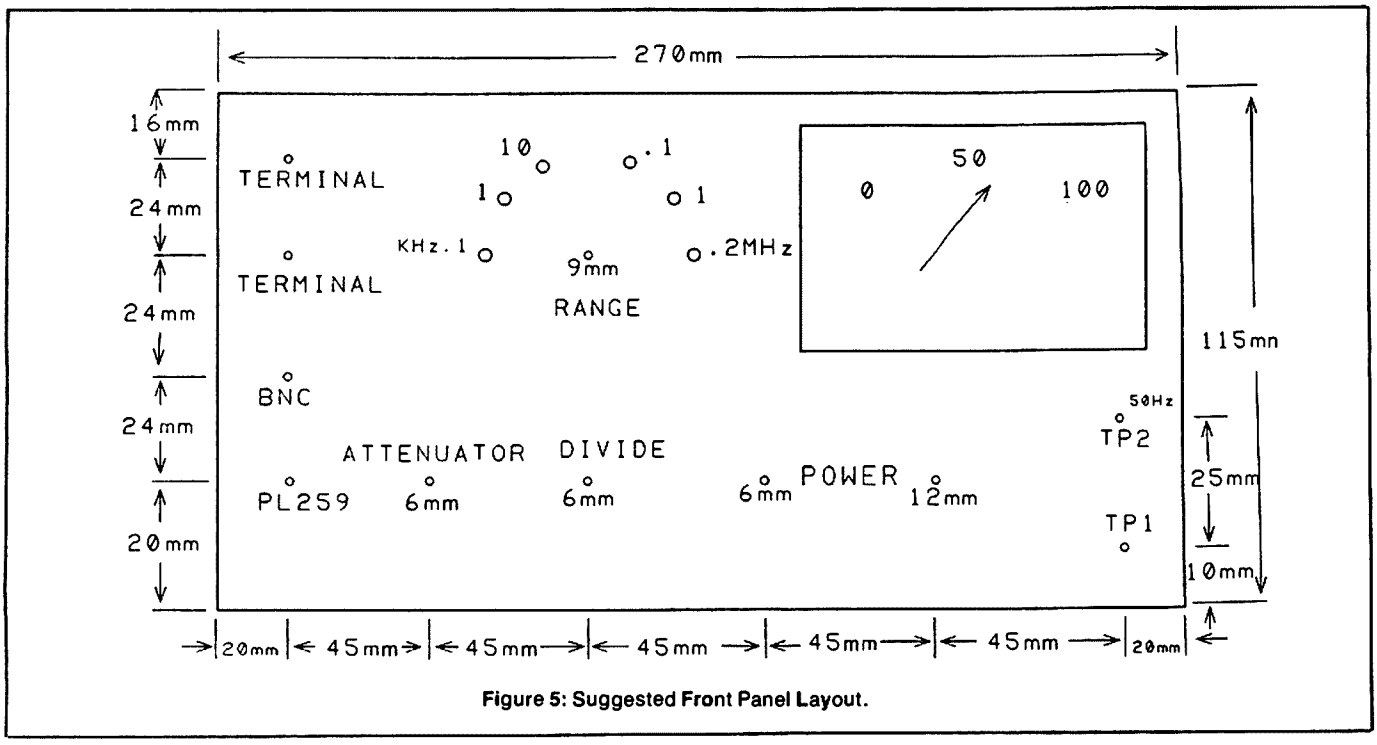


Figure 5: Suggested Front Panel Layout.

The elimination of the mains terminating block reduces the number of exposed danger points, however, the mains switch should be covered — say, several layers of insulation tape — as a protection to "poking fingers".

The main thing is to observe the usual good workshop practices. This includes the use of a rubber grommet where the main flex comes through the case. Also, lock-washers should be provided under every nut.

CALIBRATION AND TESTING

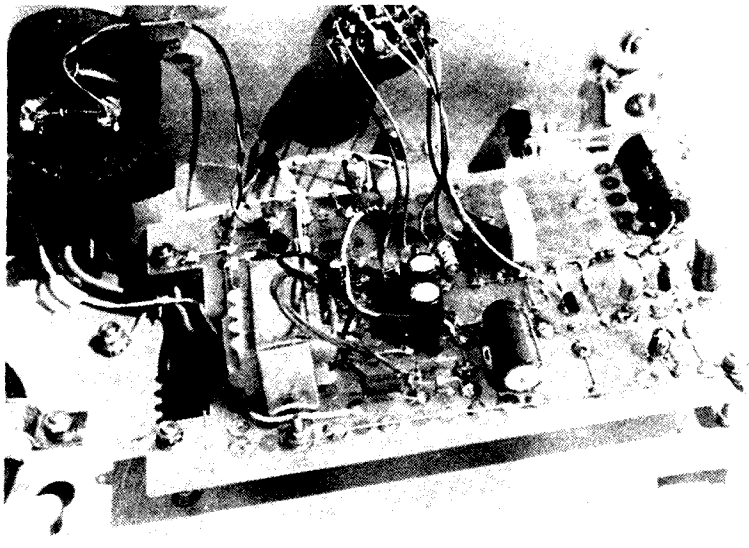
To this point, little mention has been made of the series capacitors in the Frequency to Voltage converter. These are reasonably critical and a little care should be exercised in their selection.

An elegant solution to this problem is as follows:

Go through a supply of capacitors, in the junk box or otherwise, and carefully measure each one. The professional approach is to aim for "C" values in the progression 1.0, 0.1, 0.01, 0.001, etc. This is not strictly necessary as long as the significant figures are identical; ie 0.9 0.09, etc or even 1.0 0.11 etc. Aim for the closest possible tolerance, even if you have to pad up lower value units. Remember, care taken here will reflect in the final accuracy achieved.

If you haven't built one of the capacitance meters previously described by the author in AR, or you don't possess one, it is possible to use empirical methods. More about this later.

At this point, assume that a selection as been made and fitted. Proceed as follows:



Main Electronics Board.

SMOKE TEST

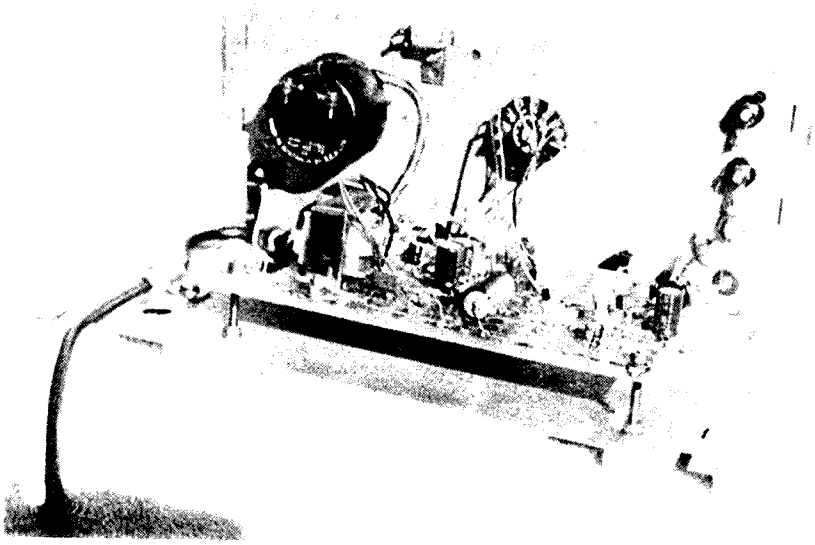
1. Connect a multimeter across the DC supply bus.
2. Plug your unit into the 240 volt mains and switch on.
3. If all is correct the multimeter should read about 20 volts.
4. Move the meter to T1 and measure the alternating 100 Hz voltage. It should be around 500 mV. Note, this is the 100 Hz reference signal mentioned previously.
5. Check the 50 Hz reference by moving the multimeter to TP2.

FUNCTIONAL TEST

6. Switch off and check that the meter mechanical zero is adjusted correctly.
7. Set RV1 and RV2 to approximately half rotation.
8. Re-power and observe the meter which should read close to zero.
9. A significant indication could be due to noise, stray pick-up or self-oscillation. Appropriate steps should be taken to eradicate this.
10. Touch input terminal and the meter should give a sizable deflection.

CALIBRATION

11. Set the range switch to 100 Hz and enable divide by 2 (S3).
12. Connect the input to TP2 via a shielded cable.
13. Adjust RV1 for FSD.
14. Change to TP1, disengage divide by 2, and adjust RV2 for full scale.
15. Re-check steps 11 to 14. This completes the calibration up to 100 kHz. The two higher ranges require the use of an external source.
16. Set this source to 1 MHz using the station receiver to ensure accuracy.
17. Connect the 1 MHz to your frequency meter and adjust TC1 for correct reading.
18. Calibrate 2 MHz using TC2.
19. As a final check, go through steps 11 to 18 again.



Internal View.

That completes the calibration procedure given suitable reference capacitors. As mentioned before, those without access to a capacitance meter have not been forgotten. The results obtainable are quite satisfactory, however, a little additional work will be required.

A known signal source is necessary. A divided down crystal controlled marker is ideal. However, failing this, an accurate signal generator will do.

ALTERNATIVE CALIBRATION METHOD

Purchase a 0.1 uF 63 volt one percent polystyrene (Dick Smith Cat No R2780) and install it in the position designated C2. This is the 1 kHz range and becomes a reference point. Proceed as follows:

1. Power-up the "22" Special and the signal source.
2. Allow both to stabilise for about five minutes.
3. Set the source to 500 Hz and connect to your unit via a shielded cable.
4. Enable divide by 2.
5. Adjust RV1 for meter full scale deflection (FSD).
6. Change the input to 1 kHz, disengage divide by 2 and use RV2 to obtain FSD.

NOTE: the basic sensitivity has now been established, hence the two trimming potentiometers should not require further adjustment.

7. Calibrate the two highest ranges by following steps 16 to 18 of procedure "Calibration" above.

The point has now been reached where work is required! The idea here is to transfer the accuracy of the 1 kHz calibration as follows: Fit the following value capacitors 0.82 uF, 0.082 uF and 820 pF to switch positions 100 Hz, 10 kHz and 100 kHz respectively.

8. Set the source (maybe check with a receiver) and range to 100 kHz. Your meter will indicate a value less than 100.
9. Trim C4 by adding small capacitances until FSD is obtained. Try to keep the number of additions down to a minimum.
10. Repeat procedure for the 10 kHz range.
11. Use TP1 as your reference when setting up the 100 Hz.
12. When satisfied, check all steps, especially number seven as the stray capacitance may have changed slightly due to the padding arrangements.

OPERATING INSTRUCTIONS

Operation of the "22" Special is self-explanatory. However, a brief account will be presented.

Proceed as follows:

1. Set *range* to 2 MHz.
2. Switch on.
3. Plug *short* coaxial test lead into the appropriate socket.
4. Connect the signal to be measured.
5. Rotate the *range* switch counter clockwise until a significant meter indication is obtained.
6. Multiply the meter and range figures together.
7. The resultant is the frequency of the input signal.
8. The *divide* by two function may be enabled provided that the meter deflection is less than half scale. The indicated frequency will now be double the actual.
9. Upon completion of measurements, return *range* to 2 MHz and switch off.

All that remains to be done now is to fit your brand new frequency meter into its case and find a place for it in your shack.

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PC IN YOUR POCKET

Atari of the United States is launching an IBM compatible personal computer the size of a Walkman, in November.

Its liquid crystal screen displays eight lines of 40 characters. With 512k of internal RAM and 256k of ROM, it can do spreadsheets, an address book, calculator, diary and wordprocessing.

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RESIGNATION OF VK CORRESPONDENT TO 73 MAGAZINE

Back in 1982, the WIA was approached by the American magazine *73 Amateur Radio* to provide an Australian correspondent for the International section of the magazine. For those who have not been able to see at least the odd copy of *73* since then, it has featured each month a collection of news items about amateur radio from various countries around the world, a column of two from each country, headed by its national flag.

Jim Joyce VK3YJ, was asked if he would like to take on this quite demanding task, and agreed to do so with some hesitation, as he had no previous journalistic experience. Nevertheless, Jim has done a magnificent job ever since, and was the only foreign recipient of one of the awards given to its contributors by *73* for meritorious service.

Unfortunately, all good things come to an end, and after 45 articles and 60 000 words, Jim can no longer find time to continue as the VK columnist. On behalf of all Australian amateurs, the WIA thanks him sincerely for keeping our activities in front of the American amateurs for so long. Is there anyone out there who would like to volunteer to take over the job?

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MAIL GETS THROUGH

Many complain about our mail delivery service, including yours truly, but this little excerpt from *Weather News*, must give anyone confidence in the system.

The letter and contents addressed in pencil are reproduced hereunder as they were written, and arrived on the desk of Mr Bill Ware, who is Antarctic Liaison Officer for the Commonwealth Bureau of Meteorology.

Any Scientist
Any Weather Station
South Pole Antarctica

Dear Sintest

Please send me some piturs of Antactica. We are learning about it. Are teacher read us a story about it. Wiy did you go down thear.

The young lady, a Miss Karmin Diedrick of Amherest, Ohio, USA was sent a package of Antarctic leaflets, general information and a note from Bill.

One has to congratulate all parties concerned in getting the letter to its destination and Bill, for his prompt reply.

—From *Weather News*, September 1988, Issue No 287

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THREE-YEAR MEMBERSHIP OF THE WIA

If you are a Full, Associate, Pensioner, or Family member of the Institute, and your membership renewal is due on or after January 1, 1989, you will be able to avail yourself of a new facility for members.

A three-year membership.

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Obviously, with inflation and fees rising each year, this facility will save you money.

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THE WEST AUSTRALIA TO SOUTH AUSTRALIA TWO METRE PATH

A real "bight" of the action!

John Hawkins VK6HQ
39 Glyde Road, Lesmurdie, WA. 6076

Sandgropers get a goodly go at VHF/UHF tropospheric ducting, not only up and down the west coast, but also, and more spectacularly, across the Bight from the southern ports, particularly Albany. A real "bight" of the action, as it were!

For the uninitiated, tropo-ducting occurs when a layer of warm dry air becomes trapped beneath cooler moister air, refracting the signal along a track parallel with the Earth's surface, with a flat path being good and a path over water even better. One can take a reasonable punt on when "local" ducting will make DX communication available but to predict the onset of an opening between Perth and Adelaide is nigh on impossible. Such openings are infrequent. Like several years infrequent!

Openings between Albany and Adelaide happen more often, although if you don't happen to live in Albany, the odds against getting yourself and your equipment there right at the appropriate instant are long. Nevertheless, for once, luck came my way.

In 1980, no one was sure whether the Perth/Adelaide two metre run had been accomplished. A handful of Perth VHF enthusiasts could certainly recall when last the Adelaide beacon was heard. But I was, to say the least, sceptical of it ever happening when I was around. However, when on the morning of January 23, 1980, as on countless previous occasions, I turned my five by five skeleton[1] slot through an easterly quadrant, stopping only to squeeze the PTT, to my unbridled joy back came an identification with a figure five in it. Adelaide at last!

It could have been Sporadic E, but the weather map pointed to a classic ducting situation; a high in the Great Australian Bight and trough down the west coast. Anyway, I felt in my insulators it was a ducted signal, a bit like the way the discerning Hi Fi buff claims to pick a valve amplifier from a transistor amplifier by the feel of the sound. Suffice to say, the signal that morning conjured up memories of the epic film *Zulu* and the sound of spear on shield wafting over miles and mile of veldt.

I drew a breath, microphone-hand trembling just a little. "This is VK6HQ in Perth calling CQ and listening". Even the word "Perth" seemed strange and unreal. Nothing, but the repeater tail. Emphasising the "6", I tried again. "VK6HQ on frequency and listening for any calls!" Silence. I supposed they were all at work. After breakfast, I dialled up 144.100 and tried sideband. Still no replies, but *someone* came up momentarily and anxiously asked me to keep the calling frequency clear. "There's some DX coming through!" he said. I was not making it on sideband because of the vertical antenna, I thought and sadly turned off the set and left, late for work, knowing that several Perth stations were on frequency and were doubtless going to get through[2].

Since then there have been isolated VHF/UHF openings from Perth to Adelaide, notably the one when Bob VK6KRC, made it on 70 centimetres, but the thrill of that day in 1980 stays ever in my memory.

It is funny how things go full circle.

I was in Adelaide for a conference during the first few days of December 1987 and, as one is wont to do, used limited spells of off-duty time to work the local repeaters. I remarked to Les VK5ALW, how eerie it was to reflect that, years before, I had accessed the repeater we were now using, but ***from Perth***, and nobody heard me.

"Yes! Funny you should mention that," Les said. "I heard you." I couldn't believe my ears. "I couldn't get back to you," he said. "But I did go on to work several Perth stations."

It was some weeks later that my curiosity (and, I confess, my ego) finally got the better of me and I wrote to Les asking if he would mind letting me have a *copy* of the *entry* in his log. He did more than that and, as can be seen, it was a busy and extraordinary day for VK5ALW that day in 1980, and confirmed my "trip" across on two metres.

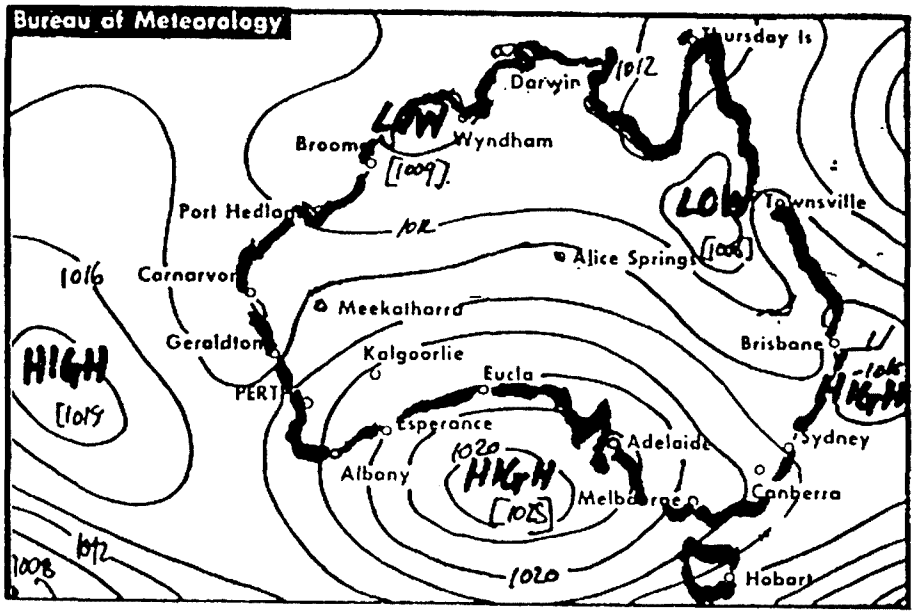
John VK6HQ, portable at Mount Adelaide, Albany, West Australia, in February 1988.

CALL SIGN VK5ALW LOOSE LEAF LOG SHEETS PAGE NO.....

NO	STATION	DATE	TIME-S- TIME-F-	FREQ	MODE	RST-G- RST-R-	NAME Q.T.H	NOTES	QSL S	QSL R
	VK6JI	23-1-80	21.06 21.13	Ch.5	FM	5-9 5-3	Chris Wagin Mt Albany		✓	
	VK6XY	"	23.51 23.55	Ch.5	FM	5-9 5-9	Aubrey Albany	Seeking S.S.B contacts on 144.10 D.X.	✓	✓
	VK6XY	"	23.56 23.59	144.10	A3J	5-9+10 5-9	" "			
	VK6FM	"	00.10 00.14	144.10	A3J	5-3 5-3	Ron Rockingham		✓	✓
	VK6HK	"	00.02 00.07	144.10	A3J	4/5-0	Tom Wembley Downs	Could not make two way contact due to my fixed beam.	✓	
	VK6WD	"	00.02 00.07	144.10	A3J	5-3 5-2	Wayne. Warwick		✓	✓
	VK6HQ	"	00.02 00.07	144.10	A3J	5-2	John.	Unable to make contact.		
	VK6KZ/P	"	00.10 00.19	144.10	A3J	5-9+ 5-8	Wal.			
	VK6KJ	"	00.14 00.19	144.10	A3J	5-9+ 5-8	Bernie		✓	✓
	VK6ZEL	"	00.20 00.23	144.10	A3J	5-3 5-3	Jack Twigg		✓	✓
	VK6ZFG	"	00.23 00.26	144.10	A3J	5-1 5-1	Ken. Kalamunda		✓	
	VK6EO	"	00.27 00.29	144.10	A3J	5-4 5-4	Jim Albany	Called by Jim.	✓	✓
	VK6WD	"	00.50 01.12	144.10	A3J	5-1 5-1	Wayne Warwick	Called by Wayne to check path conditions		
	VK6NL	"	00.55 00.59	144.10	A3J	5-1 5-1	Vic.	called to arrange sked.		
	VK6ZKO	"	00.59 01.10	144.10	A3J	5-2 5-3	Phil Perth	200W with 13el. yagi. Gooseberry Hill.	✓	✓

A page from the log of Les VK5ALW, showing January 23, 1980.

Les VK5ALW (Athelstone) at the time of the big Adelaide/Perth two metre opening in 1980.



The Weather Map for Sunday, February 22, 1988 as published in *The West Australian*.

The story cycled once more in February this year. I combined a Monday training visit to Albany with the preceding weekend. As the time drew near to leave for Albany, the weather map began to look good. The heatwave in Perth was set to reach a new record and I began having visions of records of a different sort at Albany! In the event, *no* records were broken by VK6HQ, but, with prolonged and substantial openings on both mornings, two metres DX surpassed my widest expectations.

As, at 7.30 am on Sunday, February 21, I sped from our accommodation on Frenchman Bay Road towards the Albany lookouts, VK6DM came up on Channel 4 1/2 Albany with the spurring news; the band was open to the east!

The sky was clear and blue and the harbour looked like an azure millpond. Would it work? Would the signal really get through? Frank had recommended the Mount Adelaide lookout in preference to Mount Clarence, for vehicle accessibility and height above sea level so I took the righthand fork to Mount Adelaide.

No sooner had I set the brake, taken-in the magnificent vista and scanned the repeater frequencies when in came two separate conversations, noise free. And none of the voices was an Albany VK6. This was it! Wait for a break and call sign!

I could not believe it! It was Les VK5ALW, the station who heard me in 1980 and with whom I'd not long spoken in Adelaide! Les was working Bob VK5ZRO and after I had broken in, Les could see what a series of coincidences we had shared. Both Les and Bob were as astounded as I was over the fine propagation conditions.

In the ensuing two hours I went on to work 20 VK5s and Bob VK3DEP through the repeaters and then John VK5BJW and Eddie VK5ARL, on 146.500 MHz simplex with reports around five by three. A big bonus was that the Perth Hills Amateur Radio Group had use of the VI88WA call for the month of February and it was possible to repeat many of the QSOs using VI88WA/P.

Having said I would be back well in time for breakfast and the 9.30 am WA WIA Broadcast, I had some minor explaining to do to my ever patient wife, Connie.

Monday meant a full day's work and I knew there were would be precious little time available for amateur radio. Nevertheless, with special dispensation from Connie, I grabbed a bite of breakfast and shot off at 7.30 am once more for the lookouts.

Climbing in altitude, I switched to VK5RAD and put the unit on CW. A tiny heterodyne showed the repeater was in use and the signal grew in strength every second, until — Ouch! The Mount Adelaide car park gates were not yet open! Without bringing the car to a halt I threw a U-turn (and nearly a fit!) and back-tracked as fast as I could for Mount Clarence. Once there, by edging the car this way and that a few inches at a time, several VK3s chatting on the 146.850 MHz Mount Macedon repeater were heard free of noise but, try as I may, I could not attract their attention and raced back to Mount Adelaide. By this time, the gate was just being opened.

There was no response now from either of the Adelaide repeaters, but, with time running out, back came Trevor VK5ADY/P and Ken VK3KAV, in reply to my call on 146.950 MHz, the Mount William repeater in Victoria which rounded off things very nicely. With a quick change of reports, it was off to the office.

As a footnote, the equipment used at Albany was an FT-480R with 10 watts into a halfwave, base-fed vertical clipped onto the car rear window and just clear of the roof[3]. (See Figure 2).

Very soon after my return to Perth I worked two of the VK5 stations (which I had worked in Albany) again, this time not on two metres but on 20 metres phone and we all remembered! It is interesting the effect DX has on on people and it still seems to be one of the most popular topics for discussion.

Certainly, there is a whole host of DXers waiting at either end of the Perth/Eastern States path, eager for the ***Big Duct*** to come again. . .

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1. Skeleton Slot. *RSGB VHF/UHF Manual* page 7.12.
2. *VHF-UHF — an expanding world,* VK5LP. *Amateur Radio* March 1980, page 36.
3. *Vertical Aerial needs no Groundplane,* VK4CCR. *Amateur Radio,* March 1980.

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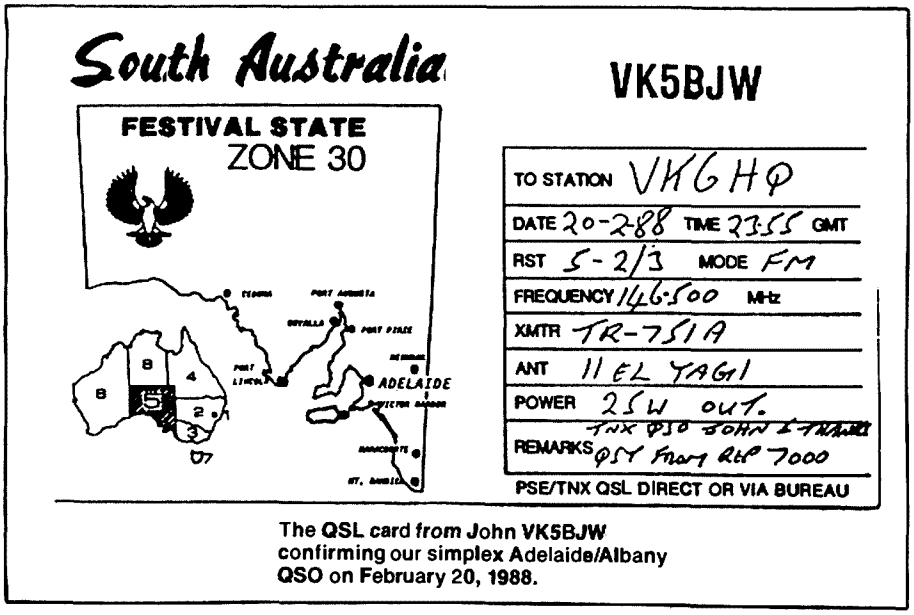
See next page for diagram of antenna.



The QSL card from John VK5BJW confirming our simplex Adelaide/Albany QSO on February 20, 1988.

KENWOOD TS-530S TRANSCEIVER

Con Murphy VK6PM
PO Box 88, Yarloop, WA. 6218

If you have installed the YK-88C CW filter as an extra and you have now gone on to RTTY AMTOR, you can have a 500 Hz filter in both LSB and USB positions of the mode switch if you tie both posts A and B together.

For results move the IF shift to the plus side. Use the narrow position for 500 Hz.

Try it and good luck!

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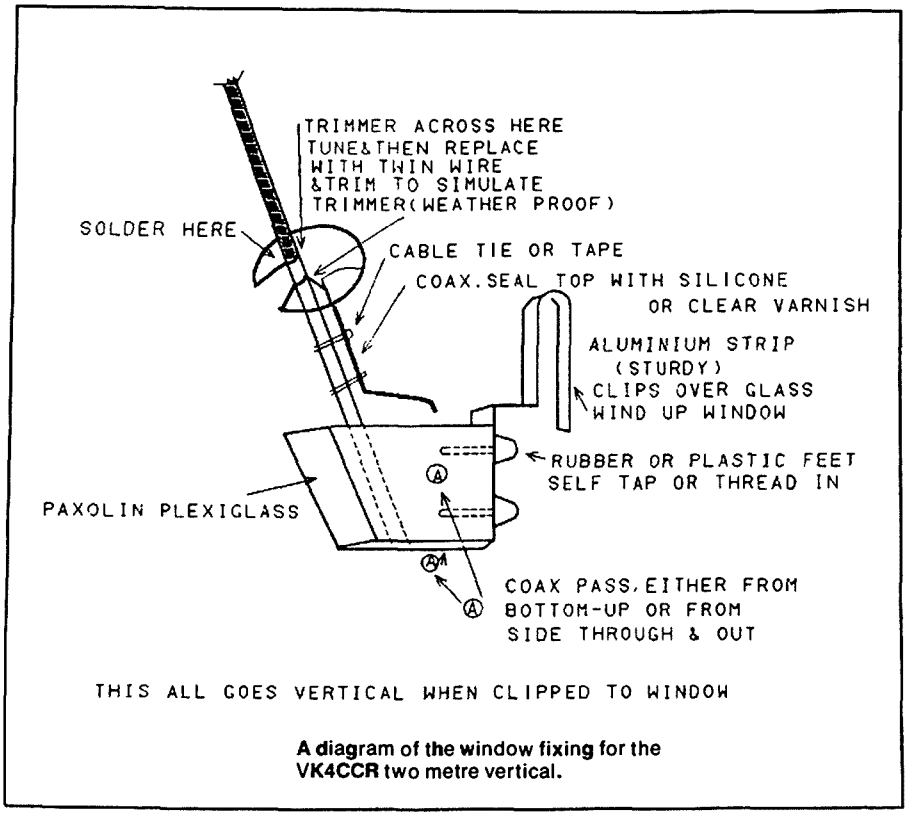

A diagram of the window fixing for the VK4CCR two metre vertical.

Try This!

Ron Tulloch VK4BF
PO Box 718, Hermit Park, Qld. 4812

Have other amateurs experienced this frustrating fault on an intermittent basis?

This fault manifests itself when, without any warning during normal operation, the digital display just drops right out, and the set goes quite dead except for some slight audio noise from the speaker.

It had been happening with my TS-530S on and off for around two years, and the only advice I could get from other amateurs with the same fault was to "take the top cover off, and push and prod the wires and plugs to the display board a few times, and all would be well!"

This did work after a fashion, and the set would again come to life and operate for a couple of months or so, and I never came away from this exercise really sure of what I had actually done to overcome the problem.

The last episode happened recently, and no amount of pushing and prodding would cure the problem, so I thought there must be a logical reason for this. Out came the trusty multi-meter, along with the owner's manual, and the confusing circuit diagrams that seem to be the norm with all owner's manuals.

After about an hour's eye strain tracing out the power leads to the boards through the maze of parallel lines on the circuit diagram, and the bundles of connecting wires in the set, I felt I had come up with the answer.

There is no control on the front panel for changing from the internal VFO to the external VFO. Right at the back and rear of the chassis there is a socket labelled EXT VFO. This socket is combined with a switch, and the actual insertion of the EXT VFO automatically changes the nine volt supply from the internal VFO to the external VFO. Here is the situation where a low voltage source depends on a set of small switch contacts to get where it is supposed to be going. I have never had an EXT VFO, so it is possible to assume that a combination of time, dust and humidity would result in the build up of a high resistance joint to the low voltage, thus disabling the VFO and therefore being the primary cause of the fault.

A couple of minutes spent manually operating the switch on the EXT VFO socket, duplicated the fault every time, so in connection with some cleaning spray, effectively cleaned the switch contacts, and allowed the nine volts to get to the internal VFO.

I now know what I am going to do "when I get around to it!". I have no intention of using an external VFO, so I am going to bypass this switch on the EXT VFO socket, and take the nine volts directly to the internal VFO where it rightly belongs.

Hopefully the above comments will be of assistance to others who own TS-530/TS-830 equipment, and allow you to use this otherwise trusty, "no-frills" equipment for a long time to come!

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DIGITAL DISPLAY DROP-OUT IN TS-530/TS-830 TRANSCEIVERS

PACKET RADIO IN THE GERMAN DEMOCRATIC REPUBLIC

During past years, packet radio has found its way into the shacks of radio amateurs in the German Democratic Republic. Compared to our liberal regulations, the radio amateur of the GDR are somewhat more restricted with regard to their use of packet radio. The following is an edited translation from the July issue of the West-German amateur radio magazine *cq-DL*. Klaus Zielski DF7FB, the author of the original article compiled his information from the East-German amateur radio magazine *Der Funkamateur* (the radio amateur).

Packet radio is an error-proof computerised RTTY mode. It allows the forwarding of messages from their originator to their receiver via several intermediate stations. These intermediate stations act as digipeaters; ie they receive packets of information and transmit them further onwards. If one wants to make *use of* these facilities; eg because one cannot directly contact the proposed addressee of the message to be sent, one is bound to the prerequisites given below:

1. the use of an amateur radio station of a foreign country is illegal.
2. any amateur radio stations acting as digipeaters must be exclusively under the direct control of the radio amateur responsible for their operation.
3. topic 2 and 3 do not apply to repeaters, network nodes, and satellites.

The following standards apply:
Baud Rate: below 30 MHz 300 Baud — above 30 MHz 1200 Baud.
Shift: below 30 MHz 200 Hz — above 30 MHz 1000 Hz.
Frequencies for F2B mode: mark 2200 Hz — space 1200 Hz.

The subjects discussed in RTTY contacts may, of course, not differ from the subjects discussed during contacts in other transmission modes. As the increased use of computers in the amateur radio service demands some changes in practice, the permissible subjects from this point of view are outlined in the following:

The operation of mailboxes requires a special licence. The application for this licence has to be directed to the Central Committee of the Society for Sport and Technic (GST) at the Ministry for Post and Telecommunication. Transmissions in one of the RTTY modes mentioned above are regarded as open (unciphered) in respect to the use of computers within the amateur radio service to the GDR. Computer programs may be broadcast, subject to the condition that their purpose is related to the amateur radio service. The use of data formats specific to a *certain computer type* is illegal. BASIC, FORTRAN, COBOL, PASCAL, as well as the mnemonic code and machine code of the U 880 D (similar to the 8080; the translator) are regarded as open languages. If computer programs are being broadcast, the regulations are, that at the beginning and at the end of the broadcast, the purpose of the program and the programming language must be specified, using the same transmission mode that is going to be or was used to broadcast the program. Examples — Contest evaluation in BASIC, RTTY program in assembler source code U 880, filter design in PASCAL...

—Translated from *cq-DL*, July 1988, by Michael Wegener VK5ADN

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RECEIVER LARGE SIGNAL PERFORMANCE

John Day VK3ZJF
5-7 Old Warrandyte Road, Donvale, Vic. 3111

Vast improvements have been made!

Recently, I have heard on-air, and seen written, some rather horrifying misconceptions about the nature of in-band interference. Many people have assumed that because they are experiencing interference from a fellow amateur operating nearby that his transmitter is at fault. On many occasions it is, but in as many more occasions, the problem lies in the receiver.

When a receiver or transceiver is being designed, several compromises are inflicted on the final specification of the product. Given the price people will be prepared to pay for a given level of features, what money is left over for the performance. Secondly, what level of performance do we offer for that amount of money, thus influencing the ultimate profit from the product.

A detailed study of modern transceivers will reveal that, whilst vast improvements have been made in the features and facilities offered on modern equipment, relatively little improvement has been made in the specifications of the equipment. Only when amateurs start selecting equipment on the basis of superior performance will the manufacturers start designing superior equipment.

RECEIVER SPECIFICATIONS

As in all electronics, the performance of one piece of equipment can only be compared with another when a set of definable specifications are used. Perhaps now is a good time to explain some of the more important specifications in evaluating receivers and some of the characteristics which determine the performance of a receiver.

SENSITIVITY

When evaluating receivers, some basis of comparison must be established. This is generally accepted to be a 10 dB output signal to noise ratio. Thus a receiver will generally have its sensitivity quoted as X uV or -xxx dBm for 10 dB S/N/ ratio.

The actual amount of signal required to achieve this 10 dB S/N ratio is determined by the noise figure of the receiver. Noise figure can be said to be the ratio by which the receiver or other 'something' degrades the input signal to noise ratio. Noise figure is measured by using a noise source that generates a known amount of 'excess' noise over and above that calculated for the object at room temperature.

Noise is used rather than a single signal because the excess noise will then be measured in the same receiver bandwidth as the internal noise. Firstly, the output of the receiver is measured without the noise source turned on. Then the source is turned on and the increase in output is noted. Noise sources for this sort of work are calibrated in terms of excess noise ratio, thus if the noise source had an excess noise ratio of 30 dB and the output of the receiver increased only 15 dB when it was activated then the receiver must have a noise figure of 15 dB, a not uncommon figure for an HF receiver.

Combining all of this information, we can say. . .

- For an output S/N ratio of 10 dB, this receiver will need an input S/N ratio of 25 dB due to its 15 dB Noise Figure.
- For the 3 kHz bandwidth suggested above for an SSB receiver, the signal must be -139 dBm (base noise) + 25 dB = -114 dBm (0.9 uV).

A not uncommon specification for a high frequency receiver. Another useful figure to remember is one known as the receiver's 'input self noise'. This is the apparent noise level at the input to the receiver and is equal to the base noise power (-139 dBm in this case) plus the noise figure. Thus, in this example, the input self noise of the receiver is -139 dBm + 15 dB = -124 dBm. This is sometimes also referred to as the "mds" or minimum detectable signal level.

"Suppose I was a new chum in all this amateur radio game and I came to you and said that I was having trouble hearing weak stations when other stronger stations are on the same band. What would you say?"
"I would say that you had accidentally discovered one of the most important, yet least talked about specifications of a receiver. One which is of immense importance in being able to utilise the sensitivity and noise figure we have already talked about."

DYNAMIC RANGE

Whilst the noise figure and thus the sensitivity of the receiver are useful indications of the very weak signal performance of a receiver, they tell us absolutely nothing else. Two things are of concern in respect of the large signal handling capability of a receiver.

- The ability of the receiver to handle a single large signal in the passband. (A very strong desired signal) and . . .
- The behaviour of the receiver in the presence of strong undesired signals.

The first is directly related to the dynamic range of the receiver. In an SSB receiver we have automatic gain control circuits which reduce the gain as the signal level increases so as not to overload the following stages. Thus, if a receiver has a sensitivity of 1 uV (-113 dBm) and will tolerate a maximum of one volt before overloading, then it must have a dynamic range of 120 dB.

Overloading of the receiver in the presence of a single large signal is only one measure of the dynamic range of the receiver. What it does in the presence of several large signals is extremely important. In today's crowded HF bands and with so many more amateur operators crowded into the limited HF band space we are more and more likely to have several large signals in our receivers passband at one time.

To treat dynamic range in isolation is to walk into a trap. Dynamic range can only be usefully defined when an additional set of qualifying parameters is given. Dynamic range when simply stated as above will tell us only the range of signal inputs over which the receiver can operate *with no other input signal present*, a situation which, we would all agree, is relatively unlikely to occur. A more useful guide would be to determine the ability of the receiver to recover a low level signal in the presence of a nearby high level signal. This measure of performance is known as the *third order intermodulation qualified dynamic range* shortened to intermodulation dynamic range and abbreviated to DR3.

Obviously, to define and understand the DR3 method of dynamic range specification, we must understand intermodulation itself.

INTERMODULATION

When two signals are introduced into a non-linear stage they combine to produce one or more new frequencies, these are known as intermodulation products. These products occur at spacings equal to that of the original signals. Let us suppose we have a receiver listening on 8 MHz, if interfering signals of 4 and 12 MHz were present a 'spurious' signal would be heard, the difference between 12 and 4 being 8. This is known as second order intermodulation distortion. Fortunately, second order effects (and higher odd orders) are of little concern, because the large interfering signals are so far from the desired signal they are usually eliminated by passive filtering at the input of the receiver.

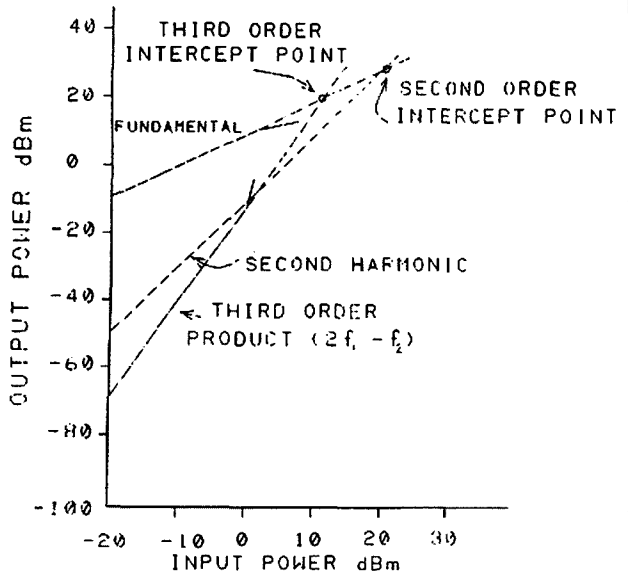
What does concern us however, is the third order intermodulation distortion and to a lesser extent, the higher odd orders, 5, 7, and 9. If we have two large input signals at frequencies f1 and f2 we will get third order products of 2f2 — f1 and 2f1 - f2. The problem with this third order IMD is that the products can very easily be very near or even within the passband of the receiver, thus they are not as easy to cope with as second order products. For example, with our 8 MHz receiver and interfering signals at 9 and 10 MHz we have 2 x 9 - 10 = 8. An undesired signal smack in the middle again.

INTERCEPT POINT

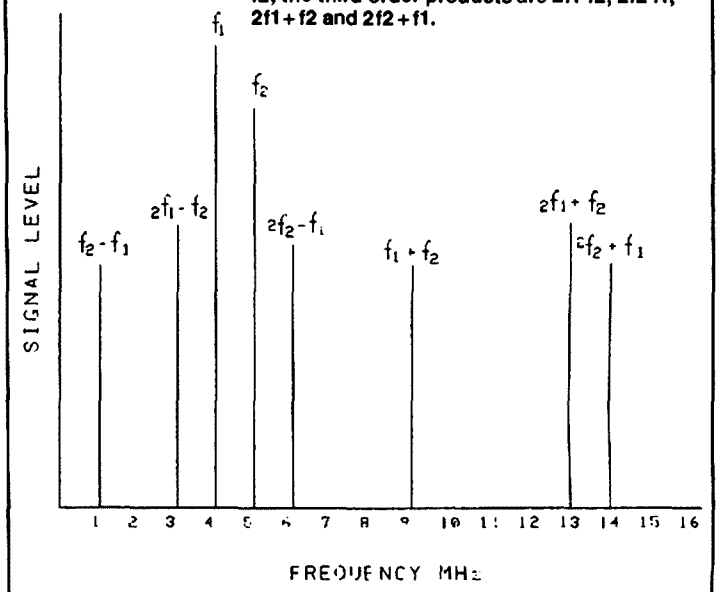
A detailed mathematical analysis of the non-linear behaviour of amplifying and other stages was undertaken by Franz McVay, and in 1967 he wrote an article called *Don't Guess the Spurious Level.*

During his work, McVay developed the concept of an intermodulation distortion intercept point. Let us state a rule without doing all the mathematics behind it. *The intermodulation products of order N increase in amplitude at a*

Intermodulation Intercept Graph: Relationship between and output signals showing the intercept point concept.



IMD3 Spectral Display: Second and third order intermodulation distortion products. f1 and f2 are the two signal frequencies, second order products shown are f2-f1, f1 + f2, the third order products are 2f1-f2, 2f2-f1, 2f1+f2 and 2f2+f1.



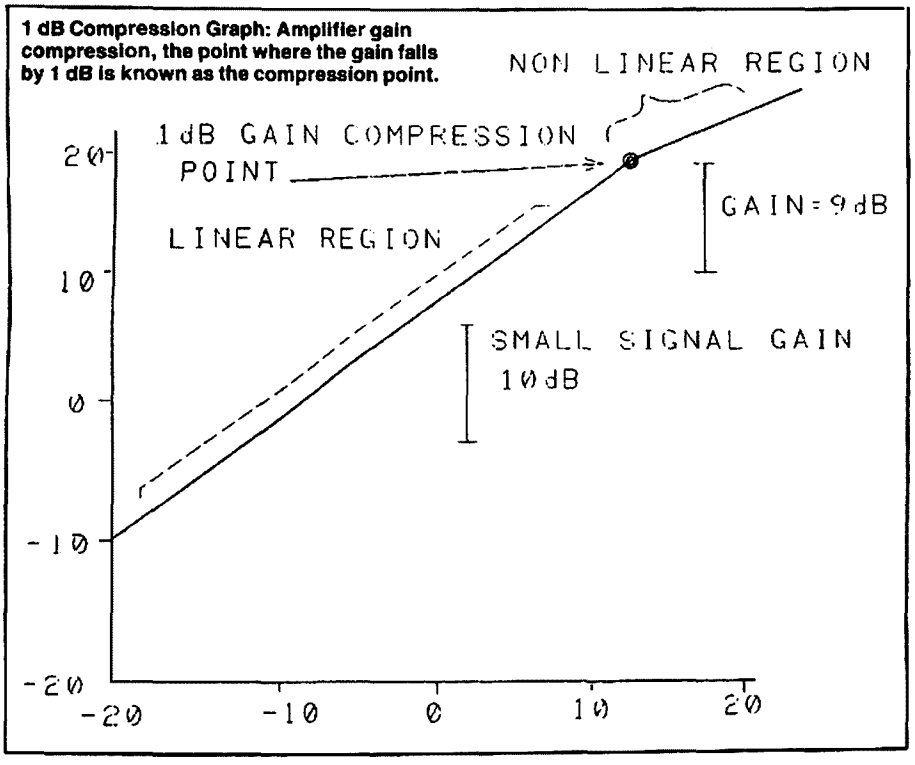
rate of N dB for each 1 dB of increase in input signal level and the level at which the intermodulation products equal the desired signal shall be known as the intermodulation intercept point.

Obviously, if the level increased sufficiently, the distortion products would increase to a level equal to that of the output signal. If we graph the input and output levels for the desired signal an intermodulation product we see:

It is important to bear in mind that the power levels indicated are per signal. Usually IMD testing is done with a two-tone or two signal signal using two signals close together. In this case, the third order products can be seen either side of the desired signals.

In the graph above, we have shown the output level increasing at a constant rate, unfortunately this is not the real case. Real amplifiers 'saturate' or suffer an inability to increase output to provide more output for more input. Usually we specify amplifier performance at the 1 dB compression point. This is where the gain of the amplifier departs from the linear relationship by 1 dB.

1 dB Compression Graph: Amplifier gain compression, the point where the gain falls by 1 dB is known as the compression point.



If we wish to use an amplifier over its optimum range then we should hopefully not exceed the 1 dB compression point. Whilst audibly obvious distortion of the demodulated signal will not be noticeable at this point, it isn't far away!

When measuring an amplifier, it is normal to first measure the 1 dB compression point, then at some input level below this, commonly 10 dB, measure the IMD3 level. From this measurement of IMD3 below desired signal, we can then directly calculate the IMD3 intercept point.

eg: *P*in for 1 dB compression is +10 dBm.
*P*in for tones is 2 x 0 dBm.
IMD3 products are -60 dB at that level.
Intercept point = output level in a desired tone + half the difference between desired output and distortion products or, in this example,
0 dBm + 1/2(60 dB) = +30 dBm.

In respect of receiver specifications, the third order intercept point will allow us to calculate an all important but very rarely quoted parameter, *IMD Dynamic Range*. IMD dynamic range is a measure of the ability of the receiver to receive weak signals in the presence of strong out-of-passband signals. If a pair of signals located outside the passband have an IMD product appearing in the passband of the receiver, its sensitivity will be degraded by the interfering signal. Since the ear can recognise a desired signal at or just below the noise level, one way to specify the dynamic range is to state how far above the noise level each of the two interfering signals are when the IMD product causing the interference is equal to the noise level.

Like sensitivity which was discussed above, the IMD dynamic range (abbreviated DR3 for Dynamic range, third order) is dependent on receiver bandwidth since noise power is proportional to *receiver* bandwidth, as the input noise power is:

N = kTBFG
where
F = Noise factor
G = Receiver gain

For convenience we can arrange this to work in decibel units. Let us say that the receiver third order intercept point is IMD3 above the noise level. Since the third order slope is three, the upper signal input level of a two signal input producing IMD products at the noise level will be IMD3/3 below the intercept. Thus the DR3 can be calculated from:

$$DR3 = \frac{2(IMD3 - kTBF)}{3} \text{ dB}$$

where kTBF is in decibel power units.

For example, we have a receiver with the following characteristics.

Noise figure	12 dB
Bandwidth	3 kHz
IMD3 intercept point	+20 dBm
	(a fairly common value)

Therefore,

Receiver input self-noise	-127 dBm
	= (-139 + 12) dBm

Then the IMD dynamic range will be:

$$DR3 = \frac{2[+20 - (-144 + 5 + 12)]}{3} \text{ 98 dB}$$

or, in real terms, a pair of out of passband interfering signals of - 29 dBm each will produce a third order IMD product in the passband equal to the input self noise of the receiver.

We must be careful in this case to ensure that the measurement is truly performed outside the passband. Remember that the IF filter has a finite slope and ultimate sensitivity. For convenience, close in IMD measurements are usually performed at =/- 30 to 50 kHz from the desired frequency.

"Surely there must be some compromises and some costs in all of this. Can you have a receiver with good sensitivity, good dynamic range and at a reasonable price?"

To answer that question we really must know a little more about receivers and how they are built. But I suppose in essence the answer is, yes you can.

SUMMARY

Whilst we have now considered many of the problems encountered in specifying a receiver, let us look at what the manufacturers tell us. Why don't you go away and look at the data on your own receiver or transceiver and consider how well it might perform in relation to a high-performance receiver, as well as considering how much the manufacturer might not be telling you.

References

"Single Sideband Systems and Circuits" Sabin and Schoenike (Editors). McGraw-Hill 1987.

"Communications Receivers, Principles and Design" Rohde and Bucher. McGraw-Hill 1988.

"Solid State Design for Radio Amateurs" Hayward and deMaw, ARRL, reprinted 1988.

"Dynamic Range, Intermodulation and Phase Noise" Chadwick. *Radio Communication*, March 1984.

"Don't Guess the Spurious Level" McVay. Electronic Design, February 1, 1967, pp 70-73.

Many other useful contributions have appeared in *VHF Communications* specifically in relation to VHF/UHF receiver performance and in *VHF/UHF Techniques, Ham Radio* magazine, by Joe Reisert W1JR, over many years. Dr Ulrich Rohde, one of the leading writers on receiver design has had a number of articles in *Ham Radio* over many years, they are worth seeking out!

ar

FRANCESCO COSSIGA IOFCG PRESIDENT OF THE ITALIAN REPUBLIC

During the Bicentennial year, Australia has been host to many visiting heads of State and Prime Ministers of various governments.

Many of these dignitaries came also to represent their country at the various National Days at the Brisbane Expo.

The latest such visit was by Francesco Cossiga, President of the Italian Republic. Between October 11 and October 16, 1988, the President visited Canberra, Brisbane, Adelaide, Melbourne and Sydney.

Very few of our fellow amateurs know that the President is a radio amateur. His call sign is IOFCG and he is listed in the *International Call Book*.

To celebrate his visit, the WIA New South Wales Division made him an Honorary Member of the Division for the month of October 1988, during his stay in Australia.

Unfortunately, his high office and protocol prevented the representatives of the NSW Division to meet the President personally.

On behalf of the Australian radio amateur and radio amateurs of Italian origin in Australia, a framed Honorary Membership Certificate and various WIA mementos were given to Dr G Scalici, the Consul General of Italy, with a request to give them to this distinguished amateur.

—Contributed by Stephen Pall VK2PS

ar

POSTSCRIPT TO ICOM IC-32AT REVIEW

This versatile hand-held transceiver for both the two metre and 70 centimetre bands was reviewed in AR for October 1988 on pages 18 and 19.

The reviewer commented critically on the poor quality from the built-in speaker, but indicated that audio was normal from an external speaker plugged into the socket provided.

Upon return to Icom, the internal speaker was checked and found to be damaged, although the set had been working perfectly when it first left Icom. The actual time and cause of the speaker becoming defective is impossible to ascertain, but we would like to make clear that the reviewer's criticism applied only to this one set as he found it (at that time the only one in Australia), and was meant to emphasise that poor audio is not characteristic of Icom equipment.

We apologise to anyone who has been affected by this misunderstanding.

ar

A TRIBAND DELTA LOOP ANTENNA

Bob Hancock VK5AFZ
30 Tottenham Court Road, Port Elliot, SA. 5114

This may be the solution to your antenna problems!

The major problem in constructing multiband quad-type antennas is the difficulty in achieving a sufficiently rigid, yet lightweight, structure, then getting it up in the air and keeping it there. Having constructed and repaired a number of quads over 10 years, ranging from a 10/15 metre two-element duobander to a 10/15/20 metre four-element tribander, I have often pondered how the standard design could be made easier to handle.

The first criterion was that the antenna should be simple to gain access to for minor adjustments. Although most quads will produce a reasonable signal without critical tuning, there is nevertheless not much point in having a large antenna which is not operating at its optimum *efficiency — you may as well use something* simpler and smaller. But, if you are faced with a major operation like tilting a tower with a large quad on top, there is not much incentive to "fiddle" with the tuning for optimising front-to-back ratio, forward gain, SWR, etc.

The second major headache with large quad-type structures is the relatively high wind loading on the multitude of spreaders, which can cause the antenna to thrash about like a wounded octopus in a slight gale. This leads to broken wires and loosening of spreader clamps, so that eventually it has to come down again for repairs.

Obviously many other amateurs have looked at these problems, and one of the designs often chosen is the delta loop configuration. Usually this is mounted with the triangle apex downwards and fixed to a supporting boom, and a strong lightweight structure can be produced. There still remains the problem of getting it up and down because of the large volume of free space needed to manipulate the antenna.

One solution to this has been supplied in the design by GW2DDX, which uses a pulley and halyard system to raise the structure on a mast, and a light H-shaped spreader to hold the base of the loop open. (See Figure 3).

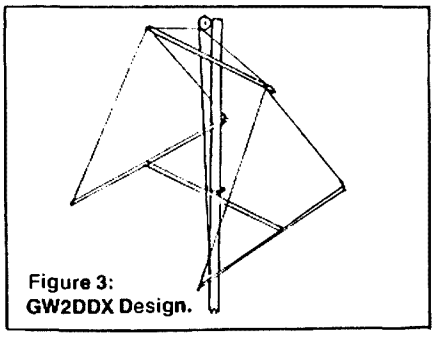


Figure 3: GW2DDX Design.

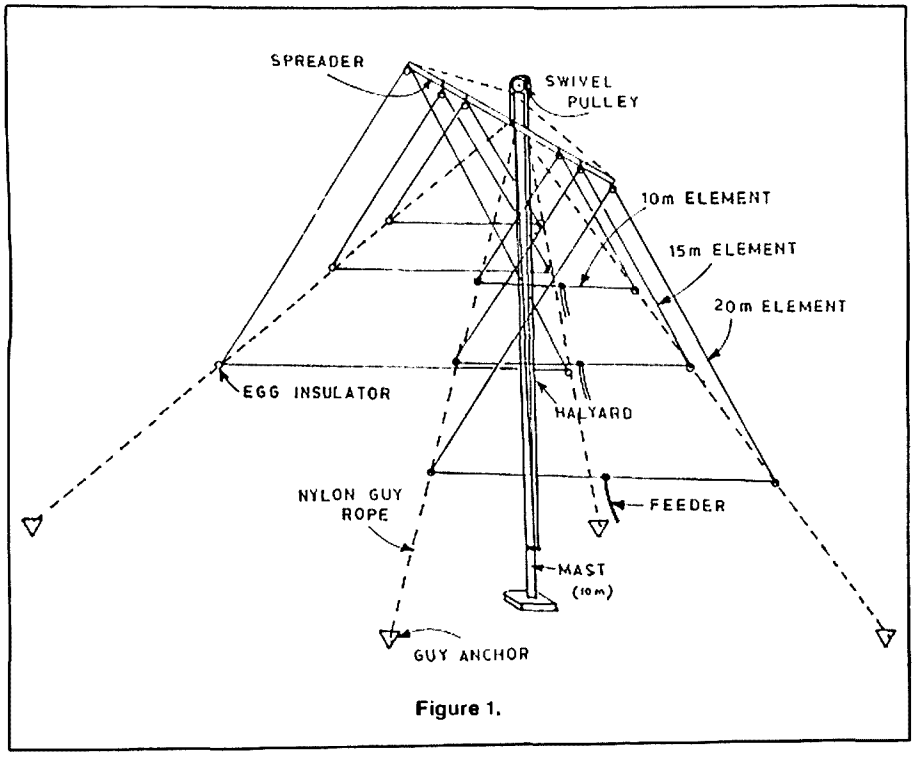


Figure 1.

Looking at the GW2DDX design, it quickly became apparent that the lower spreader could be eliminated by using light guy ropes to hold the loops open. If these were continued up to the centre point of the supporting spreader, additional loops could easily be incorporated into the structure, to produce a triband array. (See Figure 1).

With this type of construction, the whole antenna can be laid out and assembled on the ground at the base of the mast, and then hauled into the air in a "collapsed" state, which is a very simple operation. Then the four spreader ropes are stretched into position to open out the loops, and secured to the guy anchor points.

If tuning adjustments are required, it is simply a matter of lowering the halyard until the elements are within reach, making the modifications, and hauling it back up the mast.

When it is required to rotate the array, it is necessary to have movable guy anchors with a quick-release attachment for the ropes. The guy ropes are disconnected and the antenna walked around until the top spreader is pointing in the right direction. The anchors are then relocated in the new position and the ropes re-attached to them. If you have soft enough ground, tent pegs are ideal, otherwise you could use a large brick, bucket of sand, etc. The system requires a "turning circle" of about 11.6 metres on the ground (See Figure 2), but if you have a few obstructions, there is no problem in moving the antenna past them because it is not a rigid structure. Likewise, some of the "obstructions" could be utilised as guy anchor points.

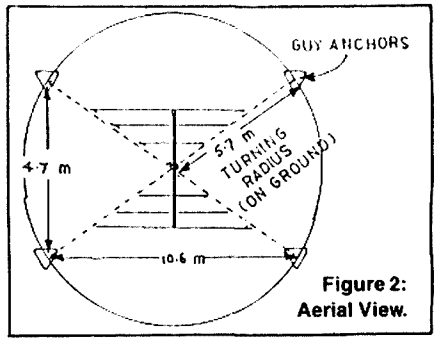


Figure 2: Aerial View.

Table 1 shows some suggested dimensions for a 10/15/20 metre triband system, taken from information in William Orr's *All About Cubical Antennas*. Loops for other bands could also be added.

Table 1.

DIMENSION /mm	20 m		15 m		10 m	
	D E	REF	D E	REF	D E	REF
Side of Loop	7191	7370	4817	4937	3583	3672
Distance from Centre						
— Top Spreader	1587	1587	1063	1063	791	791
— Guy Rope	7364	7539	4932	5050	3669	3756

sr

AIR CORED COIL CALCULATION PROGRAM IN G W BASIC

Keith Angrave VK3BVK
50 Fischer Street, Torquay, Vic. 3228

A simple BASIC program for calculating air cored coils.

Despite the coming of "Black Box" operating in most shacks these days, I still feel the need to be able to build some form of device and get it working correctly. This invariably leads to calculation of some form of resonant circuit and you can guarantee that the battery in the calculator is flat again or the sliderule is missing!

The program listed seems to fit my requirements for air cored coils quite well although entry of the figures for higher frequencies may seem a little messy, ie 432.2 comes out as 432200, very easy to lose a digit.

It is written in GWBASIC using a Micro-Buff PC Turbo, but should work just as well in "ordinary" BASIC on your favourite machine. There are no fancy tricks used in the various routines as I am not the world's best programmer, by any means.

The program has been divided into several subroutines with space left between for any additions that the individual may like to add. Lines 100 to 280 select which option to use. Note that in Option 6 I have returned to the operating system at line 1460. In my case, I am using MSDOS 3.2 and have batch files to select whatever program needed for a particular requirement. If needed, it is possible to change line 1460 to an END statement.

Lines 400 to 500, 600 to 700, 800 to 920 are the subroutines for options 1, 2 and 3 respectively. Each of these options use lines 510 to 580 as a common routine to output the results to a standard Centronics parallel printer port.

Lines 1000 to 1160 and 1300 to 1450 are the subroutines for Options 4 and 5. Again a common print routine is employed for these two options at lines 1170 to 1250.

A printout of the results of calculations for each option is included in this article so, to prove the program buy a new battery for the calculator and compare results. You will find that it works!

ar

```
10 REM a series of programs for the calculation of components required
20 REM to resonate at a particular frequency with aircored coils
30 REM data for calculations extracted from 1982 ARRL handbook
40 REM compiled by R.R.Angrave VR3BVR.18/03/88.
90 CLS
100 CLS:PRINT:PRINT TAB(25)"RESONANT CIRCUIT CALCULATIONS"
110 PRINT:PRINT TAB(20)"*************************************"
120 PRINT TAB(20)"*    SELECT REQUIRED OPTION         *"
130 PRINT TAB(20)"*  1.To find Frequency with L/C Known  *"
140 PRINT TAB(20)"*  2.To find Capacitor with F/L Known  *"
150 PRINT TAB(20)"*  3.To find Inductance with F/C Known *"
160 PRINT TAB(20)"*  4.To find Number of Turns for Coil  *"
170 PRINT TAB(20)"*  5.To find Inductance of Coil with   *"
180 PRINT TAB(20)"*        turns/radius/length known     *"
190 PRINT TAB(20)"*  6.To return to system               *"
200 PRINT TAB(20)"*                                      *"
210 PRINT TAB(20)"*************************************"
220 INPUT S1$
230 IF S1$="1" THEN 400
240 IF S1$="2" THEN 600
250 IF S1$="3" THEN 800
260 IF S1$="4" THEN 1000
270 IF S1$="5" THEN 1300
280 IF S1$="6" THEN 1460
290 REM
400 CLS:PRINT TAB(20)"Find resonant frequency knowing L&C (Option 1)"
410 PRINT:PRINT "F is frequency in Kilohertz"
420 INPUT "Enter Inductance in Microhenries";L1
430 INPUT "Enter Capacitance in Picofarads";C1
440 F1=10^6/(6.28*SQR(L1*C1))
450 PRINT TAB(25)"Resonant Frequency is:";F1;"Kilohertz"
460 PRINT TAB(25)"Inductance =";L1;"Microhenries"
470 PRINT TAB(25)"Capacitance=";C1;"Picofarads"
480 INPUT"Run this option again.Y/N";R$:IF R$="y" OR R$="Y" THEN 400
    ELSE 490
490 INPUT"Do you want a printout of the results Y/N";P1$
500 IF P1$="y" OR P1$="Y" THEN 510 ELSE 90
510 LPRINT:LPRINT
520 LPRINT"Results of your calculations from the data given for Option
    ";S1$;"."
540 LPRINT:LPRINT TAB(25)"Frequency of Resonance is";F1;"Kilohertz"
550 LPRINT TAB(25)"Inductance of Coil is:";L1;"Microhenries"
560 LPRINT TAB(25)"Capacitor required is:";C1;"Picofarads"
570 INPUT"Do You Want More Hardcopy Y/N:";H1$
580 IF H1$="y" OR H1$="Y" THEN 510 ELSE 100
600 CLS:PRINT TAB(20)"Find value of C knowing Frequency and Inductance
    (Option 2)"
610 PRINT:PRINT
620 INPUT"Enter Frequency in Kilohertz";F1
630 INPUT"Enter Inductance in Microhenries";L1
640 PRINT"C will be Capacitance in Picofarads"
650 C1=10^12/(((F1*6.28)*(F1*6.28))*L1)
660 PRINT TAB(25)"Resonant Frequency is:";F1;"Kilohertz"
670 PRINT TAB(25)"Inductance=";L1;"Microhenries"
680 PRINT TAB(25)"Capacitance=";C1;"Picofarads"
690 INPUT"Run this option again Y/N";R2$
700 IF R2$="y" OR R2$="Y" THEN 600 ELSE 710
710 INPUT"Do you want a printout of the results Y/N";P2$
720 IF P2$="y" OR P2$="Y" THEN 510 ELSE 90
800 CLS:PRINT TAB(20)"Find value of L knowing Frequency and
    Capacitance (Option 3)"
810 PRINT:PRINT
820 INPUT"Enter Frequency in Kilohertz";F1
830 PRINT"L will be Inductance in Microhenries"
840 INPUT"Enter Capacitance in Picofarads";C1
850 L1=10^12/(((F1*6.28)*(F1*6.28))*C1)
860 PRINT TAB(25)"Resonant Frequency is=";F1;"Kilohertz"
870 PRINT TAB(25)"Capacitance=";C1;"Picofarads"
880 PRINT TAB(25)"Inductance required is";L1;"Microhenries"
890 INPUT"Run this option again Y/N";R3$
900 IF R3$="y" OR R3$="Y" THEN 800 ELSE 910
910 INPUT"Do you want a printout of the results Y/N";P3$
920 IF P3$="y" OR P3$="Y" THEN 510 ELSE 90
1000 CLS:PRINT TAB(20)"Find number of turns for a coil given L,radius
    and length (Option 4)"
1010 PRINT TAB(25)"L=inductance of coil in microhenries"
1020 PRINT TAB(25)"a=Coil radius in inches"
1030 PRINT TAB(25)"b=Length of coil in inches"
1040 PRINT TAB(25)"n Will be the number of turns required"
1050 INPUT"Enter coil radius in inches";A1
1060 INPUT"Enter coil length in inches";B1
1070 INPUT"Enter coil inductance in microhenries";L1
1080 N1=(SQR(L1*((9*A1)+(10*B1))))/A1
1090 PRINT TAB(25)"Coil Inductance is";L1;"Microhenries"
1100 PRINT TAB(25)"Coil radius is";A1;"inches"
1110 PRINT TAB(25)"Coil length is";B1;"inches"
1120 PRINT TAB(25)"Number of turns=";N1
1130 INPUT"Run this option again Y/N";R4$
1140 IF R4$="y" OR R4$="Y" THEN 1000 ELSE 1150
1150 INPUT"Do you want a printout of the results Y/N";P4$
1160 IF P4$="y" OR P4$="Y" THEN 1170 ELSE 90
1170 LPRINT:LPRINT
1180 LPRINT"Results of your calculations from the data given for Option
    ";S1$;"."
1200 LPRINT TAB(25)"Number of turns required is";N1
1210 LPRINT TAB(25)"Coil Radius is";A1;"Inches"
1220 LPRINT TAB(25)"Coil Length is";B1;"Inches"
1230 LPRINT TAB(25)"The inductance is";L1;"microhenries"
1240 INPUT"Do you want more hardcopy Y/N";H4$
1250 IF H4$="y" OR H4$="Y" THEN 1170 ELSE 90
1300 CLS:PRINT TAB(20)"Find inductance of coil given turns,radius and
    length (Option 5)"
1310 PRINT TAB(25)"L will be inductance of coil in microhenries"
1320 PRINT TAB(25)"a=Coil radius in inches"
1330 PRINT TAB(25)"b=Coil length in inches"
1340 PRINT TAB(25)"n=number of turns"
1350 INPUT"       Enter coil radius in inches";A1
1360 INPUT"       Enter coil length in inches";B1
1370 INPUT"       Enter number of turns";N1
1380 L1=((A1*A1)*(N1*N1))/((9*A1)+(10*B1))
1390 PRINT TAB(25)"Coil radius=";A1;"inches"
1400 PRINT TAB(25)"Coil length=";B1;"inches"
1410 PRINT TAB(25)"Inductance of coil is";L1;"microhenries
1420 INPUT"Run this option again Y/N";R5$
1430 IF R5$="y" OR R5$="Y" THEN 1300 ELSE 1440
1440 INPUT"Do you want a printout of  the results Y/N";P5$
1450 IF P5$="y" OR P5$="Y" THEN 1170 ELSE 90
1460 SYSTEM
```

RF IMPEDANCE MATCHING USING FERRITE TOROIDAL CORES

Part 4: CONSTRUCTION AND TESTING

Stephen Bushell VK3HK
74 King Parade, Knoxfield, Vic. 3180

In previous articles we have discussed three commonly employed transformer families and some basic circuit formats used in impedance matching. This month we will consider assembly methods and performance testing, concluding with a farrago of circuits.

1. CORE PREPARATION

Before commencing construction, the first operation one should perform is the marking of the core body to facilitate later identification. There is bound to be some future use for these cores and unless they are identified now, the results of the next application will be uncertain.

Depending on which manufacturer's core is used and what part of the range it represents, there will be quite a variation of finish ranging from smooth, colour-coded enamelled surfaces to the basic uncoded, abrasive raw material.

In the case of the former finish, no surface preparation is required. With the latter however, it is essential to wrap the core with a protective covering in order to avoid damage to the enamelled winding wire during assembly. Virtually any non-conductive material may be used for this purpose. The cheapest by far is PVC tape. A word of warning however, especially if the assembly is to be used outside. Unless the transformer is mounted in a water/dust proof container (IP56) or the entire assembly is potted, the adhesive backing of the PVC tape will soon deteriorate and expose the enamelled wire and core to the elements with consequent deterioration and failure being inevitable.

A more durable and generally useful tape is EPR (ethylene/propylene/rubber) which has a high voltage rating in excess of 1000 volts, a temperature rating of 130 degrees Celsius (PVC is generally rated at 75 degrees Celsius) and, most importantly, has a self-fusing characteristic which eliminates the need for an adhesive backing.

To use, the tape is simply stretched and wound about the item to be covered. The individual layers after a few minutes combine to form a single piece seal.

Yet another method of protection is to paint or varnish the core. If it is painted, don't forget to identify the core after the paint has dried.

With low powered units, insulated hook-up wire or sections of ribbon cable may be used as the windings and can be applied directly to the untreated core.

2. WINDING

Prior to commencement of winding it must be ascertained the length of wire required. One method is to wind a piece of string, the required number of turns, about the core. Add 10 percent more, plus the length of tails (ends). This saves wasting wire and the dissatisfaction of having to rewind because of insufficient wire to complete the necessary number of turns.

Windings may be laid flat about the core with the wires running parallel with respect to each other, or they may be twisted together prior to assembly and applied to the core as a single winding. See Figures 1 and 2.

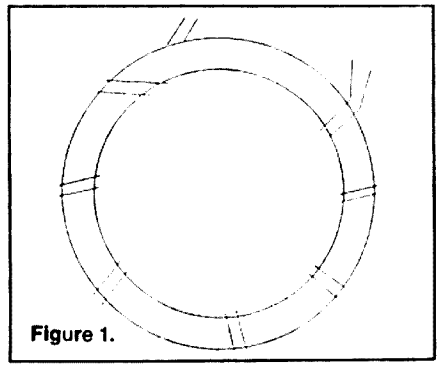


Figure 1.

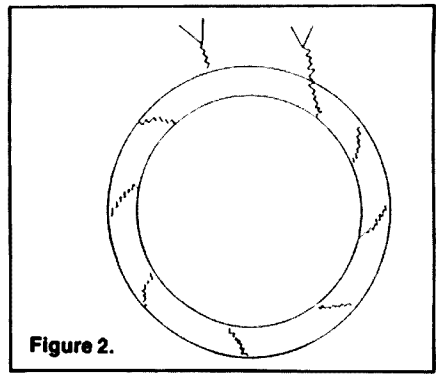


Figure 2.

Whatever method is used, the windings should be spaced evenly over at least five-eighths of the core body. If, in the case of multiple circuits occupying a single core, each circuit should share an equal proportion of the core body. See Figure 3.

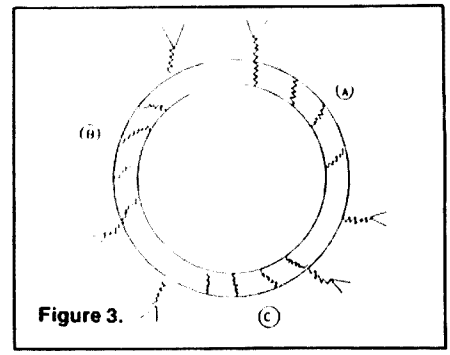


Figure 3.

3. TWISTED MULTIFILAR (stranded) WINDINGS

These are often more easily applied and, in case of transmission line and auto-transformers, provide for a more efficient power transfer than the flat parallel formation. Identification of windings is initially more difficult with this method but may be overcome by testing with a multimeter and then marking to suit individual requirements.

4. CIRCUIT NOTATION

The three types of transformers discussed are all drawn according to commonly accepted protocol. One difference however is the placement of a dot beside the windings to indicate the phasing or commencement of the winding. See Figure 4.

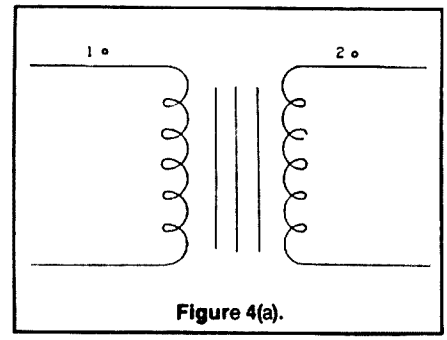


Figure 4(a).

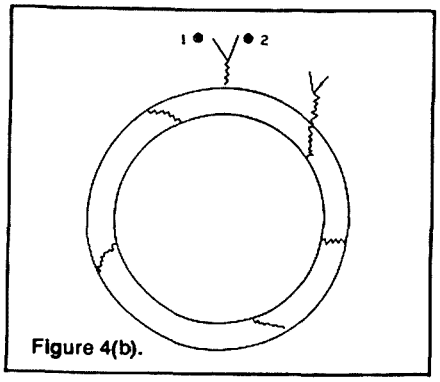


Figure 4(b).

Take into account that which has preceded and apply the wire to the core. See Figure 5.

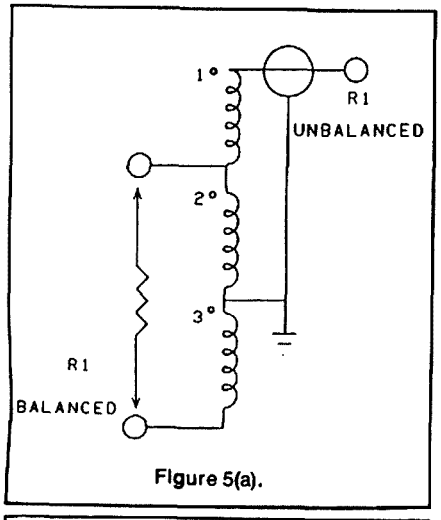


Figure 5(a).

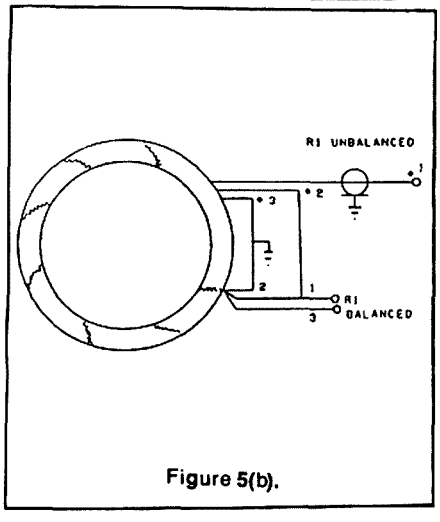


Figure 5(b).

Transformer details. . .
TYPE — 1:1 balanced to unbalanced auto-transformer.
WINDING — 1 trifilar winding tapped at the junction of the first and second windings and at the junction of the second and third windings.
CORE — FC564*, 43 Mix Amidon — FT140.
WIRE — Enamelled #20 — Metric equivalent 1 millimetre.
TURNS — 8 turns.
POWER — 100 watts PEP. This power rating coincides with the majority of transceivers currently in use in Australia and New Zealand.

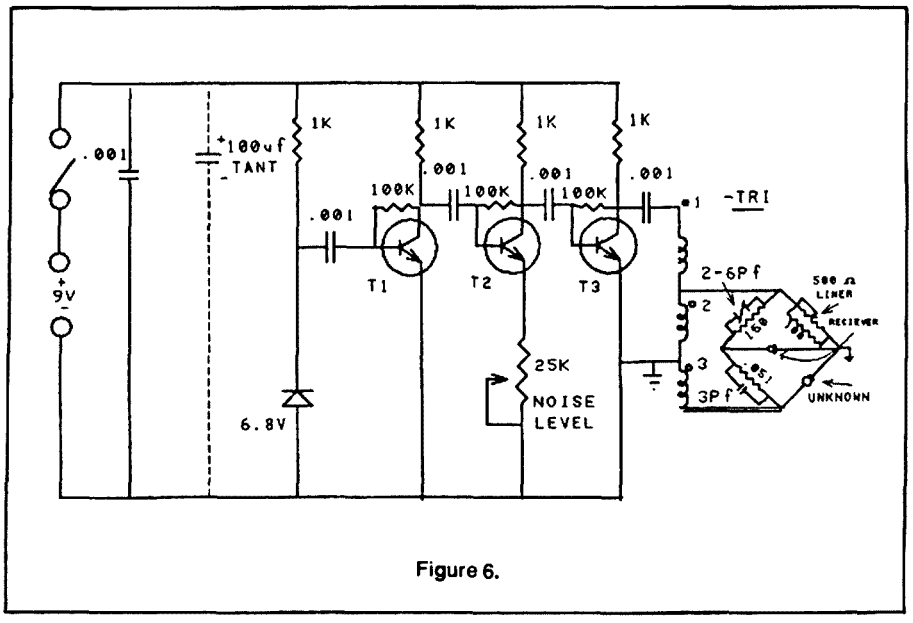


Figure 6.

FREQUENCY — 1 to 30 MHz.

* Core coding of Stewart Electronics. Cost of core approximately $6.18 each plus tax.

This balun would make an ideal addition to a G5RV antenna providing correct balance of current between the coaxial cable (unbalanced) feed and the 300 ohm ribbon (balanced) stub and would, without doubt, improve the radiation pattern of the antenna by correcting the current phasing of each leg of the dipole flat top.

NOTE: Although the nominal impedance of television ribbon is 300 ohms, because of the operation of the cable as a quarter wave stub in the G5RV, the reflected impedance at the junction of the ribbon and the coaxial feeder is about 75 ohms when the antenna is operated on its centre design band of 20 metres. This impedance alters from band to band, the difference showing as a VSWR of greater or lesser degree depending on the adjustments made by the flat top.

6. TESTING

After constructing a transformer one may wish to test it for bandwidth and circuit integrity. Did we put it together correctly?

The least complicated test is to inject wideband RF *noise* into the transformer input. The output of the transformer is terminated in a resistance of similar value to the impedance of the load which will be placed on it in operation. A check of voltage transfer with respect to impedance transformation stability over the required frequency range is achieved by using a noise bridge in conjunction with a receiver to cover the frequency range under test. See Figures 6 and 7.

T1, 2, 3 BF198 or similar.
TR1 1:1 balun wound on FC470*, 77 Mix Amidon — FT50, using a bifilar winding consisting of windings one and two and a single winding for three.
Enamelled wire, SWR #20 or metric 1 millimetre using six turns per winding will allow operation over the range 1 to 30 MHz.
The transformer should be wound according to the following . . . Both windings must be wound in the same direction. The bifilar winding occupies the opposite half of the core body to the single winding.

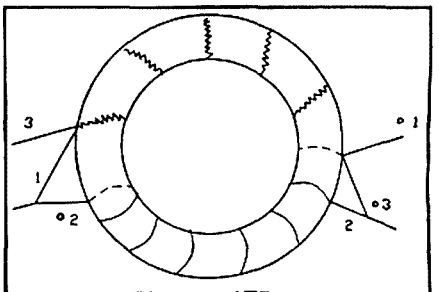


Diagram of TR1.

R1 should be a 500 ohm linear taper carbon or plastic film potentiometer.
*C. 100 Mfd tantalum required if external power supply is used.
FC470 Stewart Electronics stock number.

7. TESTING METHOD

Assuming that the noise bridge is operating correctly and has been calibrated. . .

a) Connect the bridge and transformer according to Figure 7. R should be selected according to the load impedance to be used in the actual circuit; eg a dipole antenna equals 75 ohms.

b) Set the noise bridge noise-level control to maximum and adjust the balance (resistance) to the known resistance (R).

c) Set the receiver AGC to fast or disable it.

d) Set the receiver to the lowest frequency of interest.

e) Null the bridge as indicated on the receiver S-meter or by the receiver noise level. The position of the balance control when the null is greatest should coincide with the value of the load resistor (R) — given that we are testing a 1:1 transformation ratio. If the balance reading is not close to R, you have wrongly assembled the transformer, the core or the number of turns are not suitable for your lowest frequency.

f) Carry out the same test as step e), at mid-frequency and top-frequency and note the position of the balance control at null. If your load resistance value R coincides with the noise bridge balance control at null for bottom, mid and top frequencies, you are ready for the next step which is to put the transformer into service.

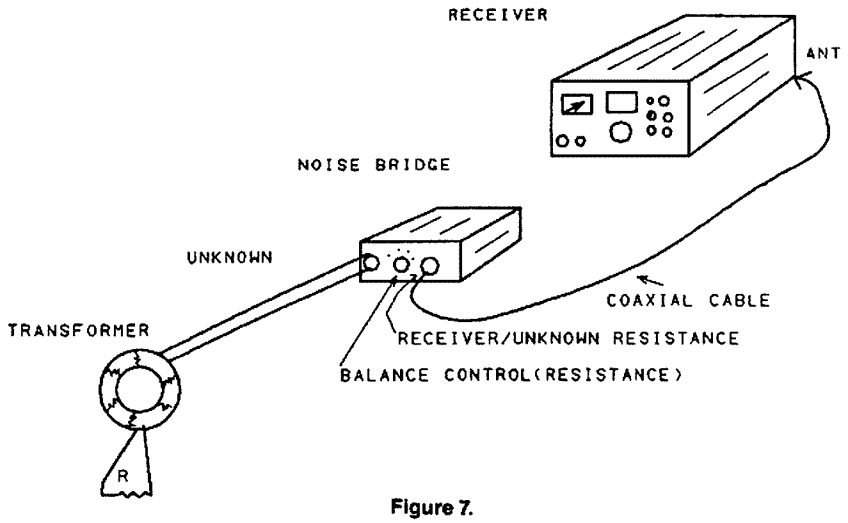


Figure 7.

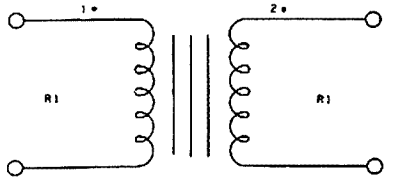


Figure 8 (a).

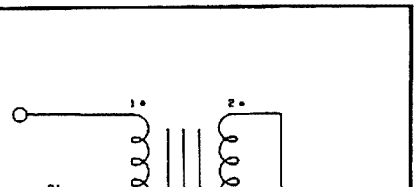


Figure 8 (b).

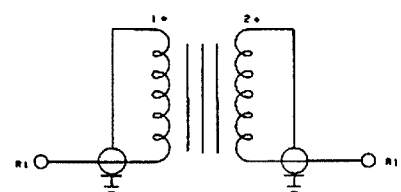


Figure 8 (c).

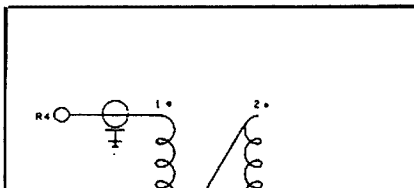


Figure 8 (d).

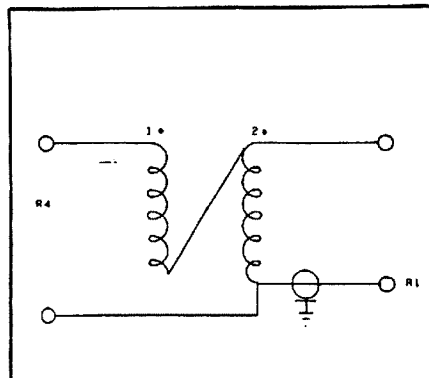


Figure 8 (e).

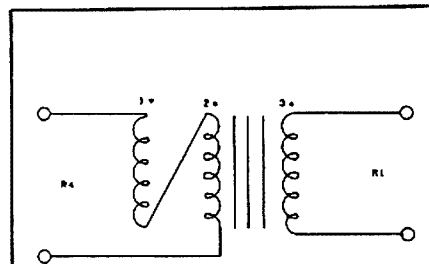


Figure 8 (f).

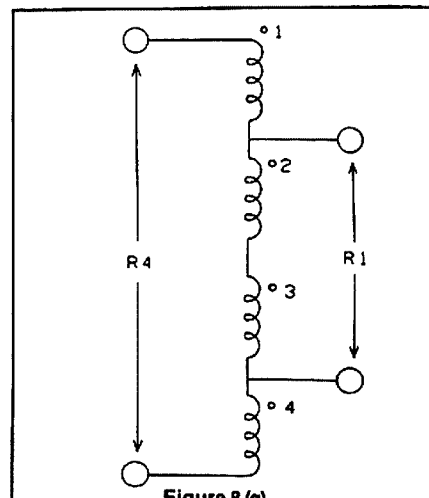


Figure 8 (g).

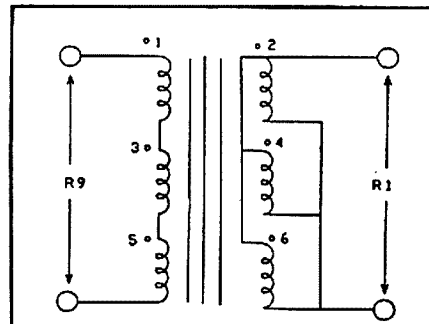


Figure 8 (h).

8. CIRCUITS

9. CONSTRUCTION DETAIL.

All my transformers were designed for use in the range 1 to 30 MHz. I concentrated on two power levels to facilitate the two ranges provided by barefoot operation and add-on linear usage. With 100 and 400 watts PEP output respectively.

	100 WATTS	1000 WATTS
Core type	FC564* Amidon FT104-43	FC518* Amidon FT240-77
Wire size	1 mm ϕ SWG #20	1.25 mm ϕ SWG #20
Core cost*	$6.18 plus tax	$22.30 plus tax

Neither core showed any sign of heating whatsoever. The #43 core mix was selected for its wideband frequency range, 1 to 50 MHz and its medium flux saturation of 2750 Gauss.

The #77 core mix was selected for its wideband frequency range .5 to 30 MHz and its high flux saturation of 4600 Gauss.

* Stewart Electronics stock number and pricing.
Stewart Electronics, 44 Stafford Street, Huntingdale, Vic. 3166.

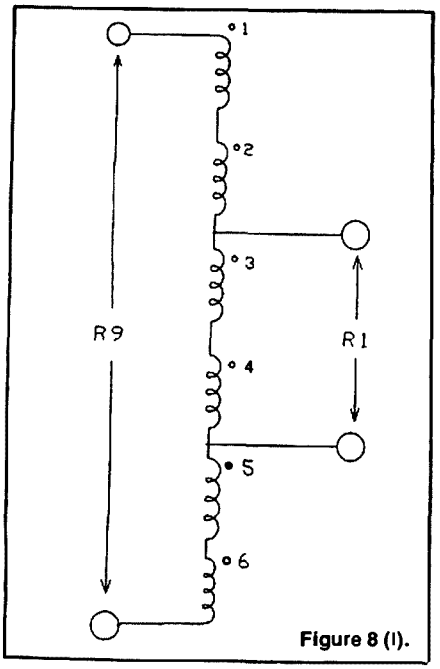


Figure 8 (l).

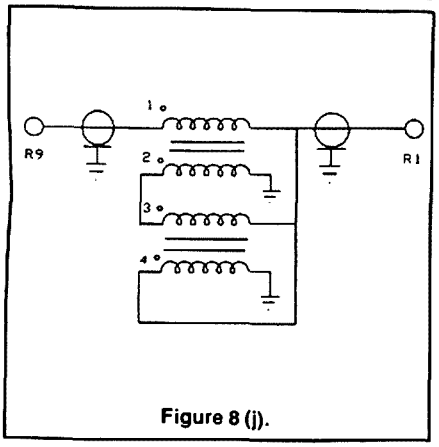


Figure 8 (j).

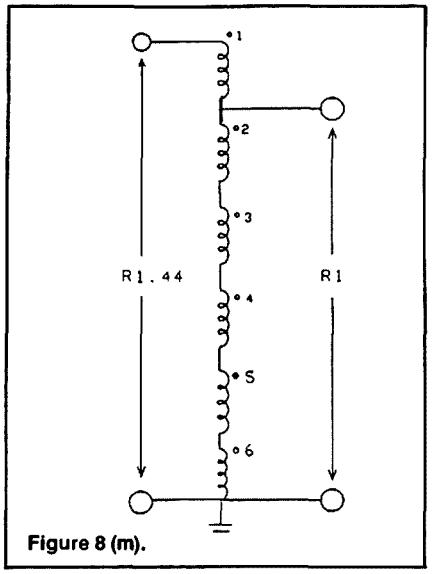


Figure 8 (m).

10. CONCLUSION

I would like to thank two colleagues for their roles in my compilation of these articles — Pat Lawler VK3DCN, for the initial discussions which occasioned the series, and John Day VK3ZJF, for making the entire Amidon ferrite and powdered iron core range of Stewart Electronics available to me. This range covers from DC to 1000 MHz, from 1 milliwatt to 10 000 watts. Needless to say, this proved more than adequate for my purpose.

There is a far greater amount of theory and practical detail associated with the subjects of RF transformers and ferrite cores. Parts one through four were designed to give a basic insight and a practical introduction to those with limited, or no background on the subjects.

REFERENCES

PITZALIS & COUSE. *Broadband Transformer Design for Transistor Power Amplifiers.*
Ham Radio magazine.
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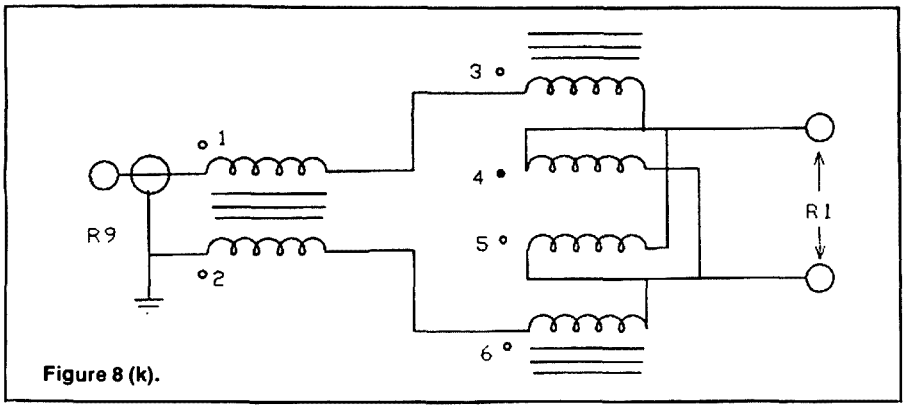

Figure 8 (k).

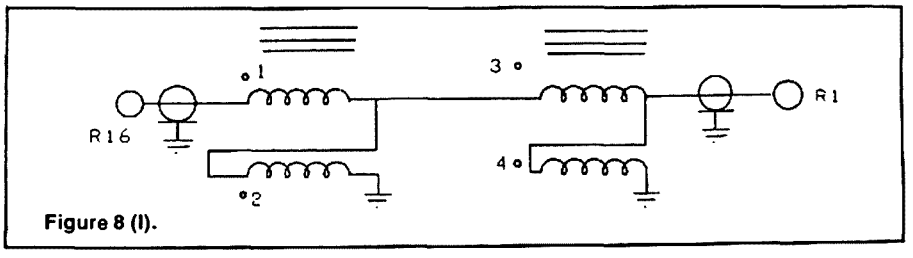

Figure 8 (l).

REPRINTING THE RD LOG AT A LATER STAGE

Terry Neumann VK5ATN
PO Box 200, Balaklava, SA. 5461

After the adaption of Dion Thomas' C64 RD Log Program for my TRS 80 Model IV, it became apparent that it was not possible to reprint the log in the form required by the Federal Contest Manager (FCM), other than during the contest itself. This is because the file as saved to disc contains only a 'condensed' version of each contact (saved as a string in a sequential file), and does not include date, or full cipher exchange as such. When the disc file is reloaded into the RDLOG program, the printout option allows only a short form printout similar to that shown in the 'last contact' part of the main operating menu.

DISASTER IN THE CONTEST

The 1987 contest was not one of my best. I elected to retire from the fray on the Saturday evening due to a "Force Majeure" at about 10.30 local time, so any possibility of a high score was dashed. However, a *return* was possible later *on* the Sunday and some 440 plus contacts were to result from the encounter which again reaffirmed its reputation as the 'friendly contest'. The good humour and professional approach of almost 100 percent of operators encountered indicates that the spirit and purpose of the contest is alive and well!

During the course of the contest I became aware of several mistakes in entering data, mostly wrong call signs which were picked up later in the event. A major blunder also occurred when a careless operating error coupled with a fool-prone routine in the version of the program in use, resulted in two stations being given the same number. It was clear that I could not claim a point for the second of these contacts. The possibilities of this recurring were eliminated by a change to the program. However, since these mistakes were all faithfully recorded on disc, it became obvious that some means of correction and re-printing of the log would be necessary. Otherwise the final result would again resemble a untidy shambles, which no self-respecting contest manager should be expected to tolerate.

GETTING THE RECORD STRAIGHT

Corrections to the data saved on disc were easily effected using the LDOS utility FED (File EDitor), an excellent utility which enables the alteration and editing of disc files. Although FED is only available on the Model III versions of LDOS, the disc files of the Model IV are fully compatible and can be edited in the Model III mode. Needless to say, such corrections *must* be done on a backup of the original disc file, to guard against any disasters.

Accordingly, details entered incorrectly during the contest, as noted on the correction sheet, were again put right. Things started to look a little brighter; all I had to do now was find a way of getting it all down on paper again!

THE SECOND PROGRAM

Rather than modify the RDLOG program to reprint the log at the expense of still more memory space, it seemed more reasonable to write another dedicated program to do the task. The now much modified version of VK2PD's original program was used as a basis for a new program to recover and expand the corrected disc file and print it in the required format. As this progressed, routines were written into the program to automatically total and print the score for each page. The problem of an invalid contact which should score zero points was solved by again using the FED utility to add an X on the disc file at the end of the number received for that particular contact. The program tests for the presence of this X when re-expanding each contact, and if present, scores zero for that contact.

A further subroutine was written to check for the new UTC date which occurs during the contest by performing a test on the time of each contact. When the first contact for the next UTC day is detected, the printing is interrupted and the option to enter the new date is offered. A warning is displayed on the main menu to this effect, to enable starting date to be reset prior to the next test printout.

Finally, the option of 'printing' out the final result, either to screen or paper is available from the menu. This allows the testing of the final result before committing it to paper. The page length can be altered to suit your own needs but for convenience, the hard copy option is set for 50 contacts per page. Some editing in the program will be needed if you need to change this. The 'screen page' can be set at any length from the Main Menu.

In practice, I found that the program would enable me to print the entire log in the required form with each page scored, without any need to put pen to paper, except for the signature on the front cover, other details of which were done by word processor.

The main operating menu is shown in Figure 2. Most of the functions are similar to the original RDLOG program, or have been changed where necessary to more usefully reflect the requirements for re-printing the log. Both this and the RDLOG program need editing in a couple of places to change the call sign to that of the user. These are noted in REM statements at the start of the listing. When all REM statements are removed, there is just enough space in the LOGPR program to handle the maximum number that can be accumulated with the original RDLOG Program (about 850 contacts).

VERSIONS FOR THE TRS 80 MODEL III

Finally, and primarily as an exercise in programming, I spent some time adapting both programs for the TRS 80 Model III. These versions have *not* been tested extensively, but appear to be capable of performing all of the main features of the Model IV version, albeit at slower speed. These are offered to Model III LDOS owners who might be interested as such, but a test run is strongly suggested prior to the contest itself, and some further de-bugging may be needed. Indeed such a run is a good idea with any such program, because you, the operator will become more familiar with the operation of the program.

```
LOG REPRINT PROGRAM - - - Version 4.04     -  7096 Bytes free
================================================================================
 443 Contacts loaded into in memory !    Force Trash Collection - < Shift F3 >

TO CHANGE: -     Page Length - < F1 >    Date - < F2 >

Display log - < Shift  F1 >              Print log - < Shift F2 >

Recall Disk Files    - < ! >             Force Last Page Total    - < $ >
================================================================================
Date is presently set for : 16/08/87                Page length is  50 entries

Select Function:
```

In addition you may also find any remaining bugs which have eluded my own laborious efforts. Use a copy of last year's log for at least a couple of hundred contacts or so as a test for both yourself and the programs.

Owners of the TRS 80 Models IV or III, or indeed anyone who is interested is welcome to listings or disc copies of either or both programs. Additional notes on the operation of both programs are included. Inclusion of return postage is essential, and a formatted blank 5¼ inch diskette with suitable packing for a safe return (again with appropriate return postage included) is required for disc copies. Please remember to state which Model TRS 80 you have. It is assumed that you have the required DOS (either LDOS 5.1.4, 5.3 or TRSDOS 6.3 or LS-DOS 6.3) for your machine. Modem transfers at 300 Baud are available via Telecom at the recipient's expense and risk.

In conclusion, I have found the programs, once up and running, to be an invaluable asset to entering the HF section of the RD Contest, and getting that all important log in to the FCM. I would like to congratulate and thank Dion Thomas for submitting his original article and listing in July 1987 AR, which provided both the stimulus and working basis for the subsequent results.

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DEADLINE FOR FEBRUARY IS DECEMBER 30, 1988

TOPICAL TECHNICALITIES

Lindsay Lawless VK3ANJ
PO Box 112, Lakes Entrance, Vic. 3909

Trap dipoles are useful aerials capable of operation on several bands without a coupling unit. They are usually constructed from a proven design using specified components and element lengths. It is easy to design a system to suit available components or desired element lengths.

Figure 1 illustrates the simplest version — the centre section, 2B in length, is a halfwave at a frequency f_1. The traps isolate this section from the remainder of the aerial when operating at f_1. At a lower frequency, $f_2 = f_1/N$ the traps are loading reactances (X_2) to resonate the total aerial of length A to f_2. Simple manipulation of basic parallel circuit theory reveals:

$$X_2 = N/w_1C(N^2-1) \ldots (1)$$
$$C = N/w_1X_2(N^2 - 1) \ldots (2)$$
$$L = 1/w_1^2C \ldots (3)$$
where $w = 2\pi f1$

Those three expressions enable a choice of L, C or X_2 and calculation of the others.

EXAMPLE 1

(a) Choose a length A greater than a halfwave at f_1.
(b) From the charts, for off-centre loaded dipoles in the *ARRL Antenna Book* determine the reactance necessary to suit A and B — this is X_2.
(c) Calculate C from (1).
(d) Calculate L from (3).

EXAMPLE 2

(i) Choose L and C from the spares box.
(ii) Calculate X_2 using (1), (2) and (3).
(iii) From the chart in the antenna book determine the length to match X_2.

The total aerial need not be symmetrical and the traps need not be identical but chosen to suit the available components.

N = 2 is the simplest design example and the following is the result for an aerial for use on 3.5 and 7 MHz.

C = 68 pF
L = 7.6 uH
X_2 = 223 ohms

From the antenna book chart, at the intersection of approximately 220 ohms and B = 50 percent, A is approximately 85 percent, 85 percent of a halfwave at 3.5 MHz is approximately 35 metres. B is a quarterwave at 7 MHz about 10.2 metres.

Those dimensions are close to those found experimentally.

For readers interested in some experimental maths, a set of simultaneous equations will reveal the possibility of operation of that aerial on 14 MHz and the low end of the 28 MHz band.

The formula, from which the ARRL charts were derived, can be found in *CQ* magazine of December 1981, together with a solution program in BASIC.

It is not possible to design for any value of N and the above information can be used to determine the possibilities and impossibilities. Try and design for 24 and 18 MHz — that is one of the impossibilities!

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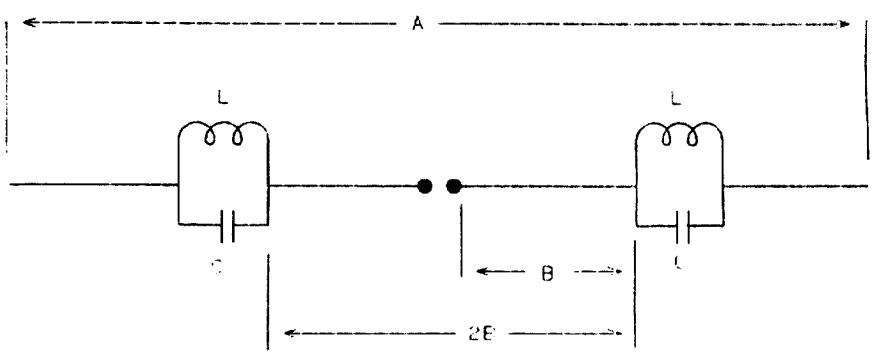


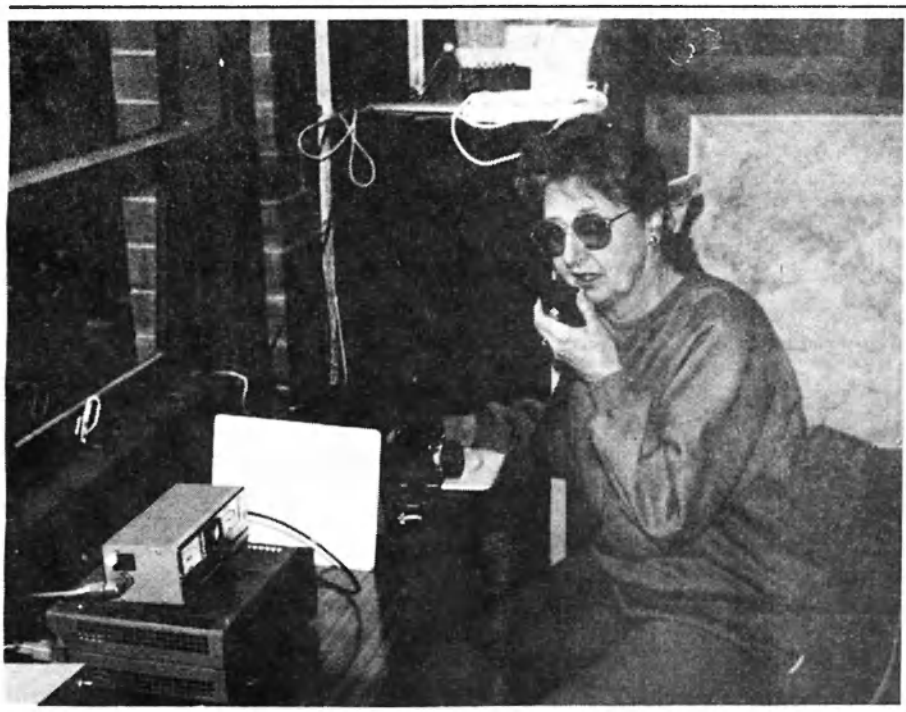
Figure 1.
L and C form resonant traps at f1 and loading inductive reactance at f2.
2B = halfwave at f1.
A = Y% of halfwave at f2.
Y is found from charts in the *ARRL Antenna Book*.

THREE WEEKS IN AUGUST

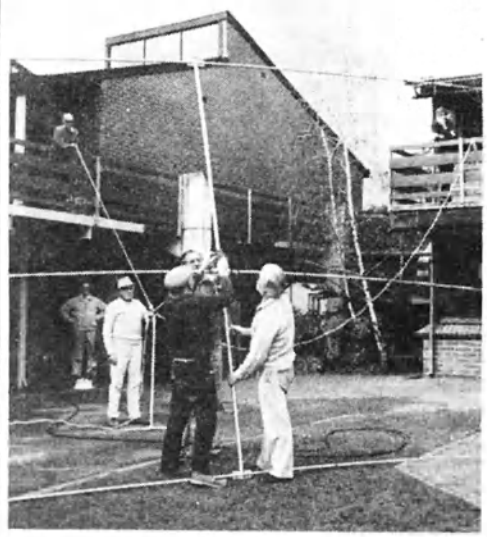
Meg Box VK5AOV
56 Clifton Street, Hawthorn, SA. 5062

The unaccustomed sound of static crackling through the library and the unfailing attraction of the voice of the operator exchanging comments with amateurs in far places drew the girls into the shack . . . for three weeks in August students of Walford Anglican School for Girls (years 1 to 12) in South Australia had an amateur radio station operating from their Senior Library.

Bryan VK5NOS with (from left) Emily Strickland, Rhonda Summers and Sarah Schluter at the microphone.



Meg VK5AOV, checking the equipment.



Erecting the TH3 — Members of the Adelaide Hills Amateur Radio Society (from left) (up) David VK5OV, (down) Graham VK5KGS, Bill VK5KWM, Alan VK5ZD, Ron VK5RV, Bryan VK5NOS and Hans VK5YX.

Walford students (from left) Sally Veitch, Emily Steele, Diana Williams, Clare Patience and Alex Long with the radio station that was set up at the school.
—Photograph courtesy *Messenger Press*

The operation was mounted as part of the school's Bicentennial celebrations and was facilitated by the encouragement of the South Australian Division of the Wireless Institute of Australia, the Adelaide Hills Amateur Radio Society whose members supplied and erected a TH3 Jr, and the generosity of the many amateurs who gave their time to run the station between 0300 and 0700 UTC each school day. (There are two amateurs on the staff of the school, Denise VK5YL and Meg VK5AOV, and Christine VK5KTY, is a former member of staff).

Antenna-raising was the order of the day on Sunday, August 7, and in record time both the TH3 and VK5NN's trapped dipole were safely established in position. Then, courtesy of the AHARS members, out came charts, maps, DX lists, UTC clock, a J-pole, an azimuthal map and all the extras that went to make a study room become a shack.

Because Walford is a girls' school, I was keen to have as many YLs as possible as operators and we managed to have YLs operating on 10 of the 15 days, all of them members of ALARA.

About 60 of the students are boarders, some of whom have been involved with radio communications as part of their property management or through the School of the Air. Here was a different experience for them, and an opportunity for them to excel when it came time to take the microphone.

One of the highlights of the operation was the "Schools Across Australia, Amateur Radio Communications" link where the girls made contact with boys from Wesley College in West Australia, via Trevor VK6ATR, students from St George's College, South Australia, courtesy Alan VK5TP, and students from Marryatville Primary School in South Australia through Graham AX5AQZ, the co-ordinator of the link across Australia. (If you would like to hear students comparing notes why not listen in around 0430 to 0530 UTC on 21.180 MHz on Fridays).

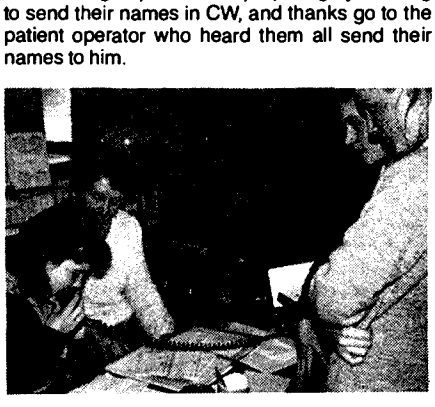
The signals on 15 metres improved as the afternoons wore on and many friendly amateurs chatted with the students from their QTHs in Italy, Seattle, Chicago, New Zealand, South Africa, Bogor, Russia, London, etc, as well as from Townsville, mobile on the way from Perth to Meekatharra, portable from Windy Point overlooking Adelaide (simplex two metres) and so on.

One group heard the Travellers' Net and had the operation explained to them. Another learned about WICEN, whilst all were encouraged to find the originating stations on the world or Australian map and place a pin to record the location of each contact.

Students were given a copy of the phonetic alphabet and a standard format to prepare comments for their QSOs. In this way they were able to spell out their names in phonetics and be assured of having something to say when their turn came to take the microphone in their shaking hand. The shaking came more from the excitement of the experience rather than from shyness and the girls received many complimentary comments about the clear diction and pleasant presentation.

The use of phonetics also showed the girls that, even when a name which is uncommon in one country is spelled out, then others will understand and be able to reply using the correct name. For example, the name Ruth was not familiar to one of the Italian contacts until phonetics were used.

Another group had been preparing by learning to send their names in CW, and thanks go to the patient operator who heard them all send their names to him.



Jenny VK5ANW, with some of the girls.

Geography, great circle routes, long and short path, communication, courtesy, friendship, co-operation, and the excitement of making new friends appealed to them all.

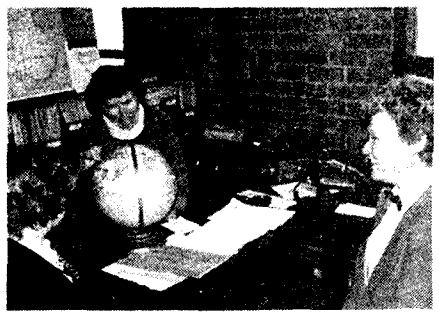
"Can we talk to Carlo in Turin today?", "may we ask the boys for their telephone numbers?", "will that King be talking today?" were examples of the interest generated.

Thanks must also go to the Librarian who, at the conclusion of the three weeks was heard to say that she hadn't been sure that she would be able to cope with the presence of the radio but apart from one day when there were many students moving through her group in the library she enjoyed it all and found it most interesting.

There is talk of a repeat performance for Walford's Centenary in 1993, so look for us again then! And, in any case, it is a worthwhile experiment which others may like to try, and who knows how many new amateurs we may bring to our hobby in the future?

Walford students have had an experience they will remember for a long time.

On behalf of the school I wish to thank all of our operators, and all who worked AX5WI or VI88SA. We would welcome your QSL cards as a record for the school — our cards are on the way to you. Please QSL to PO Box 430, Unley, SA. 5061.



Denise VK5YL with a student and her mother.

LIST OF OPERATORS

Some worked in pairs and trios, whereas others were solo.

Alan VK5ZD	Jenny VK5ANW	Christine VK5KTY
Bryan VK5NOS	Denise VK5YL	Bill VK5KWM
Joy VK5YJ	Doug VK5KDH	Frank VK5AZS
Maria VK5BMT	Geoff VK5TY	Myrna VK5YW
Meg VK5AOV		

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MOUNT SKENE REVISITED

William Magnusson VK3JT
359 Williamstown Road, Yarraville, Vic. 3013

"It's been far too long," someone said. I agreed. It had been three or four years since we had mounted a full scale Mount Skene DXpedition. The rumblings were there however, people were getting restless. Peter VK3AVE and Caroline signed on instantly. Dick VK3ARR and Eileen replied "When do we start?". Graeme VK3NE, was working with the Australian Antarctic Research Expedition as VK0NE, on Macquarie Island. His reply was telexed post haste, "Don't go without me. I'll be back in November." Huntly VK3ZE, was champing-at-the-bit. George VK3LA, began organising a leave pass for a week, and Philip VK3AWG, started to brush the cobwebs out of the amateur television equipment.

I thought to myself, 'This is crazy, they have forgotten about the ants, the March flies, the freezing cold nights, the inevitable two or three days of wild weather' but then I too remembered the sheer magic of the place. A mile high in the alps. The clear, crisp mornings with a million drops of dew reflecting the sun's rays. The mist rising slowly out of a hundred valleys. The bird songs. The unbelievable sunsets. The blacker than black night sky with stars blazing. The brilliant wildflower display.

Was it any wonder we had made this place a must for so many years in our amateur radio calendar? I remember 'discovering' Mount Skene on a trip during one of the old VHF/UHF field days of many years ago and musing then on the possibility of a full scale DXpedition some day. I had been a regular visitor for some years when one night Dick and I were working late in his laboratory at school. I think he was building an ATV transmitter. He was looking for a site to try ATV from a portable location not too close to Melbourne. Of course, Mount Skene sprang to mind and the first of many expeditions was born. It was highly successful. We worked ATV to Sylvester VK3ZSD, in Geelong. Good quality colour pictures over 200 kilometres (120 miles) on five watts of power using a 48 element phased array on 426 MHz. We worked through OSCAR 6/7/8. We even made it on to the front cover of *Amateur Radio* magazine and it whetted everyone's appetite for more. It became a regular event for a dozen or so amateurs, their family and friends. From time to time Dick and I (we were both teaching then) would take students on a technology camp to "the hill" to share our experiences. The little group grew until we had people with interests in HF, VHF, UHF, ATV, satellite communications and packet. Stephen VK3YMY, even brought up an astronomical telescope one year. The location proved to be perfect for astronomy. Altitude 1600 metres (5200 feet) no large settlements for 80 kilometres (50 miles) and black skies at night. We built a rigid mounting base out of local rock, rugged up and had a wonderful time peering deep into the southern night sky.

While Dick went overseas for a few years and I made preparations for an eventual move to Eden, New South Wales, the Mount Skene trips were put 'on hold'. That was in 1983, the year that OSCAR-10 was launched. It worried me that we now had the best opportunity ever for DX by satellite but were not in the position to mount a full-scale expedition.

I was keeping in touch with Dick by mail. He was studying at the University of Dayton, Ohio. In one of his letters he said that he was in a position to work OSCAR-10 from the station of our mutual friend, Paul W8HSU. It was around Christmas time so we organised a sched for New Year's Day on Mount Skene. George and I held a full dress rehearsal in the fields at the back of his QTH and all was ready. Huntly and I made the trip up the mountain a few days before sched time and set up the equipment. It all worked perfectly and we made many contacts into the USA. At the appointed time we watched the 'window' extend slowly across the States. We worked into W6, W5, W7 and finally W8 areas but there was no sign of Dick and Paul.

We called out heads off over a four day period only to get back down to Huntly's place to find a telephone message from Dick to say that they had been hearing us all along but had a series of equipment failures that had prevented then replying to us.

Now, three or four years have passed and it would seem the troops are ready and we are off and running again. Timing is, as always, the period between Christmas and the first week in January. There will be a dozen or so in the party. Equipment will cover all HF and VHF/UHF bands. We will be taking plenty of equipment — computers, transceivers, power supplies, decoders, modems, masts and antennas. Verticals, Yagis, a long wire, quads, loop Yagis, circularly polarised arrays for use with the satellites - we may even rebuild the phased array for 426 MHz. Power will be via a portable petrol generator with battery back-up.

We now have a new satellite, OSCAR-13. Huntly, Graeme and I will be concentrating on working that, and Fuji or RS-10. Peter will, no doubt, bring his packet set-up and digipeat far into Gippsland, Tasmania, and New South Wales. Dick, George and Philip will operate on 426 MHz ATV, and try to better their contacts with Sylvester in Geelong. We will probably run out of time, we always have in the past. Look out for us signing 'portable Mount Skene'. Times and frequencies are as follows:

3.570 MHz SSB	2030 UTC
7.090 MHz SSB	0630 UTC
14.150 MHz SSB	0603 - 0730 UTC
147.800 MHz FM AO-10 & AO-13 Mode B	1000 UTC
426 MHz ATV at all hours	145.907 MHz downlink Liaison on 147.400 MHz FM
2m packet usual packet frequencies	all hours

Remember however, all the above activities will be interspersed with important things like walking, bird-watching, photography, cooking, eating, socialising, and generally sitting in the sun.

Given a day or so to set everything up we should be ready for operation on December 27, and we plan to stay until the end of the first week in January 1989. Depending on the weather, of course, as it has been known to snow up there even in January!

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Miniaturisation Brings Change

Electronic components have been shrinking in size ever since the first wireless sets were built and means of connecting them have had to change to accommodate this miniaturisation. Soldering continues to be the method used but the actual soldering techniques have changed radically while the metallurgy of the solder used has not.

Typically an alloy of 40 percent lead and 60 percent tin is used. This is called a "eutectic," the mixture of the two metals with a lower melting point than either of the metals alone. The popularity of this type of solder is its low melting point, the ready availability of the metals and their relative cheapness.

In the days of valves, electronic circuits were assembled by point-to-point wiring. This meant components such as resistors had to have axial leads for soldering. The point-to-point wiring method is essentially simple but requires a lot of labour. Even so, it is still used today for some high power electronic circuitry.

The next step in the evolution of electronic components was the introduction of the printed circuit board which had the circuitry incorporated. This occurred at the same time as the first transistor radios appeared but printed boards were also used extensively for valve circuits such as television sets in the late 50s and early 60s.

With printed boards, the electronic components no longer had to be individually handled and soldered into place. Components could now be assembled onto the boards by machine and soldered by a continuous process in a wave solder bath where the solder is made to flow so a peak of solder comes briefly in contact with the component and solidifies as the component moves on. This led to more reliable circuits as solder joints became more reproducable and consistent.

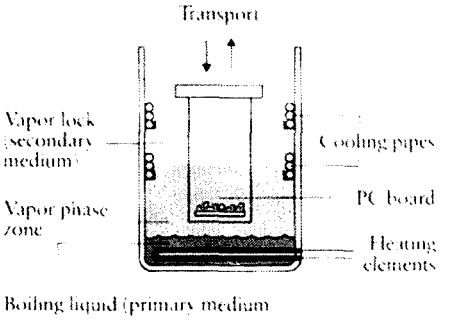
With the wider use of transistors, circuit voltages were lower and components could become much smaller. Finally, as integrated circuits were introduced, component size was reduced even further.

Because of this miniaturisation a system of attaching components called "surface mounting" was developed. With conventional technology components were secured by soldering leads on the underneath of a printed circuit board after passing them through a hole. This was called the "through hole system". The increasing numbers of components meant boards would have to become too large if through hole technology was used. Also, as transmission speeds increased, processing of information was slowed down if components were too far apart. Finally drilling holes through the printed circuit board increased the cost. To cope with these new requirements the components were attached directly to the board and soldered on top if it or surface mounted.

Because of the generally higher costs of surface mounting such a system has been adopted only recently. Two areas of difficulty were the need for new techniques in soldering and the possibility of fractured components and solder connections due to different rates of expansion on heating of the components and circuit boards during soldering and service.

Now these problems have been solved, surface mounted components are rapidly spreading to all branches of electronics and, particularly in Japan, to consumer electronics.

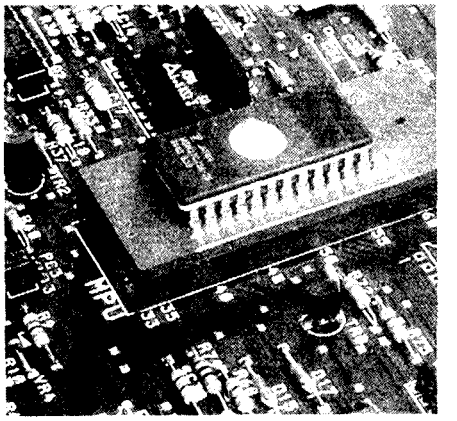
The Principle of Vapour Phase Soldering.



While many surface mounted components can be soldered in several ways, progressively new automated soldering techniques have been developed. Wave soldering is the most popular automated soldering process in the production of printed circuit board assemblies. The solder bath temperature is between 240 and 260 degrees Centigrade and contact between the solder and the component is one to three seconds.

Dual wave soldering is best for surface mounting. With the first wave a jet of solder is sent up to ensure good wetting of all metal parts while a second wave removes the excess solder.

The latest type of soldering used with surface mounting is a vapour phase reflow technique. A form of solder paste is applied to the printed circuit board which is then uniformly heated in a container of vapourised inert gas. This gas is trapped in the container by a cooler gas above it.



As the board is withdrawn from the inert gas the solder solidifies and holds the components in place. Vapour phase soldering is thus a very gentle method of soldering that stops overheating and minimises heat damage to sensitive components.

With the solving of technical difficulties including soldering technique, it is estimated that surface mounted components will take 70 percent of the total component market by 1990. Their success lies not only in the miniaturisation of assembly techniques and the increased reliability of components. Such components are also lighter than conventional ones making them ideal for mobile appliances while the elimination of the need for leads makes them highly resistant to shock and vibration.

—Diagram courtesy of Siemens Ltd. Article reprinted from *Elements* July 1988, the quarterly magazine of the Australian Lead and Zinc Development Associations (ALDA/AZDA)

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SUBSCRIPTION REMINDER NOTICES

As from now, only one membership subscription notice will be forwarded to members each year.

A reminder notice will not be sent!

As from now, only one additional issue of *Amateur Radio* magazine will be sent to you if your renewal subscription is not received.

Not two additional issues as in the past!

Only a small number of *Amateur Radio* magazines are now being printed each month surplus to members requirements. This means that if you do not renew your subscription on time, you may not be able to get your missing copies of AR!

WHEN YOUR MEMBERSHIP RENEWAL IS DUE, PLEASE PAY PROMPTLY AND ENSURE CONTINUAL RECEIPT OF *AMATEUR RADIO* MAGAZINE!

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GIFT HONOURS WAR CASUALTIES

Former RAAF Wireless Operator and Air Gunner, Maurie O'Keefe VK3KO, can rest a little easy these days after successfully completing a five-year mission to restore radio equipment for the Australian War Memorial.

Maurie 63, was an operator in the RAAF Squadron 460 which flew Lancaster bombers in World War II.

"The reason I took this job was to show future visitors to the Australian War Memorial some visible signs of the equipment we used," he said.

His restoration of wireless sets for the War Memorial are a personal memorial to the heavy casualties suffered by the squadron. A total of 978 crew embers were killed during the war.

Maurie began his mission after seeing the famous G-for-George Lancaster bomber exhibit at the Memorial, in Canberra, and regretting it did not have radio equipment.

The T1154 transmitter and R1155 receiver were used in the bombers. An earlier story in *Amateur Radio* magazine reported the restorations of a transmitter and receiver.

These sets are now on a navigator's table beside the G-for-George exhibit. Maurie proudly handed over a second transmitter and receiver combination for installation inside the bomber on October 12, 1988.

Maurie O'Keefe with three women who helped staff radio stations in World War II — Shirley Schaeche, Joan St John and Nancy Wright.

—Photograph courtesy Leader Associated Newspapers Pty Ltd

Maurie demonstrates the transmitter to another ex-serviceman.

Maurie with the radio and transmitter he restored for the bomber.

Photograph courtesy Darryl Gregory of *The Canberra Times*

STUDENTS TODAY — SPACE ENGINEERS TOMORROW

Paul Butler VK3DBP
HEAD OF SCIENCE AND COMPUTING
Mentone Girls' Grammar School
11 Mentone Parade, Mentone, Vic. 3194

Australia's embryonic space industry will depend heavily on today's school students.

It is important to capture their interest in space now, in the hope that some of them will become involved in space technology.

The Satellites in Schools Project, an initiative funded as part of the Bicentenary, has been established to help teachers get started with satellite technology in the classroom. The project will eventually involve teachers and students from all parts of Australia.

The program will be based initially on studies conducted over the past few years into ways in which satellite technology can be incorporated into a school's curriculum. Schools have shown that satellite technology, including amateur radio satellites, can be used in physics and general science at upper primary and secondary level. A study of satellite orbits and of data coding and decoding can be included in other subject including geography, mathematics and information technology.

Students from Grade 6 upwards at Mentone Girls' Grammar School are learning about satellites in physics and electronics lessons. They receive signals directly from satellites and record them using an ordinary cassette recorder. The audio tones are then decoded electronically and displayed on a computer terminal.

Best results so far have been from two educational and scientific satellites built by the University of Surrey, in Guildford, UK, and operating on the amateur bands. Called UoSAT 1 and UoSAT 2, they transmit several kinds of data, including telemetry and whole-orbit data.

Measurements of internal and external temperatures, solar cell currents, battery voltages, satellite spin rates and other quantities are continually made and transmitted to Earth directly as telemetry or stored over several orbits and sent as a complete block of data.

Students can plot graphs of whole-orbit data and then use their graphs to study the physics of the satellite and its environment. The spin and orbital periods can be deduced from the graphs, while the nature of the Earth's magnetic field and the charged particle activity in near space can be studied.

The possibility of two-way satellite communication is being investigated as part of the project. Direct communication is possible through AMSAT satellites, as well as indirect messaging using the digital communications experiment (DCE) aboard UoSAT 2. Schools in Australia can send messages to the UK, for example, using amateur radio stations to access the DCE digital store-and-forward facility.

The Satellites on Schools Project will enable lessons learned in schools already using satellites to be shared with other schools. More than 60 schools have expressed interest in being involved with the project, including Footscray Technical School, where teachers Bill Magnusson VK3JT and John Seddon, are using amateur satellites in classroom experiments.

Their students have built antennas to receive signals from the UoSAT satellites and are involved in a program of experiments. John Seddon said that electronics drew heavily on other disciplines such as physics and mathematics. There would be few better ways of demonstrating the relevance of these subjects than a satellite communications project, he said.

In 1988, the Footscray Technical School students and others around the world followed the progress of the joint Canadian-Russian Skitrek across the North Polar ice-cap. The skiers, four Canadians and seven Russians, trekked 1730 kilometres from the northern-most point of Russia to northern Canada, navigating using search-and rescue satellites. UoSAT 2, with its digitalker speech synthesiser, enabled skiers to hear their location read to them as the satellite passed overhead.

To increase space education activities in Australian schools, a start will be made soon on the development of classroom resources and teacher training materials. Satellite hardware and software purchased using a Technology Education grant from the Victorian Government will be available for loan by participating schools.

This project is only a beginning. More studies are needed to assess the value in the classroom of a range of satellites, including weather, communication and surface-imaging satellites. Teachers and students interested in being part of the Satellites in Schools Project should contact the author of this article.

ar

MORSEWORD 22

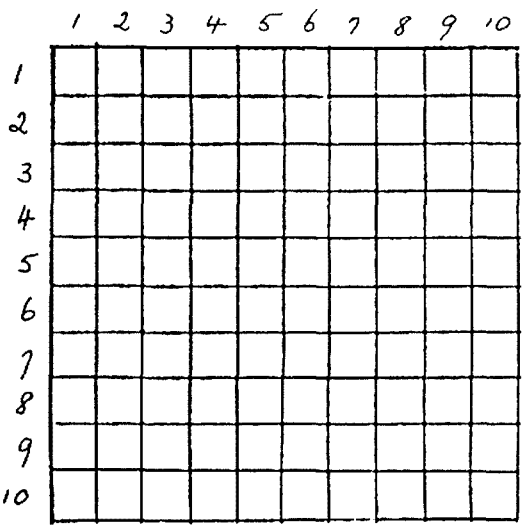
Audrey Ryan
30 Starling Street, Montmorency, Vic. 3094

ACROSS

1. Wound
2. Joint
3. Short holiday
4. Errors
5. Those people
6. Poems
7. A peer
8. Sporting ground
9. A present
10. Reduces the light

DOWN

1. Expectorated
2. Eat and drink
3. Stitches
4. Gentle
5. Skin
6. Intertwine
7. Conversation
8. Enjoy
9. Desserts
10. Cooking term



Solution page 50. . .

Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7277

CONTEST CALENDAR

DECEMBER 1988

3 — 4 ARRL 160 Metre Contest (Unconfirmed Date)
10 — 11 NZART, VHF/UHF Field Day Contest
10 — 11 ARRL 10 Metre Contest
— 24 Commencement of the WIA Ross Hull Memorial VHF/UHF Contest (Rules November AR)

January 1989

— 7 Conclusion of the WIA Ross Hull Memorial VHF/UHF Contest (Rules November AR)
28 — 29 VHF/UHF National Field Day Contest (Rules this issue)

MARCH 1989

11 — 12 RSGB Commonwealth Contest
18 — 19 NZART Field Day Contest
18 — 19 WIA John Moyle Memorial Field Day Contest

FIELD DAY

A VHF/UHF Field Day Contest is to be held in New Zealand on December 10-11, Saturday from 1700 NZDT to 2300 NZDT, and Sunday 0700 to 1300 NZDT. 12 x 1 hour periods.

All bands, modes and techniques apply.

Full details of this, and the general rules for ZL VHF contest appeared in *Break In*, December 1987. (Information from ZL1AAS). Thanks John.

The rules for the ARRL 160 metre contest appeared *in* December 1987 AR.

The information regarding the rules for the 1988/89 Ross Hull Memorial Contest have been passed to the NZART for publication and more interest should be apparent from ZL now that the winners certificates are issued to cover the various locator "Fields" and now call areas or countries.

The number of logs received for the 1986 and 1987 contests remained static, let us see if we can get more logs into the results this year.

Whilst attempting to answer a query from a contester who was somewhat confused about the system of call sign allocation used in New Zealand I received some information that could explain to a certain degree why such confusion can exist for DX stations. In ZL, novice stations have the N suffix, ie ZL1NAA, but as at present, if a VHF limited station passes in the novice Morse test, he is then allowed novice privileges, but still retains the T or U suffix as used by limited licence holders, ie ZL1UFO holds a Novice Licence.

Amateur radio, or the "Amateur Service" as it is known throughout the world, always includes in the definition "self training in radio communications" amongst the other portions described.

This self training is meant to improve the amateurs ability to transmit and receive with 100 percent accuracy a message, be it in plain language or some form of code. Over a great number of years the use of contests have been to the fore in putting this ideal into practice under various operating conditions.

The vast majority of contest logs received have no errors at all and reflects the care and required attention to detail of the operators involved in the passing of messages with a 100 percent accuracy. This is what a contest is about. Accuracy and speed of message passing, plus the skill in using the propagation to your advantage. Operators who have had an entry disqualified in a contest because of errors in excess of those allowed for in the rules should not feel they are being penalised too much, but should participate in more contests to improve and build up their technique. Remember, even the world's best contest operators made mistakes, and contesting can still be fun. If in doubt ask for a repeat report.

For the VHF/UHF operators who have been asking for a VHF/UHF portable contest, January will be the month for you. In response to all of you who have written to me regarding the lack of a national field day type contest, I have compiled a set of rules that should accommodate your requests. I have deliberately kept the rules simple (to make my life easier) and am using the Maidenhead locator square system as in the Ross Hull Memorial Contest. The scoring is biased towards the portable stations. Much thought was put into the date and time period, and the placing of the contest is between the Ross Hull and John Moyle contests when the weather is still summery and a good proportion of the contesters will be on holiday. The times chosen will give most of you time to set up the station at your favourite spot and get home again before nightfall. Good luck to you all. Please try and participate so we can see what the prospects for a 1990 repeat are like.

May I take this opportunity of wishing you all the compliments of the season and a prosperous New Year.

73, Frank Beech VK7BC

RULES FOR A NATIONAL VHF/UHF FIELD DAY CONTEST 1989

OBJECTS: To promote the portable operation of amateur stations using VHF/UHF amateur bands, modes and techniques. Overseas stations are invited to participate.

PERIOD: January 28 to January 29, 1989. From 0200 UTC Saturday until 0159 UTC, Sunday.

SECTIONS:

Section A — any continuous 12 hour period.

Section B — full 24 hours operation.

CATEGORIES:

(a) Single operator, Single band — one person performs all station functions.

(b) Single operator, All band — one person performs all station function.

(c) Multi-operator — those stations using more than one person for operators, loggers, spotters, etc.

(d) Home station, All band — one person performs all station functions.

CONTEST EXCHANGE: Contest exchange is: Signal Report RS/T, Serial Number commencing at 001, Maidenhead Locator Square Number to fourth figure, ie QE38.

SCORING:

Two points per QSO on 50 and 144 MHz.

Four points per QSO on 432 MHz.

Six points per QSO on 1296 MHz.

QSOs between portable field day stations count for double points.

Home stations, half score; ie 1 point on 50 and 144 MHz, 2 for 432 and 3 for 1296 MHz.

MULTIPLIERS: The total number of different Grid Squares on *each* band; ie each different grid square counts as one multiplier on each band it is worked.

FINAL SCORE: Multiply the total number of QSO points by the total number of multipliers.

REPEATERS: The use of terrestrial repeaters is not allowed for scoring purposes.

REPEAT CONTACTS: To generate activity, repeat contacts are allowed after a period of four hours on each band.

LOCATION: A station must remain at one location; ie cannot change the locator grid number by being stationed on a grid square boundary.

POWER SUPPLIES: *For Portable Field Day Stations* — the use of mains bourne power is not allowed.

SCORING EXAMPLE:

BAND	QSOs	QSO POINTS	GRID SQUARES
50	26 x 2	52	10
144	70 x 2	140	17
432	12 x 4	48	4
1296	3 x 6	18	2
TOTAL	111	258	33

Final Score = (QSO points) x (Total number of grid squares) 258 x 33 = 7514 points.

AWARDS: Highest scorer in each section of each Maidenhead Locator Field.

Highest scoring club station.

ENTRIES: Post your entries to the Federal Contest Manager, C F Beech VK7BC, 37 Nobelius Drive, Legana, Tas. 7277. Entries must be postmarked no later than February 28, 1989.

FRONT SHEET: This must include a signed statement that the rules and spirit of the contest have been respected.

The claimed score must be set out as in the example shown.

DISQUALIFICATION: The contest disqualification criteria, as laid down from time to time in *Amateur Radio* will apply to this contest.

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WILL YOU HELP?

As you no doubt know by now, the WIA has established a QSL collection. Something had to be done to save both old and present day QSL cards for the future. These then may be used by historians and others to record the history of amateur radio and can be used for exhibition.

We all know the fate of most QSLs, but *some can be saved.*

If you can help or perhaps know of a widow/er or other close relative of a Silent Key who may wish to donate QSLs to the collection, please contact me. If you hear of any amateur shifting QTH and having a clean out of the shack, please pass on this message.

We need *any* kind of QSL,, and appreciate donations of any number of cards. Old timers of all States of Australia have been generous but we need many more QSLs — also QSLs of present DX operators (we are very light on here).

Please contact , PO Box 1, Seville, the Honorary Curator, Ken Matchett VK3TL Vic, 3139, or telephone (059) 64 3721, if you think you can help.

Ken will make arrangements for the pick up of the cards.

Will you help? It is a worthwhile cause.

—Contributed by the Honorary Curator, Ken Matchett VK3TL

ar

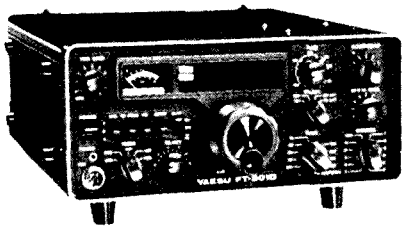
KNOW YOUR SECONDHAND EQUIPMENT

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

Last month we looked at the last of the valve-final transceivers from Yaesu. This time we will discuss the first of the full solid-state HF transceivers. I have always had a feeling that some of the early Yaesu solid-state final units were not as popular as they should have been. I will give my impressions of why this might have been as we go along.

YAESU FT-301 TRANSCEIVER SERIES

These were compact, solid-state transceivers designed to operate from a 13.8 volt DC source. There were three in the series — the 301S with about 10 watts output, the 301 with 100 watts output and the 301D, 100 watts output and a digital frequency display built in.



Personal feeling is that Yaesu made a bad mistake with the physical design of the 301 transceivers. The all-black colour scheme was not all that popular and the S-meter was too small. But, if you can tolerate this they offered adequate performance on all of the pre-WARC bands from 160 to 10 metres.

The transceivers were released in early 1976 at the following prices: 301S was $789, the 301 $1076 and the 301D was $1269. These prices did not include the optional DC power supplies.

A review of the 301D appeared in the December 1976 issue of *Amateur Radio* and I made the following comments on frequency stability. "VFO stability was checked and found to easily meet the specified 100 Hz per half hour. Drift over the first half-hour was almost exactly 100 Hz and over the next half-hour did not exceed 150 Hz. However, over the same period of time, the digital readout shifted 800 Hz. An interesting case where the VFO is more stable than the frequency counter."

Apart from the power output, the S-model did not have the notch filter but did include the RF speech processor common to the other models.

Secondhand value for the three models would be: FT-301S about $350, FT-301 about $525 and the FT-301D about $575.

YAESU FT-7

Without doubt, the most famous of them all! Introduced in mid-1978 at a price of $539, the FT-7 was not immediately popular. But in early 1979 the price dropped to around $370 and everyone wanted to own one. Now, if you happen to be one of the few who has not come across the FT-7, let me describe it to you.

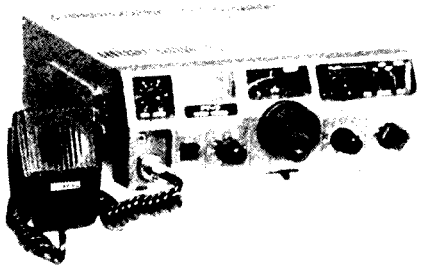
The FT-7 is a fully solid-state HF, SSB/CW transceiver that covers the pre-WARC amateur bands from 80 to 10 metres. It covers a total of 500 kHz on each band including 10 metres where the standard coverage is 28.500 to 29.000 MHz. As there is only one band-switch position for 10, any additional coverage here requires a slight modification. Power output on both CW and SSB is around 15 watts with some exponents of FT-7 modifications claiming up to about 30 watts. Whatever, because of the excellent transmitted audio, the 15 watts goes much further than may be imagined. Perhaps one of the best liked features of the FT-7 is the simplicity of operation — set the band-switch, tune to the required frequency and talk! A receive-only clarifier, noise blanker and crystal calibrator are the only concessions to the bells and whistles brigade. Receiver sensitivity is excellent and the smooth dial drive makes tuning a pleasure. For home station use a DC power supply is required which delivers 13.8 volts at about four amps.

Secondhand value today would vary from about $250 for one in marked condition up to about $375 in mint condition. When you see one advertised, don't hesitate, they don't last long!

THE YAESU FT-7B

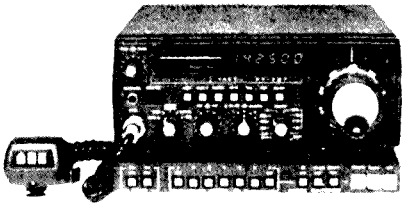
This has the same appearance as the FT-7 but the output power is increased to about 50 watts CW and PEP AM is added to the other modes, a receiver front-end attenuator is selectable by pulling on he microphone gain control, a drive control is now concentric with the tune control and the band-switch now has positions for full coverage on the 10 metre band although only one position is fitted with the required crystals as standard. Again this is 28.500 to 29.000 MHz.

In general, the 7B has never enjoyed the popularity of its smaller brother. Released in late-1978 the price was around $600. Secondhand value now would be about $475



THE YAESU FT-707

The FT-7B was superseded by the 707 in early 1980. Appearance was changed completely and the initial impact was excellent. Full amateur band coverage from 80 to 10 metres including the new WARC bands was provided in 500 kHz segments and a bright and very readable digital readout accurately indicated the frequency. But, the most controversial aspect of the 707 was the LED meter. You either like it or you don't and most didn't. It seems that where most have accepted LED meters on VHF transceivers, the 707 experiment proved that they are not liked for HF.



The version of the 707 sold in Australia had 100 watts output, but apparently a few of the 707S transceivers found their way here. Watch out as these are a 10 watt output version and are worth somewhat less.

General performance is reasonably good, however the VFO is not as stable as it could be and the transmitter talk-power seems light on There is no speech processor provided.

The main competitor of the 707 is the Kenwood TS-130S which, I feel, is a much better performer in this price range. However, as a portable, mobile, or as a second unit for home, the FT-707 is worth considering for the right price. A number of optional accessories were offered with the FT-707. These included the FV-707M digital VFO. This unit, only about 25 centimetres high, is a push button operated memory, VFO and scanning system. It has no display built in, and relies on the display in the transceiver. I found it rather fiddley to operate and not a great advantage.

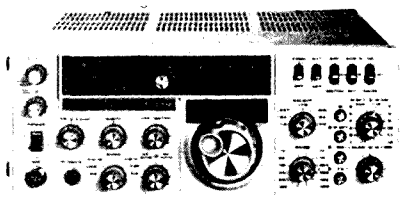
The FP-707 power supply is a nice unit. It has a built in speaker and, as well as a captive lead with a matching connector for the 707, it has a pair of terminals for auxiliary equipment. The matching ATU, the FC-707, is also a nice little unit. It has built in power meter with 15 and 150 watt scales plus a built in dummy load. The only thing against it is that it does not have 160 metres.

Secondhand values: FT-707 about $600, FT-707S about $450, FV-707DM VFO about $150, FP-707 power supply about $250 and the FC-707 ATU about $225

THE YAESU FT-107

This was the last of the 'first' fully solid-state transceivers. It had all the signs of being highly successful in the amateur market but, for some strange reason, was only available for a relatively short time. Released in early 1980 at a price of $1150 depending on options selected, it was one of the first solid-state units to have a built in AC power supply. Actually, the built-in AC supply was an option, but I have yet to see a 107 that didn't have one.

An external AC power supply was available and, at the end of the run, these were sold off at most attractive prices. The first of the 107s covered all the HF bands including 160 metres, but not the new WARC bands. According to the advertisements of the time, a kit was to be



available to give WARC band coverage. I am not sure if one appeared! However, it was not long before 107s with the WARC bands installed came onto the market. With provision to take an inbuilt AC power supply, the 107 was similar in size and weight to the valve final transceiver, such as the FT-101Z series described last month. A digital readout was a standard fitting and a 12 channel memory was available as an option. With a memory selected, it was possible to VFO it up and down the whole band, either from the control on the transceiver front panel or via the up/down buttons on the microphone.

It should be noted that, unlike the memory system on modern general coverage transceivers, these memories were on one band only. Flipping the band-switch from say 40 to 20 would bring the memories to the same relative position on the selected band. An excellent notch/peak filter and variable bandwidth control were standard fittings. All in all, they offered a high standard of performance. Why Yaesu dropped them so soon is a mystery. These days owners of FT-107s prize them highly.

Secondhand value of an early (pre-WARC) model with in-built power supply and DMS (memory) would be about $700. A later model with the WARC bands, power supply and memory, about $775.

In addition to the external power supply mentioned above, several nice accessories were available. The FC-107 ATU rated at 250 watts would have a secondhand value of about $225. A transverter that can be optioned to take two bands from either of the 430, 144 or 50 MHz ranges. It would be worth about $150 The external VFO, the FV-107, was also sold-out on special and its secondhand value would be about $60.

Next time, we will look at the last of the Kenwood valve-final Kenwood transceivers.

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1989 SUBSCRIPTION PRICES FOR VHF COMMUNICATIONS MAGAZINE

Although the German price has remained the same for 1989, due to currency fluctuations and the increase in our overheads, the 1989 subscription through the WIA Executive Office will be:

Airmail Subscription	$28.00
Surface Mail Subscription	$25.50

PEACE DIGITALKER

AMSAT-Brazil plans to launch early next year the Brazil Peacetalker — a multi-lingual satellite beacon.

Using a speech synthesiser it will transmit a peace message in the English, Russian and Portuguese languages.

The beacon operating two-watts FM on the two-metre band is also to give out its routine on-board telemetry through the digitalker.

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HINCH AT SEVEN DAMAGES REPUTATION OF AMATEUR RADIO SERVICE

MEDIA MISREPRESENTATION OF AMATEUR RADIO

Following is the text of a news item broadcast on the AX2WI Broadcast.

Last Tuesday night on television Channel Seven's nightly program *Hinch at Seven*, and also in the Sydney newspaper the *Daily Telegraph*, there was an item concerning interference to a marine Mayday call. Hinch reported that the signal, which originated off the coast of Wollongong was jammed by *ham radio operators* thereby hampering rescue attempts and placing lives in jeopardy. The *Daily Telegraph* reported (and I quote):

"... a third complication arose when the distress signal frequency became jammed by a ham radio operator who was interfering with the marine distress frequency."

(end of quote).

Nothing could be further from the truth.

Upon hearing this item, some amateurs telephoned Channel Seven to obtain more information. When this proved to be a waste of time, these amateurs went right to the source, that is the rescue authorities are also annoyed in the manner in which the item was broadcast.

The truth of the matter is, a call was heard which stated that there was a Mayday four kilometres off the coast of Wollongong. No further information was given nor could the unidentified station calling Mayday be raised.

The authorities had noted that for sometime that evening, the radio conditions were such that there was an enormous amount of "skip" present and the frequency of 27.880 MHz was extremely noisy. Also, this frequency has, in the past, suffered image interference from local CB operators.

According to the authorities, the interference to the distress frequency was due to the "skip" conditions present that night. This fact seems to be irrelevant to the media, who think that the story would sound better if something (or someone) more tangible was to blame. So who is to blame? The media consider anyone even remotely interested in radio (CB, amateur or otherwise) to be a "ham radio operator". We are the scapegoats! There seems to be some truth in the old saying "why let the truth spoil a good story?".

While some could forgive them for not being knowledgeable enough to distinguish between amateur, CB or private commercial stations, the fact remains that the public have been told that "ham radio operators" were responsible for the interference to a distress signal. What image does this place *into the public's eyes of us* — the amateur radio operators? Not a good one we can assure you!

When Channel Seven was approached by the VK2 Council, they freely admitted that the facts were not totally correct and that they had not told the entire story. They were asked to broadcast a correction to the item but at the time of writing this, none has eventuated.

The VK2 Council are writing to Channel Seven and the *Daily Telegraph* to attempt to set the record straight and get a correction item broadcast.

We ask that all amateurs do likewise. The more letters that Channel Seven and the *Daily Telegraph* receive, the more likely that they will actually do something about it. It is most important that our hobby not be degraded by this inaccurate act of journalism.

Please support this by writing into Channel Seven and the *Daily Telegraph*. It is the reputation and public image of our hobby that is at stake!

SUPPORT

The WIA Victorian Division fully supports the actions of the New South Wales Division in the above matter.

It FAXed a protest letter to Mr Derryn Hinch. On the VK3BWI weekly broadcast, members were encouraged to telephone and write to the Hinch at Seven program which is headquartered in Melbourne.

The WIA Victorian Division then decided to leave further representation to the New South Wales Division. This was because the WIA needed to speak with one voice and not by two Divisions.

The New South Wales Division is close to the action, the rescue groups and the DOTC District Radio Inspector, also the *Daily Telegraph* is a Sydney newspaper and appropriately should be rebuked from within its primary readership area.

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VHF UHF — an expanding world

Eric Jamieson VK5LP
9 West Terrace, Meningie, SA. 5264

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.005	H44HIR	*Honiara*
50.005	ZS2SIX	*South Africa*
50.011	JA2IGY	*Mie*
50.020	JE6ZIH	*Japan*
50.028	JA7ZMA	*Fukushima City*
50.066	VK6RPH	*Perth*
50.075	VS6SIX	*Hong Kong*
50.080	KH6JJK	*Hawaii*
50.110	BY4AA	*China*
50.490	JG1ZGW	*Tokyo*
51.020	ZL1UHF	*Auckland*
52.013	P29BPL	*Port Moresby*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*
52.345	VK4ABP	*Longreach*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VX3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.445	VK4RIK	*Cairns*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RHT	*Launceston*
52.485	VK8RAS	*Alice Springs*
52.510	ZL2MHF	*Mount Climie*
144.022	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.445	VK4RIK	*Cairns*
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
144.950	VK3RCW	*Melbourne*
145.000	VK6RPH	*Perth*
432.066	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK1RBC	*Canberra*
432.420	VK2HSY	*Sydney*
432.440	VK4RSD	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*Macleod.*
432.535	VK3RMB	*Mount Buninyong*[2]
432.540	VK4RAR	*Rockhampton*
1296.198	VK6RBS	*Busselton*
1296.410	VK1RBC	*Canberra*
1296.420	VK2RSY	*Sydney*
1296.440	VK4RSO	*Brisbane*
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
2304.445	VK4RIK	*Cairns*
2306.440	VK4RSO	*Brisbane*
10445.000	VK4RIK	*Cairns*
		EUROPE[1]
50.020	GB3SIX	**Anglesey**
50.030	CT0WW	**Portugal**
50.035	ZB2VHF	**Gibraltar**
50.045	OX3VHF	**Greenland**
50.050	GB3NHQ	**Potters Bar**
50.060	GB3RMK	**Inverness**
50.085	9H1SIX	**Malta**
50.500	5B4CY	**Cyprus**

1. The above list shows the operational six metre beacons in the European region.
   The list was compiled by G3COJ and is current at September 1988. The list comes courtesy of Peter VK6KXW and Don VK6HK.
2. Maurie VK3XEX, has written to confirm that the VK3RMB beacon is now operating.

EUROPEAN TELEVISION STATIONS

From the *European Broadcasting Union List of Television Stations No 32* (again per favour G3COJ and VK6KXW) is a list of vision and sound frequencies from European television stations. The list starts with vision carriers at 48.239 MHz and has a number of stations up to 48.260 MHz, again from 49.739 to 49.760, also 53.739 to 5.760 MHz. The sound carriers are in the ranges of 53.729 to 53.760, 56.239 to 56.270 and 59.239 to 59.760 MHz. In a number of cases, the vision transmitters have an ERP of 250 kilowatts, the sound transmitters up to 25 kilowatts. In either case, they may be considered as possible indicators of band openings from Europe.

The list, comprising 42 stations and their respective frequencies, is too long for total inclusion in this column. Anyone requiring the list may have a copy by sending a SASE to VK5LP.

SIX METRES AND THE UK

Ken Ellis G5KW, of Folkestone, Kent, has written stating there is considerable interest by United Kingdom amateurs in establishing contacts with stations in Australia, particularly to VK6 which probably offers the greatest opportunity.

Ken writes: "Now that eight UK amateurs have had two-way QSOs with LU7DZ, in Buenos Aires, we are now looking forward to a first with Australasia, possibly this November, but we may have to wait until next year; but the way the solar flux is rising and the excellent conditions we are getting, it could be this year; anyway, we over this side are monitoring for your beacons and the DX frequency of 28.885 and 50.110 MHz during possible suitable periods.

"As you are aware, of course, that G4BPY, G3COJ and myself (G3KW) had a crossband QSO with VK6OX on November 27, 1980. The opening only lasted for 15 minutes (0940 to 0955 UTC) giving Gordon and myself crossband WAC. Brian G3COJ, did not get a South American QSO. G4GLT, is the favourite over here as the first, as he was one of the lucky ones to work LU7DZ, the others are: G1PAM, G3CCH, G4VXE, G4AFJ, G4UXB, G3ZZY and G6ION. LU7DZ also worked to CT4 on September 18, at 1954 to 2001 but did not get through to the UK."

As a matter of interest, the distance from Perth to London is about the same as Perth to San Francisco, with the same oblique angle crossing the equator, the first being north-westerly, the second north-easterly, with the distance being around 15 000 kilometres (9000 miles) in each case. It will certainly require a very special set of conditions for contacts to eventuate to the UK on six metres, but it has been done before, hopefully, it will be done again, but it will require vigilance from both sides.

It has often been said by VK6 operators, that they are poorly placed when it comes to comparing their situation with that of the eastern coast of Australia, regarding contacts with the USA, Pacific areas and New Zealand. Few would dispute that statement. However, for some other possible, but nevertheless, difficult contacts, VK6 is more favourably placed. The path to the UK we have just discussed; the possibility of contacts to South Africa exists, as do contacts to southern Europe. They also have the freedom to make better use of the 50 MHz segment than VK1 through to VK5 are able — this is a very useful factor as the areas most special to them will certainly be using 50.110 MHz or thereabouts!

SOUTH AFRICA

The South African amateurs have been enjoying some very good conditions. The September 1988 issue of *VHF News* per Hal Lund ZS6WB, reports a busy time in August. The 5B4CY beacon was heard by ZS6XJ on 23/8. On 28/8, 5B4CY again, plus 9H1SIX at 1600. At 1620, a crossband contact was made with OZ1KGV on Falster Island, at 1623 a two-way contact with SZ2DH, followed by DL9RM, G3SED, G3JCC, G3JVL, G8HVY, G8XZO, GJ4ICD, PA0RDY and French stations. 5B4AZ has just received some equipment from JA1VOK, and his first contact with the new equipment was with ZS6LN.

Activity on six metres is certainly increasing in the African region. Stations on the air or awaiting equipment include 5B4AZ, 9J2CR, KH6HSS/5N9, J52US and TR8DX. (You are permitted to have a peek at the Call Book List for these prefixes!). 9Q5NW has been offered equipment by N4EJW. FT5ZB on Amsterdam Island received his six metre equipment and runs a beacon daily on 50.100 from 1400 to 1800 UTC. Zimbabwe has just received operating permission, but very little operational six metre equipment remains in the country.

European countries with authorised activity on six metres include 9H1, CT, EI, F, G, GD, GI, GJ, GM, GU, GW, LA, OH, OH0, OJ0, OY, PA, SV, TF, ZB2 with several others crossband.

SIX METRES EME

David VK3AUU, writes that on September 8, 1988, at 0830 UTC, ZL2BGJ worked W6JKV. The following morning he worked WA4NJP ZL2BGJ runs an antenna which is supported by even poles with a wire content of about half a mile. W6JKV uses a 4 x 50 Yagis. Congratulations to all concerned for a good effort.

CHANNEL 0

John VK4ZJB, phoned to say that the transfer of Channel 0 to the Toowoomba area has been received with mixed feelings. At the same time the changeover was made between Channel 0 and Channel 10, the Channel 0 transmitters were upgraded to produce an ERP of 300 kilowatts. As a result, it is still possible to hear the station's crud in Brisbane, mostly on backscatter, but at relatively annoying strength on six metres.

John said that a "nice" birdie appears on 50.110, nevertheless, the removal of Channel 0 from Brisbane appears to have made the six metre band more workable. He also said he could only feel sorry for any VHF operators in Toowoomba who now have Channels 0, 5 and 5A!

It may be useful for VHF operators in Queensland to read the QSP on page 46 of October 1988 AR.

A few JAs were worked from around 0200 on 28/9. Another JA beacon appears to be operating on 50.054 from the JA5 area.

THE BAND OPENS TO JAPAN

Peter VK3DU, has written to advise the six metre DX season has opened in Victoria. On 1/10 there was a good opening to Japan commencing around 0800 and closing at 1000, only to open again at 1030 and continue to 1100 UTC. All JA areas appear to have been available, though at different

times, starting with JA1 and JA2 then moving to JA6 and JA7, etc. Signals were generally peaking to S9.

JA6IDJ informed Peter that he had worked VK2, 3 and 5, plus a 3D2 that day. JA4MBM was heard to say that a 5H1 (Tanzania) station had been worked in Japan.

At one time Peter came across VK4ALM and VK5NY in contact, amongst the JAs but he could not determine if either of those operators were still hearing JA stations. VK4ALM had a very steady signal so it was presumed the signal was coming direct and not via backscatter from JA.

Peter said the warning that the band might be open came from 10 metres, where JA signals were becoming very strong. A check on six metres revealed the band was alive with signals. The beacons JA2IGY on 50.011, JE6ZIH on 50.020 and JA7ZMA on 50.028 MHz were all audible, thus verifying the correctness of the published beacon list. Thanks for the news Peter.

GOOD SPORADIC E IN JAPAN

Through June and July 1988, the Japanese stations enjoyed many periods of excellent Es conditions. As an indication of what stations are around during such openings, many of which could eventually be available to VK and ZL stations, the following is presented for your information. Most of those listed were operating around 50.100 to 50.130 MHz.

HL9CB, KG6DX, KH2D, H44DL, H44GP, KX6DS, VS6XRC, HL9TM, 5W1GP, HL2AOS, HL1IWW, HL2AJM, HL0BIC, HL3EEX, P29ZEF, HL1INQ, HL2ASH, BY1PK, BY4AA, HL1AAY, HL1IVR, HL0BFO, KL7IKV, AL7C, HL1ST, VS6XWR, 9V1ES, NF7X, N7DB, K7RWT, W7FIM, W7FN, N7ML, W0CL, K1GO, K5MM, KL7NO, KH6JJI, KH6IJ, AH6IO, KH6VP, KH6FOO, KH6SB, KH6IAA, KH6HI, NH6FL, VS6XMQ, WA6JRA, KT7G, K6HCP, KK6C, K6QXY, WA6BYA, WB7AEK, W7ON, KH0AC, KH6CH, DU1EFZ, JD1YAA, and T20AA.

The most prolific stations were the HL prefixes, then KH6. There were a lot of contacts to the US mainland; the special DXpedition station, 9V1ES, in Singapore, received a lot of attention. Many contacts have also been made with stations in northern VK4 and an odd contact to VK8.

The distance from Tokyo to San Francisco is around 8000 kilometres (5100 miles) while from Sydney to San Francisco is about half as far again, at more than 12 000 kilometres (7500 miles). The journey for VK stations to work the US also involves crossing the equator, so it needs a set of good conditions for contacts to occur. The path *from* Auckland to San Francisco is shorter by some 1000 kilometres or 620 miles, which seems sufficient, on many occasions, for contacts to be made from there with more ease than from Australia.

Thanks to Graham VK6RO for supplying the news from the Japanese *CQ ham radio* magazine.

John VK4PU, also sent a communication covering similar news for which thanks are also tendered. John said he had received a state visit from Yoshi JR2JDX, who also holds the Australian call sign VK4BYM.

While we are still looking at Japan, David VK3AUU, said that during September there had been several appearances of JA stations, mostly with weak signals. Rob VK3XQ, worked several on 19/9 around 1130 UTC, but David heard only JA5CMQ, very weakly on 50.040 MHz. David also reported that Rob's signal had a rough character about it, something akin to aurora, but not so pronounced. Such characteristics have been noted before when six metres has been trying to open to the north.

OTHER NEWS

Fred VK2YZU, from West Epping, writes to say that he has returned to operating after a break of 10 years. He is a former VK4 and is now active on six and two metres, using a TS-600 and 10 watts to a four element Yagi on six metres and a TR-751A with 25 watts to a six element Yagi on two metres. He said it is a humble return to VHF. (Maybe, but you are back Fred, that's more important. I will look forward to hearing from you as events unfold. . .VK5LP).

Charlie VK3BRZ, is sending details to the WIA Awards Manager, of a proposal to institute an award for contacts with 100 Grid Locator Squares, with endorsements for particular bands. It is suggested that the award commence from January 1, 1989. Operators to exchange their Grid Squares and signal reports. The object of the award, amongst other things, will be to encourage activity on the bands.

Charlie has said account should be taken of the activity of any operators who go our portable to give others the chance of working remote squares. By so doing, they normally deprive themselves of an opportunity to work rare locations. Recognition should be given to the portable station as having worked the square from which he is operating if he is able to work another operator in the same square as his own base station.

If operators have any input regarding the matters mentioned in the above two paragraphs, then it is suggested you write to the Awards Manager outlining your views and comments so the Manager can consider all relevant points before approving the Award.

The back page of the Newsletter of the South East Radio Group Inc at Mount Gambier, carries the constructional details of a two metre coaxial power divider. Those contemplating stacking antenna arrays may find the project worthy of consideration, as it appears to be a very sound and reasonably priced approach to provide what is normally an expensive item. It was constructed by VK5KMP, the Engineering Consultants being VK5NC and VK5ZOO. I am sure a SASE to SERG, PO Box 1103, Mount Gambier, SA. 5290, would see a photocopy arriving at your QTH.

I recently received a telephone call from Graham Alderson ZL2AAD, whilst he was in Mount Gambier, at the QTH of Trevor VK5NC. It was good to talk to Graham again. My first direct contact with him was in 1980 when I spent an evening with him at his Christchurch home, discussing EME and the construction of parabolic reflectors. Graham said he is currently experimenting with EME on 2304 MHz, after successfully achieving results on 432 and 1296 MHz.

THE ROSS HULL MEMORIAL CONTEST

At the time of writing these notes at the beginning of October, no details of the 1988 Ross Hull Contest have emerged, so I am unable to make many comments.

However, it would be safe to urge as many as possible to enter the contest and equally as important, submit a log of your activities. As VK5LP and my prime interest being VHF and UHF, I have tried for years to increase the log entries, without a great return for my efforts. I have written pages on the contest, I have reported pages of information from others, so much so, I get the feeling at times, that were the matter being dealt with by some government departments, the matter would be placed in the "too hard" basket!

I am encouraged by receiving advice from Charlie VK3BRZ, that he and Mike VK3ASQ, will be journeying to Mount Cowley, in Grid Square QF11 for the start of the Ross Hull Contest. They will be operational on 52, 144 and 432 MHz and hope their portable operation will assist in generating other contacts and provide a well located station for DX contacts.

This advice brings memories that some years ago, many operators went out portable, mainly from VK3 and VK5, but some other States too. VK5LP has been mountain-topping on and off for nearly 30 years, others have been doing so for a similar period. In the early days, we had cumbersome AM valve equipment, with heavy modulators and power supplies, connected to an equally heavy alternator, but we had a lot of fun.

Today, most equipment is already in the portable category, light efficient, and with adequate power. Many units can operate using multiple modes and are connected to small lightweight alternators. There are many more aids to make camping on the same windy, and sometimes cold, hill-top much more comfortable than bygone years, yet less and less people seem prepared to make the effort to go out to an often better location than their home station, thus providing more contacts, also enjoying the fun which can be part and parcel of a hill-top expedition. A portable operation could be mounted from a unit sitting on the front seat of a car, connected to a small beam antenna with its mast tied to the door handle and rotated by hand from the comfort of the car — as simple as that!

As the years go by, like everyone else, VK5LP is getting older, but I still find it difficult to remove the bug of portable operation from my system. So much so, that only recently I was giving consideration to whether I should go out portable during the Ross Hull Contest this year. My better sense told me I should stay home and utilise my otherwise quite good home location, but my lesser sense told me I ought to go out again before I get too ancient! However, I have decided that if the period of the Ross Hull Contest is long enough to warrant the mounting of a hill-top expedition, I will probably go, but if it is going to be only for one or two days at the most, then the effort to operate portable with at least three bands is hardly worth the bother. Hopefully, I will know the details when November AR is received.

Before closing this portion on Contests, did you by any chance notice that the single entry using VHF, for Home Stations, mains powered, of the John Moyle Memorial Field Day Contest — 1988 was . . . VK5LP! Although I was unable to participate as a portable station, from my home station I had nine contacts (including one using CW) with portable stations, for a points score of 455.

FROM THE USA

Although this first copy was published at the end of 1987, a new publication has come into my hands in the form of *The International 6 Meter Digest* and published by Harry A Schools KA3B. Within its pages there are a number of interesting items which are not really dated with the passage of time, dealing with the profiles of some well-known six metre operators of the world.

The first is about Jorge CX8BE, of Uruguay, who reports very little 50 MHz activity from Uruguay, with what there is concentrated in Montevideo, the capital. There are 15 stations capable of operating on 50 MHz, all on AM, except that CX6AV, CX9BBF, CX1DDO and CX8BE are active on SSB. Most operators are not interested in VHF/UHF due to lack of contacts.

CX8BE has been active on six metres since 1958 and was the first station in Uruguay to utilise SSB on six and two metres. So far, Jorge has worked 42 countries on 50 MHz. He runs a beacon at times using 10 watts output.

A very well-known operator to Australian stations is Joel Chalmers KG6DX, from Guam. Joel has lived on Guam for 13 years and was active through Cycle 21. During the cycle, the 50 MHz band was open to the US mainland for five years, 1977 and 1978 were marginal, 1979, 80 and 81 were great.

November 1979 started with an opening to VE1 and W1, and followed sunset across the States. By November 1980, Joel had worked 48 US States, the two elusive ones being Louisiana and Wyoming.

From his viewpoint, Joel said Cycle 22 started in April 1987 with openings to Japan, 1500 miles (2500 kilometres), and plenty of television sync signals from UA. He believed these openings were TE related, as the JAs were working into VK via their typical TE path. Guam is in a high MUF area, located 13 degrees above the equator and five degrees above the magnetic equator. During the peak years of the last cycle, six metres was open 24 hours a day! The best path was into Brazil. He could hear the PY2AA beacon in the morning

whilst beaming towards the east and again at night while beaming towards the west. Brazil is halfway around the world from Guam. Looking eastwards, Joel says the distance is slightly less, so he calls that the short-path, the western path is the long-path! The JAs would regularly work Argentina on morning TE and 5B4 (Cyprus) and EL (Liberia) on long-path *in the mornings. The* JAs also had openings to KP4, 6Y5 and KP2, etc on long-path at night (1 am) on some kind of TE hook-up which was not audible in Guam.

Joel has been using a three-element beam up 20 feet and connected to an IC-551D at 100 watts. A 6N2 Tempo amplifier is presently gathering dust, but may be pressed into service if conditions continue to improve. He also runs a beacon from time to time, either on 50.100 where it sends VVV de KG6DX Guam QK23KL, or 50.110 where it calls CQ. He usually points the antenna to the USA from 2100 to 0100 UTC, towards the south from 0100 to 0430, then towards the north-west from 0430 to 1400.

THE LOCAL SCENE

Having been away for a week or two visiting Expo 1988 in Brisbane, (which was thoroughly enjoyed), I returned home to find that Miningie had been buffeted by some heavy winds in my absence, causing the driven element of the six metre beam to break off at one delta-match feedpoint. This has been most unfortunate as that type of break completely deadens all signals. Hopefully, my friend David VK5KK, will be able to climb the 70 feet to the antenna at an early opportunity to affect repairs which will enable me to share some of the good conditions which have been prevailing whilst I have been off the air!

In the meantime, I have gathered the following six metre news from Roger VK5NY Roger reports there was a small opening to Japan on 13/9 with JA7 and JA8 being worked. On 19/9 there was a big JA opening to all areas, with pages and pages of contacts. The band opened again to JA on 21/9, *also to Neil* VK8ZCU, at Tennant Creek. On 30/9 *VK2* was worked.

A most interesting day occurred on 1/10. The JAs were in early, then a brief contact with VK4ALM, at 0905. Ever mindful of missing valuable contacts, Roger kept all contacts short. At 0913 he worked VK8ZMA, in Alice Springs, then VK8GF and VK4DO. At 0955 UTC the band opened to Hawaii with KH6HI being worked at 5 x 3, later his signals rose to 5 x 7 when he was observed working P29. At 1015 Roger heard an American voice signing KA6?? but due to the incessant QRM from the JA stations he was unable to decipher the call or make a contact. Roger said it was obvious the opening was favouring the Pacific area, even the JAs were peaking in that direction rather than on the direct path, so the contacts were probably made by the F2 mode.

Six metres opened again to Japan on 5/10 with good signals from 1238 to JA2, 5, 6 and 9. VK8ZCU was worked again, also Alice Springs and VK4.

Reports are filtering in that east coast VK4 stations have already been working to the USA coast, so it looks like my antenna failure has come at a most inopportune moment.

Although all eyes and ears turn to six metres from much of the time at the moment, there are still those fairly regular contacts on two metres and 70 centimetres taking place between VK3 and VK5 by the dedicated operators.

OVERSEAS BEACONS

I note that a recent Japanese list of overseas beacons includes a number well-known to me. I list them here and suggest you extract the details and keep them near your operating position for reference.

50.004 PY1RO, 50.015 SZ2DH, 50.025 6Y5RC, 50.030 CT0WW, 50.033 ZD8VHF, 50.035 ZB2VHF 50.035 HC1JX, 50.038 FY7THF, 50.045 OX3VHF, 50.048 VE6ARC, 50.060 PY2AA, 50.067 WA6IJZ, 50.080 HC8SIX, 50.080 TI2NA, 50.085 9H1SIX, 50.089 WA6JRA, 50.090 ZF2KZ, 50.500 5B4CY, and 50.500 FK8KAB.

How many of the above list are actually operating I cannot say, this being one of the main reasons I do not list them. Suffice to say, the segment between 50.000 and 50.100 is full of beacons when viewed on a world-wide basis. At best, one can only listen; if you hear a signal, please note the call, frequency and time, also make a tape *recording of the identification. In this way,* you are more likely to be believed when you claim such a hearing rather than the matter being placed on the query list in the absence of verification; eg I have just heard rumours that Portugal had a contact with Indonesia on six metres! As far as I am aware, there are no six metre stations in Indonesia, the only operations from there have been by Japanese stations mounting DXpeditions. See what I mean!

LATE NEWS

Following the receipt of several telephone calls, the following late news has been compiled in relation to six metres.

Peter VK8ZLX, for Alice Springs, reports almost daily contacts with JA. Also, HL9CB is active most nights and will soon be going to DU for a while where he will be on six metres. Peter said JA1VOK, told him that JA had worked into Malta (9H1) on 9/10.

Graham VK6RO, said that as a result of a large solar flare, they had an excellent opening to Japan extending over six hours from 0500 to 1100. Graham worked 40 JAs and also confirmed that HL9CB was going to DU.

Wally VK4DO, from Airlie Beach, phoned on 12/10 to say they had had an incredible day. From 0245 he worked KI6CG, W5FF, K5FF, N5JHV, WA7EPU, all from the USA mainland, with signals to 5 x 6. Ross VK4RO, was also heard working the US stations.

Wally said KH6 has been available almost every night, HL9 is a regular contact and also confirms HL9CB will operate from DU as from January 1989. During the past few weeks there has been much television from Asia, and recently he received a noise free picture from Russia (the sound was missing due to being 6.500 MHz from the vision carrier), also KH6IAA has recently worked JA, W, HC and PY. Areas available to VK4 include VK, ZL, P29, HL1, HL2, JA, H44, KG6 and KH6 plus W.

There was also a report that a two metre contact had been established between Bowen/Mackay area to New Zealand around 5/10. Also, Wal VK4AIV, apparently worked ZL on 70 centimetres.

Finally, John VK4ZJB, advised working K6HCP at 5 x 9 at 0200. The US station runs a mere 1600 watts! Others were K6MYC, K6QXY, both 5 x 9, N6AMG at 5 x 8. Then at 0945, KH6IAA. Others involved included VK4PU and VK4ALM. KG6DX, on Guam, was also worked plus HL9CB and HL9TM. John said this may be the first time ever that the US mainland has been worked from VK during the Spring period. The A index was a high of 53, so obviously a very active solar flare was involved.

Hat JA1VOK, wrote to say that JR6HI, in Okinawa, worked 5H1HK, in Tanzania, at 1634 UTC, on 27/9 and PY2BBL, at 0211 on 28/9 for the first time this Cycle for Japan to Africa and Japan to South America. 5H1HK uses an IC-551D and six element Yagi. The contacts were on 50.110 and 50.130 MHz respectively.

CLOSURE

If normal summer-time propagation prevails this year, instead of the failed conditions of last year, we can expect a lot of six metre contacts during November and December. These should include extended Es contacts from various island nations of the Pacific region. But, whilst six metres may be very busy, do not overlook the Es potential of two metres.

This December issue commences the 20th year of my involvement in these columns. At the 10 year mark I prepared a separate article reviewing the previous 10 years of VHF/UHF activity. Perhaps such an article should be considered following December 1989.

Whilst extending my Seasons Greeting to all my readers, on-air friends and the Editor and staff of AR magazine, I hope 1989 will be the type of year which brings some joy into your lives and those *around us.*

I wish to once again thank all my correspondents, who, in some cases, have been regular contributors, either in writing or by telephone, for many years. I am grateful for all help received and the many complimentary letters I receive from you and readers in general. I am very indebted to the constant flow of material which comes from my friend, Bill Tynan W3XO, from "World above 50 MHz" in *QST.* With access to many more operators than I, Bill always seems to have something worth reporting in his columns. When all put together, the overall support received has made the prolonged effort in producing these columns worthwhile.

Closing with two thoughts for the month: "At this period of Christmas, it is well to remember that the Lord gave us Commandments — He didn't mention amendments" and "The turtle lays thousands of eggs without anyone knowing, but when the hen lays an egg, the whole country is informed". 73. The Voice by the Lake.

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AMATEUR RADIO IN YUGOSLAVIA

We have received a letter from Vladimir Markovic YU1ANV, of which copies appear to have been sent to a number of amateur radio magazines around the world. The purpose is to tell us, in effect, that amateur radio is alive and well in Yugoslavia,and to give some idea of the way in which it is organised and the range of activities. As in Australia, many radio clubs are active. All are constituents of the Radio Amateur Federation of Yugoslavia (Savez radio-amatera Jugoslavije). In turn, there is a close connection between the clubs and their association and the "mass organisation" for the popularisation of science and technology called People Technics (Narodna Technika). This is further connected with the professional engineering institution, the House of Engineers and Technicians of Serbia (Dom inzenjera i technicara Srbije).

Vladimir's club is named "Kosutnjak" and located in the Belgrade suburb of Rakovica. He operates CW, but the club members have been active in packet radio and computers since 1986, and form art of a country-wide 144 MHz net.

The letter gives a list of many of the Yugoslav clubs:

Radnik (The Worker) YU1XOT	11090	Rakovica Belgrade
Bratsvo-Jedinstvo	11000	Belgrade
Cedus (at the University of Sarajevo)	71000	Sarajevo
Miladin Popovic YU8FF6	38400	Prizren
Duro Opacic YU8KZE		Ajvalija
Boris Kidric YU8AL6	38230	Urosevac
Rudi Cajavec	77240	Bosanska Krupa
Partizan	75320	Bijeljina
Kosmaj YU860P	38250	Gnjilane
Heroj Pinki YU7AKU	21000	Novi Sad
Vuk Karadzic (i) YU7AKE	21243	Kovilj
Vuk Karadzic (ii) YU7AJN		Budisava
Nikola Tesla YU1AHI	11000	Vracar Belgrade

Amater 68290 Sevnica, Triglav 61000 Ljubljana, Iskra 64000 Kranj, Nikola Tesla 75300 Brcko, and Elektron 38000 Pristina are also listed without call signs.

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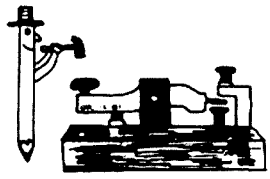


Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright. Vic. 3741

KIT REVIEW

Hi Morsiacs. This month I want to feature a low power transmitter kit from C M Howes Communications, in England, which was sent to me by Dick Smith Electronics for evaluation. If you are new to amateur radio or want to try QRP home-brewing for the first time, then this kit is a "little beauty". Its construction would also provide some essential help in understanding some of the theory, for those who want to sit for their exams with plenty of preparation.

One thing I can say is, that building the kit is easier done than said. After spending 15 minutes reading the five pages of instructions, I managed to wind the five inductors in about 30 minutes and then spent about an hour assembling all the components on the board. The board measures 12.5 by 5 centimetres and the only external components required are a key socket, antenna socket (or relay) and a crystal changeover switch, should you have more crystals on hand. The instructions provide very detailed diagrams and a component list which includes space to tick off each item as you install it on the board. All component numbers and polarities are printed on the board, complete with labels for individual leads, where appropriate, so it is almost impossible to make a mistake at this stage. As long as you don't splash solder all over the place there is very little chance that anything will be wrong when you "power-up".

Following are some brief specifications:

output power	better than 40 dB down plus key-click suppression
crystal frequency	5.579.5 MHz supplied and on board provision for external VFO and two more crystals
supply voltage	nominal 13.5 volts at 500 mA approximately
output conditions	50 ohms unbalanced better than 2:1 VSWR recommended output transistor will survive bad match

Having assembled and tested by eye, one might think that all that is needed is to "fire it up" and that is the end of the story. Not true. The best is yet to come, and nothing beats the feeling you get from hearing the oscillator doing its task, except maybe the first contact you have with another amateur.

Detailed tuning-up instructions are provided and you will need a power (or SWR) meter and a dummy load. There is one slug to adjust in the oscillator, then you set the required power level with the preset potentiometer. Using a 13 volt supply I found the maximum power to be 4.5 watts so I backed off to four watts before connecting the antenna. The heat sink became only slightly warm during the testing, so there should be no need to worry during normal Morse operation.

Connecting the unit to my trusty long wire antenna, the only one I have which will tune 1:1 at that high above the CW section, I started calling CQ. The station receiver provided ample side-tone for easy sending, and it was connected to the 160/80metre dipole. It is a good idea to have a switch on the supply to the transmitter because the constantly running oscillator will drown out signals in the receiver! It was necessary for me to pull-the-plug on the transmitter when listening for a reply. After a few calls I received a reply from Ken VK3PKE, near Frankston, which is about 350 kilometres from my location. He gave me a signal report of five by nine, and on his second over said, "...home-built transmitter is doing a great job, sounds very nice. Looks as though you might have to get some more rocks for it. Very nice to meet you..." For a first contact I think that is pretty good!

I used a hand key for that contact, but later the same evening I tried the electronic keyer (8044ABM) and the transmitter sounded okay in the station receiver, even at 30 WPM there was only a trace of key clicks, but that is only to be expected when monitoring your own signals. I then worked Karl VK7CW, in Somerset, and he gave me a 599 RST report, and clean tone under very noisy conditions. I arranged the contact by tail-ending on 3.530 MHz with eight watts on the main rig and asking him to listen on 3.579.5 MHz. Thanks Karl.

The CTX 80 transmitter kit from Dick Smith Electronics (Part No K6326) is one of a family which include a VFO (K6327) and direct conversion receiver (K6328), all for operation on 80 metres. At the time of writing, the transmitter kit costs about $50 and stocks are okay! I hope to publish reports on the other kits in the near future, and as building-time permits. Thanks are extended to John Links of Dick Smith Electronics for kindly supplying the review kit.

Readers may remember another kit I mentioned in the column a few months ago. It was the Club Communicator Kit-set from the CW Operators QRP Club. You will notice therefore that the CTX 80 is a simpler kit, but with the addition of a VFO it would be a worthwhile project for home-brew beginners — or just for those who like the thrill of building their own equipment. The receiver kit would be great for a study aid and for listening to the Morse broadcasts in order to practice for the examinations. I am looking forward to seeing it.

It seems to me that suppliers are again taking an interest in amateur kits, so the more support we give them, the more kits that will be available for everyone.

If anyone knows of a supply of crystals for the CW end of 80 metres, please let me know so that I can pass the information on to other amateurs. And, don't forget to have a listen on 3.579.5 MHz for those with television crystals. Unfortunately, it is a noisy frequency so you will have to listen intently.

FIFTY YEARS AGO...

..."Quite accidentally the British have made the discovery that the metal structure of an airplane in flight collects and re-radiates or reflects the ultra-shortwave impulses employed in television broadcasting, so that receiving sets produce a double, or 'shadow' image. The shadow image is formed by the waves that reach the television receiver directly and by those that rebound from the plane flying within range. It was also discovered, still be accident, that the width of the shadow image cast by the airplane reflections bears a definite relationship to the plane's distance." ... from *Scientific American* August 1938.

Having myself worked a little "aircraft enhancement" mode on two metres, this snippet caught my eye, even though it is not a Morse subject. I wonder who made the discovery and whether they went on to the discovery of radar from observations such as these!

CAN WE HELP?

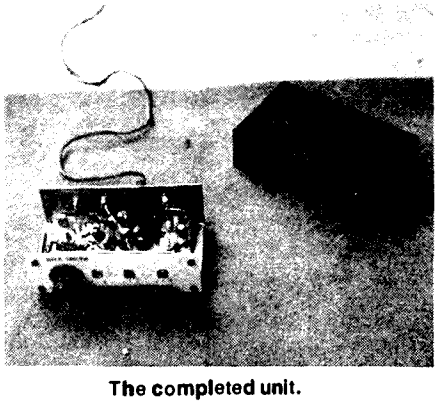
You may have read in October AR about the amateur who reads Morse through his *fingertips* because of his deafness. I wonder whether reading a flashing light by eye would be easier. I would be interested in hearing from any deaf amateurs who have solved their problem in some way. Even if you have not thought of a solution before, it might be well worthwhile considering what you would do should your hearing fail. There seem to be a number of blind amateurs, but I have never worked a deaf amateur. Maybe our ideas could help!

JOHN MOYLE RESULTS

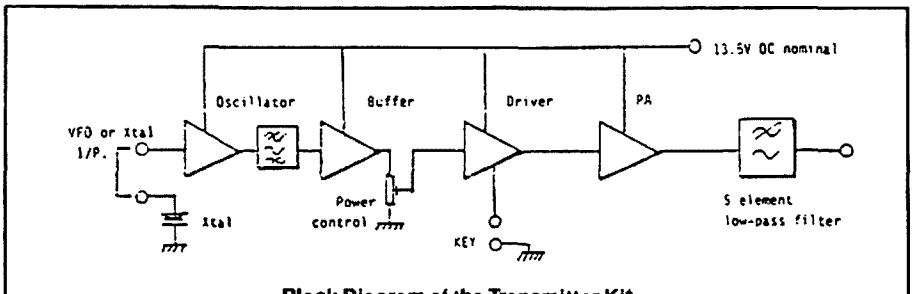
I was very disappointed to see the results of the John Moyle Field Day Contest in October AR because, it seems that I was the only operator in Class b to enter a log. Class b is the single operator, portable field station, CW section. Surely there is someone else willing to help show the flag in this annual contest. Does this mean that, in an emergency, we will have to rely on the voice modes? What if the conditions are bad? How do you know you could operate in an emergency if you don't make the effort to practice on the one weekend in the year when the chance is offered? This is what the contest is all about, you don't have to "knock-yourself-out". Even the six-hour section had no entrants this year. Fair enough is you have other commitments on that day, but in a real emergency you will not be likely to give in to laziness or moods, so if you want to keep the spirit of amateur radio and Morse code alive, how about entering in 1989!

73 and Merry Christmas.

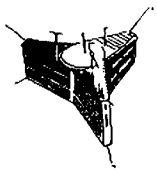
Gil VK3CQ.



The completed unit.



Block Diagram of the Transmitter Kit.



AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR

INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC.
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz

AMSAT SW PACIFIC
2200 UTC Saturday
14.282 MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia News.

This information is also included in some WIA Divisional Broadcasts.

APOLOGY
I must apologise for the absence of notes in last month's *Amateur Radio*. Due to an overseas work assignment I managed to get a little disoriented time-wise, upon my return to Australia and overlooked the Editor's deadline for copy.

AMSAT-AUSTRALIA NEWSLETTER AND SOFTWARE
The fine monthly publication *AMSAT-Australia Newsletter* published on behalf of AMSAT-Australia by Graham VK5AGR, now has 280 plus subscribers. Should you also wish to subscribe, then send a cheque for $20 made payable to AMSAT-Australia and post to:
AMSAT-Australia, C/- PO Box 2141, GPO, Adelaide, SA. 5001.

The Newsletter provides the latest news items on all satellite activities and is a must for all those seriously interested in amateur satellite activities.

Graham also provides a Software Service in respect to general satellite programs made available to him from various sources. The only requirements to make use of this service is to send Graham a diskette nominating your requirements, a nominal $10 donation to AMSAT-Australia and sufficient moneys for return postage and packing. To obtain details of the programs available and other AMSAT-Australia services, send an SASE to Graham.

UNIVERSITY OF SURREY ACTIVITIES
Summarised from UoSAT Bulletins 148-153
UoSAT-D and UoSAT-E on Ariane

Changes in the NASA/USAF launch manifest have resulted in the postponement of the UoSAT-C mission, originally scheduled for launch on NASA-DELTA in late 1988. Simultaneous with the news of this delay, however, UoSAT signed final agreements with Arianespace for the launch of two UoSAT satellites into an 800 kilometres, polar, sun-synchronous orbit on Ariane with the SPOT-2 primary payload in early 1989. The Ariane launch opportunity — secured after long negotiations amongst UoSAT, AMSAT-NA and Arianespace — involves a total of seven payloads: SPOT-2 (a replacement for the SPOT-1 imaging satellite), UoSAT-D, U-SAT-E and four AMSAT-NA MicroSats. UoSAT-D and E will now take over the mission objectives of the postponed UoSAT-C mission to support:

* amateur radio packet store-and-forward communications transponder,
* studies of the orbital radiation environment,
* in-orbit demonstration and evaluation of novel spacecraft technologies,
* further development of low-cost CCD Earth imaging techniques.

The UoSAT-D and E spacecraft, accompanied by the four AMSAT-NA Microsats, will be placed around a new Ariane structure — the Ariane Structure for Auxiliary Payloads (ASAP) — specially designed to provide small secondary payloads with inexpensive launch opportunities.

Due to mass limitations on the Ariane ASAP, the payloads originally intended for UoSAT have had to be split between two spacecraft (UoSAT-D and E). The two UoSAT spacecraft will be structurally identical, and have identical housekeeping subsystems, but will carry different payloads. UoSAT-D will carry an amateur radio digital store-and-forward communications transponder operating in the amateur satellite service, and also investigate the effects of the space radiation environment on spacecraft components — funded by the University of Surrey, the Royal Aerospace Establishment (UK), AMSAT-UK, AMSAT-UK and VITA (USA). UoSAT-E will support in-orbit technology demonstration and CCD camera experiments.

The primary payload on UoSAT-D will be the Packet Communications Experiment (PCE) which was originally to be carried on UoSAT-C. The PCE is an orbiting packet node with four mega-bytes of message storage space and advances the work done on UoSAT-2 with the Digital Communications Experiment. The PCE system (hardware and software) is being developed under a contract from the Volunteers in Technical Assistance (VITA), who hope in the future to use store-and-forward communications as a link with development workers in remote areas. The flight of the PCE on UoSAT-D and its use by radio amateurs is funded by the University of Surrey and AMSAT-UK.

All amateur radio stations with appropriate equipment will have open access to the PCE via AX.25 packet radio. The UoSAT-D PCE will use 9600 bits/second, frequency-shift-keyed (FSK) uplinks and downlinks. These channels will be compatible with existing modems from G3RUH and K9NG. The spacecraft will operate in Mode-J; with one uplink in the two metre band and a downlink in the 70 centimetre band. RF communications links should be good enough to provide a consistent service to ground-stations with modest non-steered antennas. An experimental high-power downlink mode for very small ground-stations will also be included.

Whilst the UoSAT/AMSAT-UK PCE will use standard AX.25 communications links, it will also provide a platform for experimentation with higher-level packet communications protocols. Current 'PACSAT' systems employ ALOHA access (each station transmitting when it wishes to) and user interfaces based on terrestrial BBSs. The PCE will employ experimental access techniques aimed at more efficient machine-to-machine communications. The user-friendly BBS-like interface will be on the ground, in the ground-station's personal computer or TNC. The ground-station and the satellite will communicate using high level protocols, making the best use of short satellite passes. Software to support these ground-station-to-satellite protocols (along with complete specifications of the protocols) will be developed at UoSAT and made available to the amateur community.

The PCE will be controlled by a 80C186 microprocessor running at 8 MHz. The 80C186 is a highly integrated microcontroller with integral direct memory access (DMA) controller, interrupt controller, timers and other peripherals. With a full 16-bits bus running at such a high speed, this processor will have adequate computing power to control all of UoSAT-D's housekeeping concurrent with the packet radio communications system.

COSMIC PARTICLE EXPERIMENT
The CPE will provide an active package to characterise the radiation environment experienced by the spacecraft in orbit which affects on-board semiconductor devices — causing displacement damage to bulk devices (eg solar cells) and single event upsets (SEUs) in VLSI memories. Silicon diodes in the CPE will detect external cosmic radiation, specifically energetic protons and heavy ions. Multichannel analysis will be performed on the magnitude of detected signals after appropriate amplification. Every five minutes this quantised data will be passed to the Packet Communications Experiment (PCE) to be stored for later transmission to Earth.

TOTAL DOSE EXPERIMENT
The PDE will measure the total ionising dose accumulated at various positions on and within the spacecraft during its orbital lifetime. The sensors used are 'RADFETs' which comprise specially designed MOSFETs. The RADFETs possess a thick gate oxide (>1000 Angstroms) which makes them sensitive to ionising radiation. Positive charges proportional to the ionising dose are trapped in the gate oxide and shift the threshold voltage of the RADFET pairs (one biased and the other unbiased) fabricated on the same die — producing a change in threshold voltage proportional to ionising dose and independent of temperature. Average dose rates, integrated over the orbit, of around 6 rads/day are expected inside the spacecraft in the UO-D/E orbit.

PAYLOADS
The UoSaT-E satellite will be based on an identical 'bus' as UoSAT-D; OBC, telemetry, telecommand, power generation and conditioning, and mechanical structure will remain the same. The compliment of payloads and experiments, however will change. UoSAT-E will be primarily a technology demonstration mission, flying the Transputer Data Processing Experiment (TDPE), Solar Cell Experiment (SCE) and CCD imaging system which were to fly on UoSAT-C.

ADVANCED SOLAR PANEL TECHNOLOGY
The UoSaT-E Solar Cell Experiment comprises an array of solar-cell samples from several manufacturers which will be constantly monitored for changes in performance caused by radiation, temperature, and other environmental effects. The cells will represent the complete range of solar generator technologies under development: Gallium Arsenide, Indium Phosphide and Silicon. The cells will be covered by various over slides designed to enhance panel efficiency and/or reduce panel degradation due to radiation. The SCE will be mounted on a panel that will replace part of a solar panel on the side of the UoSAT-E spacecraft.

The SCE monitoring system will wait until the sun is directly upon the SCE, and then make a series of 100 current/voltage measurements on each cell sample. These data will be sent in bursts to the satellite's 1802 OBC, for storage prior to transmission later to ground.

In addition to the SCE, UoSAT-D will carry the first Gallium Arsenide solar arrays manufactured by FARI/CISE (Italy) and EEV/MSS/RAE (UK).

UOSAT-D/E UPDATE (Bulletin 153)

Over the last two weeks, engineering structure qualification and magnetometer calibration tests have taken place.

The engineering model spacecraft structure has been subjected to vibration tests at the Royal Aerospace Establishment, Farnborough, UK. Both random (20 grams) and sinusoidal tests have been performed in lateral, longitudinal and thrust axes. Also, two 1000 gram shock tests have been carried out. So far, no unexpected resonances in the structure have been found. The next test to be performed on the engineering structure is a further shock test.

Also, the engineering model navigation magnetometer has undergone preliminary tests at RAE, Farnborough. Preliminary results show that the instrument is performing well.

de Colin VK5HI

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"..... CQ ..... CQ ..... CQ ....."

WICEN News

BIKE RIDES TOP OFF BUSY WICEN YEAR

The resources of the Wireless Institute Civil Emergency Network (WICEN) will be stretched to the limit when it provides safety and emergency communications for two bike rides.

The largest ride is the Australian Bicentennial Caltex Bike Ride which takes to the road for two weeks beginning in Melbourne on November 26, for a route through Gippsland and cover in excess of 1000 kilometres, linking Melbourne, Canberra and Sydney.

The other event is the Fifth Great Victorian Bike Ride organised by Bicycle Victoria, which travels from Swan Hill to Melbourne, from December 3 to 11.

WICEN's involvement in previous bike rides providing safety and emergency communications has won widespread praise from organisers and participating cyclists.

The radio amateurs who give their support to such events not only gain experience which could prove invaluable in times of a natural disaster, but they perform a worthwhile service.

At the same time give our hobby some good public relations. WICEN urgently needs radio amateurs for both rides. If you can arrange to join the entire route of a ride, then fine, but even a day along a route would be helpful.

Perhaps you could join the WICEN team as a ride passes through your area — but you need to make your availability known soon.

Meals are supplied along with a petrol allowance for the time you spend with a ride. WICEN would also like to hear from any radio amateur who could reliably monitor 3.600 MHz from midnight through to the early hours in case of an emergency.

If you can assist, or would like more information, the following WICEN contacts can help:

Colin VK3AKQ (03) 799 2061.
Denis VK3XP (03) 783 5400.
Ian VK3FOX (03) 785 2976.
Steve VK2DNN (02) 660 4783.
Denis VK1DG (02) 31 3226.

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NEW AMATEUR RADIO SPECIALIST

Chris Ayres VK2YUS, has been appointed specialist product buyer in charge of amateur and related communications products at Dick Smith Electronics' Head Office.

This new position recognises the new emphasis that Dick Smith Electronics is putting into hobbyist and enthusiast products. Managing Director, Jeff Grover, said that in creating the specialist position to service the amateur radio market, the company had acted on the feedback it had received from customers.

"Many customers believed that we were getting out of amateur radio, or at least winding it down," Jeff said. "This is, of course, exactly the opposite of our intention. However, we needed someone who knew the amateur market intimately who could guide us in our decisions. Chris Ayres has that knowledge, is a very keen and active amateur and will be able to help Dick Smith Electronics once again become the leading supplier of amateur radio equipment in Australia."

Chris Ayres will be no stranger to amateurs or to current Dick Smith Electronics customers: prior to his promotion he was manager of the North Ryde store, and has managed several stores, and been amateur radio specialist In others, since joining the company some eight years ago.

—Contributed by Adam Benecke, Dick Smith Electronics Pty Ltd

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When inquiring about products you have seen in AR, don't forget to mention where you learned of the product!

HAPPY BIRTHDAY

Amateur Radio's present printer Westernport Printing has just celebrated 90 years of service to the Industry. During this period the business has undergone many name and ownership changes and four since commencing the printing of *Amateur Radio*, over a decade ago as Waverley Offset Printing Group, which was unfortunately demolished by fire.

The Managing Director, Mr Chris Fisher says that "...the sales team are improving our customer service and are keen to develop the potential for growth with our major customers."

Every good wish to you personally, Chris and the staff at the Koo-Wee-Rup plant. Koo-Wee-Rup, is a quiet country town off the South Gippsland Highway being discovered and named Yallock c1847 by a surveyor. In c1890 it was changed to its present name. The name has many spelling variations nevertheless Australia Post prefer the Kooweerup version which has an Australian Aboriginal meaning of "Blackfish". The area was originally a swamp which has been reclaimed by an extensive drainage system that flows in to Westernport Bay.

—Contributed by Ken McLachlan VK3AH

ar

Awards

Ken Gott VK3AJU
WIA FEDERAL AWARDS MANAGER
38A Lansdowne Road, Saint Kilda, Vic. 3183

NEW FEDERAL AWARDS MANAGER

Ken Hall VK5AKH, who has been WIA Federal Awards Manager since February 1986, has retired from the position and the Federal Executive expresses the thanks of WIA members to him for his services.

Ken's retirement as Federal Awards Manager coincides with his retirement from his church ministry and an impending change of QTH. However, Ken says he will continue to live in Adelaide and hopes to have more time to devote to his favourite amateur radio activity, CW on HF. Best wishes Ken in your two retirements.

Ken is succeeded by Ken Gott VK3AJU.

Ken obtained his call sign in 1983 and is an honours economics graduate of Melbourne University, who worked as a business writer, lecturer and analyst for many years in New York and Hong Kong. He returned to Australia in 1978 as international affairs analyst for a leading mining company, and now works as a freelance writer and consultant.

Ken's radio interests are DX and portable work, preferably combined. He was runner-up in the solo 24-hour section of the 1987 John Moyle Memorial Field Day Contest and winner in 1988.

He holds the WIA DXCC Award and the ARRL Golden Jubilee DXCC Award, as well as several awards from NZART. He also holds awards from all WIA Divisions, except VK2 (he says he is working on that). Ken insists however, that he is not a "paper chaser".

Ken is currently President of the Moorabbin and District Radio Club. His first Awards Column appears below.

—Bill Roper VK3ARZ

We all know that an award is one thing and a contest is something quite different. But have you ever considered turning an award into a contest?

The idea is that, when a new award is announced, you set out to win the first certificate, or go as close as possible to Number 1.

My favourite example concerns Harold Hepburn VK3AFQ, and the VK3 National Parks Award.

The conditions for this award appeared in the December 1967 issue of AR. Briefly, it could be won by making QSOs from 15 National Parks in VK3. (There was also a parallel award for stay-at-homes who made 15 QSOs into National Parks).

Harold and Peter Downie VK3APD, decided to be the first winners. They spent a weekend working from some parks close to Melbourne (such as Ferntree Gully and Churchill) as a trial-run, and then prepared for two tours which would take them to the parks in eastern and western Victoria, in that order.

They assembled HF and VHF equipment, a generator, 40 foot mast, camping equipment and plenty of enthusiasm, all packed in Harold's station wagon.

The expedition was carefully planned and its schedule publicised via the VK3 weekly broadcast. Harold went on the broadcast personally and a telephone number was given from which details of the expedition could be obtained as it progressed.

Five days were allotted for eastern Victoria, with operation between 1400 and 1600 local time at each destination.

When the stations came on air, there was usually a pile-up awaiting them. Ah, there was enthusiasm in those days! The pair logged close to 400 QSOs during the trip.

Their camping equipment was never unpacked. At every stopover, Harold and Peter were besieged with offers of meals and accommodation. Ah, there was hospitality too, in those days!

Peter had to withdraw after the eastern Victorian tour, but Harold soldiered on to win Certificate No 1. He would have been No 1 anyway, since the arrangement was that at each stop he took the first hour of operations, and Peter the second!

The certificate bears the signature of the late Keith Roget VK3YQ/YJ8HP, who served the WIA in many capacities, among them as VK3 President, Secretary and Treasurer. Keith combined a love of nature with amateur radio and was instrumental in establishing the National Parks Award. After his death in 1981, the award was renamed in his memory, and the certificate redesigned. Being in full colour, the new design does not lend itself to reproduction in these pages.

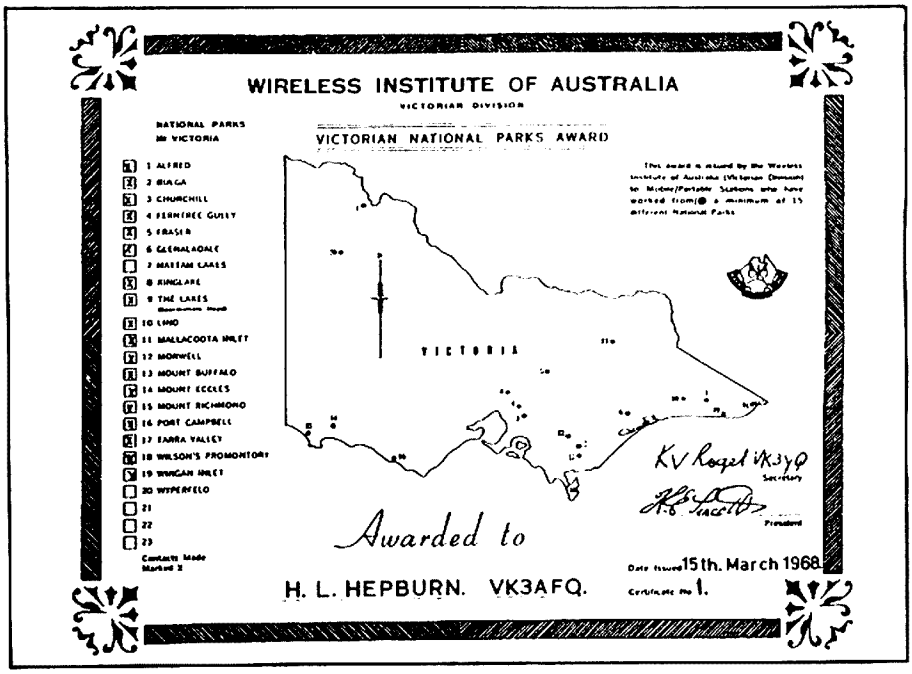
Other examples of an award becoming a contest, or at least a personal challenge, come to mind in connection with the Golden Jubilee DXCC Award of the ARRL announced in 1986. This was to mark the 50th Anniversary of the DXCC itself in 1987, and QSOs had to be made within that year. Unlike the "real" DXCC, cards were not required.

Jim Smith VK9NS, of the Heard Island DX Association and 14.220 MHz Net, offered a personal prize to the first amateur to win the award. The prize went to the tireless and ever-helpful Harry VK3ABO, who completed his 100 countries by January 20, 1987.

The ARRL Golden Jubilee Certificates were not numbered, but despite Harry's great effort, he was days, if not weeks, behind some of the enthusiastic DXers in the USA.

I have played this game myself on a couple of occasions, the first being when the VK5 Division announced an award to mark the 150th Anniversary of South Australia.

This award, which had an opening date of January 1, 1986, was conceived with flair and imagination and I commend its rules to all who might be designing similar commemorative awards. (The rules are in AR, October 1985).



One could earn it by contacting 150 VK5 stations and there is nothing wrong with that. VK5s are splendid people, the salt of the earth, and wonderful to talk to. However, preparing a log extract of 150 QSOs can, at times, be a tedious task.

However, the VK5 Jubilee Award had some wonderful short cuts for getting the 150 points needed. There were great bonuses for contacting club stations, for QSOs on 1.8 MHz, 50 MHz and above, and on WARC bands.

At the moment, I cannot think of any other example of a WIA Division giving an incentive for use of the WARC bands. I estimated that one could maybe win the award with as few as 50 QSOs.

So, starting January 1, 1986, I made my run to be the first to win the certificate. When it duly arrived, it was numbered 10, which was not a bad result. However, I was very happy to see that it was endorsed "first to use WARC" (bands). That was really encouraging.

Later in 1986, there was another VK5 Sesquicentenary award to mark the first settlement on Kangaroo Island. This was timed to commence when the operating party arrived by ship at Cape Willoughby Lighthouse on the island. Having visited this historic light station, I was determined to win the first certificate for the "Kangaroo Island Cape Willoughby Lighthouse Jubilee Award", as it was called.

So, there I was, mic in hand, waiting for the opening minute to toll. The operators were right on schedule and I fired away. Result: Certificate No 2 — again, not so bad.

Obviously, if you want to play this game, you need information on the rules of forthcoming new awards ahead of their opening dates. That is a reason to keep reading this column in which I hope to be able to be the first with the latest on new awards and changes in the rules for old ones!

Returning to the VK3 National Parks Award introduced on 1968.

For more than 20 years this was the only award of its kind in Australia, which was surprising in view of the number and quality of our National Parks and the publicity they periodically receive.

However, VK2 has now introduced a National Parks and Historic Places Award to mark the Australian Bicentennial and you will find out more about it in the VK2 Mini-Bulletin, June 1988 AR, page 60.

In past years, VK3 amateurs have sometimes declared a weekend when they would activate as many National Parks as possible. This was often on the Moomba long weekend.

Now that VK2 has a similar award, it would be good if the two Divisions could get together in an effort to have an annual activation of their respective parks.

Those interested in these two awards should note, however, that the criteria for qualifying parks and nature reserves are different for the two States.

In VK3, only National Parks count towards the award, whereas in VK2 a variety of State parks, fauna and flora reserves and other types of parks are allowable.

In VK3, one of the original National Parks (the Organ Pipes) has lost that status since the award was introduced, and many others have been added to the list. A little like DXCC, isn't it, with its deleted countries and new countries? The last time a list of VK National Parks appeared in AR was in the February issue 1985, when there were 31.

At least one VK3 amateur has won his State's National Parks Award by visiting parks and accessing two metre repeaters from them.

What a wonderful way to spend a vacation! Maybe somebody in VK2 will prepare a similar travelogue for publication in AR, describing experiences on working from New South Wales parks and sires awards.

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Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

Now that I have written December at the top of this article, it seems that the years is nearly at its end, although in reality I am writing in mid-October, and there is still a vast amount to be done before the new year.

Events in the education field of our hobby have moved more slowly than we were led to expect, and it appears unlikely at the time of writing, that the devolvement arrangements will all be in place until well into 1989.

This may not be such a bad thing. I am sure that a little extra thinking time is of great value in such matters. When the first flush of enthusiasm has subsided, it is possibly to be much more objective and realistic about the plans and ideas which were thrown around.

There are two possibilities. The original grand plans may gradually be reduced in scale as it becomes apparent that the proposers are expecting others to pick up the proposals and carry them out, or the problems assume a higher profile. Alternatively, the original idea can be developed, refined and extended to a more comprehensive and useful program as new participants are brought into consultation and possibilities are researched.

I have the feeling that the devolvement plans developed by many groups are of the diminishing rather than the growing type. The thinking and planning was done in something of a rush when there was pressure for a response, and now that we are in a situation where we cannot proceed, there is a risk that the earlier enthusiasts will lose interest, and so many of the potential virtues of the proposals will be lost.

I hope I am wrong. But I do not want to see clubs or individuals lose sight of the long term aspects of becoming accredited examiners.

The examiners who operate on a 'once only' basis will be in the minority.

In most cases, I hope, the aim will be to run at least one examination per year, or have a regular program which can be advertised in advance so that outsiders can be directed into it. This system will call for a degree of continuity in several aspects.

It is probably unrealistic to expect complete continuity of personnel, but every effort should be made to avoid sudden and complete changes — the examiner should ensure that there is an 'understudy' who is familiar with all the processes and requirements and is prepared to move into the appointment in due course.

Continuity of recording is, of course, essential, both because of Departmental requirements and for the benefit of the candidates. And I would hope that the selection of questions for each paper would be carried out with due consideration being given to the questions used in previous or concurrent papers. Even if the random generating program is used, there will still be a need for this sort of overview, so that a balance is maintained both within and between papers.

I know that a few groups are working steadily towards becoming efficient and effective examining bodies. I wish them well, and hope to be kept informed of their progress. I would be very interested to hear of the "state of play" in other groups, the problems being encountered or overcome and suggestions of the kinds of assistance which may be needed or offered to make the various programs work well.

As I have said before, I am sure there is much room for sharing of ideas, resources and workloads between the examining bodies. This will not only reduce the pressure on everyone, but will also help to ensure an even standard throughout the country.

My best wishes for the Festive Season and New Year to all our readers. May 1989 be a year of co-operation, harmony and healthy growth for the Institute and for our hobby in general.

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Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

G — General
C — Constructional
P — Practical without details constructions information
T — Theoretical
N — Of particular interest to the novice
X — Computer program

HAM RADIO, August 1988. 4800 Baud Modem. (P). Hundred Years of Electric Waves (G). Impedance Matching (T N). Regulated High Voltage Power Supply (P). Propagation Basics (G N).

CQ, August 1988. Antenna Special Issue. Coaxial Mast (P). Portable Antennas (G).

BREAK IN, August 1988. ATV Issue. Audio Modulator for ATV (P). Simple Video Signal Generator (P).

QST, August 1988. Two Metre Linear Amplifier (C). Versatile Timer/Controller (C). Integrating Squelch Circuit (C). Elevated Vertical Antenna Systems (T P).

RADIO COMMUNICATION, August 1988. New Amateur Radio Licence (G). VHF/UHF Beam Antenna (P). CW Filter (P), National VHF Convention (G).

OST, July 1988. Talking Wattmeter (C). Simple Tuning Indicator (C). RFI and VCRs (P N).

73 MAGAZINE, July 1988. Licensing and Novice Issue.

VHF COMMUNICATIONS, 1/1988. SMD Technology on 1296 MHz (C). 70 cm Converter (P). Wideband Power Divider/Combiner (C). 12V/12V Regulated Converter (P). Index to Volume 19.

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ALARA — Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

YLRL AWARDS
This year (1988) is the 50th Anniversary of the YLRL, and it might be an appropriate time to have a look at some of the awards offered by that organisation.

YLRL 50TH ANNIVERSARY AWARD
Details of this award were published in November *Amateur Radio*.

YL CENTURY CLUB (YLCC)
Two-way communications must be established on authorised amateur bands with stations, mobile or fixed, operated by 100 different licensed women amateurs. Any and all amateur bands may be used.

All contacts must be made from the same country.

Contacts may be made over any period of years provided only that all contacts are from the same country.

The YLRL YL-DXCC Certificate Custodian, with the approval of the YLRL President and Vice-President in charge of contest and certificates, may designate a YLRL member as a sub-custodian in DX countries to check QSL cards of an applicant for the YL-DXCC Certificate or sticker and confirm the list of contacts to the certificate custodian in the USA.

ENDORSEMENTS: After receiving the certificate, a silver sticker will be awarded for contacts with YLs in 25 additional countries. Same list and postage requirements as in the original application.

Contacts with YLs anywhere in the world are recognised provided only that confirmations clearly indicate the stations were operated by duly licensed women amateur radio operators.

Application must be accompanied by 100 QSL cards or photocopies of both sides of each QSL card used to confirm contacts for the application, or other written communications from the station worked confirming the necessary two-way contacts. The application must be accompanied by a list of claimed contacts, including the full name of the operator, alphabetically arranged by last name, the call letters and the date of each contact.

Sufficient postage must be sent with the confirmations to finance return by First Class mail, plus sufficient postage to mail the certificate. YLRL will not be responsible for any loss or damage to confirmations.

Anne Hood GM4UXX, and her 20-hour old niece, Natalie Frances.

WORKED AL STATES — YL
The WAS-YL Certificate is available to all amateurs, US or foreign. Contacts must be made with a duly licensed YL in each of the 50 United States. The District of Columbia may be counted for Maryland. No time or band limitations.

Contacts must be made from the same country. The call used is immaterial, provided it is licensed to the applicant.

Applications must be accompanied by QSL cards or photocopies of both sides of each QSL card used to confirm contacts for the application or other written communications from the stations worked, confirming the necessary two-way contact.

The application must be accompanied by an alphabetical-by-State list, showing call of station worked, date, band, mode, RS/T and YL's first name.

Sufficient postage must be sent with the confirmations to finance their return by First Class mail, plus sufficient postage to mail the certificate.

WORKED ALL CONTINENTS — YL
The WAC-YL Certificate is available to any licensed amateur in the world.

Two-way communications must be established on the amateur radio bands with the six continents: North America, South America, Europe, Africa, Asia and Oceania. Any and all authorised amateur radio bands may be used. Contacts may have been made over any period of time.

Contacts with all six continents must be made from the same country. The call used is immaterial provided it is licensed to the applicant.

Application must be accompanied by six QSL cards or photocopies of both sides of each QSL card to confirm contacts for the application, or other written communication from the station worked confirming the necessary two-way contact. A list of contacts must accompany the cards.

Sufficient postage or IRCs must be sent with the confirmations to finance their return by First Class mail, plus sufficient postage to mail the certificate. YLRL will not be responsible for any loss or damage to confirmations.

YL — DXCC CERTIFICATE
Two-way communications must be established on authorised amateur bands with stations, fixed or mobile, operated by licensed YLs from 100 countries on the current ARRL list of countries.

All contacts must be made from the same country.

Any band or mode (except cross-band contacts) may be used.

Applications must be accompanied by QSL cards or photocopies of both sides of each QSL card to confirm contacts for the application. The application must be accompanied by a list in alphabetical order by countries of call, name, band and mode.

Sufficient postage or IRCs must be sent with the confirmations to finance their return by First Class mail, plus sufficient postage to mail the certificate. YLRL will not be responsible for any loss or damage to confirmations.

DX-YL CERTIFICATE
This is available to licensed YL operators only, for working 25 other licensed women operators outside your own country on or after April 1, 1958. USA and possessions are counted as separate countries, as well as Alaska and Hawaii. Any and all amateur bands may be used.

Contacts do not have to be with 25 countries, just 25 DX-YLs.

All contacts must be made from the same country. The call used is immaterial provided it is licensed to the applicant.

QSL cards must be in your possession, but do not send them to the DX-YL Custodian. Another amateur must sign the log, verifying that the QSL cards are in the possession of the applicant.

Send copy of log to the DX-YL Custodian. Log must show date, time, station worked, frequency, her report, your reports, mode, her name and her QTH.

ENDORSEMENTS: Stickers will be awarded for each 10 additional DX-YLs, subject to the same confirmation as above.

No charge is made for the certificate, but sufficient postage for First Class mail must accompany the application to cover the cost of mailing the certificate.

NOTE: For all YLRL sponsored certificates which require the submission of QSL cards to confirm the claimed QSOs, a verified log may be submitted in lieu of QSL cards and a list of QSOs. The log must be in the same order as that required if cards and a list are sent instead. The log must contain the following:
name, call sign, QTH, date, time, RS/T, band and mode of contact. YLRL will accept as satisfactory proof of confirmed QSOs, and that the QSLs are on hand as claimed by the applicant, if the log is signed by (a) a radio club officer, OR (b) two YL licensed amateur radio operators. If this method of confirming contacts is used, sufficient postage to cover the cost of mailing the earned certificate to the applicant must be included with the verified log.

BASIC RULES APPLICABLE TO ALL YLRL CERTIFICATES
1. Contacts made through repeater devices or any other power relay method cannot be used for any YLRL Certificate confirmation.
2. Decisions of the custodians regarding interpretations of the rules as here stated or later amended shall be final.
3. All inquiries regarding cards, applications, or the certificates should be addressed to the appropriate custodian.

(Names and addresses of current custodians for these certificates may be obtained from VK2EBX. Please enclose an SASE.).

ALARA CONTEST
The ALARA Contest was held on Saturday, November 12, 1988. Details in a future column.

Just a reminder to post your logs to the Contest Manager, Marlene VK3JAW, by December 31, 1988.

Australian YL novices entering for the Florence McKenzie CW Trophy should indicate their CW score separately.

Logs must show: date, time (UTC), band, mode, call sign worked, report and serial number sent, report and serial number received, name of operator of station worked and points claimed.

They must also show full name, call sign and address of the operator and final score (points claimed) and ***must be signed.*** Logs must be legible, no carbon copies. No logs will be returned.

Please check your log before submitting to the Contest Manager to ensure that it complies with the above regulations and avoid disappointment.

BITS AND PIECES

Elizabeth VE7YL, was operating an interesting call sign, CZ7YL, on the 222 YL Net, on October 3. It was, apparently, for Canadian International Development Day.

Lynn DU1AUJ, runs an Asian YL Net on Sundays, at 0700 UTC, on 21.288 MHz. All YLs welcome.

VK3BSM came on the 80 metre ALARA Net on October 3, hoping some of the members could talk to the Guides in attendance. Unfortunately, not many of the stations on frequency could hear them well enough for a QSO, but one or two managed it and gave the girls an insight into amateur radio, and a chance to get in a little practice for JOTA.

VK3 members of ALARA operated the call sign VI88VIC, in late September, making a total of 770 contacts. Not a bad effort!

Several JLRS "YL-88" Awards have already been received at the time of writing, together with an attractive souvenir JLRS scarf. A nice gesture by the Japanese ladies.

That is it for this month, and this year. Wishing everyone the joys of the Festive Season, and see you again in 1989.

73/33, Joy VK2EBX.

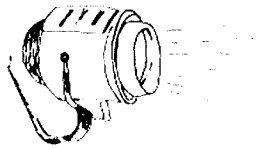
ar

Solution to Morseword 22

Across: 1 stab 2 heel 3 vac 4 sins 5 they 6 odes 7 earl 8 arena 9 gift 10 dims

Down: 1 spat 2 sup 3 sews 4 kind 5 hide 6 twist 7 talk 8 like 9 ices 10 saute

	1	2	3	4	5	6	7	8	9	10
1	•	•	•	—	•	—	—	•	•	•
2	•	•	•	•	•	•	•	—	•	•
3	•	•	•	—	•	—	—	•	—	•
4	•	•	•	•	•	—	•	•	•	•
5	—	•	•	•	•	•	—	•	—	—
6	—	—	—	—	•	•	•	•	•	•
7	•	•	—	•	—	•	•	—	•	•
8	•	—	•	—	•	•	—	•	•	—
9	—	—	•	•	•	•	•	—	•	—
10	—	•	•	•	•	—	—	•	•	•



Spotlight on SWLing

Robin Harwood VK7RH

52 Connaught Crescent, West Launceston, Tas. 7250

The Bicentennial Year of 1988 is rapidly drawing to a close as we look back over the past 12 months. One notable fact has been that HF propagation has dramatically improved as the solar flux has climbed higher. The ionospheric experts are now tipping that the maxima will arrive as early as this coming year, possibly September or October. I am getting signals from Europe on 21 MHz as early as 0700 UTC about now, but it is very interesting to observe that it is Long Path propagation.

Propagation on the lower frequencies did not seem to me as dramatic as in the previous 12 months. I also note that the QRN levels have also escalated and that one has to go much higher in frequency to escape it. Fortunately, there are plenty of interesting and odd signals to whet the appetite.

This year has seen some changes in both style and presentation to Radio Moscow. It certainly has brought an increase to their audience in the Western Countries. This, indeed, is a reflection of the domestic changes within Soviet life during 1988. It is a pity that other socialist states haven't also revamped their programming, yet they are presumably nervous themselves about recent changes in the Soviet Union.

We also saw the demise of a well-known broadcaster on shortwave, when the US Armed Forces' Radio and Television Service, closed down their HF operations at the end of September. As reported in October AR, all AFRTS programming is to be routed via satellite feed to maritime vessels. The closure of the HF facility has upset many listeners throughout the world, in particular, expatriate Americans who have relied on AFRTS to keep them abreast of domestic news. The Voice of America (VOA) is not designed for American audiences, for its charter is to broadcast to non-American audiences. The VOA is a part of the US Administration and generally reflects its views, although the news is supposed to be independent and unbiased. AFRTS has mainly relayed domestic network news and sports minus the commercials, which has also been a boon to American listeners.

This year has also seen increasing use made by international broadcasters of sharing each others senders, to reach their target areas. This year saw the Spanish and Chinese begin sharing time over each others senders, closely followed by the Japanese and French, the Canadian and Japanese, as well as the VOA and Deutsche Welle. Another trend is for some broadcasters to lease transmitter time from Radio Bras in Brasilia, eg the BBC, Swiss Radio International and Deutsche Welle. This trend is to be welcomed instead of building super-powered senders which in turn pollute the frequencies for more modest powered senders.

Many nations are very loath of entering into time-sharing arrangements because they do not wish to compromise their neutrality or territorial sovereignty. Sweden, for instance, would benefit by having such an arrangement, yet the government will not countenance it as it jealously guards its neutrality.

Yet another welcome trend is that the level of jamming has decreased, although broadcasts from Radio Free Europe/Radio Liberty to the USSR and easter Europe, are still heavily jammed. Another jammer that recently went silent is the Iraqi "Klaxon" sound. The eight year long Gulf War came to an end in the middle of the year. A number of anti-Iranian clandestines also slowly disappeared. And, talking of clandestine operations, the emergence of a Palestinian clandestine station on 7.440 MHz, presumably within Syria, was noted. The Middle East and Latin America will continue to be areas of clandestine broadcasting operations.

The trend towards utilising data modes on HF, especially packet, has been obvious. We have all witnessed recent correspondence within the pages of this magazine of late. It is to be expected that the data activity will increase, as more information can be rapidly processed compared to aural means. Unfortunately, data does suffer from propagational disturbances, necessitating numerous repeat feeds. Data systems are likely to proliferate, particularly on VHF/UHF

Keep listening on frequencies above 20 MHz over the next 12 months. Already more stations have woken up to the 11 metre broadcasting allocation (25.600 to 26.100 MHz). The BBC has been using 25.750 MHz, from Daventry to Asia, from 1100 UTC. Paris is on 25.820 MHz. Others will follow rapidly in the next six months.

Well, it only remains for me to wish you all Seasons Greetings and may 1989 be a safe and peaceful year for you and yours!

73 de VK7RH.

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Intruder Watch

Bill Martin VK2COP

FEDERAL INTRUDER WATCH CO-ORDINATOR

33 Somerville Road, Hornsby Heights, NSW. 2077

Well, it is time to present my final column. My first was in AR, October 1982, and we have seen a few changes since then in the hobby. As my resignation from the position of Federal Intruder Watch Co-ordinator was to be effective on my replacement being found, or the end of the year, it appears that is will become effective on December 31, 1988. My very best thanks to all those who have been supporting the IW over the years, and particularly while I was in office. I am, of course, still Monitoring System Co-ordinator for IARU Region 3, so am still involved in trying to chase the nuisances off our bands.

I regret that I cannot supply the name of the next Federal Co-ordinator, as no one has come forward and offered their services. However, I am sure that somebody will, sooner or later. Please give him/her and your Divisional IW co-ordinator some assistance in reporting intrusions into the amateur bands.

I have just initiated inquiries in Japan regarding the nuisance caused by Japanese fishing boats, especially on the 80 metre band. The JARL Intruder Watch co-ordinator is making inquiries on our behalf, and I have asked him to try to publicise the problem in Japan with a view to a possible reduction of the problem.

The VK2BWI Slow Morse sessions, in particular, suffer harmful interference from this source. At the time of writing all reports are not in for September, so statistics are unavailable for that month. The deadline must be obeyed! Reports received so far are from VK4NGF, VK5GZ, VK5TL, VK6RO, VK8HA, VK8JF

All the very best wishes for the Christmas and New Year Season to everyone, and I hope that 1989 sees a reduction in the number of intruders who make such a nuisance of themselves. I won't see you in the magazine again, but look for me on the air. Goodbye and good luck.

Bill VK2COP

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How's DX?

MACQUARIE ISLAND

John VK2DEJ, will act as QSL Manager for Robyn VK0AE, during her stay on Macquarie Island in 1989.

Address QSLs to: John Saunders VK2DEJ, 8 Toni Crescent, Ryde, NSW. 2112.

HEARD AND WORKED ON 20 METRES at Woodbine, NSW

3/9/88 — Worked W0OKC, 3B9FR (QSL F6FNU); heard A4XKB (QSL N4GNR) between 1254-1322.
4/9/88 — Worked I1WFF, G3XEP/P, OZ8ERA/P, G4SJM/P, G4SDP/P, FE6DIZ (QSL F6GVS), G3WAS/P, LS0F (QSL LU1FT), ON5CM, G4HRS/P, EI7M/P between 0545-0722.
10/9/88 — Worked SM3PZG, G4WXD, VK6HQ, WA4AFE between 0652-1017.
11/9/88 — Worked OH2BH, YT3AA, 6K24SO* between 0709-0948 UTC.
14/9/88 — Heard VR6ID (QSL KB6ISL) at 0913 UTC.
17/9/88 — 0917 worked HL88SOYC, special station for Olympics. QSL HL2S direct. Heard FR5VS at 1256 (QSL F6FNU).
18/9/88 — Worked A35SA (QSL KB7QC), WA2IUO, HA8KQX, KC2Q**, W3AE between 0455 and 0937.
24/9/88 — Heard 5W1HG at 0912, QSL via N5CX.
25/9/88 — Between 0923 and 1016 worked OX3SG, OY9JD, W4/G4MZF (QSL NK4U), OH2PM and OH2BH.

* This station was located in the Olympic Village, Seoul. QSL to the Korean ARL.

** A special station located on the site of Marconi's first commercial electricity station. QSL to OMARC, PO Box 357, Bradley Beach, NJ. 07720. Send QSL plus one IRC.

—Contributed by Bob Demkiw AX2ENU

Charlie VK6MP, will shortly be heard from Casey Base — see page 36 November AR.

Club Corner

CENTRAL COAST AMATEUR RADIO CLUB INC

GOSFORD FIELD DAY

1989 Preview

All amateur radio operators, their families, friends and those interested in amateur radio, are invited to attend the 1989 Gosford Field Day to be held on Sunday, February 19, 1989, at the Gosford Showground. Gates will open at 8 am, wet or dry, as all displays are under cover.

REGISTRATION: Gents — $5, Ladies and Pensioners — $3, Children — $2. A special group concession will also be available on application.

PROPOSED PROGRAM

0730 - 0930	Open Mobile Scramble
0800 - 1300	Registration
0800 - 1700	Tea and Coffee available in Dining Room (no charge)
0930	Disposals booking-in closes (Dwyer Pavilion)
0945	Marshal outside Agricultural Pavilion for the 1000 hours Pedestrian Talk-In Fox hunt — two metres FM (146.500 MHz)
1000	Disposal open (Entry southern end of Dwyer Pavilion)
1030	Quiz sheets available at Nametags. Return to Nametags before 1330
1100	Ladies Events
1100	Entries close for Home Brew Contest in Dog Kennel Building
1100	Marshal outside Agricultural Pavilion for the 1115 hours Pedestrian Talk In Fox Hunt — two metres FM (146.500 MHz)
1130 - 1230	Lucky Registration Number Drawing — six drawings
1215	Drawing of raffle check at information for winners
1215	Home Brew Antenna Evaluation Contest (Agricultural Pavilion)
1230	Bus tour departs
1245	Marshal outside Agricultural Pavilion for the 1300 hours Long Pedestrian Talk In Fox Hunt — two metres FM (146.500 MHz)
1300 - 1530	Packet Seminar (in Restaurant)
1530	Prize Presentation. Advise Information if leaving early to arrange delivery of prizes.

Field Day attractions include:

Home Brew Contest, Home Brew Antennas Evaluation Contest (70 centimetres), Lucky Door Prizes, Disposals, QSL Bureau, Trade Displays, Amateur Television Display, Packet Radio Display, Ladies Stall, Complimentary tickets for bus tour and Reptile Park.

Novelty Events include:

Ladies events, Ladies and Gents quizzes, youngest amateur, oldest amateur, longest licenced amateur, longest distance travelled.

Trains from Sydney and Newcastle will be met by a courtesy us which will run between Gosford Railway Station and the Showground between 8.30 and 10.30 am. There is plenty of off-street parking available at the Showground.

Accommodation is usually scarce on the Central Coast at Field Day time, so early booking is advised.

Tea, coffee and biscuits will be available from 8 am to 5 pm at no charge in the Dining Room. Take-away food can also be purchased in the Showground.

Companies, persons, groups, or clubs wishing to set up a table or display at the Field Day should contact the Central Coast Amateur Radio Club Inc at PO Box 252, Gosford, NSW. 2250, before January 31.

Bring your QSL cards for the "Call Present" Board.

An open Scramble will be held from 7.30 to 9.30 am. Rules are as follows:

1. No operation in Showground or one kilometre radius.
2. No operation on Gosford repeaters.
3. Log extract to the Event Recorder before 10 am to show:
   time of contact, station worked, mode of operation, band, full serial numbers.
4. Incomplete or late logs are not eligible.
5. You may re-work the same station on several bands.
6. Scoring one point per station per band regardless of mode.

For the Home Brewing Antenna Contest, entries will be divided into two categories — beam antennas using horizontal polarisation on 432.400 MHz and omni-directional vertical antennas for 436 MHz. Entries must have mounting hardware to suit a 25 to 50 millimetre mast.

Entries for the Home Brew Contest are to be entered by 11 am in the Dog Kennel Building. Prizes for Open and Junior constructors. Judging will be in two categories. Kits and published designs.

Disposals forms and lot numbers can be obtained in advance from Reg Brook VK2AI, PO Box 252, Gosford, NSW. 2250, or phone (043) 23 1662. Forms and lot numbers will also be available at the Showground on Saturday afternoon, February 18, 1989. All items for disposals must be booked in before 9.30 am on Sunday. Late arrivals or equipment improperly tagged or catalogued may be refused.

For further information about the Field Day write to the Gosford Field Day Committee, PO Box 252, Gosford, NSW. 2250.

—Contributed by Les Watsford VK2CLP, Gosford Field Day Committee

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TABLELAND RADIO AND ELECTRONIC CLUB

A new club was recently formed on the Atherton Tablelands, North Queensland.

The Tableland Radio and Electronic Club caters for amateur and citizens band radio enthusiasts, also computer and electronic hobbyists.

The club will apply for affiliation with the Wireless Institute of Australia. Meetings are held on the first Thursday of the month at the Atherton SES building. A club on-air net is held every Sunday on 3.550 MHz, SSB at 0830.

Interested persons are invited to join the club and share their knowledge with others. Electronic and computer workshops will be held as the club progresses.

The club will also be operating the Tablelands Repeater, located at Longlands Gap, near Herberton, transmitting on 146.675 MHz, with a -600 kHz split. Other repeaters and beacons are planned in the near future.

For further information contact:

The President — Wilf Booth VK4ZNZ, phone 95 3888, or

Vice-President — Bill Jessop VK4FET, phone 96 2124, or

Secretary/Treasurer — Dale McCarthy VK4KDM, phone 91 1446, or

Write to — TREC, PO Box 720, Atherton, Qld. 4883.

—Contributed by Dale McCarthy VK4KDM, Secretary/Treasurer, Tableland Radio and Electronic Club

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ROYAL AUSTRALIAN AIR FORCE ASSOCIATION

Ex-Service personnel are reminded that the RAAF Association was formed nearly 70 years ago, just after World War I, so that ex-flyers could get-together socially and assist each other when the need arose. The Association has survived and grown until today, when its aims are more varied.

Nowadays, it aims to foster friendship and ideals of service life, provide welfare for members, maintain a vigilant interest in civil and defence flying and relevant government policies.

Anyone who has served six months in Her Majesty's or Allied Air Forces or Services (Army or Navy) are eligible to join the association. Application forms are available from the Secretary at the Air Forces Memorial Centre, 4 Cromwell Road, South Yarra, Vic, phone (03) 240 8573. More members are always needed to carry out the above aims.

The Association has recently joined a government scheme to provide a weekly club session for retired ex-service men and women, and their friends. The club meets in Victoria each Wednesday at 1000 hours at the above Memorial Centre for an interesting program including morning tea and a light lunch. Each program has a speaker, and 52 speakers a year is quite a lot of people to find. If any readers, ex-service or not, can hold the interest of an audience for an hour, and you would like to donate your services as a speaker, please contact the President, Mrs Enid Base on phone (03) 572 1598.

—Contributed by Betty Cooper, member of the RAAF Association

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CENTRAL HIGHLANDS AMATEUR RADIO CLUB

On August 13, 1988, the Central Highlands Amateur Radio Club relocated their second repeater to its new site on Hodson Peak, about 35 kilometres west of Dysart, Queensland.

The club, whose members comprise amateurs from the Central Highland towns of Middlemount, Moranbah, Clermont, Tieri, Glenden, Emerald, Dysart, Rubyvale, Blackwater, Capella and Springsure, has only been formed since December 1986, and now has a two metre repeater (VK4RRR) and 70 centimetre repeater (VK4RHR) linked together to cover the central highland area.

The club believes this may be a first for Queensland, if not Australia.

The Hodson Peak exercise proved to be quite a day for those members who took part in the actual installation, which took about 12 months planning, with field trips both on the ground and in the air to find the best possible access to the location. Nearby Browns Peak was also looked at but was unsuitable due to the extremely difficult access by foot.

Due to the rough terrain, Oaky Creek Coal was approached for assistance with their Bell Jet Ranger helicopter to locate the pre-fabricated equipment on the peak.

The repeater parts were made up in different towns so all planning and measurements had to be done "on-the-air".

The tower section came from the Middlemount Scout/Guide group, the brackets for the antennas and solar cell were made in Clermont by Mai Lees VK4FPL and Les Dixon of the local SES group, with the repeater itself being assembled by Repeater Officer, Richie Chappel VK4RR, in Moranbah. The repeater housing was made in Middlemount by Club President, Peter Sampson VK4MKT, and an old overworked drinks-fridge was also obtained there, to house the battery and spare sundry items, eg 20 litres of distilled water.

The day began early, with Peter VK4MKT, leaving Middlemount at about 0601 and Richie VK4RR, leaving Moranbah at about 0603. Another group leaving Emerald at about the same time were, Geoff Bonney VK4GI and Geoff Hosking VK4ZGH, with their wives Audrey and Dianne. On the way Peter called into his work QTH, the German Creek Coal Mine, to pick up the drag-line

Peter VK4MKT, guiding the tower down from the helicopter.

Geoff VK4GI, Leo Smart, Peter VK4MKT, Richie VK4RR, moving a refrigerator out of the way after the first helicopter drop.

(From left) Richie Chappel VK4RR, Peter Sampson VK4MKT, atop Hodson Peak with Lords Table Mountain in the background.

Oaky Creek helicopter with the first load onto Hodson Peak.

VK4 Repeater Highland Radio Finished. There is a pole on top of the tower to act as a lightening arrester, 70 centimetre antenna, two metre link folded dipole, solar panel, repeater housing and an old refrigerator for the battery.

operator and pilot, Leo Smart. Leo is not an amateur but was to help out with communications with the helicopter pilot on his aviation hand-held.

The group met at the base of Hodson Peak at about 0745 hours with some members actually meeting for the first time. Hoping everything would fit, the equipment was given a final check before the ground party left for the summit, as it was not known whether the helicopter would be able to land. Wind conditions on the morning were very strong. Geoff VK4ZGH, also a pilot, decided to stay at the bottom to load the equipment on to the helicopter when it arrived. The rest of the group started out for the summit, 780 metres (2560 feet) above sea level at about 0830 hours. The climb to the top takes at least an hour and a half and the helicopter was due at 1000 hours!

Geoff VK4GI, took his video camera up the peak so he could tape the actual repeater installation. This was a mighty fine effort by Geoff to carry the heavy equipment up the mountain.

The helicopter, piloted by Oaky Creek Coal pilot, John Cooper, and relief pilot, Buck Ryan, arrived just after 1015 and flew over to check the site. The communications between us and the helicopter were co-ordinated by Leo with his hand-held radio at the bottom of Hodson Peak.

On the first run, a chain saw and fuel were lowered to clear a couple of trees on the approach and side areas at the top. Peter VK4MKT, then had some quick lessons in tree-felling. The drop area on the ridge was only about four metres (12 feet) across and, after the trees were cleared, 20 metres (60 feet) long.

The lifts were done by cargo net and slings. First to come up was the fridge and corrugated iron, followed by the tower, with the housing and battery last. The helicopter touched down on the top on full hover to pick up the nets and slings after each drop which took some very skillful piloting due to the

Peter VK4MKT, unloads equipment from the helicopter which is precariously balanced on top of Hodson Peak.

high winds coming up the cliff face. The brackets and antennas arrived inside the helicopter. Peter VK4MKT, received a bit of a fright while unloading these as the helicopter had to lift off a little due to the high winds but re-settled to allow Peter to finish getting the equipment out and the net, etc in.

On the last trip, Geoff VK4ZGH, was brought up in the helicopter to assist with the rest of the task. A minor mishap occurred when the housing was blown over the side of the mountain by the helicopter downdraft. Leo and Geoff VK4ZGH, went down to try to retrieve it. About an hour or so later, two very tired fellows arrived back rolling the housing up the hill. Amazingly it required only minor panel beating, especially considering it must have fallen about 300 metres (1000 feet).

The rest of the installation went to plan and the repeater was finished and tested by Richie at about 1700. The trip down the mountain was certainly much easier than the one up.

On behalf of all members of the Central Highlands Amateur Radio Club, the club would sincerely like to thank the following for their assistance in getting these repeaters operational for the benefit of amateurs and he community within the region.

The Blair Athol Coal Company, for their generous grant to the club, Oaky Creek Coal for the use of their helicopter and Messrs John Cooper and Buck Ryan, for their expert piloting, Mr Bruce Templeton for the use of his land and the assistance given during field trips. Capricorn Coal Management for equipment and assistance, the Middlemount Scout/Guide Group for the tower section, Waterson Communications of Mackay for their continued assistance and equipment, and the Clermont SES Group for the use of their Drummond Range UHF CB repeater site whilst VK4RHR was being tested.

The CHARC is offering copies of their video taken by Geoff VK4GI to clubs for use on ATV or meeting nights. The copies can be obtained by writing to Geoff, but a blank two or three hour tape in a padded post bag with return self-addressed label and postage must be included. His address is, Geoff Bonney, PO Box 582, Emerald, Old. 4720.

Club Repeater Officer, Richie VK4RR, has supplied the following technical information on the Central Highlands repeaters:

BLUE MOUNTAIN REPEATER	HODSON RANGE REPEATER
First under test January 31, 1987.	Installation August 12, 1988. Original test site Drummond Range, 26 kilometres west of Clermont, September 1987.
Location: 30 kilometres south-west of Sarina.	40 kilometres east of Clermont.
Call sign: VK4RRR	VK4RHR
Height: 1070 metres (3500 feet).	780 metres (2560 feet).
Transmitting: 146.975 MHz.	438.500 MHz.
Receiving: 146.375 MHz.	433.500 MHz.
Power: 25 watts.	25 watts.
Time out: four minutes.	four minutes.
Equipment: Philips 828 Mk2, identification and control housed in same case.	Philips 828 V Mk2 identification and control housed in same case.
Filter: RFS CP145-432N, insertion loss 2.75 dB.	6LD-450S insert loss .95 dB on transmit and 1 dB on receive.
Attenuation: 100 dB.	85 dB.
Feedline: 30 metres (100 feet) LDF4-50A Heliax.	six metres (20 feet) RG-213.
Antenna: RFI 6 dB Collinear at 24 metres.	6 dB Collinear at five metres.
Solar power: 42 watt panel 200 AH battery.	Two 42 watt panels with Reg 200 AH battery.
	LINK TRANSCEIVER. Equipment: Philips 828 Mk2. Call sign: VK4RHR. Transmitting: 146.375 MHz. Receiving: 146.975 MHz Power: four watts. Time out: four minutes. Antenna: Dipole at three metres.

Linking distance between Hodson and Blue Mountain is 150 kilometres.

Richie reports the main reason for using 70 centimetres is to get away from TVI problems associated with Channel 5A in Moranbah and Capella. ABC Television Channel 4 Mackay is received in Moranbah via Channel 4 receive Channel 0 transmit Nebo, Channel 0 receive Channel 5A transmit Copperbella. On the two metre band I have received FM broadcast radio and six metre amateur station being relayed via Channel 0 5A translator. 100 mW on 146.375 MHz interferes with my own television.

Another two metre repeater will be operating shortly from Hodson Range and will be linked into the above system.

Mobile contacts so far have been from Proserpine to Marlborough on the coast, and south-west to Emerald.

—Contributed by Peter Sampson VK4MKT, President, Central Highlands Amateur Radio Club

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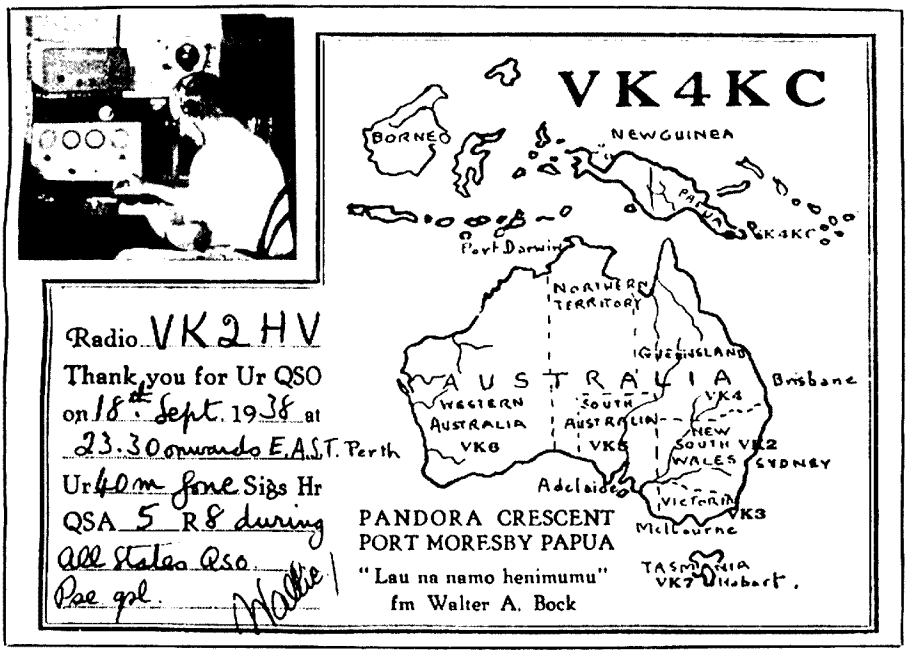
QSLs from the WIA Collection

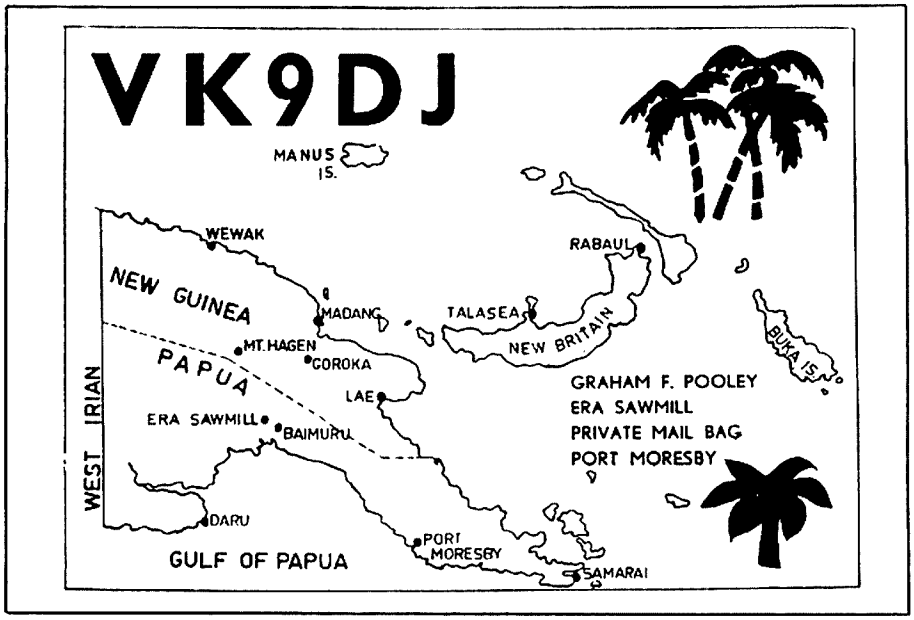


VK4KC

This interesting pre-World War II QSL bears the rather rare prefix VK4 — for Papua. In the early 1930s the only VK prefix was for Australia, which country had been allocated the prefix bracket of VHA-VMZ. In 1936, we find the first listing of VK9, not for the present nation of Papua-New Guinea, but for the Territory of New Guinea. Before World War II, Papua and New Guinea each had a separate public service and were treated independently in their administration.

It was John Moresby of Great Britain, who surveyed the south-eastern coast of the island in the 1870s, and by 1884, it was annexed for Britain. This relatively small part of the New Guinea island-mass was formerly called British New Guinea, but under the Papua Act of 1905, it became known as the Territory of Papua, Australia administrating it from 1906. The remaining territory of the island, called New Guinea, became a mandated territory in 1920.

Both Spanish and Portuguese navigators had been active in the area in the early 1850s. It was the Portuguese explorer, Don Jorge de Meneses who gave Papua its name. This was said to be from a Malaysian name for "frizzy hair". The large territory of New Guinea was named in the mod-1850s by the Spaniard, Ortis de Retez, apparently because of the resemblance of the native inhabitants to those he had seen on the African Guinea coast.



It was not until January 1937, that we find Papua listed as a country in *QST*. Mention is made of this magazine for it was in this same edition that the first "Official List" of countries was given. This was to become, in effect, the start of the present DXCC listings, although the ARRL Communications Department did not announce an actual DX award in *QST* until September 1937. The prefix for Papua was given as VK4, that of the Territory of New Guinea as VK9. Incidentally, one notes from Walter Bock's QSL card that, at the time of this QSL (September 1938), the Australian mainland prefixes were limited to VK2 — VK7.

VK9DJ

This much more modern QSL card from Papua (dated July 1966) shows the territory of Papua in relation to New Guinea and West Irian. The large island of New Britain to the north is also part of New Guinea. The VK4 prefix for Papua continued to be used (along with VK9 for New Guinea) until 1948, when the prefix change to VK9 was made.

Much of Papua is thick tropical forest along with towering mountain ranges. The coastal city of Port Moresby (named after the surveyor of the area) was then the capital of Papua. After the two territories of New Guinea and Papua were brought together administratively by the Papua-New Guinea Act of 1949, Port Moresby became the capital and administrative centre of the combined territory, known as Papua-New Guinea. From July 1, 1969, Papua-New Guinea employed the prefix allocation VK9AA-VK9MZ (at the same time as Norfolk Island, Christmas Island and Cocos Island received their new allocations).

It is interesting to note that, despite being united, Papua and New Guinea continued to be listed as separate DXCC countries (both as VK9) until becoming deleted countries when independence came in 1975.

P29PNG

Although it had become self-governing in December 1973, Papua-New Guinea became independent within the British Commonwealth on September 16, 1975. Since independence, the International Telecommunications Union prefix allocation has been P2A — P2Z, but the prefix P29 has been authorised by Government.

Incidentally, the NAA — NZZ serial letters denote novice licence holders and ZAA — ZZZ limited (VHF) licensees.

As stated on the reverse side of this special event QSL card, the logo shown was the official symbol of the 10th Anniversary of the Independence of Papua-New Guinea.

The Papua-New Guinea Amateur Radio Society organised activity nation-wide to celebrate this special occasion. Many thousands of such QSLs were sent throughout the world with the help of many participating amateurs belonging to the PNGARS.

The call sign suffix is significant and was obtained by special authority. The two symbolised birds shown are the famous Birds of Paradise, characterised by their gorgeous colours and bizarre forms of plumage, probably unsurpassed in splendour by any other bird species. Little wonder that these feature both on the official coat-of-arms of Papua-New Guinea, and its national flag.

If you are able to help the collection along with a donation of QSL cards, please contact Ken on (059) 64 3721 or write to PO Box 1, Seville, Vic. 3139. Arrangements will be made for the collection or delivery of cards.

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Forward Bias

Norm Gomm VK1GN
GPO Box 600, Canberra, ACT. 2601

MONTHLY MEETING

The September meeting saw Noel Schubert of Motorola talking about some of his company's communication products. Noel described a number of VHF/UHF mobiles and hand-helds. While the equipment had excellent specifications, including Milspec ratings, the prices were well above the pockets of the average amateur.

After the break Noel described the Motorola Trunked Radio System, which allows a large number of independent users to share a group of radio channels to provide a more effective usage rate. The system consists of five channels (including a control channel). A central controller automatically switches radios between channels depending on availability. If all channels are busy then callers are put in a queue and called back in order of waiting. Noel claims that the system is an important step in relieving spectrum congestion.

JOHN MOYLE FIELD DAY 1989

Another reminder that if you have any suggestions, or wish to participate in the John Moyle Field Day, please contact the writer, Norm VK1GN, on 54 8512 at home.

EVATT PRIMARY SCHOOL BICENTENARY FAIR AMATEUR RADIO DISPLAY

The Evatt Primary School, Canberra ACT, held their Bicentenary Fair on September 17, 1988. The event proved to be a good opportunity for the local WIA members to promote the hobby of amateur radio to parents and children in the Canberra community, and at the same time enable us to probigate our special event call VI88ACT on all HF bands.

We commence setting up the station at around 9 am once the rain, which looked set-in for the day, had subsided. Alan VK1WX, and myself, managed to clamber onto the school roof and install the trapped vertical with little difficulty. Having secured the antenna to the metal roof we were surprised to find it tuned-up well on all HF bands, not requiring an ATU. The first contact was made to JA on 15 metres at 9.30 am with very poor reports being exchanged. Both 10 and 15 metres didn't appear to be improving so 40 metres was the order-of-the-day.

Good contacts were made into most Australian States on 40 metres with a few mobile VK4 stations to keep the onlookers interested. Late in the afternoon, 10 metres heated up to an all time high with a pile-up of JA stations fighting to make that rare contact with VI88ACT. This gave the public the opportunity to see the station in full swing making some 30 contacts in as many minutes.

The day was a great success with a total of 42 contacts in all to various countries, and numerous inquiries from the visiting public. Some were just mildly curious, while others seemed very interested, and kept the station operators busy discussing the world of amateur radio, the purpose and functions of the WIA, and the activities of our local Division.

Thanks to Alan VK1WX, Lawrie VK1KLB, Richard VK1UE and Erainer VK1NDV for their help and support in running the display.

—Contributed by Gavan Berger VK1NEB

JUGIONG PICNIC

On Sunday, September 25, 1988, Wagga and Canberra amateurs met at Jugiong for a barbeque and the battle of the fox hunts. It goes without saying that the Canberra amateurs were the epitome of sportmanship and genteel behaviour, while the Wagga amateurs did some dreadful things to throw us off the scent. All jokes aside, the outing was rated as a great success by all who attended and exemplified the spirit of amateur radio.

The VK1 Division would like to have more of such outings with other radio clubs in the area. If you are interested, please drop a line to Forward Bias.

JOTA 88

At the time of writing we will be running six JOTA stations in the Canberra region:
VK1SAA — VK1SAF and VK1GGA — VK1GAF.

QSL BUREAU

A reminder that, with the improvement in conditions and corresponding increase in QSL cards, it becomes even more important to assist our volunteer bureau operators. ***Please, Please, Please*** — make sure that you sort your cards into call areas before depositing them with the bureau. In addition, the call sign of the destination area should be written on the top right-hand corner of the back of the card.

Also note, VK1 cards go to the inwards bureau, not outwards.

NOVICES ON TWO METRES

The VK1 Committee notes the increasing number of novices using two metres and is pleased to see, in general, good operating procedures being used. With the increased usage of the local repeaters, it is even more important to leave a few seconds between overs in case someone else wants to pass an urgent message. If you have any queries on repeater or two metre operation, please feel free to contact a member of the Committee for advice.

PRESIDENT'S CHRISTMAS MESSAGE

Have a safe Christmas. If you drink, don't drive as I want to see you all back here next year.
73 de Alan VK1WX.

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VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

ALINCO TWO-METRE HAND-HELDS

Members will be aware of the special which has been on offer for the last couple of months from the New South Wales Division. Stocks are starting to run down but why not buy yourself a Christmas present? A review was published on this unit in the October issue of *Amateur Radio*. A specification *sheet* is available from the VK2 Division at PO Box 1066, Parramatta, NSW. 2150. Please include a stamped self addressed envelope. This offer has been extended to any licensed member of the WIA. The price is $325 plus $7.50 to cover post and packaging. All orders ***must*** include a recent address label from *Amateur Radio*, for example, the one with *this* issue. Cheque of Bankcard details with order.

NEW ADMINISTRATIVE SECRETARY

Maureen Lavery, who became the Division's Administrative Secretary in the latter part of 1982, the year the Division relocated from Crows Nest, left this position on October 20. On behalf of the members and council, we wish Maureen the best and our thanks for the time she spent with us. By now a new Administrative Secretary will be learning the ways of the Institute.

THE YEAR IS ENDING

Well, it is only a month to go until 1989 arrives to become just another year without the celebrations. The "Bicentenary of Australia 1788-1988 Award" contacts cease after December 31, 1988. You have until June 30, 1989 to submit a claim. For a VK2 to obtain the award, you have to work 200 different stations, anywhere. From the start of 1989, this award will be replaced with a VK2 Award, details next issue.

Should you need some blank Bicentenary QSL cards to cover replies to this year's contacts, check the Divisional Office for remaining stock. A new card will be released next year.

Did you work either of the special event award stations recently? VI88WIA for the Fisk Award on September 22, 1988 or the Parramatta Bicentenary Award last month, VI88NSW. A special QSL card, in addition to the award is available. Would you submit claims as soon as possible?

The AX2WI broadcasts conclude for the year on Sunday, December 18. They recommence on Sunday, January 8.

There will be special Divisional operation of VI88NSW on December 31, 1988. The remainder of December is available for both club and individual use. Check the broadcasts or the Office for details.

This month is also the Ross Hull Memorial Contest.

The Postcode Contest is on Friday, December 30, from 9 to 11 pm. The band is six metres, all modes.

The next Trash and Treasure should be the end of January!

The end of the year is also the time for all office bearers to prepare their annual reports and returns. It is also the end of the Divisional year.

PUBLICATIONS

If you need a Christmas present, why not check the Divisional Bookshop. They may have just what you want. You should also inquire and have your name put on the list for the *1989 ARRL Handbook* or either the International or North American call books. Some stock should be available soon.

Providing there has not been further delays in the production of the Australian call book, this will also be available from the Bookshop.

NEW MEMBERS

A warm welcome is extended to the following who were in the October intake.

N G Burne VK2MDU	Bewong
R Caruana Assoc	Blacktown City
J S Churchill VK2VJS	Maroubra
A G Clenton VK2PPQ	Sawtell
J E Conway VK2YLL	Saint Marys
C R Cooper Assoc	Scone
S A Guignon Assoc	Forestville
S J Johnson Assoc	Sanctuary Point
M J Lautizar VK2FSA	Hurstville
A M McDonald VK2NXQ	North Ryde
J Matthews VK2ZDM	Randwick
P L Middleton Assoc	Dareton
G J C Paillard Assoc	Rydalmere
J F Patrick VK2AKJ	Lane Cove
W N Southall VK2PRS	Heckenberg
R R Stiebel	Bexley
M A Wilson VK2AZZ	Sanctuary Point
D M Young Assoc	Sydney

VK2 QSL BUREAU NEWS

Have you received any OSL cards from the bureau during the past six months? If not there could be a number of reasons for this.

1. You do not work DX.
2. No cards have arrived at the bureau for your call sign.
3. You have had a change in call sign or address and have not notified either the WIA or the bureau.
4. We do not have any credit for postage to enable us to send out your cards.
5. The club to which we were instructed to send your cards is now out of credit with the bureau or you have not been to collect your cards from them.

If *reasons* 3, 4 or 5 of the above can be answered with a yes, the volunteers at the bureau would be very pleased if you could remedy the problem.

We have quite a number of drawers which have large collections of unclaimed cards. As at the end of September, this bureau has handled in excess of 146 000 cards for this year. We try very hard to ensure that all cards reach the desired destination but as mere mortals, find it difficult to read some call signs and to understand just what the amateur desires. With this number of cards coming in, sometimes in batches of 3 000, you could appreciate that time spent checking individual cards slows up the processing of all the others.

If there is any way in which we can be of assistance through the bureau, please contact us via PO Box 73, Teralba, NSW. 2284, or telephone the Westlakes Radio Club on (049) 58 1588. You will be surprised how often we are in attendance.

—Cheryl Stoddart, VK2 QSL Bureau Manager

ar

VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

NEW MEMBERS — WELCOME!

Geoffrey Coombes VK3BGC	Ivanhoe
Craig Dickson * VK3HE	Northcote
Leon Evers VK3TEQ	East Saint Kilda
Ian Johnston * VK3SH	East Ringwood
Malcolm Lee * VK3CLM	Bangholme
Antonio Lucani *	*Stanley*
Harold Muir * VK3KRM	Christmas Hills
Tino Pavic * VK3EGN	Geelong
Trevor Reid * VK3NNR	Heidelberg
Paul Sarre * VK3PSD	Creswick North
Ivan Thomas VK3CVI	Loch Sport
Mark Withers * VK3JCB	Wodonga
Salah Romane *	North Melbourne

* Joined with pink Invitation to Join form.

ar

CAR INSURANCE

If you have amateur equipment in your car be very careful as to how you handle your insurance. After an incident in which one of my sons was involved and found his car (the middle of a sandwich) written off, he tried to recover some expensive audio equipment from the vehicle and was told t belonged to the insurance company.

Wondering how this would apply to an amateur and his radio gear I fronted my insurers and was told if my vehicle was written off the radio gear belonged to them. As I was not impressed with this answer, I wrote them a letter so that I could at least have the proof of what they had told me *in* writing.

The last thing most amateurs want is some clown in a wrecking yard playing Batman and Robin on the transmitting gear that has been left in his vehicle in the event it is a total loss after a smash. I feel that the DOTC would also take a rather dim view of this.

After several weeks the Wollongong office of the insurance company received word from Sydney that provided the equipment was noted on the insurance and the vehicle insured for its full value plus the value of the equipment the following procedures could take place if the vehicle was ever "written off".

1. I could apply to the Claims Manager to buy the gear back at a price to be negotiated at the time.
2. If I didn't want the equipment they could sell it to a licenced operator, or
3. They could destroy it. (In the meantime they had contacted DOTC and were given the message on unlicenced operators).

Far be it from me to cause you any falling out with your favourite insurance company but be warned — they have a very unbending set of rules when it comes to what is bolted onto an insured vehicle. For your own benefit clarify the situation with them or you could be facing the daunting task of trying to get your gear back and they won't part with it.

—*This information from VK2EMV re car insurance was originally broadcast on VK2TTY and is copyright to ANARTS*

ar

$120 CHRISTMAS GIFT FROM EMTRONICS

WITH EVERY HF TRANSCEIVER KENWOOD, ICOM OR JRC YOU WILL RECEIVE THE NEW TET-EMTRON.

MV-3

THREE BANDS (10.15 AND 20 METRES) VERTICAL ANTENNA WORTH $120

ABSOLUTELY FREE!

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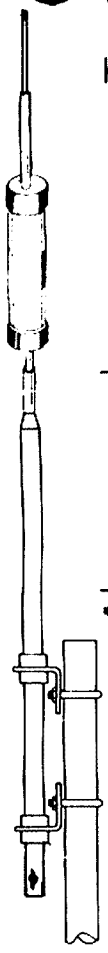

MV-3

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- DIAWA MR 7504 motor in stock

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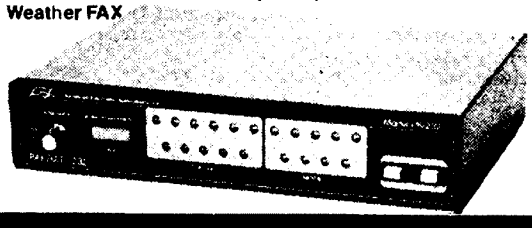
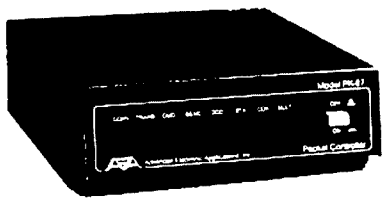


PRICE $649 WITH FAX



NEW **PK-88 ™ PACKET CONTROLLER NOW $299**

The PK-88 is not just another copy, it is much more. With all the packet program features of the Multi mode PK-232, the PK-88 is an economical new TNC designed to bring you enhanced completely compatible packet software plus new hardware features for improved packet operation.

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288-294 Queen St, Melbourne
Vic. 3000
Entrance from Lt. Lonsdale St.
Ph: (03) 67 8551 or 670 0330
FAX: (03) 670 0671

QUEENSLAND:
416 Logan Road, Stones Corner
Qld. 4120
Ph: (07) 394 2555
FAX: (07) 394 4316

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

DISPLAY OF MEMBERS' EQUIPMENT NIGHT

Although the September meeting of the WIA VK5 Division was reasonably well attended, the amount of equipment displayed was very small this year. That is not to say that the quality was any less, just the quantity. Perhaps we are all turning into a nation of "Black Box Operators", or perhaps the 'builders and tinker-ers' just prefer to do their thing at home, and not show it off at a meeting. The Millar Award, which is given, frequently, to encourage a newcomer, was awarded this year to Dave Goode VK5BF, for his Antenna Tuner and Power Meter. Now, as one of of our well-known Old Timers, Dave hardly qualifies as a newcomer, but *this* was his first foray into the world of 'those caterpillar-like things' that we call chips. Dave freely admits that he is much more at home in the world of 'glowing glass bottles', but we hope that, with the encouragement award and the WIA voucher, Dave will continue to build and experiment with those "caterpillars".

The other voucher winners were, Clarry Castle VK5KL, for his 'Sweep-Oscillator' and Mark VK5AVQ, for his Satellite Telemetry Decoder. It was decided not to award the ICS Award this time, as there was not one overall winner. Congratulations to all three winners and our thanks to Merv VK5MX, for donating the Millar Award and also for judging the entries. Might we tentatively suggest that the rest of you get out your soldering irons and junk boxes and start working on next year's September meeting.

NIGHTTIME BROADCAST

Once again we have had inquiries regarding the re-broadcasting of the Sunday Morning Broadcast, on perhaps a Sunday or Monday night. This one rears its head from time to time, and the answer is always the same — ***volunteers needed!*** The Division is happy to see it happen, DOTC have approved the idea in principal, all that we are short of are the people to do the work, so, if you are one of those who would find it much more convenient to listen to the Broadcast any other time than Sunday Morning, please let a member of Council know and we will see if we can't get it "off the ground" this time!

DIARY DATES

Tuesday, December 6: WIA Christmas Social. Woodville Community Hall, 64c Woodville Road, Woodville. Speaker is Dr Mike Tyler, reader in Zoology at Adelaide University. The topic is "FROG is a four lettered word". Bring your partner along to hear this 'hilarious' speaker and enjoy the social gathering afterwards. Please bring a plate of supper to augment the Salad Platters, pies, pasties, sausage rolls and drinks provided by the WIA. Starting time is 8.00 pm.

January 24, 1989: Buy and Sell meeting at the BGB. This meeting will be preceded by ESC, QSL Bureau, and Publications Sales. We will endeavour to start at 7.30 pm.

January 31, 1989: No meeting.

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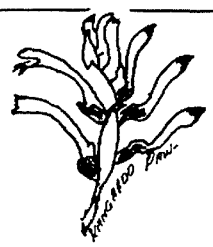

WA Bulletin

John Sparkes VK6JX
VK6 PUBLICITY OFFICER
83 Anemone Way, Mullaloo, WA. 6025

The 1988 VK6 Hamfest was organised and held by the Northern Corridor Radio Group on Sunday, October 9, at Carine Technical College.

We are still recovering from what eventuated to be a great day which was extremely well attended by VK6 amateurs as well as members of the public. The weather was very kind, and we were grateful that the area was covered to stop sunburn — and not the expected wind and rain!

The following retailers generously donated prizes, with the first four being present on the day with well-stocked stalls full of Hamfest Specials.

Dick Smith Electronics	Radio Direction Finder Kit
West-Am Electronics	Five-Eighth wave Larsen Whip on magnetic base and Icom 24-hour clock
Willis Trading	Two Digital Multimeters
Worldwide Electronics	$100 worth of parts voucher
Atkins Carlyle	Digital Multimeter

A very special vote of thanks is extended to these companies for their kind donations and their presence — we look forward to seeing you all again next year.

The WIA and other special interest groups were well represented as follows:

WIA Bookshop	WICEN
WIA Membership	ARDX SWL Club
AARTG	AMTOR
Packet Radio	ATV
Morse Workshops	Ten-Ten Club

Other displays included:
VK6WT's Morse key collection
Weather FAX
Restored equipment
Coaxial cable stall
Cake stall (cakes donated by the ladies of NCRG members

There was a fully operational satellite display out in the car park (conducted by VK6ZSB and friends), and there was even a working display of UHF CB equipment and repeater manned by UHF CBers.

Activities were very well patronised and included:
Bring and Buy sale
Car Boot sales
Two Auctions
QSL Card Raffle draw (for prizes)
Raffles
Home-brew Construction Competition with prizes
Kit Construction Competition with prizes
Free Skill Games and two Lolly Jar guessing game for the children.

There was a mountain of food and drinks (which disappeared rapidly), competently sold by hard-working ladies, as well as a doughnut stand.

The NCRG believes it is in line for a special certificate or equivalent as nine new members joined the WIA at the Hamfest!

A sincere vote of thanks is given to the hardworking committee and all members of the NCRG and their wonderful wives who made the 1988 Hamfest such a resounding success. Keep up the good work and next year's Hamfest can only get better.

ar

QSP

HIGH POWER TRANSISTOR

A transistor able to handle 250 watts of RF has been introduced by Philips and aimed at the VHF FM transmitter market.

The new BLV37 operates from a 28 volt supply *and* the Class B device has a minimum power gain of 10.5 dB.

RF power of 3 kW can be achieved by putting 15 of them in cascade.

ar

WORLD-WIDE BEACON SCHEDULE

Many radio amateurs are not aware of the world-wide beacon schedule on 14.100 MHz. There are 10 crystal controlled beacons that transmit for approximately one minute, one after the other, over a 10 minute period.

Each transmits four series of 10-second dashes using 100 watts, 10 watts, one watt and 100 milliwatts.

Listen to the beacons and get a quick appraisal of where the band may be open around the world. They can also be used as a means of comparing receivers and antennas by switching them during the same 10-second dash.

The schedule is as follows:

Time-slot 0	4U1UN/B	New York
Time-slot 1	W6WX/B	California
Time-slot 2	KH6O/B	Honolulu
Time-slot 3	JA2IGY/B	Japan
Time-slot 4	4X6TU/B	Israel
Time-slot 5	OH2B	Finland
Time-slot 6	CT3B	Madeira Island
Time-slot 7	ZS6DN/B	South Africa
Time-slot 8	LU4AA	Buenos Aires
Time-slot 9	HK4LR/B	Colombia

Listen to 14.100 MHz and see if you can hear these beacons. It will also be appreciated if this frequency is left clear.

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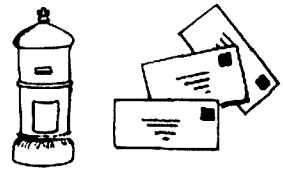
Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Over to You!



TRAVELLERS' NET

by Arthur Oliver VK6ART

When I obtained my full call on September 1, 1980, I was immediately involved in helping with the Travellers' Net. Keith VK6KC, at that time stationed at Kuri Bay, had been badgering me for some while to upgrade so that I could assist, as he was then *experiencing reception troubles* at his remote location. Bit by bit I found myself running the Perth end of the Net. When Keith retired and returned to Perth I thought I would be able to hand back to him, but for various reasons this did not work out and I therefore continued. In those days, the number of people participating each day varied from three or four to possibly a dozen and I have seen the Net steadily grow. On some days in the current year we have had more than 60 stations calling, of which more than 40 have been actually travelling. My computer has a list of nearly 1900 people who have called over the years and I am certain that many have been omitted from the days before I started computer records.

This means that I have been handling the Net for *more than* eight years. I am not getting any younger and I feel that the time has come when I should have a break from such a time-consuming commitment, around which my days have had to be organised. At the moment, there are any very able people helping with the Net, so it is opportune for me to hand over while they are still available and before I get too doddery to run the Net efficiently. I therefore intend retiring from the control of the Perth end of the Net at the end of this year. I hope to be available to give a hand if and when required and to help out with special events, such as round-the-world yacht races, emergencies, etc.

I have enjoyed my time with the Net immensely and I have made may, many friends. I hope it has given good service to many and I am sure it will continue to do so. I have had tremendous backing from a large number of people, to all of whom I give grateful thanks and I hope to maintain contact with them from time to time. To all who have participated and particularly to my long-suffering wife, Eileen, "Thank you so much for having given me such an enjoyable and unique experience." Good luck to the Net and to all who run it is the future.

Yours in amateur radio,
Arthur Oliver VK6ART
9 Maycock Place
Orelia, WA. 6167

Roy Chamberlain VK6BO, telephone (09) 331 1825 will be stepping into Arthur's shoes, ably assisted by Peter Harrison VK6HH, telephone (09) 297 5772.

ar

* * *

CANVAS SHACK LOCATION CORRECTION

by Ken Gott VK3AJU

It was flattering to see a photograph of my canvas shack and myself in October AR among the 1988 John Moyle Memorial Field Day results and pictures. However, my QTH was not Mount Hotham, but Kinglake West.

I would like this correction recorded because of the help I received from rangers and other officials of the Victorian Conservation, Forest and Lands Department prior to the contest, and also in 1987 when I used the same QTH. None are amateurs, but all are helpful towards our hobby and appreciative of its role (via WICEN) in emergencies.

Also, I note that after propagation tests and related surveys by WICEN, a new VK3 144 MHz repeater is to be installed in the Kinglake area.

So Kinglake has got a few things going for it, apart from helpful rangers!

Yours sincerely,
Ken Gott VK3AJU
38A Lansdowne Road
Saint Kilda, Vic. 3183

ar

* * *

PROCEDURE

by Ted Gabriel VK4YG

The Icom advertisement on the rear cover of AR for October, while extolling the virtues of one of their products and its advantages in improving communications nevertheless contains a horrible "boo-boo"!

In radio telephone procedure there is no such thing as 'Over and Out'. In spite of Hollywood, CB radio, television serials or fiction writers, by definition it is a direct contradiction.

For newly licensed amateurs and advertisers who may not be sure of the exact meanings the following are the correct definitions:

OVER: My transmission is ended and I expect a reply from you.
OUT: My transmission is ended, I do not expect a reply.

So it is clear that they are not to be used together.
Ted Gabriel VK4YG
PO Box 245
Ravenshoe, Qld. 4872

ar

* * *

LETHAL PACKET?

by Graham Rogers VK6RO

The Royal Navy used packet radio (via satellite) to obtain permission from London to sink the *Belgrano* during the Falklands War (true).

Don't sink our 20 metre band with packet radio above 14.100 MHz.

Yours,
Graham Rogers VK6RO
22 Grace Street
Ferndale, WA. 6155

ar

* * *

NO INCENTIVE!

by Paul and Jill Weaver VK6OF and VK6KOF

The government imposed fee for holding an amateur radio licence has gone up an extra two dollars. At the same time postage has gone up for an ordinary letter two cents. Perhaps bureaucratic thinkers at DOTC and Australia Post have some mutual formula that helps them determine how much they can take out of a service that has repeatedly demonstrated its usefulness in strategic and civil emergencies.

This husband and wife team see little financial incentive to encourage our four school age sons to take out a licence to use the same household equipment. The mathematics speak for themselves.

Yours sincerely,
Paul Weaver VK6OF and Jill Weaver VK6KOF
23 Waddell Road
Palmyra, WA. 6157

ar

* * *

OBJECTIVES

by Lindsay Lawless VK3ANJ

I applaud the new Federal President's intention to incorporate corporate management methods in our unincorporated Institute.

He states his first task to be the setting of objectives, thus following the example of a well-known private company specialising in taking people up and down. We have had many ups and downs in the history of amateur radio, it will be a change to have these corportately managed.

Regarding objectives, I believe these are already incorporated in the Articles of Association and I quote what I believe is the most important of the 16 listed:

"2. To represent generally the views of persons connected with amateur radio in the Commonwealth of Australia and its territories and dependencies." "5. To promote the development progress and advancement of amateur radio."

Those two are the key objectives and the task of incoming management is to pursue these and the other 14.

I would like to see the following words added to objectives 2 and 5 after the words amateur radio — ". . .and the Amateur Radio Communication Service as defined at Article 1 of the ITU Radio Regulations."

There is a tendency to overlook the fact that not all radio amateurs are members of the ARCS. The ARCS is the only group of radio amateurs allocated spectrum space for defined purposes and objectives; an abrogation of those will surely mean a reduction or complete withdrawal of the allocations. The WIA must therefore regard promoting the development, progress and advancement of the ARCS, as now defined as one of its most important objectives.

Yours sincerely,
Lindsay Lawless VK3ANJ
PO Box 112
Lakes Entrance, Vic. 3909

ar

REMEMBRANCE DAY CONTEST

from Stan Dogger VK2KSD

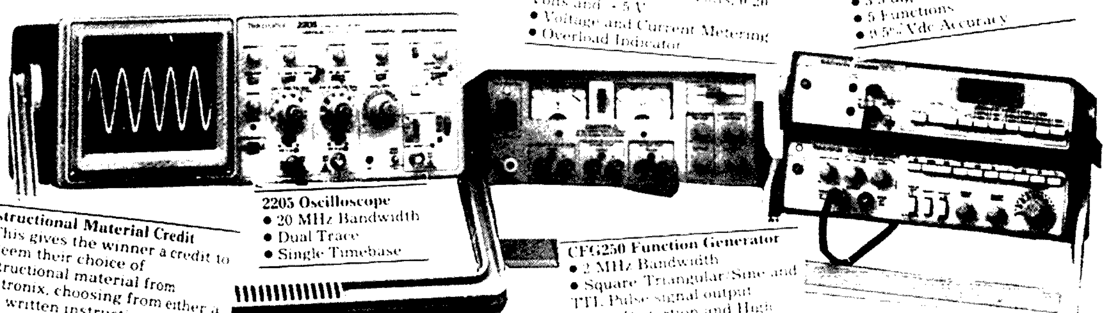
Points should be awarded due to difficulty of making a contact, ie:
SSB — 4 points
Morse — 1 point
But, subtract SSB - 2 points Black Box operation
Add CW — 1 point Encouragement.
Therefore, SSB-CW = equal points!
Multipliers:
Count Novice CW 25 percent of score of CW contacts.
Home-brew CW 25 percent of score of CW contacts
SSB 50 percent of score of SSB contacts.
Power SSB/CW 10 percent of score under five watts PEP.
Distance within VK 10 percent of score over 500 kilometres.
73
Stan Dogger VK2KSD
Tunnel Road
Stokers Siding, NSW. 2484

ar

Australian Electronics Monthly

WIN!

We could have said **SUBSCRIBE!**, but that's not as enticing as WINNING something. By subscribing to *Australian Electronics Monthly* in the next few months you could be doing both, subscribing **and** winning.



CPS250 Tri-output Power Supply
- Three outputs, 0-20 Volts, 0-20 Volts and +5 V
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CDM250 Digital Multimeter
- 3.5 digit Operation
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- 0.5% Vdc Accuracy

Instructional Material Credit
- This gives the winner a credit to redeem their choice of instructional material from Tektronix, choosing from either a well written instructional manual OR a comprehensive video tape.

2205 Oscilloscope
- 20 MHz Bandwidth
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Just think, you could be the proud owner of not only a subscription to Australia's finest electronics magazine, but the smug possessor of four pieces of lab equipment from the highly regarded Tektronix range, generously offered by Tektronix Australia.

So, you could say you'll be winning in two ways. You get the chance to win the Tektronix workshop and be the envy of all your mates, AND you get Australian Electronics Monthly mailed straight to your home or work, also becoming the envy of all your mates. HOW CAN YOU LOSE?

Don't wait! Complete the coupon provided and mail it TODAY! Just fill in the details, answer the question and tell us in twenty-five words or less what is attractive about this offer. It's that simple!

Yes, I would like to subscribe to Australian Electronics Monthly for:

☐ 1 year ($42)
☐ 2 years ($78)

NZ: A$60 1 yr surface mail, A$66 air mail.
(Unfortunately competition is unavailable to residents outside Australia)
Overseas rates on application.

☐ Yes, I do want to enter the competition.
☐ No, I don't want to enter the competition.

I am paying by:
☐ cheque ☐ money order
☐ Bankcard ☐ Mastercard ☐ Visa

Name: ____________

Address: ____________

____________ P[illegible]code: ________

No: ____________

Signed: ____________ Phone: ____________

[illegible]

● Q. What is the name of the circuit in any oscilloscope which sweeps the spot from left to right across the screen?

Tell us in 25 words or less what is attractive about this special offer.

[illegible]

[illegible]

IONOSPHERIC SUMMARY

The IPS Radio and Space Services summary for August contains the following information:

The monthly averages are:
10 cm Flux — 154.5
Sunspot Number — 111.2
A Index — 10.0
I Index — 84.9
Flares — 7

Solar activity was mostly low in August. There were seven small M Class Flares during the month, mostly in the period from August 1 to 3. The largest flares for the month were the M2 Flares on August 1 and 233. The 10 cm flux varied considerable during the month, the highest value being 190 on August 31. The low for the month occurred on August 21-22 with a value of only 113. The monthly averaged flux value was 154.5 which is the largest observed for any month so far this cycle, but was only just above the previous month's value of 153.4.

The monthly averaged sunspot number was 111.2 which is just under last month's value of 112.6 — the largest this solar cycle! The yearly averaged sunspot for February 1988 was 64.5, up sharply from the previous month.

The Class M Flares occurred on August 1, 2, 3 (when there were two), 8, 23 and 26.

The geomagnetic field was very disturbed on August 9, an extended but relatively weak disturbance on August 12 to 15, the most disturbed being August 14. On August 20, the field was generally active throughout the day. On August 22, the field was very disturbed from 0000 UTC until around 0900 UTC. August 25, saw a sudden commencement occurred at 0930 UTC. All the geomagnetic disturbances were weak, August 22 being the most disturbed day with the A Index reaching a value of 22.

August was a good month for ionospheric propagation due to the high solar flux values during the month and the low level of solar activity and geomagnetic disturbance.

M or X Class Flares refer to the Xray classification system for solar flares. In this system X Class Flares are more energetic than M Class Flares. Class M Flares have an Xray power of between 0.01 ergs/sqcm/sec and 0.1 ergs/sqcm/sec. Class X Flares are very energetic having Xray powers greater than 0.1 ergs/sqcm/sec.

The 10 centimetre Flux is the radio power of the sun at a frequency of 2800 MHz (wavelength 10.7 centimetres). This flux is a good indicator of solar activity and is widely used in place of the sunspot number. Unlike the sunspot, the 10 centimetre Flux never drops to zero even during a solar minimum. With no sunspots visible on the solar disc the 10 centimetre Flux will still have a value of around 67.

SUNSPOT NUMBER	10 CM FLUX
0	67
20	78
40	93
60	110
100	147
150	195
200	243

SOLAR ACTIVITY AND SATELLITE LIFETIMES

All satellites in Earth orbit are subject to various perturbing influences which can alter their orbit. Satellites in low Earth orbit, with perigee altitudes below 2000 kilometres, are predominantly subject to atmospheric drag. This force very slowly tends to circularise and reduce the altitude of the orbit. The rate of 'decay' of the orbit becomes very rapid at altitudes less than 200 kilometres, and by the time the satellite is down to 180 kilometres it will only have a few hours to live before it makes a fiery re-entry down to the Earth. The temperatures attained during this re-entry are usually great enough to vapourise most of the satellite but if it is particularly large, or under certain conditions, component pieces may reach the ground.

The rate at which a low satellite orbit decays is a function of atmospheric density at each point along the orbit together with satellite's cross sectional area and mass.

The air density varies along the orbit, being a function of latitude and longitude, time of day, time of year and season. However, at a fixed point in space, if we average the short time variations, we find that the density can be expressed in terms of two space environmental parameters. These are the solar 10 centimetres radio flux (F_{10}) and the geomagnetic index A_p. As each of these increase we find a corresponding increase in the atmospheric density at altitudes above about 120 kilometres.

The uncertainty in prediction of the space environment coupled with unresolved variations in atmospheric density preclude us from being able to specify exactly when a satellite will re-enter the atmosphere. Even quite sophisticated programs can only claim a prediction accuracy not better than 10 percent. This means that one day before a particular re-entry is due, the uncertainty in time of fall will be at least two hours. The satellite will have circled the globe within this time span.

The graph in Figure 1 gives a very rough guide to the lifetime of a satellite with effective mass to cross-section ration of 100 kg/m² in a circular orbit below 300 kilometres. Two cases of constant solar activity are considered, one representing solar minimum conditions, and the other solar maximum. The geomagnetic field is assumed to be quiet during this period. The lifetime values may be linearly scaled for satellites of differing mass to area ratios.

—Compiled by Frank Hine VK2QL from information supplied by IPS Radio and Space Services
ar

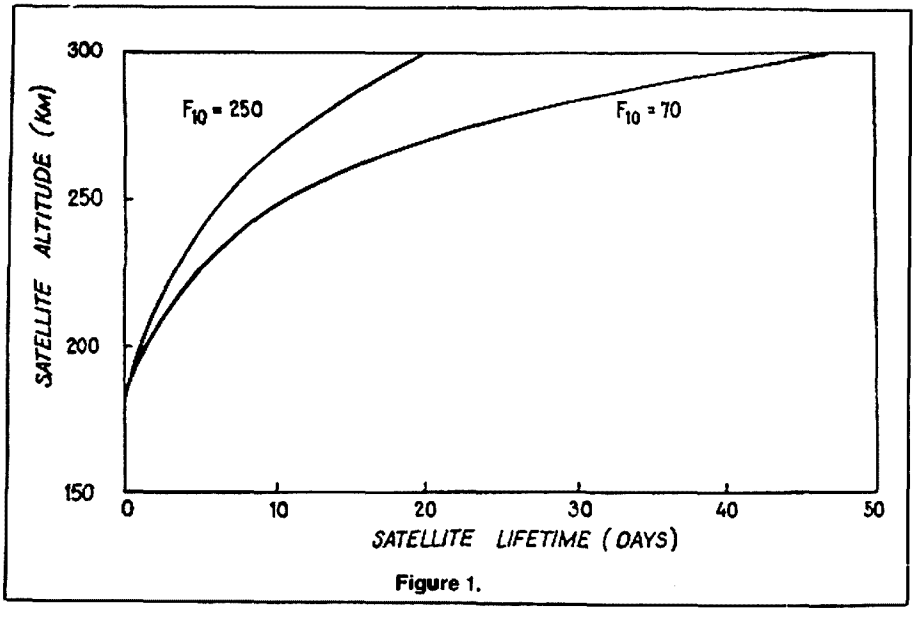


Figure 1.

HOW TO JOIN THE WIA

Fill out the following form and send to:

THE MEMBERSHIP SECRETARY
WIRELESS INSTITUTE OF AUSTRALIA
PO BOX 300
CAULFIELD SOUTH, VIC. 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms: .....

Call Sign (if applicable): .....

Address: .....

.....

State and Postcode: .....

HAMADS

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 millimetre SASE to: **RJ & US IMPORTS**, Box 157, Mortdale, NSW. 2223. (No inquiries at office please . . . 11 Macken Street, Oatley). Agencies at Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

RADFAX2: Hi-Res radio facsimile Morse & RTTY program for IBM PC/XT on 360K 5.25" floppy + full Doc. Need CGA, input port, SSBhf FSK/Tone decoder. Has re-align auto-start view save print. Also "RF2HERC" same as above but suitable for Hercules card and "RF2EGA" for EGA card (640X350 mode) Programs are $30 each + $3 postage ONLY from M Delahunty, 42 Villiers Street, New Farm, Old 4005. Ph. (07) 358 2785.

WANTED — ACT

KENWOOD FM-430 FM BOARD: YK-88CN CW filter, MS-1 mobile stand for TR-2500, MC-60A or similar scanning desk-top mic. VK1ZVR. Ph: (062) 58 9333.

WANTED — NSW

9 MHz OR 10.7 MHz CRYSTAL FILTER: Hy-Q QF9B0, QF10E7, Pye 90A or similar. As used in Building Blocks project from AR July 75. Jim Watson VK2XLL, C/- PO Stokers Siding, NSW 2484. Ph: (086) 77 9370.

RECEIVER: Amateur HF bands. No mods. Details to: N K Shaw VK2FJ, 16 Hynes Place, Camden East, NSW 2570. Ph. (046) 55 1577.

WANTED — VIC

OPERATOR'S OR TECHNICAL MANUAL: for Diablo 1620 printer. Will pay cost for photocopying, etc. Contact Denis VK3VDR. Ph: (057) 65 2321.

WANTED — QLD

AUTOMATIC AERIAL TUNING UNIT: Ph. (071) 83 5162, reverse charges.

DOW-KEY: Two position antenna relay with external contacts. UHF or N-type connectors preferred. Also, connectors for FHJ50 1/2 inch Andrew Spiral Shield Hardline. (older type than LDF450) UHF or N-type female or male preferred. New or used okay. VK4QV (QTHR VK4AGQ). Ph: (07) 266 8107.

KENWOOD SW-200 COUPLER SWC2: Doug VK4XX, PO Box 57, Zillmere, Old 4034.

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.

* Eight lines free to all WIA members, ninth line for name and address. Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.
* Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment. (A courtesy note will be forwarded that the ad has been received and will appear in . . . . . issue of AR.
* Copy in typescript, or block letters to PO Box 300, Caulfield South, Vic. 3162
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

STATE : .....

MISCELLANEOUS ☐

FOR SALE ☐

WANTED ☐

Name and Call Sign: .....

Address: .....

Phone Number (if applicable): .....

RADIO VALVE: Type No 7360 as used in FT-200. Price to: N Jones VK4NJ, 10 Bunowen Street, Ferny Grove, Brisbane, Old. 4055. Ph: (07) 351 4565.

SIX METRE SSB TRANSCEIVER: Must be in "as new" condition. Willing to pay top price for good equipment. John Lauten VK4VK, 6 Tosti Street, Sorrento, Old. 4217. Ph: (075) 38 5188 (BH) or (075) 38 1759 (AH).

QUALITY RECEIVER: R1000, R2000 or similar. Details to John VK4SZ, QTHR. Ph: (070) 61 3286.

WANTED — SA

KENWOOD TS-120S OR TS-130S. Will pay transport costs. Contact Tony VK5AH, QTHR. Ph: (08) 42 2037.

WANTED — WA

70 CM SWR COUPLER: for Kenwood meter SWR-200 (Model Nos SWC-2). Also, active antenna preamp/tuner for FRG-7700 com rx. Will pay reasonable market price. Call Allen. Ph: (09) 448 0097.

FOR SALE — ACT

SHACK CLEARANCE: Kenwood TS-820 in good condition. $500 ONO. MFJ-1224 RTTY/CW modem with software & TRS-80C computer. $400. TP10 Printer $60. WM-7000 watt meter $20. Learning aids to full call incl Morse Tutor lecture notes, etc. Ian L10124. Ph: (062) 54 4869.

YAESU FC-301 ANTENNA TUNER: 500W, 160-10 metres, with manual & original carton. $250. Pair of new RCA 6146A, $50 the pair. Muffin fans, 115V $5 ea. Digital DECMATE II computer, 10 MB hard disk, twin floppies, 4 operating systems, heaps of software, incl WP, Comms, Database, Spreadsheet, Basic, Fortran, Graphics. $2500. VK1ZVR. Ph: (062) 58 9333.

FOR SALE — NSW

KENWOOD TS-820: with CW filter, speaker & audio filter, external VFO, service manual, extras. $650. Antenna (USA) Wilson SYS-1, 3 band, 4 element, Yagi, installation book. $250. All in good condition. Ph: (02) 529 3668. **Licenced Amateurs Only.**

KENWOOD TS93X (TS-930): in mint condition. Built-in power supply & antenna tuner. $2000. Contact Harry VK2CAJ, QTHR. Ph: (02) 455 2178.

SHACK CLEARANCE: FT-780R & FT-480R 70 cm & 2m all-mode transceivers. $600 each. Kenpro KR-500 elevation rotator. Never used. $400. 75W 2m linear amp. $180. Toyo VHF/UHF SWR/Watt meter. $175. VHF/UHF 2 pole antenna switch. $40. 17 el 70 cm Yagi. $40. Shure 444 dynamic mic — the best. $125. Antenna mast 4m plus guys, hardware, mount. $50. Partially built 2m GASFET preamp plus OSCAR decoders. Larry Gagnon VK2EOY, 59 Fromelles Avenue, Seaforth, NSW. 2092. Ph: (02) 949 3124 (AH) or (02) 929 6455 (BH).

YAESU FT-ONE TRANSCEIVER: in exceptionally good condition. This is a general coverage, all mode, 100W HF transceiver. Has all optional extras & microphone. Hardly used. $1950. VK2EHL. Ph: (902) 918 9035. **Licenced Amateurs Only.**

FOR SALE — VIC

COLLINS KWM 2A 516 POWER SUPPLY: DX Eng Comp unit. Noise blanker, good supply tubes. Collins 7553 Rec fully solid state. Offers invited. Also, 312 B-5 Collins control unit. Hy-Gain Hi Tower Vertical Antenna. Covers 10 to 160 metres. Hal VK3MM. Ph: (03) 354 3986.

KENWOOD TS-520S: Original, had very little use since new. PC. DG5 Digital Readout, has dry-joint problems. $600 for both — no offers. Original packing. Also, Bendix Freq Meter LM-10 (similar BC 221). WWII Collectors item. What offers? Bob VK3AQK, QTHR. PH: (057) 44 1676.

TOWER: 14 MHz Southern X self-support motorised for tilting. Also, three band quad rotator indicator & cables. SSTV trans recvr, colour boards, cameras, etc. Ph: (055) 62 5361 for details.

YAESU FT-77: In perfect condition. WARC bands, FM board. $650. Murray VK3CGC. Ph: (03) 306 5430.

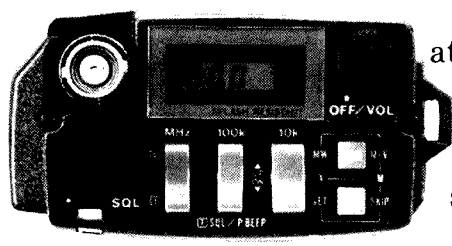
FOR SALE — QLD

YAESU FT-1: including Yaesu external speaker & Yaesu desk mic. Recently professionally service checked. $2650. Will consider near offer. John VK4SZ, QTHR. Ph: (070) 61 3286.

Advertiser's Index

ICOM PUTS POWER IN THE PALM OF YOUR HAND.

Seven watts of power is a respectable output for any transceiver. Now imagine the possibilities of that much power packed into a multi-functional handheld.



That's what you get when you attach the optional IC-BP7 battery pack to the new IC-2GAT from ICOM. And even the IC-4GAT pumps out 6 watts with the same battery pack.

Plus you also get plenty of advanced features in the one simple-to-use package.

There are twenty memory channels and one call channel. With programmed scan and memory scan built in. A pocket beep function lets you know if particular subaudible tones are being transmitted.

The top panel digital touchstep switches and readout make frequency entry simple, especially when the unit is belt mounted. And the squelch monitor unit makes squelch control easier too.

After dark operations are no problem because the LCD backlight shows all displays. Then the light turns itself off when you're not using the unit.

In fact, all models have a power saver function built in.

So we don't just give you more power in the palm of your hand. We help you keep it there as well.

Call (008) 33 8915 or (03) 529 7582 for your nearest ICOM stockist.

They'll give you all the power you ever wanted.

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