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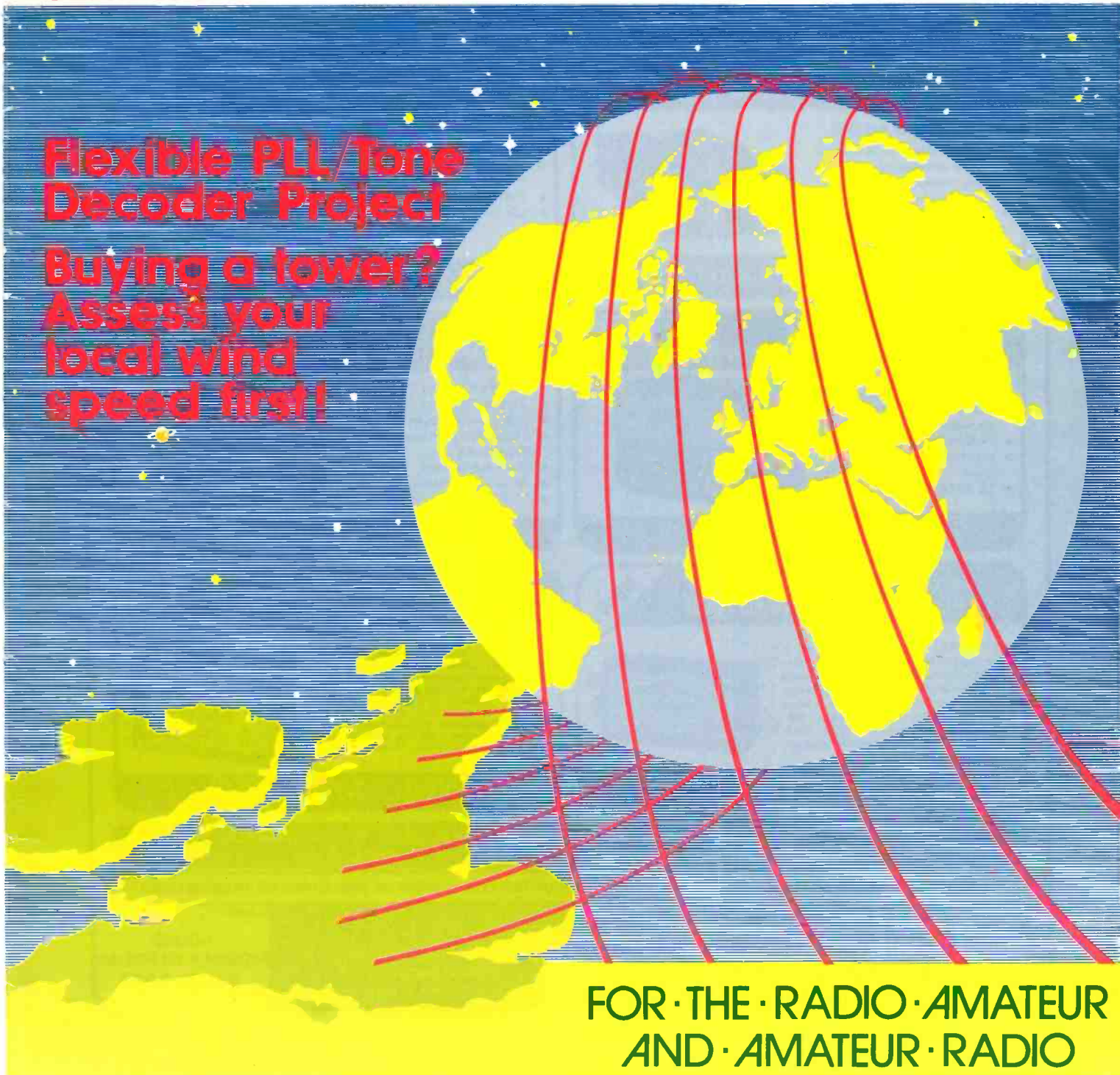
The SHORT WAVE Magazine

June 1984 Volume 42 Number 4



Flexible PLL/Tone Decoder Project

Buying a tower? Assess your local wind speed first!

FOR · THE · RADIO · AMATEUR
AND · AMATEUR · RADIO

SHORT WAVE MAGAZINE

(GB3SWM)

ISSN: 0037-4261

VOL. 42 JUNE, 1984 No. 488

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Editor: **PAUL ESSERY, G3KFE/G3SWM**
Advertising: **Charles Forsyth**

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AUTHOR'S MSS

Articles submitted for Editorial consideration must be typed double-spaced with wide margins on one side only of A4 sheets. Photographs should be lightly identified in pencil on the back with details on a separate sheet. All drawings and diagrams should also be shown separately, and tables of values prepared in accordance with our normal setting convention — see any issue. Payment is made at a competitive rate for all material used, and it is a condition of acceptance that full copyright passes to the Short Wave Magazine, Ltd., on publication.

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LOWE SHOPS

Whenever you enter a LOWE ELECTRONICS' shop, be it Glasgow, Darlington, Cambridge, London or here at Matlock, then you can be certain that along with a courteous welcome you will receive straightforward advice. Advice given not with the intention of "making" a sale but the sort which is given freely by one radio amateur to another. Of course, if you decide to purchase then you have the knowledge that LOWE ELECTRONICS are the company that set the standard for amateur radio after-sales service. The shops are open Tuesday to Saturday and close for lunch 12.30 till 1.30 pm.

In Glasgow the LOWE ELECTRONICS' shop (telephone 041-945 2626) is managed by Sim GM3SAN. Its address is 4/5 Queen Margaret's Road, off Queen Margaret's Drive. That's the right turn off Great Western Road at the Botanical Gardens' traffic lights. Street parking is available outside the shop and afterwards the Botanical Gardens are well worth a visit.

In the North East the LOWE ELECTRONICS' shop is found in the delightful market town of Darlington (telephone 0325 486121) and is managed by Don G3GEA. The shop's address is 56 North Road, Darlington. That is on the A167 Durham road out of town. A huge free car park across the road, a large supermarket and bistro restaurant combine to make a visit to Darlington a pleasure for the whole family.

Cambridge, not only a University town but now the location of a LOWE ELECTRONICS' shop managed by Tony G4NBS. The address is 162 High Street, Chesterton, Cambridge (telephone 0223 311230). From the A45 just to the north of Cambridge turn off into the town on the A1039, past the science park and turn left at the first roundabout. After passing a children's playground on your left turn left again into High Street. Easy and free street parking is available outside the shop.

The Capital City also has a LOWE ELECTRONICS' shop managed by Andy, G4DHQ. Easy to find, the address is 278 Pentonville Road, London N1 9NR (telephone 01-837 6702) and the shop is located on the lower sales floor of Hepworths. That's only a 3 minutes walk from Kings Cross railway station. So, when you're in the Capital City, visit LOWE ELECTRONICS.

Finally, here in Matlock David G4KFN is in charge. Located in an area of scenic beauty a visit to the shop can combine amateur radio with a outing for the whole family. May I suggest a meal in one of the town's inexpensive restaurants or a picnic on the hill tops followed by a spell of portable operation.

if I am absolutely honest,

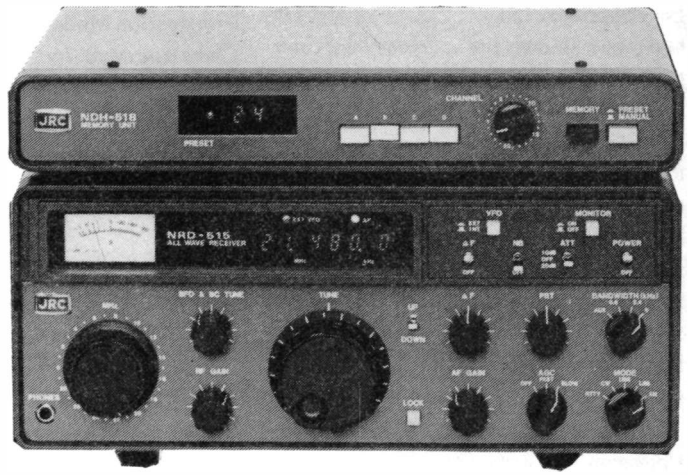
I am not certain whether I own a NRD515 because of its unbelievable performance as a general coverage receiver or just for the sheer pleasure of having and constantly admiring probably the finest piece of equipment available today.

Perhaps it comes down to the same thing, certainly the other NRD owners I have spoken to have all expressed the same feelings, that the NRD515 is a receiver in a class of its own.

As a person not owning the receiver, you may ask what sets this particular one above all the others. This is difficult to define—the feel of the equipment when wandering over the crowded band, its signal handling capability and selectivity can only really be appreciated by use. Technically, the equipment is above reproach. JRC's manufacture and production control methods as applied to other items in the range are equally applied to their amateur products. The other items referred to, only a small part of the vast range, are marine radio equipment, Marisat mobile terminal, Omega navigators, Doppler sonar, echo sounder/fish finders, communication satellite earth stations and a complete range of avionic beacons, radar and associated products. Indeed, a wider range application of electronic and radio technology for land, sea and air.

You may be forgiven for associating such advanced technology with complexity of operation, a piece of equipment that needs an operator with an electronics degree. However, this assumption is incorrect. The NRD515 is easy to use with the minimum of controls to ensure the operator really enjoys his listening time. Digital readouts, MHz, mode and filter bandwidth switches together with a VFO knob that will tune the band continuously without using any other control, from 100KHz to 30MHz or vice versa. To assist with difficult band conditions the NRD515 has pass band tuning and the medium wave broadcast section to 600KHz to 1.6MHz has a preselector control to cope with crowded conditions.

To give real "armchair copy" JRC have introduced the NCM515 remote control keypad. As its name suggests the NCM515 enables frequencies to be quickly keyed into the receiver. Four memories are provided, two rates of frequency stepping in increments of either 100Hz or 10MHz and finally the ability to add to or subtract from the operating frequency by any frequency step. Add the optional 600Hz CW filter and the 96 channel memory unit and, as the other NRD515 owners would say, "a joy to own".



the **NRD 515**

NRD515	monitoring receiver	£965.00 inc vat.
NDH515	96 channel memory unit	£264.00 inc vat.
NCM515	remote frequency controller	£125.00 inc vat.
NVA515	speaker	£34.50 inc vat.
CFL260	500Hz CW filter	£39.10 inc vat.
CFL230	300Hz CW filter	£64.00 inc vat.

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Chesterfield Road, Matlock, Derbyshire. DE4 5LE.
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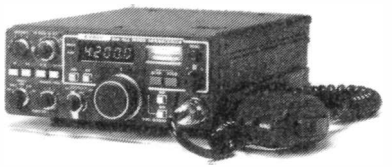
TR9130 TWO METRE ALL MODE TRANSCEIVER

This rig is proof, if one needed it, that TRIO do not bring out new models just for the sake of it. The TR9000 is remembered as a classic rig and today people are still asking for second hand ones, even they are a rarity on our S/H shelf. The TR9130 incorporates the improvements that all amateurs asked for, green display, reverse repeater, tune whilst transmitting, higher power, more memories and of course memory scan. TRIO's answer, the TR9130.

TR9130..... £442.52 inc vat.



TS780 DUAL BAND BASE STATION TRANSCEIVER

The TS780 is the perfect base station VHF/UHF transceiver for the enthusiastic operator. The rig has all the necessary control functions essential for operating on both today's busy two metre band and the wide spaces of seventy centimetres. Full repeater facilities plus reverse repeater are included and the transceiver has the usual memory channels (10), two VFO's, up/down frequency shift microphone, IF shift, two priority channels, memory and band scan, etc. A superb rig, I have one myself, ring for a full enthuse!

TS780..... £795.00 inc vat.

TR7930 TWO METRE FM MOBILE TRANSCEIVER

Those who have used or owned a Trio TR7800 will know what I mean when I say that Trio, with the introduction of the TR7930 have improved on the unimprovable. The Trio TR7930 improves on the TR7800 by giving a green floodlight liquid crystal display, extra memory channels, both timed and carrier scan hold, selectable priority frequency and correct mode selection (simplex or repeater). The most significant change is the liquid crystal display, but closely following this must be the ability to omit specific memory channels when scanning and the programmable scan between user designated frequencies.

TR7930..... £312.11 inc vat.

R2000 GENERAL COVERAGE RECEIVER

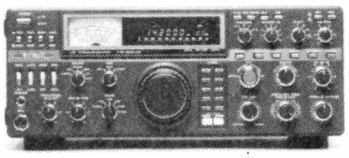
The amateur bands are only a very small part of the radio spectrum, many other transmissions are available for the short wave listener. Broadcast stations provide an alternative source of current information both political and regarding the life style of the country. Fitted with the internal VHF converter the R2000 covers continuously frequencies from 118 to 174 MHz giving access to amateur two metre transmissions (am, fm, ssb and cw) plus a lot more. Having 10 memories, memory scan and programmable scan the R2000 provides in one rig the perfect receiver.

R2000..... £421.36 inc vat.

TS930S HF TRANSCEIVER WITH GENERAL COVERAGE RECEIVE FACILITIES

Much has been said about the TS930S transceiver and it now has a place high in the affection of those amateurs fortunate enough to own one, indeed it has become the "flagship" of the TRIO range. Providing full amateur bands plus a general coverage receiver (150kHz to 30MHz), the TS930S has every conceivable operating feature for today's crowded frequencies.

TS930S..... £1150.00 inc vat.



TR2500/TR3500 HANDHELD TRANSCEIVERS

Two first class hand held transceivers, one for two metres and the other for seventy centimetres. Ten memory channels, band and memory scan, repeater shift, reverse repeater and a low power position make the rigs extremely useful for the radio amateur who wishes to keep in touch with his local scene. A comprehensive range of accessories, base station charger, speaker microphone, mobile mount, etc, can be added to enhance operation, accessories used with one rig being compatible with the other.

TR2500..... £237.82 inc vat.
TR3500..... £256.45 inc vat.

TS530SP HF AMATEUR BAND TRANSCEIVER

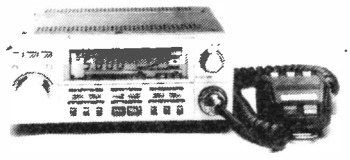
A logic progression from the reliable TS520 series the TS530SP was the most popular HF rig in the range. I use the term "was" because TRIO decided to cease production and supplies were no more, however the demand from radio amateurs worldwide for the transceiver have continued and TRIO have reintroduced the rig. A standard HF valve transceiver without the frills but providing today's amateur with all necessary facilities for reliable world wide communication, the TRIO TS530SP. Now fitted with notch filter.

TS530SP..... £638.00 inc vat.

TW4000A DUAL BAND FM TRANSCEIVER

I have been waiting for this rig for the last three years, now it is here and I am using one, words fail me. Send for details.

TW4000A..... £469.00 inc vat.



just a part of the range

Securicor carriage on the above items £6.00

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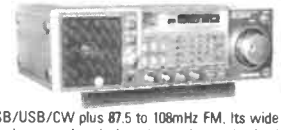
NEW

New from Panasonic is the RF B600LBS/LBE deluxe communications receiver. Featuring green LED display accurate to 100Hz, computer controlled function selecting, this fully portable receiver is one of the best we have seen for some while. Coverage is 150kHz to 30mHz AM/LSB/USB/CW plus 87.5 to 108mHz FM. Its wide range of features include 9 memory channels, comprehensive scanning, lock and search, synthesised tuning in varying steps down to 100Hz, slow/fast tuning, AM bandwidth and noise limiter, memory battery back-up, RF gain control, internal whip, external SO239 connector, 230v AC, internal battery or external 13.8v D.C.

PANASONIC RF-B600L



£399

NEW CATALOGUE NOW AVAILABLE SEND S.A.E.

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AT230 ATU	£138.00
SP230 Speaker	£42.00
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SP102 Speaker	£52.50
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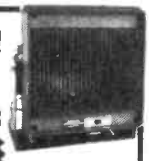
MH-1B8	£14.95
YD148A Mic.	£24.00

NEW! AZDEN MOBILE SPEAKER



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IC290D 2m 25w	£469.00
IC471E 70cm Base	£699.00
IC490E 70cm	£495.00
ICO2 2m h/held	£229.00
ICO4 70cm h/held	t.b.a.
HM9 Spkr/Mic.	£16.50
LC3 Case	£5.00
LC11 Case	£6.95
BP3 Nicad	£25.00
BP4 AA	£7.96
BP5	£48.00
DC1 12v	£12.50

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Carriage £4.00

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Here's a very brief description of new products back in stock or just arriving. **DF-72C** 2m/70cm duplexer for mobile or base station £19.50; **DP-EL770E** dual band 2m/70cm aerial £19.95; **DP-GH72** 70cms 6dB base station aerial £35.75; **5 BAND DIPOLE** – the latest model from Sagant, the MT-240X covers the 5 bands 10-80m superbly built 70' long complete with balun £54; **BASE STATION MICS** – the new Adonis base mics feature 2 models – AM303G with up/down and response switch £36.50 and the beautiful AM503G noise cancelling plus compressor £47.50; **MOBILE MICS.** – the new Adonis FS-3 is a deluxe mobile mic. that fits sun vizor roof mount – comprises boom mic, roof speaker and control box with up/down control £52; **ICOM OWNERS** – modern ICOM rigs only work with ICOM mics. – Adonis have come up with an 8 pin mic. adaptor plug that matches any mic. to your ICOM rig £10.95; **AR2001** – superb monitor receiver 26-512mHz £325; **BELCOM LS202E** – at last an all-mode 2m hand held £225. **ARRL HANDBOOK 1984** – £12.50; **ARRL ANTENNA BOOK** – £7.95; **UNIVERSAL MAG MOUNT** – SO239 £7.95.

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Items required .....

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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT WAVE Magazine

EDITORIAL

Laws

It is of interest to note a recent case in Manchester Crown Court, which was concerned with the use of an illegal CB set. The court decided that an offence had been established because the set was available for immediate use at any time. Presumably that means the aerial and the mains were connected at the time the equipment was inspected; if so, this must represent an enormous advance in the position when it comes to prosecuting 'pirates'. It is understood the case may go to the House of Lords and we await the result with great interest — remembering that although such a ruling would be very good news, it also has serious implications for the law-abiding radio amateur and SWL who each may have equipment capable of immediate illegal use.

The second item under the heading concerns the group of comics from Australia (ARTAC — Amateur Radio Third-Party Action Committee, so called) which seems to think we in the UK are lagging seriously behind other Commonwealth countries in our licensing — apparently they've never heard of the difference between Region 1, Region 2, and Region 3 band limits. And, saints preserve us, they want us to get into third party messages, and practice 'passing' them. Just imagine it — our already overcrowded bands full of messages that Auntie Agatha has arrived safely at the supermarket to the relief of her adoring family. What utter bilge it is! Our own view is that the proper place for passing such messages is *via* the telephone or the letter-box — or CB. It would be more useful if this VK pressure group could direct its undoubted energy towards a more worthwhile goal.

And talking of worthwhile goals, what about considering a stiffening in the 'operating procedure' section at the time of the next RAE-syllabus revision? After all, to hold a radio licence for a yacht or light aircraft — in the 'hobby' context for both — the test is almost 100% procedure, because it has been shown to be necessary in those areas. It has been shown — painfully so — to be necessary in 1984 on the amateur bands.

WORLD-WIDE COMMUNICATION

VHF BANDS

NORMAN FITCH, G3FPK

Legal Matters

APRIL 12, 1984 was an important date in the calendar being the day that the Telecommunications Bill received the Royal Assent, thus getting on to the Statute Book as the *Telecommunications Act, 1984*. The Bill went through its committee stage with little opposition and will, hopefully, tidy up the many loose ends of earlier Acts.

The appropriate authorities now have clearly defined powers to deal with all unlicensed operators, whether those who "borrow" unlisted or expired call signs on the amateur bands, the so-called CB DX-ers on 6 MHz or the punk rockers who set up their own stations in the FM broadcast band.

For years it had been assumed that the possession of transmitting equipment by someone not holding a valid licence to operate it was not an offence, provided they refrained from using it. Therefore, unless a pirate was literally caught in the act using his transmitter, a prosecution was unlikely to succeed. However, this motion was dispelled at Manchester Crown Court recently, when it was ruled that an offence *had* been committed because an illegal CB radio was available for immediate use at any time. It seems this case will go to the House of Lords as the precedent has far-reaching effects.

Immediate problems arise with genuine *s.w.l.'s* who use transceivers for listening and eventual use when they pass the *R.A.E.* Then again, many of us have transceivers which are immediately capable of operation outside the narrow amateur bands, *e.g.* your scribe's *IC-730* which covers 6.9 to 7.6 MHz in the 40m. position. While all law-abiding radio amateurs will welcome a clamp-down on those who flagrantly b. eak the law, we must ensure that the activities of properly licensed radio amateurs are not infringed by such Court rulings. The repercussions of the Manchester case are awaited with interest.

Awards News

Coverage of the QTH Squares Century Club awards programme in the recent issue of *DUBUS INFORMATIONEN* has resulted in a number of inquiries from overseas operators. Two more 144 MHz certificates have been awarded, no 35 going to Robert Köhler, OE1RKU, (II63f) from Vienna in Austria. His was issued on April 14 for 110 squares confirmed as verified by the *Oe.V.S.V.* Awards Manager Karl Pansi, OE6PN. All the contacts were made using SSB mode and 81 tropo., six *via* MS, 11 each *via Es* and *Auroral* propagation and one by *FAI*. The last is the first claim for a contact via Field Aligned Irregularity mode and was with F1FG in CD24g on Aug. 15, 1982. Unfortunately Robert did not send any personal or station details with his claim.

Wolfgang Kager, OE3OKS, (IH21h) from Ternitz in eastern Austria is member no. 36, his certificate being issued on April 16. His QTH is 40 miles south-west of Vienna, 400m. *a.s.l.* in a valley with mountains up to 2,000m. in the vicinity. Even so, take-off is good all around except to the west. First licensed for 144 MHz and above in July, 1978, Wolf now has a full licence for all bands since May 27, 1983. Unfortunately, due to a motorcycle accident in 1962, he is now a "pensioner," so undoubtedly amateur radio is a welcome hobby. His VHF station comprises a *Yaesu* FT-221 with *muTek* "front end," plus *Gasfet* preamplifier. The antennas are two 16-ele. *Tonna Yagis* on a tower plus a 10-ele. *Yagi* on the house for general monitoring. The PA uses a single 4CX250B valve.

Wolf has 138 confirmed so got his "125" sticker when the certificate was issued. His QSLs were also verified by OE6PN and all but one were for SSB QSOs. 69 were tropo., 44 *Es* 9 MS and 16 *Ar* contacts. Wolf operates on 70cm. with a *Yaesu* FT-780R and 21-ele. antenna and he also monitors on 50 MHz for TV DX.

Details of the QTHCC and VHFCC awards can be obtained by sending an s.a.e. to the address at the end of this feature. If you have 100 or more squares confirmed for the QTHCC, please ask for the application form as well as the rules.

Contest Notes

The second leg of this year's Microwave Cumulative Contest is on June 17, 1000-1800 GMT the band being 3.4 GHz. The next leg is on July 1 when it will be the turn of the 24 GHz folk. The 2nd leg of the 10 GHz Cumulatives is on June 17, again from 1000-1800. The June 4m. and SWL Contest is on the 3rd from 0900 to 1500 GMT, coinciding with the latter half of HF NFD. This is an experiment to encourage groups to try VHF operation from "HF" sites and to try to assess the demand for an event that Class B licensees could participate in, under supervision.

On June 9, 1600-2400, there is the 23cm. Trophy Contest, followed next day, 0900-1700, by the 70cm. Trophy and SWL event. Both are two section, Fixed and All-other, affairs with radial ring scoring. On June 24, the VHF Phone WAB contest takes place on 2m. and 70cm. Details and log sheets from Mr. S. Lawrence, 7 Ashfield Road, Market Harborough, Leics. VHF NFD is scheduled for the weekend on July 7/8, 1400-1400 and entries will only be accepted from groups who have sent a site registration form to G3XDY by June 2. There are restricted and open sections, the former limiting stations to 25w *p.e.p.* output at the Tx, antennas not exceeding 35ft. *a.g.l.* and no stacked or bayed, multiple monsters. Full, lengthy rules were in the April *RadCom*.

Beacon News

In recent *Auroral* manifestations, nobody has copied the 2m. beacon SK4MPI at the Max Planck Institute (HU46d) on 144.960 MHz. A check through SM0KJD on 20m. revealed that it is on, but very weak, so presumably the PA stage has failed.

Attempts to monitor HB9HB on 144.865 and EA1VHF on 144.867 MHz in the London area are invariably thwarted due to a group of FM-ers in North London who have taken up permanent residence on 144.875 MHz. From the comments, they are well aware they are interferring with the beacon service, but obviously could not care less. This group is a mixture of licensed amateurs and pirates and it is surprising that the former, who obviously know their pirate friends, break their licence conditions by working them. It would be interesting to see if they actually log these non-licensed stations.

There is much "rule bending" by some of the licensed stations, such as letting their unlicensed wives operate while they are mobile, etc. One callsign being pirated is G6IEG by one Melvyn, the rightful owner now being a class A operator in Edinburgh. At least six call signs heard frequently have either lapsed or belong to other people so, with the increased fines now available to the Courts for un-licensed operation, there could be a worthwhile addition to the Treasury's coffers following a determined effort to curtail this illegal activity.

The Satellite Scene

The University of Surrey's telephone answering service on May 2 reported that the *North American Air Defense Network* had been searching among the 15,000 man-made objects orbiting the Earth in an attempt to positively identify *UOSAT-2*. Should it ever be found, the message suggested that the *Stanford Research Institute's* 150ft. dish antenna, with high power, would be used to try to command this lost, dead and useless spacecraft.

Steve Reading, G4LZD, (Devon) has been using the Soviet *RS* satellites for the first time and has worked through *RS-6, RS-7* and *RS-8* into five European countries. He is the only reader to report operating on Mode A. From Adrian

Chamberlain, G4ROA, (Coventry) came the sad news of the death of Bayman McWhan, W2GAX, who was a regular operator through the *A-0-8,* then through *Oscar-10.* They had regular skeds and W2GAX made many contacts with U.K. amateurs, and was born in Harrogate but had lived in Morris Plains, New Jersey for many years. He was 79. G4ROA reports nothing new worked through *0-10,* but quite a few Californian operators previously worked pop up to say, "Hi."

Tim Kirby, G4VXE, (Gloucs.) had his first *0-10* QSO on April 30 during orbit no. 662 with W6MFO, so will be experimenting further. Reg Woolley, GW8VHI, (W. Glam.) has also been active on *0-10* and lists KV4AD, YV4WT/W4 and W8GUS on orbit no. 613 on Apr. 6, the following orbit providing VK5ZRO and UA0SBI. On Apr. 7 at 0156 on this orbit, Reg contacted 9M2CR for the claimed first GW/9M2 satellite QSO according to the QSL already received. Other QSOs that day included ZS6CAV, JR2BJE/1 and JA3IWA, VE2GFD and KB8E.

ANNUAL VHF/UHF TABLE

January to December 1984

Station	FOUR METRES Counties	FOUR METRES Countries	TWO METRES Counties	TWO METRES Countries	70 CENTIMETRES Counties	70 CENTIMETRES Countries	23 CENTIMETRES Counties	23 CENTIMETRES Countries	TOTAL Points
G4TIF	15	2	55	9	36	3	—	—	120
G1EZF	—	—	71	12	27	5	3	1	119
G4ROA	—	—	48	8	37	4	7	2	106
GW4TTU	—	—	72	18	5	2	—	—	97
G4ARI	17	1	61	12	—	—	—	—	91
GW8UCQ	—	—	46	9	26	6	—	—	87
G3BW	15	2	37	9	15	6	*2*	*3*	84
GD2HDZ	24	2	26	6	21	4	*1*	*1*	83
G4VXE	—	—	53	6	16	3	—	—	78
GW3CBY	6	3	39	7	15	4	*4*	*2*	74
G6HRI	—	—	39	7	23	4	—	—	73
G3FPK	—	—	62	10	—	—	—	—	72
G4MUT	21	2	23	5	17	2	—	—	70
G6MGL	—	—	36	6	22	6	—	—	70
G8PNN	—	—	11	6	30	10	5	7	69
G8TFI	—	—	—	—	47	10	5	3	65
G4NRG	13	1	21	10	17	2	—	—	64
G6AJE	—	—	55	9	—	—	—	—	64
G6ECM	—	—	51	10	—	—	—	—	61
G6HFF	—	—	35	7	11	4	—	—	57
G4LZD	—	—	42	7	—	—	—	—	49
G8XTJ	—	—	37	7	—	—	—	—	44
G6WXX	—	—	34	6	—	—	—	—	40
G6XSU	—	—	—	—	31	6	—	—	37
G8FMK	—	—	3	1	21	2	7	2	36
G6NVQ	—	—	32	3	—	—	—	—	35
G4EZA	—	—	20	6	—	—	—	—	26
GW4HBK	11	3	5	2	2	1	—	—	24
GU4HUY	—	—	16	3	—	—	—	—	19
G2DHV	3	1	9	2	—	—	—	—	15
G6CSY	—	—	6	1	4	1	—	—	12
GM4CXP	—	—	6	2	—	—	—	—	8

Three bands only count for points. Non-scoring figures in italics.

Maidenhead Squares

In the recent *IARU Region 1 Conference* in Cefalu, Sicily, it was decided to adopt the Maidenhead, or World, Locator System from Jan. 1, next. Ken Osborne, G4IGO, has pointed out that in European working, there is no real need to use the first two letters. His complete locator is IO 80 OV but he reckons that just 80 OV would be sufficient since a U.K. station could not be in any other 80 OV than IO field. Similarly a Spanish station in the present VD square could only be in IN 53, so the IN part could be dropped. It will be interesting to see what the contest rule makers come up with for next year.

New French Callsigns

Great excitment was caused recently when a weak station with an FCI callsign was heard on 2m. However, GW8VHI, who contacted one such station, explains that the French authorities are now issuing two letter prefixes, such as FC and FD, to mainland French stations. The new prefix for Corsica, which has been unofficially FC for decades, is now TK.

DX-Peditions

Walt Davidson, GW3NYY, has sent some advance information about a proposed expedition to XQ square in August. The dates are the 7th to the 15th, the callsign GB2XQ, and bands 144, 432 and 1,296 MHz. The main activity will be on 2m. MS during the *Perseids* shower. The other operators are likely to include G8TFI, GW4LXO, GW6EWA and GW8TVX. Skeds can be arranged by either telephoning Walt on Swansea (0792) 201111, writing to him at P.O. Box 21, Swansea, SA1 1ED or *via* the 20m. VHF net. Past DX-Peditions by Walt and his team have been very successful and reliable.

GW8VHI was informed by F1FHI of a proposed DX-Pedition to TG square from Aug. 2-15, using the callsign F0GAL/P. QRGs are 144.270, 432.270 and 1,296.270 MHz and the equipment line-up is 600w on 2m. with two 16-ele. *Yagis,* 600w on 70cm. with eight 21-ele. *Yagis,* and 200w on 23cm. using a dish antenna. Reg also mentions operation from XI38h from July 12 to 25 by OE5EFM on 2m. and the 20m. VHF net. Possible callsign F0FUX.

Six Metres

Jeremy Royle, G3NOX, (Essex) has been gratified at the number of reception reports he has received of his 6m. signals. His station comprises an *Icom* IC-551 with *Lunar Electronics* 6M10 120 P solid state, 100w amplifier, the antenna array being a pair of stacked 5-ele. *Yagis.* He finds normal tropo. contacts can be made with most of the U.K. although Scotland is more difficult. Even so, GM3WCS can be heard when there is a slight lift. The first *Es* QSO this year was with ZB2BL at 1440 GMT on Apr. 23, when Jim's signal was S9-plus on 6m., Jeremy being on 10m. G3NOX is on 50.100 MHz most mornings between 0715 and 0745 and monitors for ZB3VHF on 6m. while listening also on 28.885 MHz. He welcomes *s.w.l.* reports.

Dave Sellars, G3PBV, (Devon) is a keen 6m. chap and hears G3NOX at 304 kms. most mornings and has worked him crossband. He finds that the band does not seem to benefit from high pressure weather systems except over sea paths. For example, in the Feb. 13-15 period, signals over the 200 kms. path from Jersey were 20 dB up, whereas signals generally were much more enhanced on 2m. and 70cm. but 10m. was very poor. Dave has been sent a list of the various useful Band 1 TV TX's by Brian Bower, G3COJ, and finds that Kirk O'Shotts on 53.25 MHz is a good *Auroral* indicator, as well as MS activity pointer. Background "pine rate" is 50 *per* hour but in the January *Quadrantids* it rose four-fold. He has noticed strong Sun noise bursts in the mornings.

Dave Lewis, GW4HBK, has been QRV after evening TV closedown when earlier evening *Auroras* have occurred, hoping for a second phase. However, nothing materialised. On Apr. 26 and 27, GM3ZBE was copied at workable strength in QSO with G3OHH, but Dave was unable to break in. He reports activity still good with many licensees being heard regularly.

Four Metres

Paul Turner, G4IJE, (Essex) worked EI2CA for the first time on tropo. on Apr. 8 during the 6th leg of the *Cumulatives.* In the final leg on the 22nd, he reports poor activity. Terry Hackwill, G4MUT, (Berks.) has been QRV in these events which seem to be the only source of points for the Annual Table. During the big *Ar* on Apr. 27, he called "CQ" for ages on both SSB and CW but to no avail. Using

SSB, Martyn Jones, G4TIF, (Warks.) added seven more table counties on Apr. 22, best DX being Arthur Breese, GD2HDZ, who was also a new country. G4TIF was a new county for Arthur, too, along with G3BPM (Somerset) in the same session.

Two Metres

Quite an eventful month with a vast solar eruption, *auroras,* a reasonable meteor shower, some nice tropo. — for some — and the first *Es* of the year. Mick Allmark, G1EZF, (W. Yorks.) took advantage of some of it to take him to second place in the Annual Table. He has caught most of the several *Ar* events and on Apr. 2 at 1500 he copied GM3XOQ (ZT) and GM3JIJ (WS) but too weak to work. On the 4th, in the first phase from 1750-1900, he worked EI8EF (VO), GI8YDZ (WP), GW6CGR (XM), GM4NFC (XP) and GI4TAP (XO) at QTEs between 20 and 75 degrees. A second phase from 2220 to 0030 at QTEs 20° to 45° brought more GIs and GMs in XO, XP, YR and ZU. On the 5th, from 1525 more GIs and GMs in WO, WP, XO, XP, XR and YR were contacted, plus EI4AEB (WN). It lasted till about 1815, the QTEs being 5° to 85° but no 2nd phase was noticed. On the 9th at 0130 another *Ar* occurred but nil activity on SSB. UQ2AO and some SMs were heard on CW at QTE 65°. The next event was on the 25th when a few GIs and GMs were worked between 1722 and 1750 at QTE 30-60° and the following day from 1529 till about 1900, more GMs but his time some PEs as well at QTE 10-85°.

John Hunter, G3IMV, (Bucks.) worked GM3BOC/A (YS) in the Apr. 25 *Ar.* A couple of new squares were worked during the *Lyrids* meteor shower on the 22nd, UC2AAB (OO11a) and ON6UG/EA (AA). On May 5, G3IMV heard I3LGP mention that the I3s and I4s were working into OZ via *Es* at 1000. At 1032, John heard HG4KYB in QSO with someone and at 1033 a brief snatch of an IW0 was copied. At 1046, I3YXQ was contacted but the event was over by 1100. G3PBV worked I4ERN (GE) at 0946 and later heard I0SNY (GD). G4IGO heard Y24XN at S7 at 0956.

This first *Sporadic E* 2m. event in 1984 came much too late for written reports. G3IMV found that similar phenomenon occurred on May 4, 1980 around the peak of the *Eta Aquarids* meteor shower — see VHF Bands, June 1980, p. 218. From preliminary description of the signals and their widespread nature, it would seem this was an MS enhanced *Es* event.

G3PBV's remaining notes all refer to the April *Ar* events. The one on the 3rd, noticed at 1725, lasted till 1905 with some Gs and a GW strongly *Ar,* along with GMs in XP, XQ and YQ, a GI, two PAs and a weak SM6. The Kirk O'Stotts TV Tx was *Auroral* at 1935, still. On the 4th, GI4OPH was very strong at 1530, as was GI4OMK. At 1608, OZ7OL was a good signal along with some northern Gs and GWs and EIs. By 1900, it was all gone. The GIs on 2m. were *Auroral* before Kirk O'Shotts went that way. Nothing was heard in the event on the 25th, but the next day, from 1807, produced northern Gs and a few GMs, DK3BU, and EI8EF called unsuccessfully.

QTH LOCATOR SQUARES TABLE

Station	23cm.	70cm.	2m.	Total
G3VYF	—	117	307	424
OZ1EKI	—	116	345	461
GJ4ICD	1	115	230	346
G8TFI	51	109	126	286
G3JXN	67	108	164	339
G8FUO	39	105	88	232
G3PBV	34	101	171	306
G3XDY	54	101	149	304
G4BVY	9	100	—	109
G8KBQ	22	96	188	306
G3IMV	—	91	348	439
G3COJ	40	91	163	294
G4FRE	33	91	46	190
G8ULU	31	85	115	231
G4TIF	—	82	157	239
G8ATK	23	82	129	234
G4NQC	57	80	157	294
G3UVR	17	79	196	292
G4MCU	—	77	176	253
G8HHI	20	77	135	232
G4NBS	14	77	94	185
GJ8KNV	12	76	191	279
G4RZP	—	76	147	223
G8PNN	41	75	115	231
G8RZO	—	75	148	223
G4HFO	—	69	112	181
G8FMK	35	68	80	183
G4MUT	—	68	100	168
G6DER	22	65	105	192
GW8UCQ	1	65	105	171
G4BWG	—	64	152	216
LA8AK	25	62	200	287
G4ERX	7	61	132	200
G4TJX	—	59	90	149
G3NAQ	—	58	128	186
G4FRX	—	58	87	145
G4ROA	20	58	61	139
G8KAX	35	57	82	174
G8WPL	—	56	94	150
G8SRL	—	53	106	159
G4AWU	—	50	150	200
GD2HDZ	13	50	91	154
GW3NYY	—	48	209	257
G4STO	29	48	113	190
G4RGK	—	48	108	156
G4CQM	—	48	55	103
G6XSU	—	38	—	38
G3BW	6	36	233	275
G4KUX	—	36	193	229
GJ8SBT	20	35	182	237
G4HMF	2	35	144	181
G6ADH	—	35	135	170
GW3CBY	9	32	95	136
G4OAE	—	31	174	205
EA3LL	—	30	261	291
G6MGL	—	30	117	147
G4NRG	—	30	93	123
GW8VHI	—	30	61	91
G6CMV	1	29	142	172
GM4COK	—	28	204	232
GM4CXP	—	27	165	192
G6HR1	—	26	49	75
G6CSY	15	25	30	70
G8VR	2	24	239	265
G4RSN	2	22	81	105
G1EZF	2	19	44	65
G4ERG	—	16	243	259
G8ZDS	—	16	86	102
G6DDK	2	13	127	142
GM8YPI	—	13	96	109
G6PFR	—	13	50	63
G4MJC	—	12	120	132
9H1BT	—	11	210	221
GW4TTU	—	4	134	138
G6JNS	1	3	106	110
G4GHA	—	2	110	112
G4MWD	—	1	120	121
G3POI	—	—	417	417
DK3UZ	—	—	317	317
G4IJE	—	—	314	314
SP2DX	—	—	280	280
G4DEZ	—	—	241	241
GW4EAI	—	—	210	210
G3FPK	—	—	197	197
G3KEQ	—	—	194	194
G6ECM	—	—	174	174
G8LFB	—	—	165	165
G8TGM	—	—	158	158
G6HKS	—	—	148	148
GM4IPK	—	—	139	139
G4MFJ	—	—	135	135
G4DOL	—	—	116	116
G6DFT	—	—	105	105
G8VFV	—	—	97	97
GI4OMK	—	—	96	96
G8RWG	—	—	92	92
G6ABB	—	—	80	80
G8XTJ	—	—	74	74
G6AJE	—	—	74	74
G6NWF	—	—	67	67
G8ZYL	—	—	54	54
G4IGO	—	—	53	53
G4LZD	—	—	50	50

Starting date January 1, 1975. No satellite or repeater QSOs. "Band of the month" 70cm.

Tim Charles, G4EZA, has been a *Magazine* reader for eight years but writes for the first time to this column. His home station is in Colchester, Essex, and comprises a modified *Icom* IC-260E with a *Siliconix* U-310 preamp. The antenna is ". . a very ancient 8-ele. Yagi at 27ft . ." the feeder being 50ft. of UR-43 coax. He enters the CW table but only operates at weekends. His mother, June Charles, is G6WXX who got her licence last August, using Tim's station. They have a *Mirage* B-108 amplifier and continental working is easy.

John Nelson, G4FRX, discovered some strong *Es* on FM Band 2 on May 3. He was listening to *Radio 3* in his car in the middle afternoon when the frequency was captured by a strong Greek station for a while. Richard Burton, G4KPX, (N. London) mentions a couple of *Lyrids* MS attempts on CW. He only got two bursts from UP2BKH (KP) but did complete with LA8OW (EU) receiving a 30s. burst up to S9. He reports this shower as producing many pings, but few good bursts.

G4IGO was around for the *Ar* affairs of Apr. 4, 5, 25 and 26. The first event was discovered at 1748 with PA2VST and went on till 1900, returning again briefly at 1926. CW brought YN, YQ and ZO squares, with YL and XK heard. On the 5th at 1535, GI4OPH was heard, with fade out at 1612, though *Ar* signals still audible in YL square. They came back from 1639 to 1807 at QTE 25°. Ken had better luck in the last two with six GMs and two GIs worked on the 25th — QTEs from 15° to 30° — between 1608 and 1827. The 26th brought D, EI, F, G, GI, GM, GW and PA contacts between 1650 and 1905 at QTEs 25-60°. At 1722 there was a half minute noise burst and at 1726 another three, short but strong noise bursts. The Sun noise was terrific.

Nick Peckett, G4KUX, (Co. Durham) sent his usual detailed account of DX worked in recent, and earlier, *Auroras.* There were manifestations on April 1, 2 and 3 but the one on the 4th went further south than have many in recent months. Best DX were UK2RDX (MT), UK2RBM (MT), UQ2AO (MQ) and OH2TI (NU). These more southerly affairs bring hordes of D, G, OZ and PA callers who can usually be worked in the slightest tropo. lift. Nick's directional calls to SP, U, etc., are ignored, making real DX-ploration nigh on impossible.

The event of Apr. 9 he describes as ". . quite exceptional," and was only discovered as he got up for an *E-M-E* sked with VE7BQH. First QSO, at 0005, was with UQ2AO, others including SM4IVE (HT), OY9JD (WV) and best *Ar* DX to

ANNUAL CW LADDER

Station	4m.	2m.	70cm	μWave	Points
GW4TTU	—	142	2	—	144
G4ARI	11	120	—	—	131
G4NOZ	—	87	—	—	87
G4VXE	—	48	6	—	54
G4EZA	—	40	—	—	40
G4LZD	—	34	—	—	34
G3FPK	—	17	—	—	17
G2DHV	3	9	—	—	12

No. of different stations worked since Jan. 1.

date at 0056, OH5LK (NU) at 1,837 kms. Thereafter LA9YT (FU), OH2TI and LA1K (FX) at 0018, the last then being worked by G4DHF (ZM).

Steve Reading, G4LZD, (Devon) having no high speed keyer, tried a 40 *w.p.m.* hand key CW MS QSO with LA6QBA (FT) in the *Lyrids,* but it was not completed. Unlike G3PBV, he did hear weak *Ar* signals on Apr. 25, best being G3BW (YO). On tropo. he contacted EI9Q (WM) and F1GXB (XI). Les Bober, G4NOZ, (Essex) updated his CW Ladder score and comments upon the good standard of operating on 2m. CW. Roger Greengrass, G4NRG, (Essex) caught the *AR* on the 25th and 26th and worked GM3s WOJ (XR) and ZXE (YQ) on the key, GM4s LFA and NFC (XP) on CW and SSB respectively, plus GI8YDZ (WP) on SSB.

G4ROA heard part of the *Ar* on the 25th, when strong GMs were working into the near continent. G4TIF, using SSB, added useful points to his 1984 Table score, Martyn's best being GJ6TMM/P on Apr. 8, GI4SAM (Co. Down) on the 17th, G6WUD in Northumberland, plus GM4s RGS and UFD in Grampian, all on the 24th. Tim Kirby, G4VXE, (Gloucs.) was on for the Apr. 4 *Ar* getting EI4CL (WN) and GM4PWR (XQ) but missing out on EI8EF. Next day he worked GI4OMK (XO), and GM6LNM and GM4TXX both in XP. More GMs were netted on the 25th and 26th.

Welcome to Mike Johnson, G6AJE, ". . very recently 'converted' to *S.W.M.* after discovering a thriving VHF column," He uses a *Yaesu* FT-290R with *muTek* board, a 30w amplifier and 6-ele. *Quad,* which have accounted for 55 counties and nine countries so far this year. He heard his first *Aurora* on Apr. 26, logging GMs, Gs, PAs, etc. Mike is in Leicestershire (ZM24d) his father being G3UQX and mother G6XRR. His list of tropo. QSOs included F, ON, PA, D and GM stations worked. Glenn Bates, G6HFF, (Bolton) lists his best DX as G6HV in Devon on Apr. 21, another new county being Louth in EI.

Richard Mason, G6HKS, (Norfolk) got EI8EF for a new square on Apr. 4 in the *Ar.* He lists eight GMs and a GI on tropo. in the period Apr. 24-26, followed later on the 26th by *Ar* QSOs with GMs and GI. Earlier, on the 22nd, he worked five Ds in DL, DM and EM squares. Philip Ruder, G6MGL, from East London, is a new contributor and enters the tables. His station comprises an *Icom* IC-202S, *Tono* MR-150 amplifier and 8-ele. *Quagi* antenna.

Gordon Emmerson, G8PNN, (Northumberland) spends relatively little time on 2m. but does list new table QSOs in the period Apr. 22-25, including tropo. contacts with LA6HL and DL3LAL on the 25th. John Fitzgerald, G8XTJ, (Bucks.) was not at home much in April. At the beginning of the month he was out portable with an *Icom* IC-2E on the Isle of Purbeck in Dorset, working on FM through repeater GB3SC. Later in the month, he visited Fort William and the Western Highlands using repeater GB3HI, and making some simplex contacts to Skye from Mallaig.

After a long silence, Alex Scott, GM8BDX, (Berwicks.) has written to report a short move of QTH. So far only an indoor 11-ele. beam has been used with which the best DX is G8XUJ (YN). The Kent beacon, GB3VHF, has been copied at S½, with meteor pings to S2. Alex McCreadie, GM8YPI, also from Berwicks., reports on the best tropo. lift since last autumn which started on Apr. 23, peaking on the 24/25th, until the 28th. It was mostly coastal DX across the North Sea to LA, PA, D and OZ.

Kelvin Weaver, GW4TTU, (Gwent) is leading the table on 2m. by a good margin with 18 countries already this year. He lists EA1QF (YC) on CW tropo. on Apr. 9, with assorted D, F and PAs worked on the 12/13th. The 17th brought two stations in Co. Durham. On MS he worked DL9MCC (GH) on the 12th, and in the *Lyrids,* on the 21st, LA4B (FU) and OK1MAC (HJ), the next day bringing OK1SM (GJ), all on SSB. An expedition on the 22/23rd to XL10a in Dyfed with G8TFI and GW8VHI resulted in 150 stations worked. From home, GW8VHI worked F1GXB (XI) on the 13th, G4TMF (YN) the next day and EI4AQB (VN) in Galway on the 15th. On the 21st, I2FAK (EF) was worked in ten minutes, with a 20s. burst and "26" reports each way, on MS.

Seventy Centimetres

G1EZF seems to have been concentrating on counties on 70cm. but mentions lots of PAs and ONs worked, too. Mike lists G6XLL (London), G8OPR (Hants.) and GW4TTU/P (Dyfed) amongst the longer DX worked. John Quarmby, G3XDY (Suffolk) also mentions GW4TTU/P on the 22nd and OZ1FEF the next day. For about a week, GB3ANG was up to S9, but no GMs were heard. Others worked in the late-April lift included OZ9SL, OZ1CFO and SK6AB.

Roy Gibbons, G6XSU, (Herts.) confirms his antenna *is* a 28-ele. *Multibeam* but soon to be replaced by a *MET* 19-ele. *Yagi.* He reckons most of the late-April tropo. went over his head. GD was heard for the first time as were new northern German squares, but none seemed interested to work ZL. A 2C39A valve was bought at the *N.E.C.* show for a new PA. At present, Roy can hear much more than he can work. G4ROA got XL and ZP for new squares and found 70cm. well occupied during the lift. G4TIF also lists GW4TTU/P, as do most all contributors, and GD8EXI for a new 1984 country.

G4VXE has been busy setting up on the band and has 30w to a 21-ele. *Yagi,* with encouraging results. On the 22nd, Tim worked GD8EXI using just one watt, and on the 30th, contacted G4VCJ (Cleveland). G6MGL operates on 70cm. using an *Icom* IC-402 with a home made 35-ele. *Quad Loop* array from a design in the *UHF Compendium.* G8PNN sent photocopies of his April log which reveals much 70cm. activity. XL and CT were new squares and new 1984 countries included DL2NO, LA1BM and SM6HYG. Don Hughes, G8WPL, (Stockport) added a couple more squares thanks to GW4TTU/P and GI4GVS, so is now up to 56 on the band.

GM8YPI found 70cm. distinctly better than 2m. on the 25th, citing DG1BP who was at best S5 on 2m. but S9-plus-30 dB on 70cm. Alex's best DX so far was DL4OX (FM) and he also heard a new beacon, DB0AE in the Bremerhaven region, which runs only one watt to a "Big Wheel" antenna, according to DG1BF. GW4TTU had only been on the band from home about four days when he wrote but, while out -/P in XL, worked 120 stations. The equipment consisted of an *LS-707,* K2RIW amplifier, *Gasfet* masthead preamp. and four 16-ele. DL6WU beams.

Microwaves

G3PBV has finished his 5ft. dish and got it up. On clear paths, it is 10 dB up on the 15-over-15 *Yagi.* He and others are trying to stir up activity on 23cm. at 1945 clock time on Sunday evenings. So far, G4DGU, G4MAW, G8KBQ and G8XST have been on, while others have their Rx side working. G3XDY worked G8TFI/P in Dyfed (XL) on the 22nd. Other 23cm. QSOs were SM6HYG (FS) on the 23rd, GM8MBP in Grampian on the 24th, and DL4OX (FM), DL3YB/A (EM), DC9XO (EM) and DK1KR (FN) on the 25th.

Chris Bartram, G4DGU, (W. Devon) now has a 4ft. dish and 100w with an MGF1202 preamp. at the antenna. He is keen to make skeds with anyone on 23cm. Neil Coote, G8VNU, (Surrey) is QRV on 23cm. with an "old" *MM* transverter, while G4KPX is busy building up 13cm. capability in modular form. On Apr. 23, G4ROA worked PE1IST (CM) for a new square, then PE1CMO, the former using just one watt.

G8PNN's late April log shows lots of 23cm. activity. New 1984 countries were

continued on page 184

A Flexible PLL/Tone-Decoder Project, Part 1

WITH EXTENSION AS A SIMPLE *CW* FILTER

G. W. GOODRICH, G4NLA

THE phase-locked-loop has many applications, probably the most well known to radio amateurs being its use in digital frequency synthesisers. The principles used in the PLL can equally be applied to other applications where a circuit is required to detect a particular frequency within a pre-defined bandwith, with reference to a known frequency, called the reference frequency of the loop.

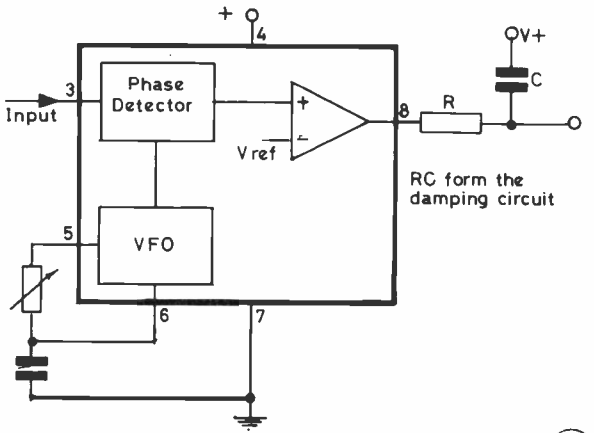


Fig.1 SIMPLIFIED BLOCK SCHEMATIC OF NE567 TONE DECODER/PLL (E 260)

In the audio region such a PLL system may be used to detect tones within a wide bandwidth, as in the case of a CW or RTTY signal at the output of a communications receiver. The project described here uses such a PLL/tone-decoder system, to produce a flexible piece of equipment suited to a wide range of amateur applications. The flexibility of the project was an important design criterion, since while my immediate requirements were for a CW filter using such a system I appreciated my probable expansion into homebrew RTTY equipment at a later date. The basic principles of tone decoding are the same for both CW and RTTY so there seemed little point in building the same project twice, if I could produce a circuit capable of both types of operating.

With this in mind I set out to develop a PLL/tone-decoder "mother-board", onto which I could "piggy-back" application boards (for want of a better term). Described here are both the main mother-board and the application boards used to derive an effective CW filter.

Before proceeding further, don't go looking for PCB artworks because there 'aint any! While I had thought about such things, being an ardent fan of Rev. Dobbs', G3RJV, "Kitchen Table Technology", I decided that such a project is best presented on Veroboard for two reasons. Firstly, component layout for this project is far from critical so you will not need a special layout and artworks to copy and etch; secondly, with care you can turn out a presentable project, and still have lots of holes for additions and modifications later.

PLL/Tone-Detector: Principle of Operation

Before describing the mother-board in detail, it would be worth having a brief look at the IC that does the donkey work. The IC used here is the NE567 PLL/tone-decoder. Basically the IC consists of a reference oscillator and a phase detector, *see* Fig. 1. If the frequency of a signal at the input (pin 3) is the same as that of the reference oscillator then the output 'lock' pin goes low. This feature can obviously be used to control other circuits. The frequency at which a lock takes place can be altered by changing the reference frequency. It is thus possible to select an individual tone amongst a whole range at the input to the IC. If the tone to which the IC is locked is now removed, the lock is lost and the output of the IC resumes its 'off' state. In this fashion a CW or RTTY signal, having the correct frequency to establish a lock, can 'key' the output of the PLL/tone-decoder IC.

The transit times from the 'off' to 'on' state in the NE567 are very rapid, and could cause instabilities in following stages due to sharp switching transients. For this reason the output of the IC is damped to reduce this problem. Getting the damping right is

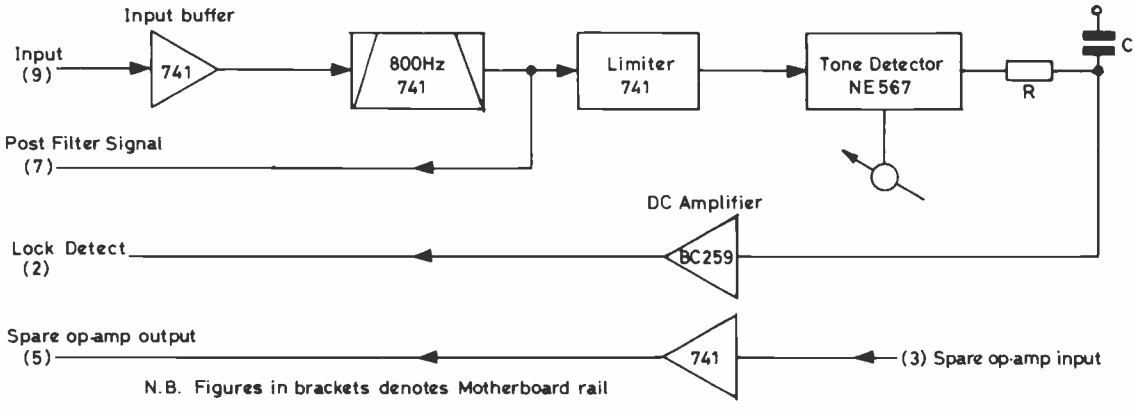


Fig.2 TONE DETECTOR MOTHERBOARD BLOCK SCHEMATIC (E 261)

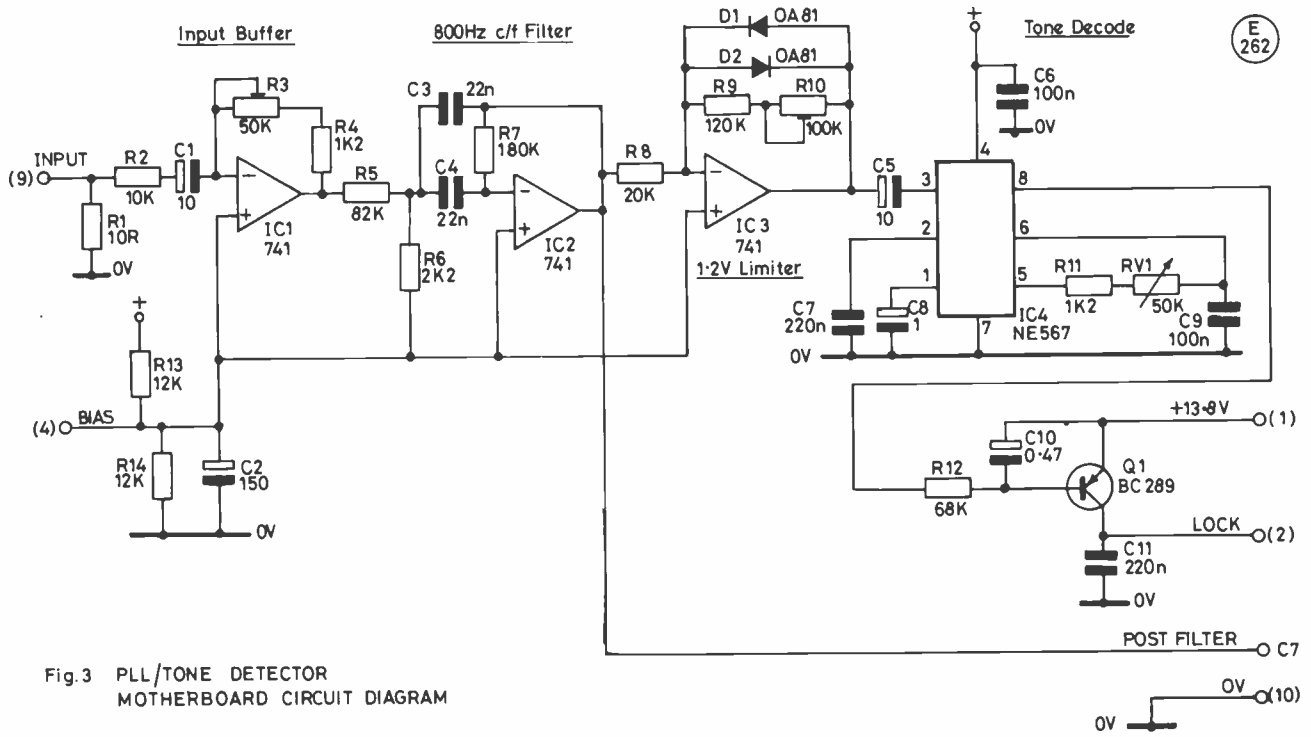


Fig. 3 PLL/TONE DETECTOR MOTHERBOARD CIRCUIT DIAGRAM

important since too much damping will not allow the IC to switch fast enough to reproduce the incoming CW or RTTY signal; too little and other circuitry is likely to be upset by the switching transients mentioned earlier. I should point out at this stage that the internal workings of the NE567 are rather more complex than the simple diagram shown in Fig. 1!

Tone Decoder Mother-Board

The mother-board consists of all the circuitry required to support the application boards for either CW or RTTY reception. These include the necessary rails to both power and control the features peculiar to the application. The rails are denoted in Table 1. As these rails are common to all functions/applications it is possible to design a board layout such that application boards may be mounted directly onto the mother-board using simple, inexpensive connectors. As is the case with most computers these days it is also possible to expand the board if a particular application so demands it.

In terms of functional blocks the mother-board consists of the following.

(*a*) an input buffer amplifier.
(*b*) an 800 Hz c/f bandpass filter.
(*c*) a basic preset limiter.
(*d*) a tone decoder IC.
(*e*) a DC amplifier.
(*f*) a spare op-amp.

Fig. 2 illustrates how these are linked together to evolve the basic tone decoder.

Rail Number	*Description*
1	+ 13.8V
2	lock detect (12V on lock)
3	spare op-amp. input
4	+/– 6V op-amp. bias
5	spare op-amp. output
6	output
7	post-filter output (hi-Z)
8	side tone
9	input
10	0V

Table 1

Table of Values
Fig. 3

R1 = 10R
R2 = 10K
R3 = 50K multi-turn preset
R4, R11 = 1K2
R5 = 82K
R6 = 2K2
R7 = 180K
R8 = 20K
R9 = 120K
R10 = 100K multi-turn preset
R12 = 68K
R13, R14 = 12K
VR1 = 50K linear-law pot.

C1, C5 = 10 µF elec., 16V
C2 = 150 µF elec., 16V
C3, C4 = 22 nF Mylar film
C6, C9 = 100 nF Mylar film
C7, C11 = 220 nF Mylar film
C8 = 1 µF elec., 16V
C10 = 0.47 µF elec., 16V
IC1, IC2, IC3 = 741
IC4 = NE567
Q1 = BC289
D1, D2 = OA81, or similar germanium type

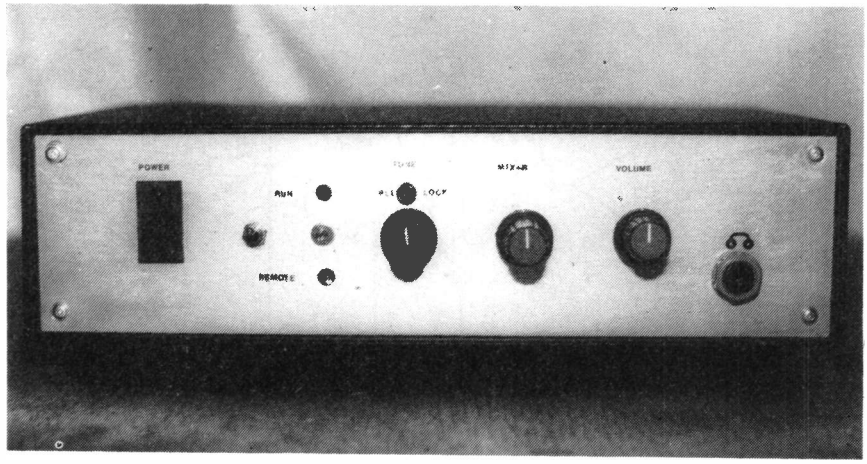
Also: 35 × 50-hole Veroboard (main board); 10 × 8-hole Veroboard (end connector); 4 × 10-way interconnecting PCB pins; 1 × 3-way interconnecting PCB pins; 1 × 10-way interconnecting PCB socket.

Circuit Operation

The circuit diagram for the main board is shown in Fig. 3. An audio input *via* pin 9 on the mother-board is attenuated by a simple 'L' network consisting of R1 and R2. The input attenuator is DC decoupled by C1. IC1 is the input buffer amplifier. The bias required to run this op-amp., and all other op-amps. from a single supply rail is derived from the potential divider network R13 and R14; this rail should have about 6.5V upon it. As IC1 is being used as an inverting amplifier it is easy to see that its gain is set by R3. The output of the buffer amplifier is connected to the input of a single-stage 800 Hz bandpass filter. The centre frequency is set by the values of C3, C4 and R3. The gain, and hence Q of the filter, is set by R7; in the event of this circuit oscillating the value of R7 should be reduced. If the Q of the filter is too high the filter may also have a tendency to ring; while this is not any problem for a human ear to accept, it does cause CW and RTTY signals to become slurred, and will prevent the PLL/tone-decoder IC to gate properly.

The output of the filter is taken to rail 7 on the mother-board where it may be monitored through an oscilloscope or amplifier having a high input impedance.

The limiter takes a signal from the output of this filter *via* rail 7 and amplifies all signals to a level of 0.4V peak-to-peak. Signals



Front panel view.

when amplified by the op-amp. (IC3), that would normally have a much greater amplitude than this, are simply lopped at the top and bottom of the cycle. Ideally, the limiter gain should be set with R10 such that signals at, or near, the noise level have the 0.4V level; this is difficult to achieve without a 'scope but can be approximated by listening to a very weak CW station and adjusting R10 until a lock is established by IC4. If the gain of the limiter is too high then the background noise will intermittently key the PLL/tone-decoder and the gain of the limiter amplifier should be cut back until this stops happening.

The output of the limiter is fed *via* C5 to the input of the NE567. The reference frequency is set by VR1, which is mounted on the front panel to allow easy adjustment in use. If a tone exists at the input to the NE567 which is within the capture range of the PLL (only a few Hertz), then the lock detect output, pin 8, will become close circuit. This discharges C10 *via* R12, effectively damping the transit time between pin 8's open and closed states. Q1 acts as an inverting DC amplifier, the collector going to about 12V once a lock has been established. C11 provides a short circuit to remaining switching transients. The collector is tied to rail 2 on the mother-board.

Components and Construction

All the components for this project are obtainable from usual suppliers, Ambit, Maplin, etc. All the resistors are ¼-watt 10% types, the only truly critical components being in the 800 Hz filter. I have built several filters in the past and have found that there is little real advantage in going to the trouble of obtaining high-precision metal-film types in a single-stage filter.

All the electrolytic capacitors used in the project are 16V rated, and should be radial or axial mounting by consulting the component layout diagram in Fig. 4. All the remaining capacitors are mylar film, as these are reasonably cheap, and don't melt if you are a bit clumsy with the soldering iron!

The PCB mounting plugs and sockets are available from Ambit. They are convenient to use since they have a ·1″ pitch so

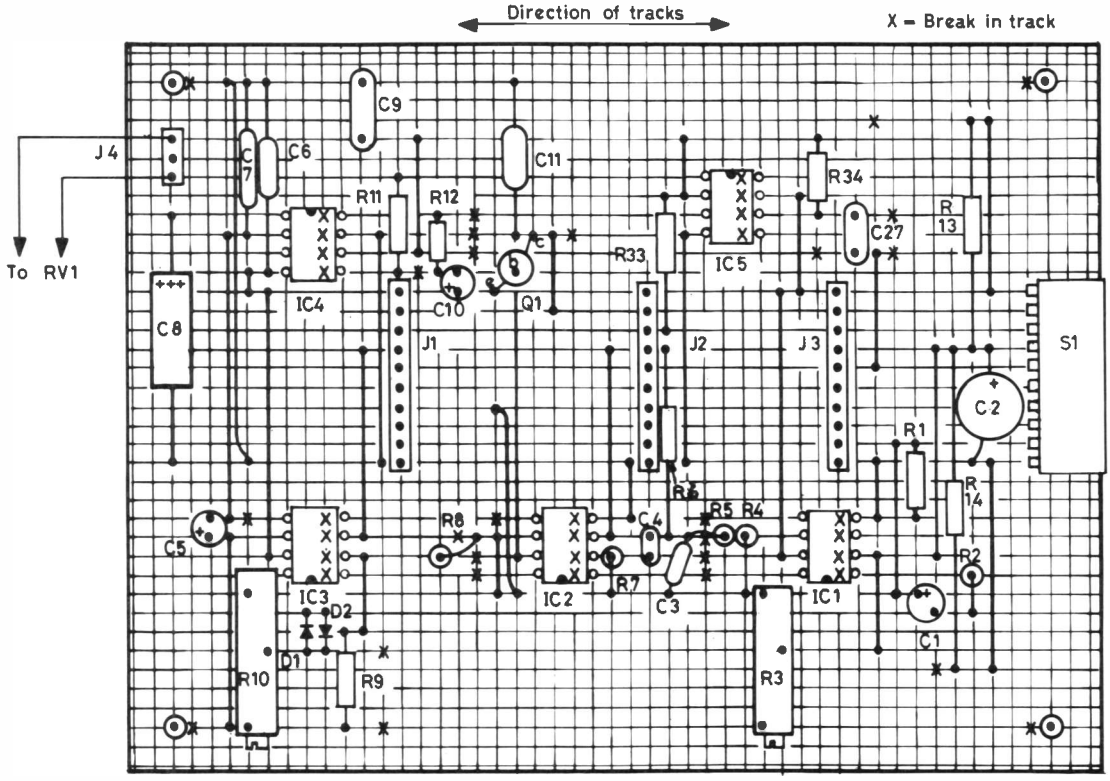


Fig. 4 PLL/TONE DECODER MOTHERBOARD — VEROBOARD LAYOUT (Full size)

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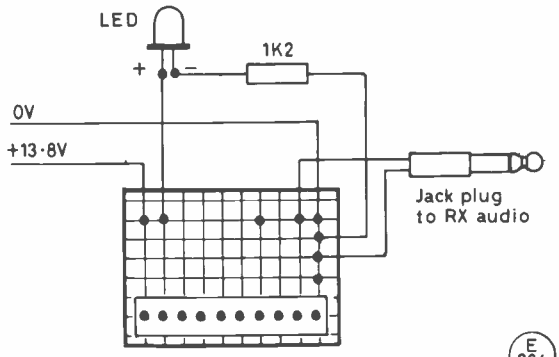


Fig.5 MOTHERBOARD END CONNECTOR -TEST JIG.

mount directly onto Veroboard. I find them easier to use than Veropins and certainly recommend them.

The op-amps. used in the project are all MC741's, and while you could use low noise versions of the same type, the cost becomes somewhat prohibitive if one is not designing a low-noise device in the first place.

Q1, the transistor used in the amplifier, is a BC289 which is the PNP version of the popular BC109. The device type in this application is not critical, and any similar PNP transistor will do.

The interconnecting leads used on the Veroboard should be single-strand insulated wire; multistrand wire should be avoided as it is not as easy to form.

When constructing onto Veroboard I find that it is easier to follow the circuit diagram stage-by-stage as fewer mistakes are made that way. Do remember to cut tracks as appropriate and avoid solder bridges between tracks.

In this case the following method is preferred. Firstly locate and solder the end socket onto the main board, as this gives a useful reference point. Now build the remainder of the mother-board up to, and including, the DC amplifier; the spare buffer amplifier can be left for the time being. All the inter-PCB plugs can now be soldered into place, as they do not cause any major inconvenience to the remainder of the construction. J4 is simply three pins cut from a 10-pin strip, but keep the remaining seven as they will be useful later.

Having completed this part of the construction, check and double-check your soldered joints, etc., looking in particular for hair-line solder bridges between tracks. One way of getting rid of these nuisances is by running a *Stanley* knife between each track; this is crude, but very effective!

Testing

Obviously it makes life easier to set up and test this board if you have an oscilloscope to hand. However most amateurs and SWLs don't, so a very simple test and set-up procedure is outlined here.

Firstly, I recommend that the mother-board is mounted temporarily on a block of wood, so that you won't have to keep chasing it around the bench each time that you want to measure or change something. The mother-board end connector should now be assembled as shown in Fig. 5, and inserted into the mother-board S1. Now apply 13.8V (or thereabouts) and look for the usual signs of disastrous wiring errors — smoke, electrolytic capacitors exploding, etc. . . .

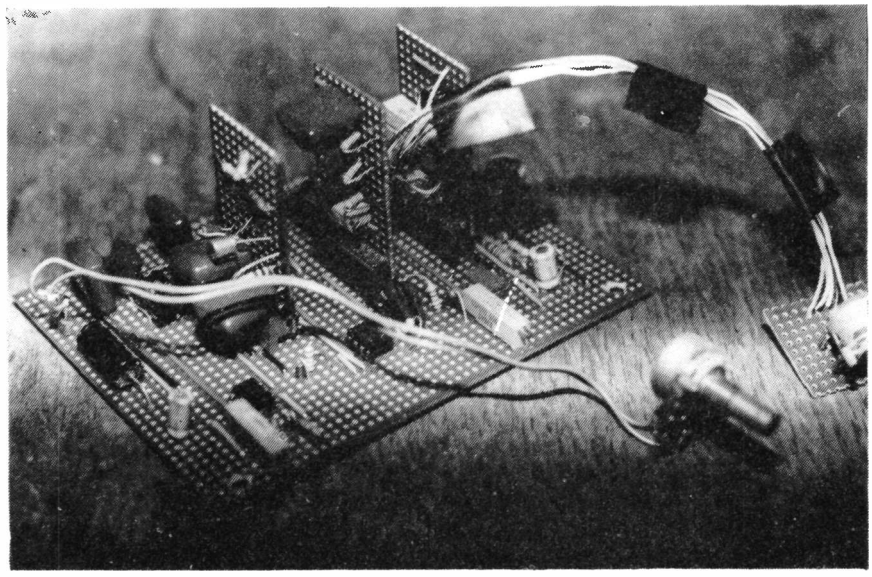
Assuming that no obvious wiring faults exist then connect the mother-board to the audio output of a receiver. The receiver should be previously tuned to an 800 Hz carrier tone. (This is the only redeeming factor for *Radio Tirana* in the amateur 40-metre band.) VR1 should now be rotated slowly until the LED lights. If it should fail to do so after a couple of attempts then try increasing the audio output of the rig. Assuming still no success try increasing the gain of the input buffer amplifier; this is done by adjusting R3 towards its maximum resistance. If this should fail, then re-check your wiring, particularly in the input and tone detect stages.

Once the LED has been persuaded to light, remove the audio input, when the LED should extinguish. If it remains on then the chances are that the audio filter is oscillating; as explained before this fault can be cured by reducing the value of R7.

Having done these initial tests the audio gain of the receiver should be reduced until the tone is just perceptible. The gain of the input buffer amplifier should now be set using R3 to a point where the LED lights up. The limiter gain preset resistor, R10, should now be set to the point where the LED is just on, and ready to turn off, although not flickering.

This completes the initial testing of the mother-board. This is not the final set-up of the board as further adjustments will be made as the other application boards are added to the system.

If you do possess an oscilloscope then the alignment of the mother-board can be done immediately. Select a strong 800 Hz carrier tone on the receiver being used for the test. The level of this audio input should be adjusted until an undistorted sine-wave appears at the output of the input buffer amplifier (IC1); the gain of the amplifier should be set such that the sine-wave is about 10V peak-to-peak. Now hook the 'scope probe to the input of the mother-board, and reduce the level of the input tone to a level of about 1-5mW, or to the point where the PLL falls out of lock as indicated by the LED. The probe should now be moved to the output of the limiter, and the gain of the limiter adjusted until the



The mother-board showing the "piggy-backed" applications boards. Left to right: sidetone switching module, AF sidetone generator, mixer.

photos: H. Jaremco

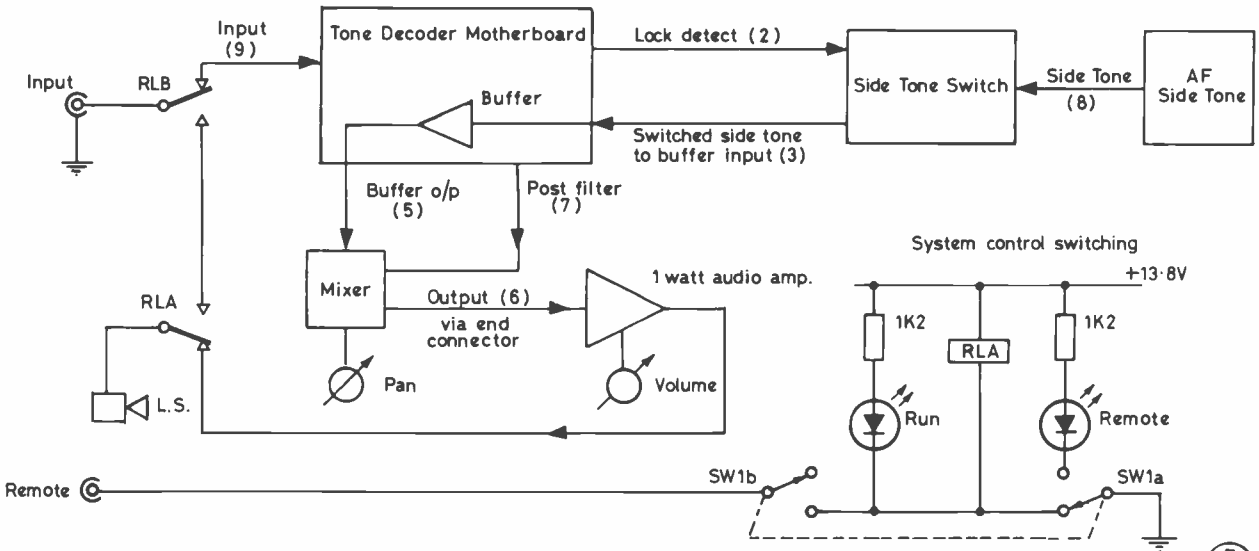


Fig. 6 COMPLETE PLL CW FILTER SYSTEM (Module power and bias rail interconnections not shown for clarity).

audio tone is just under the 0.4V level, by which time the PLL should have re-established a lock.

Complete CW Filter System

A complete CW filter system (*see* Fig. 6) can be built by using the mother-board previously described, to control the function of other "piggy-backed" application boards. As in most cases a PLL-derived CW filter has its advantages and disadvantages over more conventional tight filtering techniques in the IF strip of a receiver. Its chief advantage is its ability to pick out signals that are barely perceptible to the ear. The technique also produces interference and fade-free signals, which can be a great comfort if your main interest is in the popular QRP aspect of the hobby.

One disadvantage of this technique lies in the extremely narrow bandwidth achieved. If the station that you are receiving drifts more than a few Hertz away from the reference frequency, then the PLL will lose track of its lock, and the system will have to be re-adjusted in order to receive the station again. Of course drift does not only occur in the sending station, but may also occur in the reference oscillator itself; so far I have found that the reference oscillator is very stable indeed, and have had no problem caused by drift here.

There is also a finite limit to the speed at which the CW filter can lock-up onto fast CW sending. I have not experienced any difficulties at up to 30 w.p.m. but after this speed 'dits' tend to get lost. Note that I plan to decode RTTY signals straight off the lock detect line, so such a limitation is not imposed as the switching can be regarded as a digital-type signal.

Another feature of this application lies in its interface with the tranceiver. Many audio add-on units need to be manually switched out prior to transmission in order to avoid the ghastly sound of RF breakthrough. In this project you would not be able to hear the CW sidetone generated by the rig, unless it happened to be running at the same frequency as the reference oscillator. For this reason the unit is switched out by a conventional by-pass relay, controlled remotely by the rig.

(to be concluded)

• • • *"Practically Yours"* • • •

with GLEN ROSS, G8MWR

The SWR Bridge

THIS month we are going to have a look at what is probably the most used, and least understood, piece of equipment in the shack, the SWR meter. It is treated by many as the 'be all and end all' of aerial measurements and the "ideal" SWR of 1:1 is strived for as though anything less is a criminal offence. The ability of a cheap meter to read the SWR accurately is taken without question and the inherent limitations of the system of measurement are ignored or not understood. The idea of whether or not you need to reduce the SWR to 1:1 is rarely considered. Let us look at how the SWR meter works and, having a better understanding of it, we will then get down to building one.

First of all it must be clearly understood that the *only* place you can measure the SWR is at the aerial, unless you are prepared to make a few calculations. The meter works by measuring the

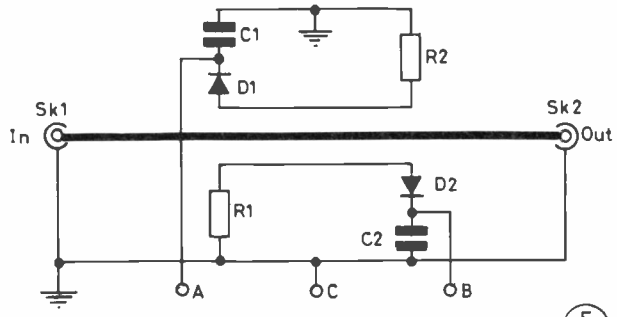


Fig.1 CIRCUIT OF THE SWR BRIDGE

E 269

Table of Values
Figs. 1, 2 and 3

R1, R2 = 50R, ¼-watt
RV1 = 10K pot.
RV2 = 10K ganged pot.
C1, C2 = 1 nF disc ceramic
SK1, SK2 = as required
D1, D2 = small signal type, *see* text
M1 to M3 = 100 μA to 1 mA f/s/d
S1 = single-pole, changeover toggle or rotary.

power going to the aerial and the power returned from it due to the mismatch between the aerial and the feeder cable. The SWR ratio is then obtained and the result displayed on a suitably calibrated meter. Let's try an example:

Frequency = 432 MHz
meter reads { forward power = 100 watts
reflected power = 4 watts
therefore SWR = 1.5:1

and everything seems reasonably satisfactory . . . but is it? One of the reasons for using a SWR meter is to reduce the effects of line losses and yet, in the example, we have not taken them into consideration! It was assumed that all the forward power reached the aerial and all the reflected power was indicated on the bridge.

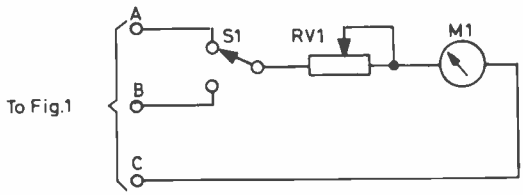


Fig. 2 SINGLE METER INDICATOR

E 270

Let's try that calculation again, assuming 3dB loss on the feeder:

Meter reads 100 watts output (minus 3dB loss) = 50 watts at aerial.

Meter reads 4 watts reflected (plus 3dB for cable loss) = 8 watts actual reflected power.

If we now recalculate we shall find that the true SWR is in fact 2.33:1, and not the 1.5:1 that the meter tells us.

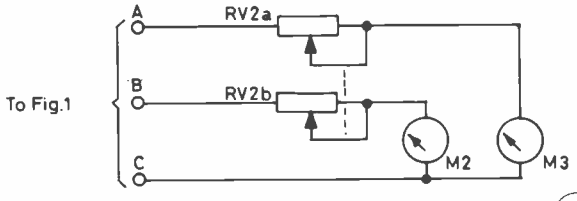


Fig. 3 DUAL METER INDICATOR

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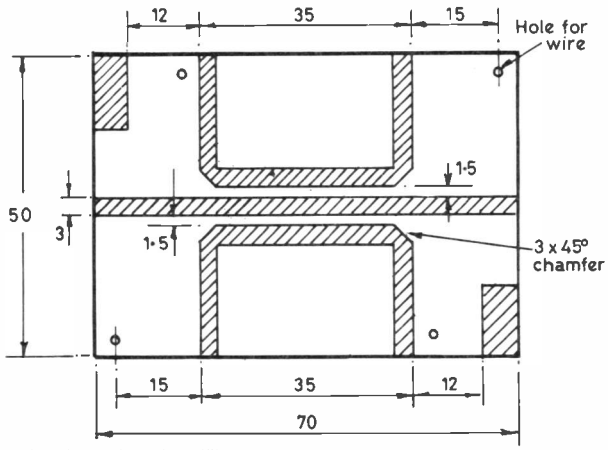
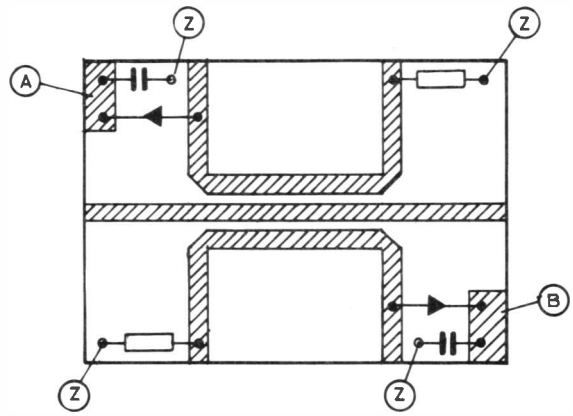
Building the Unit

The SWR meter can be considered as two units, the bridge that performs the measurements and a meter to indicate the results. The unit to be described uses PCB construction for the bridge and a full size layout is shown in Fig. 4. It is built on double-sided material and all leads should be kept as short as possible, especially those between whatever RF connectors are used and the board. If the unit is built in a diecast box, make the length of the board such that the pins of the connectors can be soldered straight to the through track, and soldering tags fitted under the connector fixing bolts should be soldered to the ground plane. If 'N' type sockets are used, and care taken in construction, the unit will work with fair accuracy to 23cm. The length of pickup line shown will be satisfactory for most uses. The sensitivity of the unit is proportional to the length of the sampling lines and the spacing between them and the main line, and it is essential that both sides



All dimensions in millimetres
Tracks each 3mm wide
Mat'l. 1·6mm thk. copper clad double sided fibreglass.
Copper on underside acts as groundplane



Z indicates wire taken through hole and soldered to groundplane.

Fig. 4

E 272

of the bridge are identical. The diodes must be small, signal types and suitable for the frequency in use (OA91, GEX66, etc.). C1 and C2 may be disc ceramic, feedthrough or chip capacitors depending on the frequency range required.

The metering system is straightforward and may be built in the same box as the bridge or mounted remotely. It can be built in single or dual meter form as required.

The only check to be made on the completed meter is to confirm that the meter reads the same no matter which way round it is connected into the coax cable. This desirable state of affairs is rarely achieved in practice but it should be close.

Traps and Trapped Antennas for the Home Constructor, Part 5

ALL YOU NEED TO KNOW!

A. P. ASHTON, G3XAP

Traps for Antennas Made from Tubing

ONE of the reasons that few constructors attempt to fabricate coaxial traps for incorporation into antennas made from tubing (*i.e.* verticals and beams) is that the conventional method of construction of these devices calls for the use of some precision engineering and involves the use of a lathe. This deters all but the most adventurous of our number. An alternative is to purchase the traps ready made, but the cost may be a deterrent plus the fact that traps for parasitic elements are not readily available.

With this state of affairs in mind the author set about simplifying the approach to the construction of suitable traps and offers two solutions, one of which uses discrete capacitors and the other which uses a true coaxial capacitor — without the need for precision engineering.

Using a Discrete Capacitor

The photograph (Fig. 1) shows an encapsulated trap, and it will be noted that part of the former used to mould the resin to the trap has been left in position. The former consists of a very heavy gauge ABS plastic tube and is sold as "threading quality" tube, which is thick enough to be threaded and yet still retain considerable strength — its use being in plumbing, both for liquids and pressurised gases. The point is that this material has adequate strength to enable it to be telescoped into tubes of suitable diameter and hence be usable with antennas of tubular construction. To ensure that the tube is permanently bonded to the encapsulating resin, its outer surface should be heavily scored in the central area where the resin is to be bonded; the author carries out this scoring by cutting several deep grooves into the tube with a hacksaw — this ensures that the resin can key-in effectively and make a permanent bond. It is also absolutely essential that when release agent is applied to other parts of the mould, none should come into contact with this area of the tube.

Since the cost of producing such traps is very low compared with the cost of a conventional coaxial trap, it is likely that more amateurs will give it a try (at least the author hopes so!), so it is considered that a little more information regarding the construction of suitable moulds and the process of encapsulation may prove helpful to some readers.

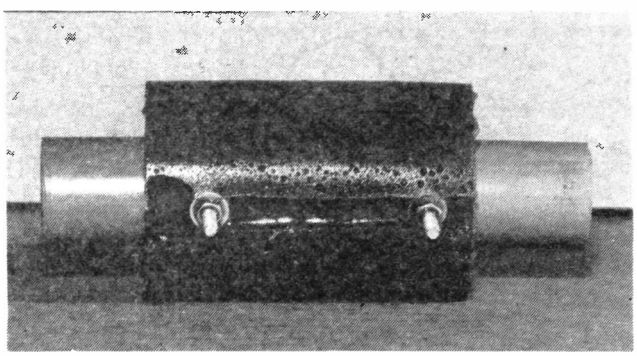


Fig. 1. An encapsulated trap with its associated inner plastic tube.

The purpose of the mould is simply to hold the resin in its required position whilst it is "polymerising", during which process it changes from the liquid state to a solid. It is obvious that the shape of the completed casting will be identical to the shape of the mould itself, and fortunately a cylinder is a suitable shape for a completed trap — fortunately, because cylinders can be constructed from suitable sections of readily available plastic tubing. Metal tubes would be equally suitable but the author prefers to use plastic for several reasons:—

(a) Some resins expand or contract slightly during the hardening process; plastic sections will flex under pressure and hence accommodate the change in size.

(b) Plastic tubes are more readily available, easier to cut and less expensive than metal tubes.

(c) Due to their flexibility, plastic moulds are easier to separate from the hardened resin than metal moulds.

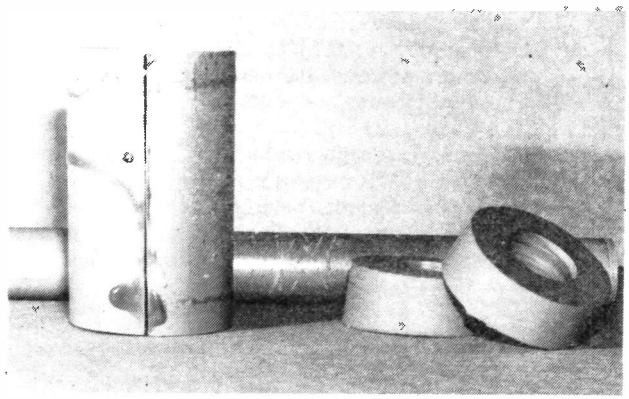


Fig. 2. The component parts of a trap mould.

The photograph (Fig. 2) shows details of the former and it can be seen that it consists of four sections — the small diameter, heavy gauge tube which will form a component part of the completed trap (note the scoring on its central area), a larger diameter tube which has been cut along its length to enable it to be opened up when required, and two identical rubber bushes. These latter items are constructed from large rubber bungs which are first sliced in half to reduce their thickness (this makes it simpler to slide them on and off the narrow tube and simpler to bore out the large hole in their centre) and then bored out with the appropriate diameter cork borer in order that they may be fitted over the small tube. Fig. 3 shows the components in their assembled form, with a trap in position ready for the resin to be introduced, and it will be

noted that the trap is actually held in position by the large plastic tube gripping the nuts on the two bolts at the ends of the trap. This also holds open the slit in the tube sufficiently to make an opening into which the resin may be poured. Note also that two wires protrude from the trap (one fastened to each end of the trap on the bolts that hold the coil and capacitor): these wires will be used to electrically connect the trap to the aluminium tubing when the device is incorporated into an antenna.

It is obvious that we wish the resin to adhere very strongly to the trap itself, and to the inner tube, in order to form a securely bonded structure, and it is equally obvious that we do not want it to adhere to those sections of the mould that need to be removed after the resin has set, *i.e.* the large outer tube and the two rubber bushes. Those areas where we wish the resin to stick must be clean and free from grease and no special precautions are necessary other than to wipe them with an absorbent material — such as a piece of kitchen roll. In order to prevent the resin from adhering to the other mould sections, these components must be treated with a release agent. A release agent is simply a material that the resin can neither stick to nor chemically react with — the author uses silicon grease which may be obtained from some model shops and the better car accessory shops. The grease is liberally smeared onto those surfaces to which we do not want the resin to stick (making *absolutely* sure that having got the stuff on our fingers we do not inadvertently transfer some of it to the areas where the resin should stick!).

Having assembled the mould (with the trap in place) and applied the release agent to the appropriate places, we are ready to introduce the resin, but prior to mixing this material with the catalyst (or hardener as it is sometimes called) we need to make some sort of estimate of the likely volume of resin to prepare, since resins are expensive and it is annoying to make up considerably more than we actually need. The calculation is quite simple and an example should illustrate the method. Assume that we have made a mould with a small tube of 2.5cm. outside diameter and a large tube of 5.0cm. inside diameter, and that the distance between the inside faces of the rubber end bushes is 8.0cm. The volume of a cylinder is given by the expression:—

Volume = $\pi r^2 l$, where r = radius of cylinder and l = length
Thus, small tube volume = $\pi \times 1.25^2 \times 8 = 39.3$ cu. cm.,
and large tube volume = $\pi \times 2.50^2 \times 8 = 157.1$ cu. cm.

The volume between the two tubes is thus the volume of the large tube minus the volume of the small tube — *i.e.* 157 − 39 = 118 cu. cm. However, not all of the space between the tubes will be filled with resin — some of it is occupied by the trap itself; also we cannot use all the resin that we prepare because some of it will remain inside the container in which we mix up the resin and the catalyst. For the example quoted, the author would mix 100 cu. cm. of resin and for the purpose of actually measuring volumes he makes use of a glass measuring cylinder — these may be obtained from home brewing shops (''home brewing'' here refers to the fermentation of the frothy stuff, not the manufacture of our own gear!). It will be found convenient to use a glass beaker for mixing the resin and catalyst, since it is possible to see the material as it is mixed and hence ensure that the catalyst is evenly dispersed throughout the resin. Any convenient implement may be used for the mixing and the author uses a glass rod (after which comment many readers will have accurately guessed that G3XAP's profession is that of chemist!).

Fig. 4 shows the cylinder, glass rod and beaker in which can be seen a mix of resin plus catalyst, whilst Fig. 5 depicts the actual pouring of the resin into the mould. Note that the mould is held in an inclined position — this is to ensure that a large air bubble does not form around the area where the capacitor is located. As the resin reaches the top of the mould, the raised end of the assembly is gradually lowered whilst the resin is still being poured — finishing up in a horizontal position just as the mould becomes full. Note also that G3XAP is wearing disposable plastic gloves in order to prevent the resin making contact with the skin — it can

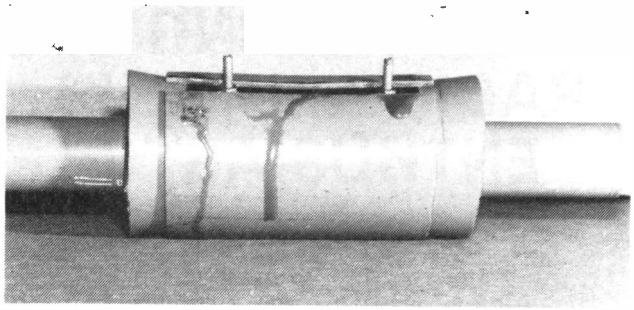


Fig. 3. The assembled mould with a trap in position.

not be overstressed that many catalysts and some resins are *harmful through skin absorption* and the utmost care must be exercised during their use. Goggles should also be worn and all handling should be conducted in as large and well ventilated room as possible, since some resin compounds give off harmful fumes.

After the mould has been filled and stood in a stable, horizontal position while the resin hardens, and while *still wearing* the rubber gloves, wipe the glass rod and the inside of the beaker with kitchen roll in order to remove as much of the remaining resin as possible; this will enable these implements to be re-used. Once the resin has hardened it is no longer toxic and may be handled quite safely with the hands. The time required for a resin to harden depends on many factors such as the particular resin and catalyst used, the proportion of catalyst added to the resin, the ambient temperature, etc. To be safe the author would recommend leaving for 24 hours prior to removal from the mould. On removing the trap from the mould it will be found that the resin is covered with the greasy release agent and this can be removed by wiping with a piece of kitchen roll.

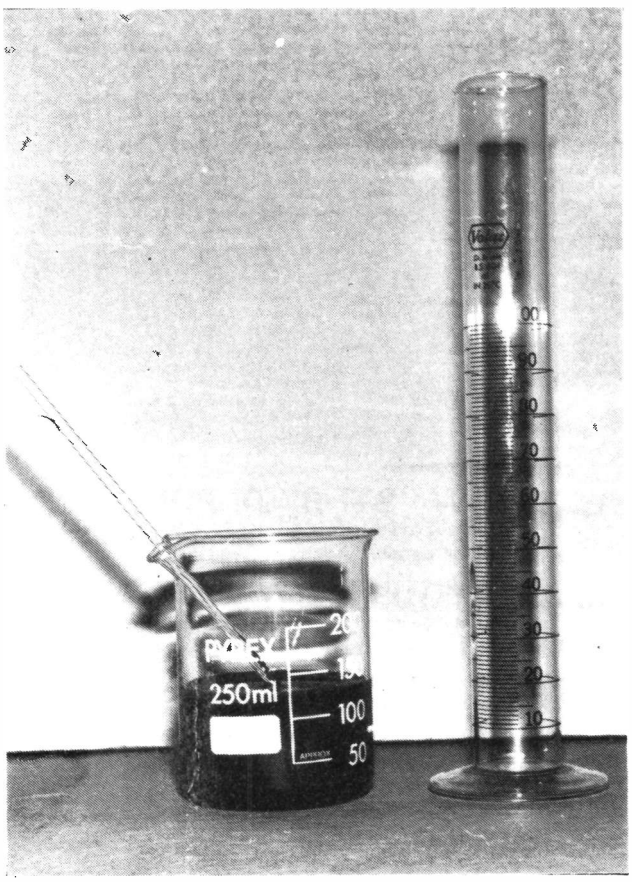


Fig. 4. The cylinder, glass rod and beaker containing the resin.

The completed trap can now be fastened to lengths of appropriate aluminium tube ready for incorporation into an antenna, and Fig. 6 shows the manner in which this may be carried out. The bolt head, wire, nut and the junction between the plastic and aluminium tubes should be waterproofed and this can be carried out by applying a liberal coating of enamel paint such as that used for painting plastic models, or alternatively a more effective (and more costly) method is to use a silicon sealant such as that made by Dow Corning for use in sealing around the edges of kitchen sinks, etc. This material is readily available at D.I.Y. shops, but is a little on the expensive side!

Earlier in this series the author stated that the resonant frequency of a trap changes as the trap is completely encapsulated in the manner described above, and suggested that a prototype be

Fig. 5. G3XAP pouring resin into the mould!

made in order to determine the exact extent of the frequency change — the final matched pair of traps should then be resonated with this change in mind. An example from the G3XAP records shows that a trap originally resonated at 7.05 MHz had moved to 7.18 MHz after encapsulation in an epoxy resin. The matched pair were therefore resonated at 6.92 MHz and after encapsulation it was found that their final frequency was 7.04 MHz, which was considered acceptably close to the required 7.05 MHz. It will also be found that the practice gained in using resins and moulds on a prototype device will enable the experimenter to proceed with rather more confidence when it comes to constructing the matched pair.

One other point to note is that because the actual ratio of resin-to-catalyst will vary slightly from one mix to the next, the author prefers to use two moulds and to encapsulate his traps in pairs after mixing up sufficient resin to fill both moulds — in this way the two traps in a pair are more "similar" than if each is encapsulated in a separate mix of resin. It is up to the reader to decide whether he wishes to work in this manner or to use a single mould — the author cannot say how the electrical properties of resin vary from one mix to another, but would concede that differences are likely to be small.

Coaxial Traps — An Alternative Approach

In *Part 2* of this series coaxial traps were discussed, with particular reference to a design by T. L. Sadler, G3VMC, which produces superb traps. However, many readers are deterred from constructing traps of this type due to the requirement for lathe work and the possible expense of this. The author feels that the approach discussed above using discrete capacitors provides a good alternative, but feels that, as simple an operation as it is, the need for encapsulation with chemicals which are slightly hazardous and in particular the requirement for making suitable moulds, etc., may still prove to be a deterrent to some would-be

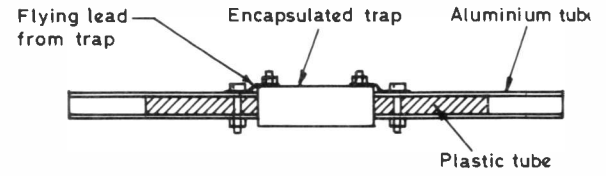


Fig.6 ENCAPSULATED TRAP SECURED TO ALUMINIUM TUBING. (E 258)

constructors. For those readers, an even simpler approach has been devised — this approach does not require precision engineering nor encapsulation but, unfortunately, one of the materials used is not quite as easily obtainable as the materials required for any of the other traps discussed so far. (Murphy's Law does not permit the construction of any trap without there being at least one snag!)

The idea is to use two lengths of concentric (coaxial) tubing as usual, but instead of using bushes of suitable dielectric material at the ends to separate them, the dielectric consists of a length of flexible tubing of appropriate material, the effective capacitance being determined by the degree of overlap of the two metal tubes. Since the dielectric tube runs down the full length of the trap, it is not possible to site the coil within the trap — it is therefore sited outside! A diagrammatic representation of the trap is given in Fig. 7. Close inspection of the diagram shows that the narrower of the coaxial tubes ends within the trap body, but this tube is joined by means of a plastic insert to a length of identical tube which protrudes from the other end of the trap. Although not shown in the diagram, self tapping screws hold the insert steady inside the two tubes — the heads of these screws being filed down flush with the metal tubes to give a smooth surface capable of fitting inside the flexible dielectric. The trap is made up exactly as the diagram shows except that the clamping nut and bolt and the shorting wire are not yet added. The inner and outer concentric tubes are temporarily shorted out with a length of heavy gauge wire which has a large crocodile clip at each end — the clips being clamped round the tubes. The trap is tuned by sliding the inner tube in or out of the outer tube plus dielectric — *i.e.* increasing or decreasing the effective capacitance. The actual test set-up for trap tuning has been discussed earlier in this series and will not, therefore, be detailed here.

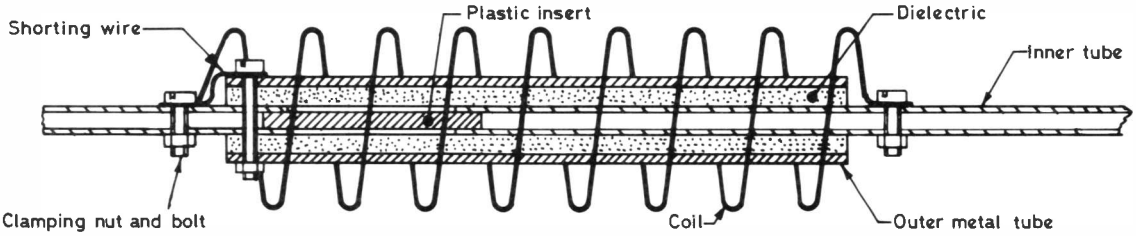


Fig.7 DIAGRAMMATIC REPRESENTATION OF THE ALTERNATIVE COAXIAL TRAP (E 259)

The dielectric used in this design is a length of flexible PVC tubing, the specification for which quotes an inside diameter of 15.9mm and an outside diameter of 22.3mm, and this forms a tight fit between ⅝-inch o.d. tubing and 1-inch o.d. 18 s.w.g. tubing (effective diameters 15.875 and 22.962mm respectively). This tubing is only available from specialist outlets and may cause problems to prospective purchasers — the author can only suggest that they try suppliers of laboratory apparatus.

The capacitance of the trap can be calculated from the formula given earlier in this series, and taking the dielectric constant of PVC as 3.0, it can be shown that the capacitance per inch of overlap of the tubes is around 9pF. Thus a trap for 7 MHz could be constructed with a capacitance of around 50pF which implies an effective length of capacitor of about 5 to 6 inches. An appropriate coil would have to have an inductance of about 10μH and suitable dimensions for this coil can be calculated from the formula:—

$$L = \frac{(N \times r)^2}{9r + 10L},$$

where N = number of turns
r = mean radius of coil
L = length of winding

If we had an effective capacitance of 50pF and wished to resonate the trap at 7 MHz, we could wind the coil with a diameter of 2 inches and a winding length of 4 inches — we would then achieve the desired 10μH by winding 22 turns.

$$L = \frac{(22 \times 1)^2}{9 + 40} = 9.9\mu H$$

This approach does have some disadvantages, the first of which is that with self-supporting coils of the type shown in Fig. 8 it is not easy to ensure that a pair of coils will be identical, and although this is obviously unimportant with antennas which only use one trap at a certain frequency (*e.g.* verticals) it becomes important with symmetrical antennas of the Yagi type or with vertical dipoles. However, with practice, a good degree of reproduceability can be achieved and the author "prewinds" these coils with 14 s.w.g. hard-drawn copper wire on a 2-inch diameter plastic tube. By winding with adjacent turns touching, it is possible to ensure that one coil is wound in an identical manner to the next — experimentation will lead to a high degree of proficiency. Secondly, such coils are obviously far more prone to become distorted or damaged if they are allowed to come into contact with other objects; however if they are treated with care and common sense, this should not be a severe difficulty.

Finally comes the problem of the weather and the effect of ice, snow and rain, etc. In fact, all one can do here is to give the coil a coat of polyurethane varnish and to treat the ends of the tubes, and the nuts and bolts, etc., with the silicon sealant mentioned earlier, and in practice it will be found that the traps are then relatively unaffected by weather (the author has yet to see one in an iced-up condition).

Conclusion

It is hoped that this series will have shown readers that there is nothing complex in the construction of traps or of antennas using them.

In order to make trapped antenna construction even simpler, the author is prepared to provide matched capacitors at a low cost and also the threaded coil formers. Interested readers are invited to write to:— A. P. Ashton, G3XAP, 30 Ford View Road, Stowmarket, Suffolk IP14 2BL.

In *Part 1* of this series (February issue) the formula for frequency on page 623 should have been, of course, $f = \frac{1}{2\pi\sqrt{LC}}$

Photographs for this series were taken by S. Robinson, G4HFJ.

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

AT the time of writing I am still coming round after the NEC Exhibition — and the entertainment meted out by the G-QRP Club. Regular contributor G3RJV was at the bottom of much of it, helped by GM3OXX, G4BUE, G3VTT and G3ROO. And when it all became a bit fierce for this old greybeard, G4UUK offered me safety, peace and blessed slumber, not to mention feeding me and aiming me in the direction of the Exhibition next morning. Thanks to all for a wonderful weekend — and thanks to all those who came to the *Short Wave Magazine* stand and chatted about DX, about the *Magazine*, and lots of other interesting things.

Ten for Starters

G3NOF (Yeovil) reports that he found the band patchy, with long periods of silence; in the mornings some signals from USSR appeared, and Africans in the early afternoon, South Americans in the evenings and the odd YC around 1500z. The odd East Coast American was to be heard at various times to as late as 2000z. Don made SSB contacts with FM7WD, FM0FJD, FY7AN, J28EB, VP2VA, ZC4GO, ZS1P, 5B4DN and 5Z4DJ, plus the East Coast W's.

G3BDQ (Hastings) has been doing some QRP-ish operating while testing aerials; Ten produced SSB contacts with UA6, IK0, VK6IH and JY9CL.

Now we come to G4HZW (Knutsford) who found his activities this month limited by ornithological interests. Tony found the band open to Africa on most days, and on many evenings to South America, but the VK and ZL beacons were never heard over the long path despite careful listening. The best day was April 21. Overall, 4S7PVR, CE8EAC, CN8EJ, CP8HD, CX6BBJ, FB8WJ (Crozet Is.) for an all-time new one, HL0U, P29AF who was RS58 with 60 watts to a G5RV, S83H, TR8DR, UA2, 3, 4, 5, 6, 9, ZP0MJO, ZP5LOY, ZS3GB and ZS6BYK. The rig as ever was the TS-820 and the aerial a two-element Quad.

G2BON (Aldridge) used his G5RV aerial at 30 feet, plus IC-740 prime mover, to work SSB to VU2DQP, A92NH, YC0DPO and FB8WJ.

Since G6QQ (Hoveton) came back to amateur radio in March last year after a lay-off going back to pre-war days, David has worked 148 countries and has already 104 confirmed. On Ten — as on the other bands — activity was down this month, partly because of a long holiday and then, when he returned the warm weather set him to 'operate' in the garden; nonetheless Ten saw contacts with EA8ALE, ZS5MY, LU2HPF, LU9BDA, UP2BND, UP2CL, UR2DL,UR2RGJ, RQ2GFQ, SM0MLL, OH5AD, PT2CP, F5RV/P/TK (Corsica), I0HC, LU2FDR and a CW contact with PP2BT.

Just in time to miss the bus last time around was G4OBK (Chorley); Phil was active as GB0PAC, celebrating 30 years of Preston Automobile Club on International Amateur Radio Day. This was real economy of effort, two celebrations in one! G4OBK used CW to work 3B8FK, LU6EF, PYs, CX4GL, and found that when he did look the band was good but there wasn't the time to comb it through.

Top Band

This band has now gone into its summer hibernation; what a change from a couple of decades ago when we could rely on the summer being filled in by all sorts of G DX activity from the rare parts of the country, and people going to these places to activate them for fun — great days. Now of course there's not a lot of local activity, and most of the regulars concentrate on the 'real' DX.

G4OBK (Chorley) used his Morse key to get at 4X4NJ (twice), K1NA, EA9KF, EL0EE/MM, IV3DVN, OE8AJK/2, K2BU, WB3ECG, AA1K, plus an interesting QRP contact with G4OEC in Bridgwater — the latter running 700 milliwatts input for a 180-mile path and his best DX so far.

G4AAW (Maidstone) needs South America for a WAC on the band and last month had two half-QSOs with Rolf, PY1RO! Not content with *that* Peter drove past the end of my road, bearing a sixty-gallon galvanised water tank which he gave to G4AKY for his earth system — if I had known about that there would have been a road block in operation and a digger at the ready! Peter, apart from encouraging G4AKY back on to the air and working a few himself, notes that the Italians have now got a piece of the action — 1830-1850 kHz seems to be the form — but as yet they seem to have no grip on the niceties of where to operate CW or SSB, which is lousing things up a bit. However, we note among the log contacts, GM3TMK, 4X4NJ several times, IV3DVN, OH1MA, I2CUV, EA9KQ, SM0KV/0, a gotaway HH2VP, RA9AKM, I2CWF, TK5VN, SP2GRT/9, 4Z4MK, IS0NZA, GB0PAC, RL7FER, K1ZM, the two abortive tries at PY1RO, VE1ZZ, LA5VAA/OY, UL7MAN, I1ONZ, I0KHP and 3A2GL, plus a load of smaller fry.

G3BDQ as already remarked has been working on his aerial and earth system — and now the aluminium greenhouse is part of the arrangement! John notes how well G4AAW has been doing on Top Band and sketches out Peter's set-up of 35 feet upwards from the shack, about 100 feet along the top and forty feet vertically down to an earth at the far end. An interesting arrangement, and unorthodox, which, as G3BDQ remarks, *works!* For John himself, the season is over for Top Band, but his Good Fairy did a bit of overtime for him . . . on April 8 a look-see revealed K1MM/IS0 for a new one who was promptly put in the bag — the first Sardinian station on Top Band possibly and only there for three days. Then on April 30, G3BDQ was moved to tune up, just to check all was well, and he immediately tripped over 3A2GL for another one!

G2HKU is still quite keen on the 'professional loafer' status he has just assumed, but he did find the time to go up to the shack and work PA0PN — who has just celebrated fifty years with the call — on SSB, plus the odd CW contact such as OH0BA, K1MM/IS0 and his XYL KA1ESR/IS0, I3LDS, ON5NT/IT8 and IV3DN.

"CXDN" deadlines for the next three months:

July issue—June 7th
August issue—July 5th
September issue—August 9th

Please be sure to note these dates

Odds and Ends

Culled from many sources, including *The DX Bulletin, DX News Sheet,* your letters, and of course our old friend W1WY who always sends us a copy of his *Contest Calendar;* he notes with some joy that the various efforts put into persuading the *Guinness Book of Records* to include the late KV4AA's score of contacts per year have at last borne fruit. Our thanks to all who helped.

We have an interesting letter from a group calling itself the 934 MHz Club UK,

who aim to encourage the use of 934 MHz CB, and to look after the users interests with regard to the authorities; and to run a regular magazine, QSL bureau, and supplies such as log books and so forth. In fact an attempt at making sure that 934 MHz CB becomes a model, not only to CB-ers on 27 MHz, but also perhaps to many amateurs. We commend the idea to you and give the contact address: Mrs. Glenys Anthony, Box 424, Chelmsford, Essex CM6 3UR.

G6NUO wrote some time ago wondering about the validity of the W6LAS/SVA station he heard on Twenty back in April 1983; now he has received a QSL *via* the Bureau from that station acknowledging his reception report; but we don't know whether Gus' operation from there was in fact accepted by the DXCC people. And talking about Mount Athos, SM0AGD tried for a permit but was turned down; it is being implied that the current governing council is somewhat anti-amateur radio, and no licence is likely unless and until an election produces a shift of the power balance.

By the time this reaches you the 1S2CK Spratly operation may have come and gone — it went into a hold condition just after the last *CDXN* was completed.

On the front page of the latest copy of *The DX Bulletin* we have a report that XU1SS is off the air, it having been overrun by Vietnamese Army invaders.

Turning to the Clipperton Is. we hear that the group who came unstuck recently in a very serious attempt to mount an expedition there are still in the business and planning a second basinful — we hope this time they can beat the odds.

An interesting new one noted from *DXNS* was HS1MG, giving his QSL address as GPO2199, Bangkok.

That BV0AA DX-pedition made some 12500 QSOs, with only two operators, one having dropped out. This should ease matters a little for the JA chaps who are expected to appear either this month or in July.

With regard to the activities of G8GRN/5X. It seems, from *DXNS's* researches, that Jim is unlicensed while he is working for the U.N. refugee organisation. G4CTQ will pass on the cards to him, but it is considered to be highly unlikely anyone will get a reply, and even less likely it will be a counter for DXCC.

All the arguments over the Pribilof Is. being made a valid country for DXCC seem to have reached (for the moment) a stalemate; the DXAC will now go through the whole business of a retrial, as the last one ended in a dead heat — eight for and eight against.

Do you use WWV's propagation information? It would seem that a target of the Reagan administration's budget cuts is to remove this information from the WWV output. If you object, it is suggested you write your howl of protest to: Harold Leinback, Acting Director, Space Environment Lab., NOAA, 325 Broadway, Boulder, CO 80303, U.S.A. We have.

The shack of Brian Edwards, G3RJB, in Hereford. Brian has been a regular reader of *S.W.M.* since 1954 and was a regular contributor to the 5-band DX table which we ran some years ago. Since getting his ticket in 1962, G3RJB has made around 23,000 contacts in 240 DXCC countries using no more than simple dipoles on all bands; present prime-mover is a Yaesu FT-401B. Brian was chairman of Hereford A.R.S. for some years and is a committee member of British Rail A.R.S.

Those who have been looking for D68AM will be pleased to know he has been sent some bits to mend the rig, and a linear, so he should soon be back on the air.

We have received a note of the SEANET World Wide DX Contest for 1984; the CW contest runs from 0001z on Saturday, July 21, to 2359z on the Sunday, while the Phone leg begins at 0001z on August 18 to 2359z August 19, all bands 160-10 metres. The categories are single-band single operator, multi-band single operator and a multi-multi category for the groups. Power input to be within the licence conditions of the operator, and the call "CQ SEA" on CW, and "CQ SEATEST" on Phone. The exchange is RS(T) plus three-digit serial number starting at 001. For stations outside the SEANET area, QSOs with DU, HS, YB, 9M2, 9M6, 9M8, 9V1 and V85 score 20 points per QSO on 160m., 10 points on 80 and 40m., and 4 points on the 20/15/10 metre bands. Contacts with other stations in the SEANET area outside those just mentioned, half these points; contacts between stations outside SEANET area don't count. There is a mulitplier of three points for each SEANET country worked. All entries, logs, summary sheets to be received by the Contest Manager, Eshee, 9M2FK, PO Box 13, Penang, Malaysia, not later than October 31, 1984. Results will be announced at the SEANET Convention; if you want a copy of the results, include some IRCs with your entry.

The Phone leg of the All-Asian contest comes up on June 16-17, times as for the SEANET affair. Essentially you are out to work Asian stations. Exchange RST plus operator's age if an OM, YLs give their age as 00 (don't think I quite approve of that!). Score 3 for a Top Band contact, 2 for a 3.5 MHz contact and 1 point for a contact on any other band; the multiplier will be the number of Asian prefixes worked according to the CQ WPX list. Note that JD1s on Ogasawara are in Asia, but JD1s on Minami Torishima are in Oceania. Logs to be received no later than September 30 for the Phone section, and for the CW section over the weekend August 25/26 you have to get them in by November 30, addressed to JARL Contest Committee, PO Box 377, Tokyo, Japan.

Twenty

Regardless of whether you like the band or not, 14 MHz is where the DX is workable through thick and thin — it may be easier at times on 21 or 28 MHz but it's far less certain!

G3BDQ, in the course of his testing of aerials, found TA1MO and 4U1VIC on SSB, with a CW contact with 4S7NS just to keep his hand in.

G2HKU managed his regular ZL SSB skeds with ZL3RS and ZL3FV most of the time, but on occasion they were a complete washout. CW found UK0QBC, DL7HZ/1M0, VK2EO and UK8JAA.

G3NOF has only been on during the morning sessions on this band, but he did manage one QSO with VK2EBX in

Yeoval, the sister town of G3NOF's own Yeovil; otherwise it was SSB to FM7WW, IP9IARU, IY4FGM (Marconi Memorial Station), KA9IBG/PJ4 (Bonaire), JY9AA, KL7XO, OH0BA, V85GF (= VS5), VE7DRO/8, and VKs including VK9NS, VR6TC, XE1VIC, ZB2EO, ZL3QT, ZL4ND and ZL8AFH.

Twenty for G2BON included such as VY1CW (Yukon), JY9TS, UH8HCB, UK8EHB, 7X2AK, CE0AE (Easter Is.), VU2RAD, KL7XO, YI1BGD, KH6DLW, 9V1VP and YN1FI.

On Twenty, G6QQ worked CW to OX3UD for a new country, plus SSB to VK5YH, VK3DN, ZL1VV, ZP5HEB, VK3AFO, KH6PK, W6IEW and VK2LX.

It was a quiet month in some ways for G4SXE; the first couple of weeks were well occupied building the "Acme Foolproof" 20m. transmitter featured in the October 1983 issue of *SWM*, for which all the bits had finally been obtained, and the week prior to his letter he was QRT due to a valve failure in the JR-500S receiver, for which a replacement is awaited. The little one-watt rig, on Twenty, produced EA3ALV, HB9BZQ, I0YNN, UK3ABC, UP2BJM and YU3IV before the receiver conked.

Fifteen

Not a lot of reports, and not much observation of the band by yours truly, for reasons already mentioned. G3BDQ noted just one contact — a 21 MHz SSB one with J3ES in Grenada, for which a large pile-up had to be waded through.

G3NOF noted the band as being dead at times; there were a few long-path openings to VK and ZL in the mornings around 0800 with the short path opening about 0900z to VK, ZL and Indonesia, the order generally being JA, VU, AP, VK and finishing off with YB around 1600z. The only Pacific station noted was AH2AV. South Americans were about between 1100 and 2000, but the North Americans have been poor, with only a few openings to the West Coast. Africans were noted between 1500-1800z. SSB contacts were made with A92P, AH2V, AP2MQ, C53EK, C53FG, CT2AX, DU7EV, F6GNS/TU, FM7BH, HB0CBJ, HI8JO, HL1AIJ, HL1EQ, HL5QQ, HL0YJ, J73CB, JAs, JE3PUM/MM, JT1AO, JY8CQ, K6AXC, K6KA, KA6FXJ/HI8, KB7UD (Oklahoma), KT7V (Wyoming), OD5AS, OE8HFL/YK, S83H, TA1UA, TR8IG, TU7I, TU73 (=TU2NW), TU1BS, UI8AFA, UJ8JKO, UM8MKF, VK3NLS, VK4BFO, VK7GK, VS6CP, VS6CT, W8AP/VP2M, W3DYP/DV2, YC2DFP, YC4FPE, YC4VV, YI1BGD, YU3TCQ/MM in the Arabian Gulf, Z21AO, Z21FO, Z21JU, ZC4ESB, ZD7CW, ZD8RC, ZD9BV, ZD9CA, ZS1AAJ ZS1AAQ, ZS2RJ, ZS4S, ZS6BZH, ZP5LX, 3D6AJ, 4S7DA, 5B4NG, 5N6CJR, 5N8BAV, 8P6CC, 5R8AL, 6Y5KH, 9J2BO, 9J2WS, 9K2BE and 9M2AR.

We turn now to G2BON; Tom connected with UM8MKF, EC9HR, PT7ACZ, TR8IG, U9Z (an expedition to the Altai Mountains, some 220km. from the Mongolian border), VU2REC, VU2VSA, HR3JJR and LU3AJW.

Finally on this band we look at the efforts of G6QQ, who managed W2CBI, VE3JF, VK2EQ, KA2HKO, WB3ICR, W8ZNN, K8YEI, KG8K, WA8TGA, JA2VPO, JF6JIP, HL1ASN, DU7EV, PY2AJK, NN5E, JH6VBC, W0UYD, W0WTZ, YJ8RG for a new one, and ZL2BJX on SSB; plus CW to JA8AMK, JA2UJ and K8GLL.

The New Bands

Here we have four brief reports this time. First one in the pile is that from G2HKU, who latched on to K5VT and VK3VJ. This last was the subject of an odd coincidence: Ted was filing some QSLs at the time, and when he heard VK3VJ he actually had his QSL for a contact back in 1948 in his hand. Thus when he called and raised him, Ted was able to tell VK3VJ the rig details from 36 years ago, much to the VK's surprise and no doubt pleasure!

On his long-wire, G4OBK pulled in ZL4QO, K5ONF, CT4DX, VK7RY, W1s, NP4V, VK3AC, DL, OK and OZ stations.

The CW from G3BDQ managed, during the aerial trials, to latch on to JA6HW and VK3MR.

G6FU (Mevagissey) took our comment last time about the new bands to heart; he had a 'harken' and found the DK0 beacon to give his TS-530S marker a checkout for frequency; and also noted G4LDE, ON4UBA, DL6ZZ, DK8EI and LA8UC on 10 MHz, along with the DK0WCY beacon.

Eighty and Forty

G2BON, of course, stuck to SSB and his G5RV, which yielded him, on Eighty, TF3KT and UB5ZFZ, while Forty yielded UJ8JKO, D44BC, VE3ICR, IT84UCS, VE3GCO, VE3CRG and OY7A.

It was QRP on 3.5 MHz for G2HKU; four watts CW input gave him DJ6FO, ON5AG and GM4HBG/A. Full power CW on Forty and one QSO was enough — that with ZL4AW.

Evening operation on Forty CW by G3BDQ came up with U9Z and VK2KM.

In the note from G2NJ (Peterborough) we note his pleasure at hearing Marion, GW4TNH, on the TOPS CW net on 3508 kHz one afternoon — they are on Wednesdays and Sundays at 1400 clock. The TOPS European net has, we gather, moved to 3534 kHz from 3592 so as to avoid RTTY; this one is 2030-2230 clock on Sundays, with the current control station G4GBG and all CW fans welcome. Another pleasant session for G2NJ was listening to the GB2RN signals from *HMS Belfast* over the Easter weekend activity period, and G2NJ was able to work them with his HW-8. Another QRP contact was the one with G3NSA/P at Ashbourne, Derbyshire, who was running four watts to an aerial tied to a convenient tree.

We have already indicated that G4SXE has had other things on his mind for much of the month, but he did find the time to look at Eighty twice, to work DJ3FR, G4KFK and PA3DEB with his 'mouse-power' rig. Incidentally, Brian uses the same end-fed aerial for both 80 and 20m., measuring the field-strength of the RF from inside the shack so that he can tweak everything to the absolute maximum.

Finale

It remains but to mention the deadline for next time — *see* the 'box' for the date; address your letters, as ever, to your scribe, "CDXN", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. Meantime, happy lawnmowing and aerial-farming!

"VHF Bands", contd. from page 169

DC0HW, PE1CMO, SM6HYG, LA6HL and Y23BD, the last, in GM05f, being an all-time new country and square on the 25th. His log, with many D and PA QSOs looks more like a 2m. log, so Gordon is certainly putting Northumberland and ZP square on the microwave map. He has a Tx going on 13cm. and SM6HYG and PA0FRE gave him S9 and DC0HW, S2. Rx problems at G8PNN precluded two-way QSOs on 13cm.

From the -/P Dyfed operation, GW8TFI used a *Yaesu* FT-225RD, *MM* transverter, *SSB Products* 10w amplifier and a pair of 7829 valves in the PA. The antennas were four 23-ele. *Tonna Yagis* with an MGF1412 preamp. up the mast. 50 stations were contacted from XL10a.

Odd Jottings

G4ROA asks if any reader knows of a FAX machine for sale as he is interested in receiving weather maps *via* radio. G4LZD asks is anyone has a *Sinclair Spectrum* program giving distance and points from Maidenhead locators.

Deadlines

June 6 is deadline date for July and for the August issue it is July 4. All your news, comments, claims, etc., to:— "VHF Bands", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL6 9EQ. *73 de G3FPK.*

The Assessment of Local Windspeeds

A VITAL CONSIDERATION FOR THE WOULD-BE TOWER BUYER

D. J. REYNOLDS, G3ZPF

Flimsy Whimsies

THE aerial system is often the "poor relation" of an amateur's station, and this not only applies to the RF efficiency, but also in some instances to the safety standards. This is particularly so when looking at the scores of CB aerials which have been erected. Whilst some of them seem to have been designed more for aesthetic appeal than for RF performance, the one thing that most of them have in common is a flimsy standard of construction, which inevitably means a short lifespan. Before readers laugh too loudly, it is worth remembering that a number of amateurs with commercial beams and towers have also found an expensive pile of twisted scrap at the foot of their gardens following a storm, and whilst the consequences of a wire aerial collapsing are unlikely to be serious, the demise of a substantial beam and tower will very likely mean damage to property or persons, so it is obviously essential that a "most safe" criterion be adopted in their design and construction.

Rush-Out-and-Buy-One

The major load applied to amateur tower and beam installations will generally be from wind forces, rather than the self-weight of the set-up, but anyone contemplating the purchase of such an arrangement may well be confused by the apparently conflicting claims in the advertisements. Such confusion seems to have arisen from the significant variation in wind forces across the country generally, coupled with local site conditions which magnify the problem even further. This puts the makers of the tower in a somewhat invidious position, since to design for the worst possible case, in the worst possible place would make the tower extremely expensive, as it would be vastly over-designed for most of the country. Cutting down the design too far results in the possibility of several failures, giving a bad reputation, and resultant loss of sales.

After a series of advertising claims and counter-claims between two of the major retailers of towers, some time ago, things now seem to have settled down to the "ring us, and we'll let you know" approach, rather than a bald statement of a headload for a given windspeed. Whilst this is actually the correct approach to take, the author admits to being somewhat surprised at the number of instances where amateurs just buy (or build) a tower, vertical, or 3-ele. tri-bander, without considering if its strength will be adequate for their particular application, although in fairness, few (if any) advertisements quote any figures, which will inevitably lead readers to assume that they will be adequate anywhere. Often the choice will be made on the basis of what a friend has successfully used for some time, but this approach, too, has its pitfalls, particularly when the stations are considerable distances apart.

The Need to Know

In the few instances where safe loads for commercial towers and aerials are quoted, they often consist of a permissible headload at a given windspeed for towers, and a windload for a given wind speed for the aerials, although very occasionally a maximum survival velocity will be given for the aerial as well. This is all well and good providing that the buyer is aware what windspeed is appropriate to his circumstances. Given the fact that few amateurs realise the variations which can occur, and the fact that even those who do will usually underestimate the power of the wind, this article will attempt to give a reasonable estimate of windspeeds for all situations. It must be stated at this point, however, that the analysis has been simplified to make it as digestible as possible, and whilst the differences between this simplified approach and a more exact calculation may not be too great for smaller installations, those amateurs who are fortunate enough to be contemplating a monster set-up must seek the detailed advice of the suppliers of their equipment.

A Code of Practice

The British Standard Code of Practice which covers wind loading on structures is referred to as "CP3: chapter 5: Part 2". It is a fairly lengthy document, since it covers wind loading on all manner of structures, but fortunately for the subject in hand, its contents can be greatly condensed, to make it understandable to those who are not professionally involved with structural engineering. The map and graphs which follow, have been derived from information contained within the Code of Practice.

The first step in the process is to determine the Basic wind speed appropriate to the area, which may be obtained from Fig. 1; this also gives a conversion from metres/sec. to miles /hour. The values on the map give the maximum three second gust speed at 10m. (33′) above ground in an open situation, that is likely to be exceeded on average only once in 50 years, in the area under consideration. Readers may care to note that Appendix B in the Code of Practice shows how these speeds were estimated, and gives the statistical basis for selecting the three second gust speed for design purposes. Cynics would remark that Murphy's Law dictates that the "once in 50 years" occurs the day after the aerial is erected.

The basic windspeed is then multiplied by a Topography Factor, since figures from the map apply only to open, level country, with no obstructions. The topography factor takes account of local variations; *see* Table 1.

Topography	*Topography Factor*
Very exposed hill slopes and crests, where acceleration of the wind is known to occur.	1.1
Steep sided, enclosed valleys, which are sheltered from all winds	0.9
All other cases	1.0

Table 1

After the basic wind speed has been multiplied by the topography factor, the resulting answer is multiplied by the Ground Roughness and Height Factor, to give the final answer, referred to as the Design wind speed. Fig. 2 gives the values for the

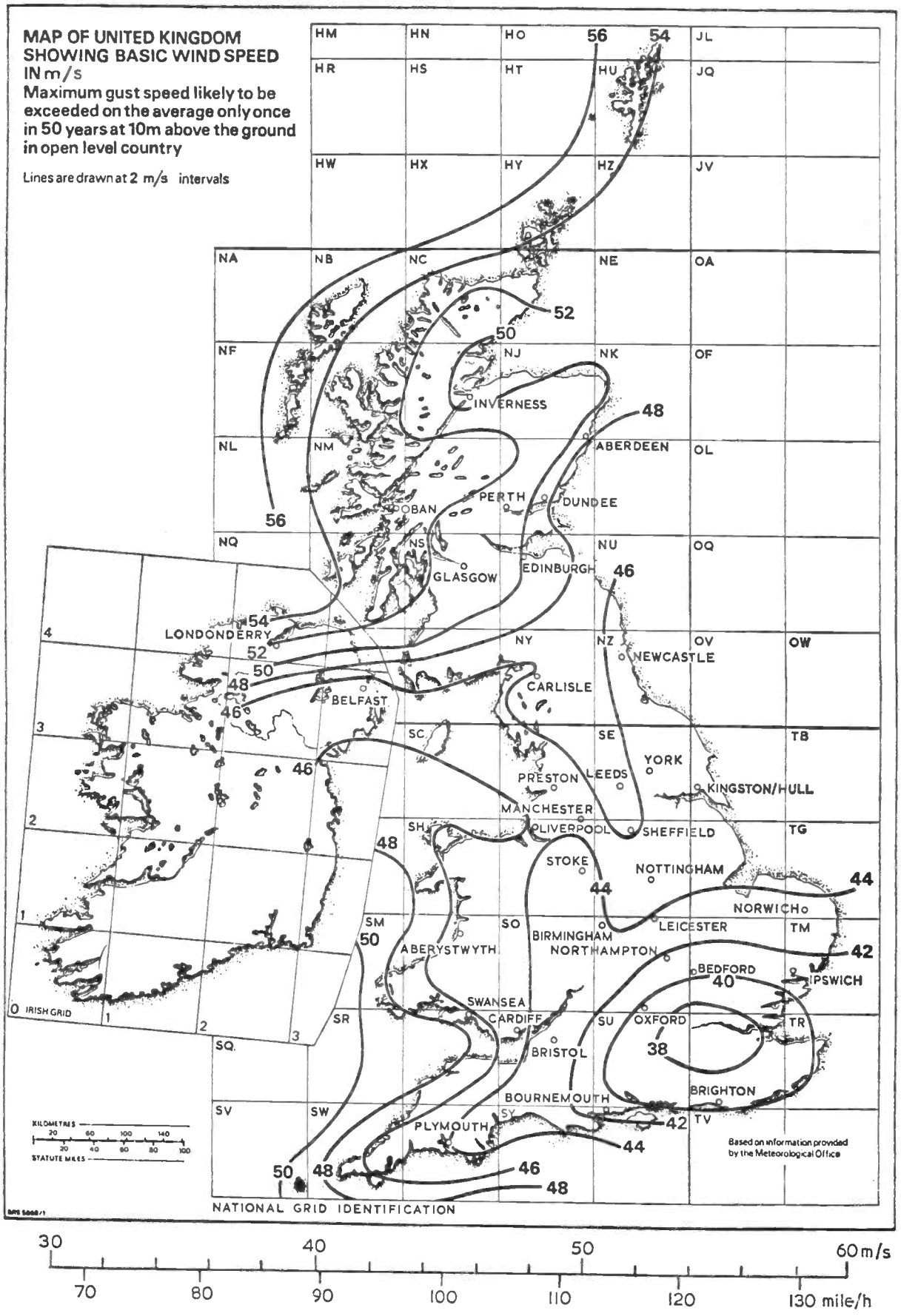


Fig. 1. Basic wind speed

ground roughness and height factor, and the various lines on the graph are appropriate to the following situations.

(*1*) This line applies to long expanses of open country, which is either level, or very nearly so, and which contains no natural shelter. Examples would be flat coastal areas, fens, airfields, grassland, moorland, or farmland without hedges or walls around the fields.

(*2*) For QTH's in flat or undulating country, having walls or hedges around fields, and with scattered windbreaks of trees and the occasional building. This would apply to most farmland and country estates, excepting those which are well wooded.

(*3*) Applicable in areas covered by frequent, large, obstructions, such as well wooded parkland, forest areas, towns and their suburbs, and the outskirts of large cities.

(*4*) This category covers only the centres of large towns and cities, where buildings are not only high, but are fairly close together.

So Now You Know

From the above information it should be fairly easy to arrive at a reasonable estimate of the design windspeed for a particular QTH. Armed with this information it will be possible to form a shortlist of products which seem adequate, before seeking further advice. Use of the various factors and categories should be accompanied with a large helping of common sense, since they are intended to apply to structures in general. A value of 0.9 for the topography factor, for example, though possible for a building, would imply an aerial so totally enclosed by surrounding high ground, that very little would ever be heard. The city centre values of the ground roughness and height factor should be used with care too, since although a building erected in a city would undoubtedly be partly shielded, a tower and beam on the roof of a tall tower block most certainly would not. Similarly a trap vertical mounted at ground level in a garden on a housing estate will not be subjected to such onerous wind forces as one on a rooftop.

Proceed with Caution

Many towers are capable of being cranked down or tilted over, and this, coupled with the fact that amateur-radio installations will not be in continuous use, can lead to economies in design if the chore of having to wind down the aerial in inclement weather is acceptable. Such methods should be used with care, however, and strain gauges or anemometers on the mast, coupled to an alarm in the shack would be essential, in case the enthusiasm of battling through a pile-up dulls one's awareness to the impending storm outside.

When examining the headloads presented by various aerials, bear in mind that this could be increased during winter months due to icing. In the design of the tower itself, allowance should have been made for this, although the problem is not a great one in the U.K., when compared to other countries, but it is unlikely that stated headloads will include any allowance for increase from ice formation. Again, common sense, local knowledge, and professional advice are the order of the day.

All of the above assumes that the tower and aerial is maintained in a good state of repair. If adequate protection of materials against the elements is not maintained, then the arrangement will weaken, and ultimately fail. Set-ups with high factors of safety designed-in will stand longer periods of neglect than a design which is barely adequate, but will cost considerably more at the outset.

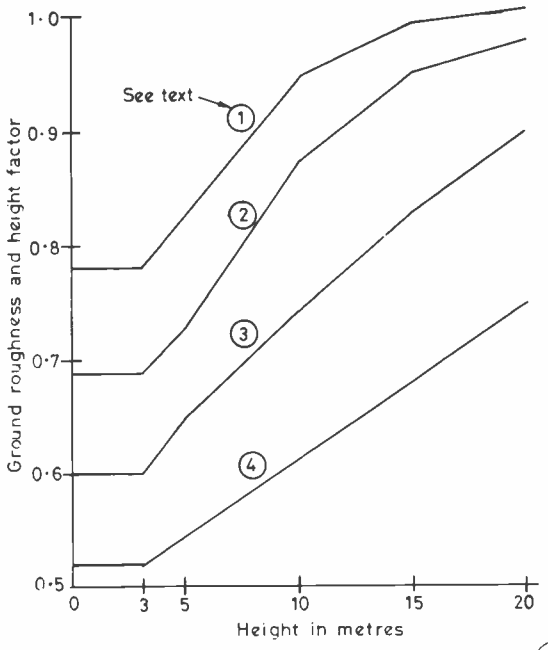


Fig. 2. Graph to determine value of ground roughness and height factor

E 239

It is worth remembering that aerial installations can have a major impact on the attitudes of neighbours, who are unlikely to view them through the rosy glow that the owners do. The image that it presents to them will colour their opinions towards the hobby in general, and whilst they may not appreciate the intrusion on the local skyscape, a soundly constructed and maintained appearance will help allay fears for their personal safety, and possibly soften their reactions to any subsequent BCI/TVI. One thing that is certain though, is that a "rag bag" set-up which collapses occasionally, or sways excessively in high winds, will poison relationships and may well result in litigation.

In Conclusion

This article will primarily be of interest to amateurs contemplating the purchase of a commercially designed tower or aerial. For those who prefer to build their own, the conversion of windspeeds to loading cases on masts and towers is a convoluted topic, beyond the scope of this article, but which could well provide the subject matter of a further article. The author will be glad to answer enquiries of a general nature, on receipt of an *s.a.e.* but for specific, detailed solutions, the variability of the problem dictates that readers seek professional advice from the makers of the equipment of their choice.

Acknowledgements:

Extracts from "CP3: Chapter 5: Part 2: 1972" are reproduced by permission of the *British Standards Institution*, 2 Park Street, London W1A 2BS, from whom complete copies of the document can be obtained.

The basic wind speed map (Fig. 1) is based on information provided by the Meteorological Office and reproduced with the permission of the Controller of *Her Majesty's Stationery Office.*

July issue due to appear on Friday, June 29th

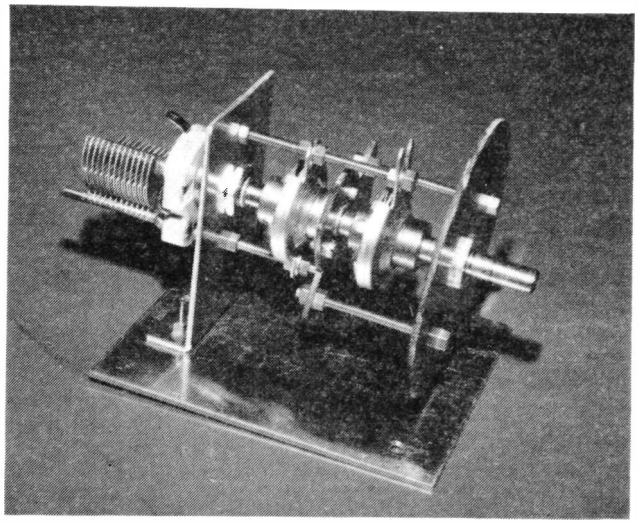
A 36:1 Reduction Drive with Indicator Scale

INEXPENSIVE AND EASY TO MAKE

S. NIEWIADOMSKI, M.Sc.

Introduction

DESPITE the advent of varicap diodes whose capacitance is controlled by applying a variable DC voltage across the diode, the most stable oscillators still use high quality air-spaced variable capacitors as the tuning element. The C804 range of capacitors manufactured by Jackson Brothers is commonly used in amateur equipment such as receivers and transceivers. These capacitors have a rotation of 180° for a full capacitance swing and so some type of reduction mechanism is generally needed between the tuning knob and the capacitor shaft to give a reasonable tuning rate. Slow-motion drives provide a popular and simple way of obtaining this reduction.



Jackson also manufacture a range of slow-motion drives; the cheapest, easily available drive has a reduction ratio of approximately 6:1. In fact, this 6:1 drive is available in a number of versions: the 4511 has a single fixing aperture; the 4511/DA has double fixing apertures; the 4511/F has a single fixing aperture and a flange to which a dial can be attached; and finally the 4511/DAF has double fixing apertures and a flange.

Another mechanism available from Jackson is the 4511/DRF, which has a forward reduction ratio of 6:1 and a reverse reduction of 30:1. This drive has a flange onto which a dial can be fitted, but it is not easily obtainable by the amateur.

To tune 300 kHz of the 80m. band (3.5 MHz to 3.8 MHz) a 6:1 reduction drive would give a tuning rate of 100 kHz per knob revolution. This tuning rate is too fast to easily tune SSB signals and a fine tuning control would be necessary. If, however, a 36:1 reduction is employed, the tuning rate is now approximately 17 kHz per revolution. This is a slow enough rate to make tuning easy and no fine tuning control would be needed. The 36:1 reduction can be obtained by cascading two 6:1 drives.

As well as requiring a reasonably slow tuning rate, the amateur generally wants to know what frequency he is tuned to. For about £20, a digital readout module can provide a readout from the local oscillator to a resolution of 1 kHz at frequencies up to 40 MHz. Alternatively, high quality combined reduction drives and scales (such as the Eddystone 898) are available, but again these are expensive. Often, a scale calibrated in terms of frequency to a lower resolution, or simply calibrated 0-100 is sufficient.

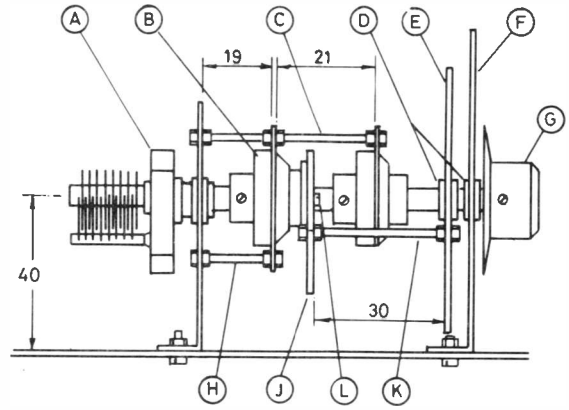
This article shows how a 36:1 reduction drive with a scale can be constructed simply and cheaply. It makes use of the easily available Jackson 6:1 drives with the addition of some home-constructed parts.

Constructional Details

Fig. 1 show a cross-section view of the design. Drawings of the two discs which need to be made are shown in Fig. 2.

The drive nearest to the tuning capacitor is a 4511/DAF whose flange turns at the same rate as the moving vanes of the capacitor and the arrangement transfers this motion past the front 6:1 drive to the scale. The front drive is a 4511 or 4511/F which has one fixing aperture so that disc A can rotate through 180°. Two lengths of 6BA studding couple the motion of disc A to disc B. A brass bush bolted to disc B ensures that the disc turns smoothly, slipping on the shaft of the front drive. Another brass bush is fitted to the front panel, supporting this shaft and preventing any side-to-side and up-down movement of the knob when tuning. As supplied, the bushes are rather long and should be cut down to approximately 6mm. overall length for use here. These brass bushes give a 'de-luxe' finish to the mechanism and can be omitted without dire results if an even cheaper arrangement is required.

A cut-out in the front panel is required to view the tuning scale. No details are given here of this cut-out, as its position and dimensions depend on the diameter of the tuning knob and the calibration of the scale. The rear of the cut-out should be covered



A	Tuning capacitor	G	Tuning knob
B	4511 DAF drive	H	6BA x 26mm stud.
C	6BA x 50mm stud.	J	Disc 'A'
D	Bushes	K	6BA x 40mm stud (2 off).
E	Disc 'B'	L	8BA screws (2 off).
F	Front panel		

Fig. 1 DIAGRAM OF COMPLETE MECHANISM

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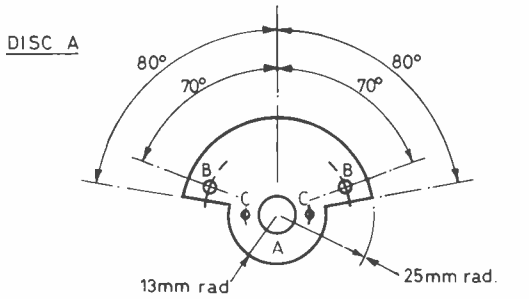
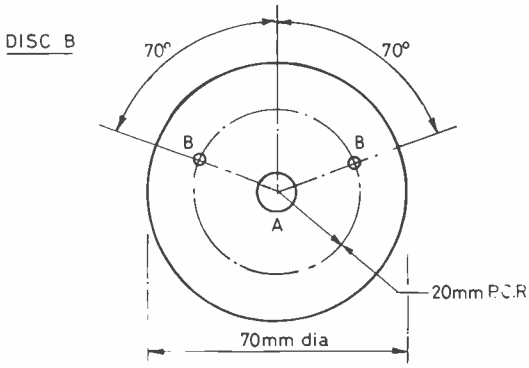


1 A hole 10mm dia.
2 B holes 2·5mm dia. on 20mm p.c.rad.
2 C holes 1·5mm dia. on 8mm p.c.rad.



1 A hole 10mm dia.
2 B holes 2·5mm dia.

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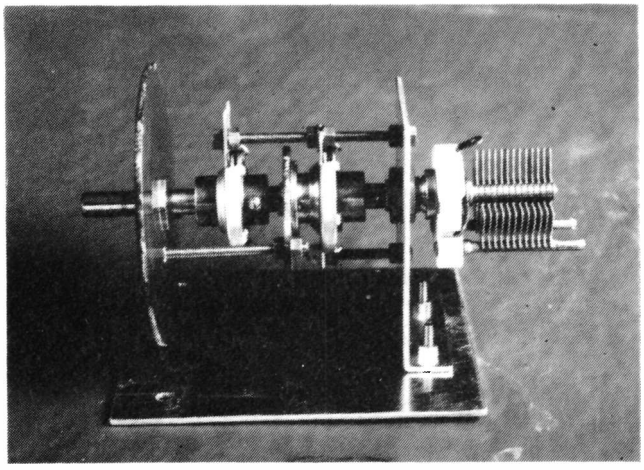
Fig. 2 DETAILS OF DISCS A & B

by a thin transparent sheet with a line scribed on it from which to read the tuned frequency.

The tuning capacitor and reduction drives are shown in Fig. 1 supported by an L-shaped bracket. This can be replaced by the wall of the box in which the oscillator circuit will usually be mounted.

The dimensions of the discs are not critical. Disc B can be any diameter (as long as it is bigger than disc A) to suit the application. A larger diameter can be accommodated either by raising the height of the whole mechanism above the base or by a cut-out in the base to allow the disc to pass through it. The only critical point is the position of the holes. The disc can be held together when drilling the holes marked 'B'. Don't worry if the edges of the discs are irregular, as they are not visible when mounted behind the panel.



Almost any thin, rigid sheet material can be used to make the discs. The prototype discs were made from double-sided printing circuit board. This is an ideal material, being rigid and easy to work with simple hand tools. Plastic, aluminium or brass are other suitable materials.

A horizontal scale can be accommodated by this system by replacing disc B with a cord fixing drum and installing a cord drive from the drum. No details of this arrangement are given here as they depend on the scale length required.

Scale Calibration

If plastic is used for disc B, it is possible to scribe a scale directly onto it. With a PCB material or metal disc, either stick on a paper scale or paint the disc and then calibrate it. Letraset, or any other rub-on lettering, can be used to produce a neat finish.

If the scale is to be calibrated in terms of frequency, it must be left until the mechanism is assembled in the finished equipment and the desired frequency coverage has been obtained. Calibration is best carried out before the hole in the front panel is covered with a transparent sheet. Lightly mark the dial through the hole at the frequency intervals required. Then dis-assemble the mechanism and re-mark the dial with neat writing or Letraset. When the dial is re-assembled and the clear sheet with a scribed line is glued to the rear of the panel hole, check that the calibration is still correct, re-adjusting the position of the reduction drives on the shafts if necessary.

Availability of Parts

The 4511 is available from *Electrovalue;* the 4511/F is available from *Maplin;* the 4511/DAF is available from *Electrovalue* and *Ambit;* brass bushes, 6BA studding and nuts are available from *Maplin,* who also supply two sizes of cord fixing drums (54.5mm. and 95.5mm. diameter), as well as other cord drive components.

Pre-printed, self-adhesive dials and symbols (such as kHz, MHz, 3.5, 3.6, etc.) are available from *Data Publications Ltd.,* 45 Yeading Avenue, Rayners Lane, Harrow, Middlesex, HA2 9RL.

A Move for Arrow Electronics Ltd.

YOUR Editor was pleased to have the opportunity of going to the opening shindig at **Arrow Electronics,** the evening before the first official day's trading at the new address. Their new premises are at 5 The Street, Hatfield Peverel, Chelmsford, Essex (0245-381673), where there is adequate car parking at the rear of the showroom; and Hatfield Peverel is conveniently situated just off the A12, between Chelmsford and Witham. Travelling along the A12 from Chelmsford — *i.e.* going eastwards, the sign-post for Hatfield Peverel comes up a half-mile or more before the actual turn, where the minor road loops up and over the dual carriageway and down again into the village. **Arrow Electronics** lies on the right a couple of hundred yards further on.

Apart from a wide range of Yaesu, Trio-Kenwood and Icom goodies, we were very pleased to note that they also had in stock such useful (and often hard to get!) things as aerial insulators, coaxial cable, PL259 connectors and other such necessary items for those wishing to radiate signals on the bands. We were assured by director Peter Clarke, G3LST, that he has more in his stocks than could be put on display — and his new spot will certainly be a stopping-off point for a large area. Mail order a speciality, too, of course.

If you are within striking distance, give them a look in — it's easy to find, and there's plenty to see.

Propagation Modes on 144 MHz

Part 1: Sporadic-E

by "Igor"

Much of the content of our monthly "VHF Bands" feature is concerned with propagation modes, such as tropospheric, auroral and sporadic-E. In the first of a proposed series of articles on propagation the author, a very successful DX operator, describes his observations of sporadic-E phenomena based on very detailed analyses of reports of events in this and other publications.

THIS is a collection of *observed* events from which the author has gained a large quantity of reliable pointers to enable him to be around at the right time, in the right place, with the right mode of transmission, so as to have the maximum chance of working what he is interested in, namely squares, counties, individual stations and — as in the case of most two-metre users — DX.

Sporadic-E is, in the main, a summertime propagation mode occurring from early May until the end of August. This form of propagation will only be caught by patient observation of the lower VHF frequencies, or by pure luck if you happen to walk in the shack as the event occurs, or if you get a tip-off over the phone; and last, but most important, that the opening occurs in your part of the world!

It would seem that once the E's season has begun there are very few days when E's are not present at some time or other. Virtually every day will produce, even if only for a short period, signals up to the 70 MHz region. For about 5% of the total E's time (60/70 hours per year) the Maximum Observed Frequency (MOF) rises to the 100 MHz region, and for 1% of the total E's time (12-14 hours) the MOF is in the 144 MHz region.

The following observations apply to Band 1 TV and 144 MHz, and to both OIRT and CCIR Band 2, though with the latter data is not so readily available. My own observations have been supplemented by reliable reports in *Short Wave Magazine, Rad Com* and *Dubus Informationen.*

The received direction at one frequency can vary very much from that of another even at only a few MHz difference, and in fact two directions can be open at the same time — but there is not all-round propagation. This opening in two directions is of great use and interest on 144 MHz. The usual changes in direction are 90 or 180 degrees; for example, on Band 1 TV channel E2 SM/LA with channel E3 EA, E2 and E3 YU or OE with E4 SM (90) or TF (180). These conditions usually exist for the period when the E is altering direction or layer height, and then appear to revert to one open direction for the remaining time. This condition has occurred on 144 MHz two or three times a year with interesting results. Examples are YU working to 4X4 and UR (90), HG to 4X4 and G (180), HG working to EA and UR (180), D to 4X4 and G (180, also with 4X4 working to G), I to OD and CT (180 with OD working to CT), and on June 17th, 1983 DL to UB and EL. If there is an opening to Italy it is well worthwhile turning the beam to SM/OH or even TF!

I feel that the strength of the 28 MHz beacons, Band 1 TV, Band 2 FM, etc., bears little relationship to the MOF: high or rising strength does not appear to indicate high or rising MOF. On many occasions I have observed the strength of signals on Band 1 rise tremendously, but the MOF did not appear to have moved up or down; likewise on many occasions the strength has not altered very much, but the MOF has moved considerably up or down. These observations may well be linked to the next point — namely, narrowness of openings.

I am satisfied that the apparent mass of signals that might be expected on Band 1, OIRT Band 2, CCIR Band 2, and 144 MHz, does not in fact take place. There are only one or two signals per TV channel, and in the case of Band 2 only up to 10 or so signals arriving from the same general area. The signals arriving at a given location, at a given time, are only arriving from a direction which is very narrow in width, but can (and often does) extend considerably in length. There are not large numbers of signals coming in from everywhere, for example YU or EA, but only the transmitters which are in the narrow, but long, wedge of the reflecting area. This wedge seems to start at about 1000 km. (there are not many reports of contacts under this distance) and, dependent on layer height, goes out to 3500km., if not further, in a single reflection (single hop) and all transmitters in a given location within the wedge may be reflected. This narrowness is most apparent on 144 MHz, less so on Band 2, and more complicated on Band 1 by the 90 and 180 degree shifts.

It also seems that once a direction has opened on 144 MHz (and therefore on lower frequencies?) that a "weakness" has developed and that the direction is very likely to open again in the same season, as suggested in Table 1. There were, of course, other openings in each year listed in the table, but the openings given accounted for 85% of the openings that occurred (*i.e.* were reported). A further check will reveal that the area — squares — involved each year are the same even down to the same stations being heard or worked over and over again from both sides of the path — "Oh no, not 9H1 again!" I can offer no explanation for this "weakness"; does anyone have any ideas?

For those in Britain the old saying "beam south-east" does still hold true, but not as much as it used to owing to the rising amateur population in Spain, Sweden and the U.S.S.R., and also because of the increased awareness of E's which means that now almost any direction is as liable to open as another.

My opinion is that all the reported contacts to date are of single-hop nature; of course I have no absolute proof of this, but the information carried in *Dubus* (2/81, pages 155/156) opens wide the door to this probability. This information would also appear to provide an explanation for the 90 and 180 degree shifts. I also suggest the possibility that a signal above about 100 MHz is actually propagated by being trapped quite close to the originating station in the E(?) layer and travelling as if it were in a Tropo duct, as opposed to the conventional idea of the signal

1980	*1981*	*1982*
1.6. G to UR	*2.6.* G to HG + YU	*9.5.* G to HG + YO
10.6. G to UC	*11.6.* G to HG + YU	*30.7.* G to HG + YO
10.7. G to EA	*9.6.* G to YU	*25.5.* G to SM + OH
13.7. G to EA	*9.7.* G to YU	*17.7.* G to SM + OH
11.7. G to IS	*6.6.* G to EA	*8.6.* G to EA + CT
3.8. G to IS	*10.7.* G to EA	*23.6.* G to EA
10.7. G to I	*30.7.* G to EA	*9.7.* G to EA
11.7. G to I		
12.7. G to I		

Table 1. Main Sporadic-E openings, 1980-1982

being reflected off the layer around the mid-point — which the 'professionals' do not now seem to think happens because of the extremely high levels of ionisation needed to reflect signals of such frequency at the very high strengths recorded.

Having watched and listened to many hours of E's propagation during the last four years or so, it seems valid to state that every hour around the hour one of the following will happen:

1. The MOF (and MUF) will rise or fall.
2. The strength of the observed signal(s) will increase or decrease.
3. The direction of the opening will start or finish changing.

As an added point of interest these effects have also been noted on Auroral and Meteor Scatter signals, with *1* and *2* above being the most easily noticed.

If there are strong E's signals in the 70 MHz region which disappear much more quickly than the slow and "fady" way they usually do, then it is worth looking to the north for Aurora. It would appear that there is a link between solar activity and E's, but in a negative way. When the Sun is disturbed and causing possible Auroral conditions, the chance of E's is very much reduced. Only on one occasion in all my observations did I note (in the summer period) E's Band 1 TV whilst there was an Aurora in progress. Was this Auroral E's? I believe this link may provide the answer as to why there is a small, but usually well-defined, peak of E's in late December and January — a period of normally low Auroral activity.

Regarding the peak time for E's, no one day is any more or less likely to produce 144 MHz E's than another, although there appears to be a tendency for E's events to bunch over a period of anywhere from two to eight days. I am still "wide open" on the matter of cyclic repeats (*e.g.* 27 days) as it is possible to observe a large number of different cycles and repeat periods each year. The peak times per day are a little more definable: around 1100 and anywhere between 1500 and 2100, with 1600 to 1800 as the best (for Britain), but 144 MHz E's have occurred between 0700 and 2300. Two-metre openings can last from only a minute or so to a couple of hours. Openings tend to start at about five minutes to the hour and to end either around 15 to 20 minutes past the hour or to continue to about 10 minutes past the next hour.

Finally, two questions. What effect does the D-layer absorption — or lack of it — have on E's reflected signals: is there anyone with some information? Also, can anyone supply information on noctilucent clouds?

A problem experienced by users of the latest Icom series of transceivers is the difficulty of using microphones other than those supplied by Icom, since all Icom microphones have amplifiers built-in to the microphone housing and the input sensitivity of the transceiver is thus too low for normal microphone outputs. Now *Adonis* has just announced their AP-1 accessory to overcome this problem; this is an 8-pin microphone plug fitted with an amplifier and drawing power from the existing DC point on the Icom 8-pin microphone transceiver socket. All that is necessary is to wire this plug onto any current microphone, thus enabling it to be used with all modern Icom transceivers. The AP-1 costs £10.95 and may be ordered, post free, from *Waters and Stanton Electronics*, Warren House, 18/20 Main Road, Hockley, Essex (tel: 0702-206835), or from any appointed dealer.

CLUBS ROUNDUP

By *"Club Secretary"*

FIRSTLY, something we have for long felt to be a good idea. Several clubs in the Essex area have made it their business to get together — Southend, Braintree and Dengie Hundred are the prime movers — to form the Essex Federation of Radio Societies, and we hear that the Colchester crowd are also interested in the idea too. The object of the exercise is to bring the clubs into closer contact for the benefit of all, and we wish them success.

The Mail

Abergavenny & Nevill Hall are to be found every Thursday evening at Pen-y-Fal Hospital, in the room above Male Ward 2. On June 2 they operate GB3NHF at the Nevill Hall Féte, GB2ABC on July 28 at the Abergavenny & Border Counties Show, and GB2PYF on August 4 at Pen-y-Fal Hospital. In addition, June 16 sees their Midsummer Buffet at the "Llanwenarth Arms", Crickhowell. More details on all these from the Hon. Sec.—*see* Panel.

Acton, Brentford & Chiswick have a review of the May R.A.E. set down for their meeting on June 19, and the venue is as usual Chiswick Town Hall, Chiswick High Road, London W4.

Now to **Axe Vale**; June 1 sees a talk on "The Entertaining Electron", and on July 16 they have a trip to the IBA station at Stockland Hill. The venue is the Cavalier Hotel, West Street, Axminster, starting at 7.30 p.m., for the visit, the gathering is at the usual time at Hq, and they will then move off in convoy to Stockland Hill.

Bangor's Mobile Rally is on June 10, but the letter with the

extra details seems to have failed to arrive — but we know they are to be found at the Sands Hotel, on the sea front at Bangor, on the first Friday of the month. More data from the Hon. Sec. — *see* Panel.

At **Basingstoke** the Hq is now the "Swan Inn", Sherbourne St. John, near Basingstoke, on the second Tuesday of each month. Programme data from the Hon. Sec. — or just go along and meet them!

We don't have the latest from **Bath** as they have just had their AGM; but we do know they have a billet at the "Englishcombe Inn", Englishcombe Lane, Bath. Other details from the Hon. Sec. — *see* Panel.

Looking now at the **Biggin Hill** listings, we find they will be at St. Mark's Church Hall, Church Road, Biggin Hill, on June 19 for the spring sale of surplus equipment, and then on July 17 they receive G4BUE for a talk on QRP operating.

The **Bishops Stortford** crowd continue on their merry way; the third Monday of the month is the main date and is set apart for a talk, films, or whatever, plus any business, while the first Thursday of the month will see them in a huddle at the bottom end of the saloon bar in the "Nags Head" which is on the A120 road to Dunmow.

B.A.R.T.G. looks after the RTTY and AMTOR enthusiasts, and the chap to ask for the details is the Hon. Sec. — *see* Panel for his vital statistics.

The **BT/Post Office** Amateur Radio Club in the Midlands is now functional; for the details get in touch with the Hon. Sec. — *see* Panel for his name and address.

The June 12 main meeting wasn't completely finalised when the **Bury** letter was written, but we can say that they can be found every Tuesday evening at the Mosses Community Centre, Cecil Street, Bury.

Cambridge welcome new members and visitors of all ages and both sexes. On June 1, as the Hq is closed, they will shift to Comberton Village Hall for the Spring Junk Sale. Back to the Coleridge Community Centre, Radegund Road, for the rest of the month, in the Visual Aids Room; June 8 and 22 are the informals, and on June 15 there will be something doing, as yet undecided.

On June 1 the **Cheltenham** crowd look like having an outing (not completely settled at the time of their writing), and on June 15 there is a natter night at the Hq in the Stanton Room, Charlton Kings Library, Cheltenham.

The **Cheshunt** group is still based at the Church Room, Church Lane, Wormley, although they are, in the longer term, looking out for a new Hq. On June 6 and 27 they have natter evenings; June 13 is a "junk sort", and on June 20 they will be out operating portable on Baas Hill Common, Broxbourne.

June for **Chichester** will be in the Long Room, Fernleigh Centre, 40 North Street, meeting on 5th and on 21st when they have their Summer Social Evening.

The matter of how banks talk to each other is the subject for Richard de la Rue at **Colchester** on June 14; June 28 sees Frank Howe wondering out loud "what next in space?" For both these events, the lads and lasses will be heading to Colchester Institute, Sheepen Road.

On June 7, the **Cornish** club members will all be present while G3WKP digs up his family tree (genealogy, not the one that absorbs the RF in the garden!); this will be at the Church Hall, Treleigh, off the old Redruth bypass. More details from the Hon. Sec. — *see* Panel for his details.

At **Crawley** on June 27 they have a talk on RTTY and AMTOR by G4OAK and G4PEY at Trinity Church Hall, Ifield, Crawley. Contact the Hon. Sec. for full details.

We turn now to **Crystal Palace**; the gang can be found on the third Saturday of each month, at All Saints Parish Rooms, at the junction of Beulah Hill and Church Road, Upper Norwood, opposite the IBA mast, starting at 8 p.m. As they've just had the AGM, no doubt they will have their heads together as this is written, organising something for June.

Now to **Dartford Heath D/F**, and here we have to refer you to the Hon. Sec. The problem is simply that the current issue of their Newsletter is full of details of the D/F Hunts and their dates, plus some very good articles, without saying if their pre-Hunt pub meetings have been dropped just from the issue, or completely! The Hon. Sec. details are in the Panel.

Dudley's meeting on June 4 will combine a committee meeting with a natter for the rest of the club; June 11 is a talk by G4JCP on computer data transmission, and on June 25 David Harris talks about radio and the sun. All these are at the new Hq address, which is the Allied Centre, Greenman Alley, off Tower Street, at a starting time of 7.45 p.m.

East London RSGB group will be in recess for a few more weeks — contact the Hon. Sec. (*see* Panel) for the latest situation report. The Hq is at Wanstead House, Wanstead, not many yards behind Wanstead Tube station.

At **Edgware** they have a place at 145 Orange Hill Road, Burnt Oak, Edgware; June 14 is a demonstration of electronic music by G4BZY, and on June 28 they have the informal briefing for VHF NFD.

For details of the **Exeter** doings we have to refer you to the Hon. Sec. as the only details we have are of the venues — the Community Centre, St. Davids Hill, Exeter.

Exmouth have alternate Wednesdays at the 6th Exmouth Scout Hut, Marpool Hill; for the other details we must you refer to the Hon. Sec. — *see* Panel for his details.

Over to **Fareham** now, where they specialise in very well organised programmes. We see that June 6 is all about PSUs, June 13 an on-the-air and natter night, June 20 a talk by G3VXM on two-metre DX, and on June 27 they have the second natter session; all are at Portchester Community Centre, Westlands Grove, Portchester.

Deadlines for "Clubs" for the next three months—
July issue—May 25th
August issue—June 29th
September issue—July 27th
October issue—August 31st

Please be sure to note these dates!

Farnborough reckons to be on for HF NFD, and on June 13 there is a talk on Racal products by G3VCX; June 27 is down for a pre-view of the VHF NFD goings-on. All are at the Railway Enthusiasts' Club, Access Road, off Hawley Lane, Farnborough, Hants.

Over the water is the **Fingal** club, and we understand they foregather every Monday evening. For more details we refer you to the Hon. Sec. — *see* Panel for his details.

Fylde seem to be very well set in their Hq at the Kite Club, Blackpool Airport, on the first and third Tuesday of each month. June 5 is down for a final briefing on their Top Band D/F Hunt, which takes place on Sunday, June 17. June 19's meeting will — handy programme filler, this! — discuss the events which went on during the D/F Hunt.

At **Glenrothes** the Hq at Provosts Land, Leslie, Fife, is under modification by the members; for details of the full programme we suggest you get in touch with the Hon. Sec. — *see* Panel.

All those who are into low-power operating, or home-brew — or even practical jokes! — should be members of the **G-QRP Club**; all the details can be obtained from G3RJV, at the address given in the Panel.

June 28 is the date for the **Greater Peterborough** crew, at Southfields Junior School, Stanground, Peterborough (except during school holidays) and the speaker this time will be G3RJV, who will *not* be talking about QRO!

Up at **Halifax** they have a surplus sale on June 19; and they also have a ragchew night on the first Tuesday of the month; both meetings each month are held in the "Running Man", Pellon

Lane, Halifax.

At **Harrow** a separate yellow sheet to their newsletter tells us they are at Harrow Arts Centre, every Friday evening. June 1 is the HF NFD briefing, and on 8th they have a talk on constructing aerials. June 15 is informal and practical, and on 22nd they have a chat about the running of special-event stations. June 29 rounds it all off with another informal and practical evening.

Hastings have their main meetings at West Hill Community Centre on the third Wednesday in the month. Fridays are chat nights at Ashdown Farm Community Centre, and there are various subsidiary club activities at the same venue on Tuesdays too. More details from the Hon. Sec. — *see* Panel.

At **Havering** the Hq is at Fairkytes Arts Centre, Billet Lane, Hornchurch, where they have something set up for every Wednesday evening. June 6 is informal, and on June 13 they have a topic. June 20 is a pre-contest briefing and then an informal, and on June 27 if the weather allows they will have a D/F Hunt.

Haverhill next, and we see their provisional list of events indicates June 8 for a talk on Fox Hunts, and June 22 when the construction of D/F loops is under consideration; the venue isn't given so for that we must refer you to the Hon. Sec. — *see* Panel.

We turn now to **Hereford**; on June 1 they have the final arrangements to make for NFD over the weekend June 2/3, and then on June 15 they foregather again for a subject yet to be announced. The Hq is at the Civil Defence Headquarters, Gaol Street, Hereford.

At **Ipswich** the club has its base at the "Rose and Crown", which lies at the junction to Bramford Road and the A45 Norwich Road; while they are 'officially' there on second and last Wednesdays, we hear that on other Wednesdays there is a pretty sound chance that some of the gang will be around. This club, by the way, puts out one of the best newsletters around.

Over the water again now to **I.R.T.S.**, the national society of the EI chaps. The current issue of the newsletter is in fact almost all given over to the doings involved at the AGM in Cork, and so we won't have the new officers' list to hand till next time; however, we can say that this is the place to aim any serious enquiries about amateur radio activity in Eire. Contact the Hon. Sec. — *see* Panel.

June 15-17 is the **Isle of Man** expedition to the Calf of Man, for HF and VHF operation; and normal get-togethers are at the Keppel Hotel, Creg-ny-Baa.

By the time this is written, the AGM of the **Kent Repeater Group** will have come and gone; for more details on what they get up to, contact the Hon. Sec. — *see* Panel.

Another repeater group reporting is the one based at **Leicester**; this group is looking for new members to support their repeaters and attend their various functions. Details from the Hon. Treasurer, whose name appears in the Panel.

Nice to hear again from **Leith Nautical College**; they have a shack and a construction evening on Mondays. All ex- and future students are welcome to membership and they also would be pleased to be visited by members of the public. Details from the Hon. Sec. — *see* Panel.

Back down south again now, to **Medway**; the group have their scene in St. Luke's Church Hall, King William Road, Gillingham, where on June 8 they have a junk sale, and on 22nd a talk by Adrian Keeble on the WAB awards.

On now to **Midland**, where the Hq is at 294A Broad Street, opposite Birmingham Repertory Theatre. More details from the Hon. Sec. Alternatively, you might try a call on S17 to G8GAZ, who claims he is the club's post boy!

The **Mid-Ulster** group meets at the QTH of GI4BAC at 3 p.m. on the second Sunday of each month; they have talks and demonstrations of various amateur radio interest lined up for the coming months.

June 12 is a Fox Hunt and barbecue for **Mid-Warwickshire** club, and on June 26 they have a talk on QRP, the speaker yet to be confirmed. The Hq is at 61 Emscote Road, Warwick; non-members pay 20p, and there is a fee of 20p to all in addition on nights when they have a speaker.

John Wilson, G3PCY, of *Lowe Electronics Ltd.* addressing an audience of over seventy at a recent joint meeting of Edgware, Southgate and Verulam radio clubs, during a lecture and demonstration by the firm of some of the latest in HF equipment. Below, close interest was shown in the hardware on display!

photos by G3PZF

The **Nene Valley** folks have natter nights on June 6 and 20 (and again on July 4); G3NRW will be talking about RTTY and AMTOR on 13th, and the Microwave Society will be doing their thing on June 27. All meetings are at the "Dolben Arms", Finedon, near Wellingborough, Northants.

It's a long while now since we heard from the **Newquay** crowd; however, they are now based in the Drill Hall, Crantock Street, Newquay, on alternate Wednesday evenings. For the rest we recommend a contact with the Hon. Sec. for the latest programme details, at the address in the Panel.

North Cambs. 70cm. Repeater Group write to remind us of their repeater and their club. More details from the Hon. Sec. — *see* Panel.

Now to **North Devon** where they alternate between Bideford and Barnstaple. Always the fourth Wednesday, but on the even months at Pilton Community College, Chaddiford Lane, Barnstaple, while on the odd months it is at Bideford Community College, Abotsham Road, Bideford. More details from the Hon. Sec.

Yet another repeater group comes up for a mention; this one is **North Norfolk** and it is into a repeater at Wells-next-the-Sea; details on this and the other activities of the group from the Hon. Sec. — *see* Panel.

R.A.M.U.G. is the club for the micro users in the hobby; they have their next meeting on July 10 at the Design Block, Eastlea School, Hilda Road, Canning Town, London E.16. The topic will be "Database and Log-keeping in Amateur Radio" by G6OVL and G4KCS.

Names and Addresses of Club Secretaries reporting in this issue:

ABERGAVENNY: D. F. Jones, GW3SSY, 80 Craesonen Parc, Abergavenny, Gwent NP7 6PE. *(0873 78674)*
ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London W3 8LB.
AXE VALE: R. H. Newland, G3VW, Ham House, Lyme Road, Uplyme, Lyme Regis, Dorset.
BANGOR: S. Mackay, GI4OCK, 11 Dellmount Park, Bangor, BT20 4UA. *(Bangor 54049)*
BASINGSTOKE: E. C. Thompson, G4SQZ, 21 Wigmore Road, Todley, Basingstoke, Hants. RG26 6HH.
BATH: C. Ashley, G4UMN, 57 Stonebridge Drive, Frome, Somerset. *(Frome 63639)*
BIGGIN HILL: I. Mitchell, G4NSD, Greenway Cottage, Tatsfield, Westerham TN16 2BT. *(Tatsfield 376)*
BISHOPS STORTFORD: S. Mammett, G6HKK, 31 Atherton End, Sawbridgworth, Herts. CM21 0BS. *(0279 724669)*
B.A.R.T.G.: J. Perkins, G4IVV, 5 Ash Keys, Southgate, Crawley, W. Sussex RH10 6TJ. *(0293 36309)*
BT/POST OFFICE (Midlands): S. Granger, G4NSG, E1.2. Brindley House, 101 Newhall Street, Birmingham B3 1BA.
BURY: B. Tyldesley, G4TBT, 4 Colne Road, Burnley, Lancs. *(Burnley 24254)*
CAMBRIDGE: D. Willcock, G2FKS, 6 Lyles Road, Cottenham, Cambridge CB4 4QR. *(0954 505917)*
CHELTENHAM: Mrs. G. Harmsworth, G6COH, 42 Leckhampton Road, Cheltenham. *(Cheltenham 25162)*
CHESHUNT: R. Frisby, G4OAA, 2 Westfield Road, Hoddesdon, Herts. EN11 8QX.
CHICHESTER: T. M. Allen, G4ETU, 2 Hillside, West Stoke, Chichester, Sussex PO18 9BL. *(West Ashling 463)*
COLCHESTER: F. R. Howe, G3FIJ, 29 Kingswood Road, Colchester. *(0206 70189)*
CORNISH: S. Rodda, G4PEM, Cliff Hotel, Penrose Terrace, Penzance TR18 2HH. *(Penzance 3948)*
CRAWLEY: D. L. Hill, G4IQM, 14 The Garrones, Worth, Crawley, W. Sussex RH10 4YT. *(Crawley 882641)*
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London SE23 3BN. *(01-699 6940)*
DARTFORD HEATH D/F: A. R. Burchmore, G4BWV, 49 School Lane, Horton Kirby, Dartford, Kent DA4 9DQ.
DUDLEY: Mrs. C. Wilding, G4SQP, 92 Ravenhill Drive, Codsall, Wolverhampton, W. Midlands. *(Codsall 5636)*
EAST LONDON RSGB: C. A. Ramsey, G8VZD, Bulwer Court, Bulwer Court Road, Leytonstone, London E11 1DB. *(01-539 7590)*
EDGWARE: J. Cobley, G4RMD, 4 Briars Close, Hatfield, Herts. *(Hatfield 64342)*
EXETER: R. Tipper, G4KXR, 11 Chancel Court, Chancel Lane, Pinhoe, Exeter. *(Exeter 68065)*
EXMOUTH: D. F. Thompson, G8SBU, 'Four Winds', 131 St. Johns Road, Exmouth, Devon.
FAREHAM: B. Davey, G4ITG, 31 Somervell Drive, Fareham, Hants. PO16 7QL. *(Fareham 234904)*
FARNBOROUGH: I. Ireland, G4BJQ, 118 Mychett Road, Mychett, Camberley, Surrey. *(Farnborough 543036)*
FINGAL: D. Tobin, 52 Clune Road, Finglas East, Dublin 11, Eire.
FYLDE: H. Fenton, G8GG, 5 Cromer Road, St. Annes, Lytham St. Annes, Lancs. FY8 3HD.
GLENROTHES: A. Givens, GM3YOR, 41 Veronica Crescent, Kirkcaldy, Fife KY1 2LH. *(Kirkcaldy 200335)*
G-QRP CLUB: Rev. G. C. Dobbs, G3RJV, 17 Aspen Drive, Chelmsley Wood, Birmingham B37. *(021-770 5918)*
GREATER PETERBOROUGH: F. Brisley, G3NRJ, 27 Lady Lodge Drive, Orton Longueville, Peterborough, Cambs. *(0733 231848)*
HALIFAX: D. L. Moss, Beechwood Lodge, Lightcliffe, Halifax HX3 8NU. *(0422 202306)*
HARROW: D. Atkins, G8XBZ, *address wanted. (0923 779942)*
HASTINGS: G. North, G2LL, 7 Fontwell Avenue, Little Common, Bexhill-on-Sea. *(Cooden 4645)*
HAVERING: J. R. Gibbs, G4UQR, 40 Bridge Avenue, Upminster, Essex RM14 2LX. *(Upminster 26904)*
HAVERHILL: R. Proctor, G4PZW, 10 Hunts Hill, Glemsford, Sudbury, Suffolk. *(Glemsford 281359)*
HEREFORD: F. Cox, G3WRQ, 35 Thompson Place, Hereford. *(Hereford 54064)*
IPSWICH: J. Tootill, G4IFF, 76 Fircroft Road, Ipswich, Suffolk IP1 6PX. *(Ipswich 44047)*
I.R.T.S.: S. Nolan, EI7CD, 68 Ratoath Estate, Ratoath Road, Dublin 7.
ISLE OF MAN: Mrs. A. Matthewman, GD4GWQ, 20 Terrence Avenue, Douglas, Isle of Man. *(0624 22295)*
KENT REPEATER GROUP: M. Stoneham, G4RVV, 8 Darenth Close, Herne, Herne Bay, Kent CT6 7EX. *(Herne Bay 69828)*
LEICESTER REPEATER GROUP: G4MGG, 565 Uppingham Road, Leicester.
LEITH (Nautical College): Miss S. Beech, c/o Halls of Residence, Leith Nautical College, 24 Milton Road East, Edinburgh EH15 2PP.
MEDWAY: A. Wallis, G4TQS, 13 Stoneacre Close, Parkwood, Rainham, Gillingham ME8 9PS. *(0634 363960)*
MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham B32 1LB.
MID-ULSTER: D. Campbell, GI4NKD, 109 Drumgor Park, Craigavon, Co. Armagh, N. Ireland BT65 4AH. *(0762 42620)*
MID-WARWICKSHIRE: Mrs. C. Finnis, G4TIL, 37 Stowe Drive, Southam, Warks. CV33 0NZ. *(Southam 4765)*
NENE VALLEY: L. Parker, G4PLJ, 128 Northampton Road, Wellingborough, Northants NN8 3PJ.
NEWQUAY: A. Angove, G6ZWI, 22 Bramble Close, Newquay, Cornwall. *(Newquay 4285)*
N. CAMBS. REPEATER GROUP: J. D. Wheatley, 25 Queens Road, Wisbech, Cambs. PE13 2PE.
NORTH DEVON: H. G. Hughes, G4CG, Crinnis, High Wall, Sticklepath, Barnstaple, Devon EX31 2DP.
NORTH NORFOLK (REPEATER GROUP): D. Bolderstone, G6XWQ, 27 Station Road, Wells-next-the-Sea, Norfolk NR23 1AE.
R.A.M.U.G.: R. Webb, 39 Aldworth Road, Stratford, London E15 4DN.
SOUTH BRISTOL: L. Baker, G4RZY, 62 Court Farm Road, Whitchurch, Bristol BS14 0EG.
SOUTHGATE: R. Snary, G4OBE, 12 Borden Avenue, Enfield, Middx. EN1 2BZ.
SOUTH MANCHESTER: D. Holland, G3WFT, 32 Woodville Road, Sale, Greater Manchester. *(061-973 1837)*
STEVENAGE: C. Barber, G4BGP, 13 The Sycamores, Baldock, Herts. *(0642 893736)*
STOURBRIDGE: M. Davies, G8JTL, 25 Walker Avenue, Quarry Bank, Brierley Hill. *(Lye 4019)*
TORBAY: Mrs. M. Rider, 7 Kingston Close, Kingskerswell, TQ12 5EW. *(08047 5130)*
TODMORDEN: Ms. J. Gamble, G6MDB, 283 Halifax Road, Todmorden, Lancs. OL14 5SQ.
VALE OF WHITE HORSE: I. White, G3SEK, 52 Abingdon Road, Drayton, Abingdon, Berks. *(0235 31559)*
VERULAM: H. Claytonsmith, G4JKS, 115 Marshalswick Lane, St. Albans, Herts. *(St. Albans 59318)*
WAKEFIELD: W. Parkin, G8PBE, 14 Cleveland Grove, Lupset Park, Wakefield WF2 8LD. *(Wakefield 378727)*
WEST KENT: P. Reeve, G4GTN, 2 Court Road, Tunbridge Wells, Kent. *(Tunbridge Wells 24689)*
WISBECH: G4UQN, 14 St. Peters Road, Wisbech, Cambs. PE13 2NB. *(Wisbech 61029)*
WORCESTER: A. C. Lindsay, G4NRD, 11 Durcott Road, Evesham, Worcs. WR11 6EQ. *(Evesham 41508)*
WORTHING: Mrs. J. Lillywhite, 41 Brandon Road, Worthing, W. Sussex BN13 2PS.
YEOVIL: E. H. Godfrey, G3GC, Dorset Reach, 60 Chilton Grove, Yeovil, Somerset BA21 4AW. *(0935 75533)*
YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.
308: D. Davis, G6YQD, 13 Maple Road, Surbiton, Surrey KT6 4AA.

Every Wednesday at the Whitchurch Folk House, East Dundry Road, Whitchurch, Bristol, the **South Bristol** lads get together to see what delights the committee have set up; June 6 is a lecture on the Radio Interference Service, June 13 and 20 are devoted to Longleat Rally, June 27 is a 'rig-tweaking night', and on July 4 they have a visit from John Nelson, G4FRX, of RSGB.

A change of date is to be noted for the June meeting at **Southgate**; it has been brought forward by a week to June 7 to avoid the Euro-elections. It will be by G4AEZ and his topic — receiver techniques.

Sale Moor Community Centre is the home of the **South Manchester** club; the Hq is in Norris Road, Sale, and the formal meetings of the club are on Friday evenings. June 1 a talk on the modifications to the club's FT-221 by G4MYB, June 8 a club quiz; on June 15 G3WFT talks on the latest developments on Top Band D/F techniques, to be followed by the Hunt on June 22 which will be followed by a barbecue at Hq. G4HON takes the stand on June 29, for "An introduction to Op-Amps." to round out the month; and there are always the informal evenings on Mondays.

At **Stevenage** the meeting-place is at *TS Andromeda,* Fairlands Valley Park, Shephall View, Stevenage; they book the first and third Tuesday of every month. More details on the club and its activities from the Hon. Sec. — *see* Panel.

The **Stourbridge** group have forsaken the delights of a pub Hq — because a member said "it didn't accord with the image of a learned society!" in favour of the Robin Woods Centre, formerly known as Beauty Bank School, in School Street, Stourbridge. June 4 is informal, and June 18 is the main meeting — no programme details to hand, so we must refer you to the Hon. Sec.

Thanet foregather weekly at the Grosvenor Club, Grosvenor Place, Margate on the second and fourth Tuesday of each month. More details from the Hon. Sec. — *see* Panel.

Torbay have their weekly meetings on Fridays at the club Hq —

Cheltenham Amateur Radio Association held its annual Constructors' Contest in March and, as usual, the standard was extremely high. The judge, Reg Elsworthy, G3GMN, eventually awarded the Cup to Richard Marshall, G4ERP, for his three superbly-engineered VHF transverters. Second and third places were taken, respectively, by Dave Carpenter, G4TLX, for his mobile 2m. rig and Guy Foster, G6CUN, for his frequency counter.

not mentioned in the letter but we believe it is still Bath Lane, rear of 94 Belgrave Road, Torquay, where they have been for years; they also continue to have a formal-plus-lecture session on the last Saturday of each month. They have their Mobile Rally at the *STC (Paignton)* works on August 26.

June 18 is the date for **Todmorden** to hear all about satellites from G8UVE, but we must refer you to the Hon. Sec. for the venue! — *see* Panel for his statistics.

The **Vale of White Horse** is a very lively group with Hq at the Landsdown Club, Milton Trading Estate, near Abingdon, on the first and third Tuesday of each month. For details of the June doings contact the Hon. Sec.

The R.A.F. Association is host to the **Verulam** club, at their Hq in New Kent Road, on second and fourth Tuesdays. June 26 is down for Dr. Dain Evans of RSGB to talk about the Society's publications.

We are asked to note the change at **Wakefield** where the new place is Ossett Community Centre, Prospect Road, on alternate Tuesdays — for June the dates are 12th for the informal, and 26th for the main meeting.

West Kent write to say they got the opening and closing times of their Electronics Fair wrong — 10.30 to 5 p.m. is more like it — on July 21. All the other details about the club from the Hon. Sec. — *see* Panel for his address.

It's a while since we heard last from **Wisbech**; they are still at the "Five Bells", Parson Drove, on every other Thursday evening, and we believe they may be putting on a special-event station at Wisbech Rose Fair in early June.

June 4 is the date for the **Worcester** crew to head for the Oddfellows Club in New Street, for a talk on RTTY and AMTOR with BBC computers by G3WHO; June 18 is at the "Old Pheasant Inn", New Street, when they will get everything settled for their Rally on July 1 — the Worcester Mobile Rally is at Droitwich High School, Ombersley Road, Droitwich.

Worthing members have their main meetings at Pond Lane Community Centre, Durrington, Sussex, every Tuesday evening — and they attract an attendance as high as 120 so they have something good going for them!

Yeovil are to be found every Thursday evening at the Recreation Centre, Chilton Grove, Yeovil; June 7 and 14 are down for G3MYM, who will discuss how the ionosphere bends a radio wave; on June 21 it is the turn of G3GC to talk about the changing face of amateur radio, and on 28th they have a natter.

The **York** crowd continues to foregather at the United Services Club, 61 Micklegate, York, every Friday evening; this club is also very fond of putting on special-event stations and showing the flag — an art at which they are experts.

Finally, **308**; every Tuesday at the Coach House, St. Mark's Church — this is the pink building in Church Hill Road, Surbiton. They are putting together what looks to be a strong programme, but we must refer you to the Hon. Sec. for the very latest gen.

Finished

That's it for another month. Arrival deadlines for your letters are given in the 'box' as usual, and should be addressed to your Club Secretary, SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.

RSGB National Convention, 1984

THIS year's RSGB National Convention at the NEC was held over the weekend of 28/29th April and was the second to be held at the new venue, previously being held in London. The move to the NEC caused some consternation among the more southerly located amateurs but attendance this year and last was excellent, fully justifying the move.

To overcome some of the problems found last year and to give a lot more space for both exhibitors and visitors the decision was made to use the much larger Hall 3a, thus enabling the whole exhibition to be held under one roof instead of two. So how did it work out in practice?

Certainly the extra space was most welcome but this seemed to have been devoted mainly to the walkways, the space available for individual stands was roughly the same as last year. The catering facilities were vastly improved with two snack areas and a decent restaurant; the bar facilities were noticeably well used and no reports were received of the beer running out, as it did last year! Although the exhibition did not open until 10 a.m. the ticket offices were opened at 9.30 a.m. and this helped to reduce the early crowding that is normally seen at these events. Car parking facilities were excellent, and free, as was the bus service to transport visitors from the car parks to the hall, a distance of a few hundred yards.

Just over 10,000 people came to the Convention (about the same as last year), and most dealers reported excellent trading and there were many bargains to be had by both the early birds and those canny enough to hang on to the end of the second day. It is amazing how prices will drop when a dealer does not want to carry his remaining stock home!

There was also a well-attended lecture stream covering all aspects of the hobby from an introduction to amateur radio up to more esoteric things like "aspects of propagation" — in fact something for everyone.

It was nice to see that a large number of small firms specialising in the more adventurous aspects of the hobby were there and reporting growing interest in their wares; a sure sign that the hobby is not stagnating.

Looking forward to next year what would we like to see? Many dealers said that a bit more space for the stand would make it easier to display the goods effectively and would ease the crowding around the counters. A lot of smaller societies and even local clubs would like to be represented at the show but cannot possibly afford the rates for stand space. The Leicester show last year had a "Club Corner" which was very cheap and very popular. In view of the amount of spare space available at this year's NEC show perhaps the organisers might think along those lines to enable the clubs to add another interesting and useful facet to the Convention.

All in all a great show which you really should not miss and which must now be classed as possibly Europe's major amateur radio show.

G8MWR

("SITUATIONS" AND "TRADE")

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TRADE

VHF-UHF mobile aerials by **Bantex**; please send *s.a.e.* for details. —**Falcon Communications**, 33 Falcon Way, Ashford, Kent. (Tel: Ashford 22506).

Learning Morse? Effective C90 cassettes: novice 0-7 w.p.m., expert 7-13 w.p.m., £5.50 each or £10 the set. Please send *s.a.e.* for information. — **G40BK Morse Tuition**, 4 Carrbrook Close, Whittle, Chorley PR6 7HD.

Amateur radio equipment bought, sold, exchanged. List of available items sent on request.—Ring **R & S Radio**, 0305-786930.

Amidon toroidal cores, ferrite rings and beads. Send *s.a.e.* for data and prices. Business hours: 10-5 p.m. Tues.-Fri.; 10-4 p.m. Sat.—**SMC (TMP Electronics)**, Unit 27, Pinfold Workshops, Pinfold Lane, Buckley, Clwyd CH7 3PL.

July issue: due to appear Friday, June 29th. Single copies at 90p post paid will be sent by first-class mail for orders received by Wednesday, June 27th, as available.—Circulation Dept., Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

QSL cards. Sample pack and price list forwarded on receipt of 24p stamp.—**Derwent Press**, 69 Langstone Drive, Exmouth, Devon EX8 4HZ.

Aircraft Communications Handbook (Europe), including U.K. spot MF, HF, VHF, UHF frequencies, military, civil, ATC, airports, long-range stations, beacons, callsigns, co-ordinates, broadcast times, etc., £6.95 inc. p/p.—**PLH Electronics**, 70 Vallis Road, Frome, Somerset BA11 3EJ.

Course for City & Guilds, Radio Amateur's Examination. Pass this important examination and obtain your licence, with an RRC Home Study Course. For details of this and other courses (GCE, Career and professional examination, etc.) write or phone: **THE RAPID RESULTS COLLEGE, Dept. JV4, Tuition House, London SW19 4DS.** Tel: 01-947 7272 (9 a.m. to 5 p.m.) or use our 24 hour Recordacall Service, 01-946 1102 quoting Dept. JV4.

Phone-Atlas gazetteer, find where that U.K. telephone number originates quickly, £2.20; with maps, £5.40.—**RWW**, P.O. Box 11, Romsey SO5 8XW.

Tuition: self-test manual for R.A.E. students—"Questions & Answers", £2.75 inc. post/packing. For details please send s.a.e.—**Peter Bubb (Tuition), G3UWJ**, 58 Greenacres, Bath BA1 4NR.

G5RV Type Aerials, half-size, £13.00; full-size, £14.95. **New hard-drawn copper aerial wire**, 140ft., 14 s.w.g., £7.90; 50 metres, 16 s.w.g., £6.90. **12 s.w.g. soft enamelled copper wire**, 10 metres, £3.50; 1.4mm., 50 metres, £5.75. **Ceramic egg insulators**, large, 50p; small, 40p. **Guy rope**, 4mm., polypropylene, 50 metres. £3.95; 4mm. nylon, 50 metres, £6.90. All items post paid.—**S. M. Tatham**, 1 Orchard Way, Fontwell, Arundel, West Sussex.

CALL SIGN LAPEL BADGES. Professionally engraved by return of post. £1.50 cash with order (state name and callsign).—AYLMER-KELLY (S), 20 New Place, Corsham, Wilts. SN13 0HL.

D.I.Y. QSL's, 5 colours, 8 designs—200 mixed, £4.20. Hampshire Logbook, £1.90. Send *s.a.e.* for list.—**RWW**, P.O. Box 11, Romsey SO5 8XW.

Ultra-slim "Slim Jim" for 2-metres, plus 4m. cable with PL259, £7 plus £1 postage. Cheques to **Berkshire Communications**, P.O. Box 31, Bracknell, Berks. RG12 4TG.

Spectrum 16/48K Morse reader, decodes onto screeen, no interface required, tracks approx 8/30 w.p.m., cassette £6.00. Morse tutor, variable speed, variable spacing, cassette £4.50. Both programs, £10.00.—J. Price, 4 Housman Walk, Kidderminster.

Morse reading programs. Work on clean signals without hardware interface. **ZX81 1K unexpanded memory:** translated code with word and line spaces for easy reading, automatic scroll action, £7.00 inclusive. **Spectrum 16/48K:** scroll action with 10-page scrolling memory, instantly accessible page-by-page, £8.00 inclusive. All types variable speeds; feed signal direct into 'ear' socket.—**Pinehurst Data Studios**, 69 Pinehurst Park, West Moors, Wimborne, Dorset BH22 0BP.

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READERS

For Sale: R-2000, one year old, with all manuals, little used (registered at Lowe's), £320. Mizuho ATU, £30. Microwave Modules 144/28 converter, £15. Jackson Varicaps: 1 double, 2 single 365pF, new; 1 double, 2 single 300pF, used; £10 the lot. All open to offers. (Brighton) — Box No. 5801, Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

For Sale: Marconi "Atalanta" receiver, 15 kHz to 29 MHz, 10 bands, built-in PSU, speaker, dual-conversion, noise limiter, BFO, bandspread etc., with works manual, excellent condition, £85. Sony ICF-2001 digital receiver, original box, little used, £90. Texas TI-99 high-resolution (23 MHz) green monitor, £35. 40-track five ¼" disc drive, s/d, d/d, suit BBC-B or Tandy TRS series, as new, £100. Woden transformer, 1500-0-1500V at 350mA, with new 813, £15. Ex-U.S.A.F. TS-452C wobbulator, coverage 5-100 MHz, variable sweep speed, built-in oscilloscope etc., £35. — Ring Peter, G3OJR, Hull (0482) 43353.

Sale: Sony AVC-1420CE black/white video camera, virtually unused, complete with PSU, manual and carrying case, original packing, £120. — Ring Comrie, 041-334 2811 evenings.

Selling: Racal RA-117 in case with handbook, and RA-218 unit with spares, £300. Two Model 75 teleprinters, with technical handbook and spares, £45. Two tape readers Models 2F and 6S/4 plus spares, £15. — Kanaar, 41 Wellesley Drive, Crowthorne, Berks. (Tel: Crowthorne 776342).

For Sale: Trio/Kenwood R-1000 communications receiver, excellent condition, hardly used, £230.—Ring Dersingham 40785 (Norfolk).

Selling: Drake R-7 receiver, complete with 4, 2.3, 1.8, 0.5 and 0.3 kHz filters, noise blanker, auxiliary program module, very good condition and performance (cost over £1300), sacrifice at £575.—Ring Lichfield 24563.

Sale: Icom IC-701, complete with power supply and mic., £450. Corsair, with all filters, hardly used, £900. HRO with PSU and bandspread coils, £40. Codar and DB-20 preselectors, £10 each. KW Viceroy with PSU, £25. Beam motor, ¼-HP, 1 RPM, details, £25. Linear, 1 kW, details, £50. QY3/125 valve, £5. (Kent). — Box No. 5802, Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

For Sale: Sony 2001 receiver, FM/AM/SSB, digital tuning, scan, memory, AC-122 mains unit, nicad batteries and charger, £75.—Ring 01-727 3199.

Selling: Icom IC-R70 receiver, as new, £345. Microwave Modules MM2001, new, £145. Both together for £475. — Ring Pitcher, Preston (0772) 27137 after 6 p.m.

Wanted: Service manual for Hallicrafters SX-28. — Miller, 66 Sidney Grove, Newcastle-upon-Tyne NE4 5PD. (Tel: 0632-724148).

Sale: Fairmate AS-32320 VHF/UHF receiver, AM/FM, digital tuning, scan, memory, cased with telescopic aerial and power supply, £65. — Ring Duke, 01-727 3199.

For Sale: Yaesu FT-220 2m. general coverage FM/SSB transceiver, good condition, £150 or near offer. — Ring Murray, G8NVU, 01-603 1160.

Wanted: Yaesu FTV-901 transverter with 2m. plus 4m. or 70cm, or all three. Will collect 50 miles radius of Worcester. — Ring Dave, G4IDF, Worcester (0905) 351568. (Not QTHR).

Selling: EC-10 Mk.II Rx, mains PSU, Sentinel 2m. converter, tatty but useful signal generator, £120 the lot. Buyer collects. Ring Greenslade, G8LBW, 0707-872948 (Herts.)

Wanted: Trio TS-120V or TS-130V HF transceiver, cash waiting. — Stone, 7 Fassett Road, Kingston, Surrey.

27th Longleat Mobile Rally: On Sunday, June 24th, at Longleat Park, Longleat, near Warminster, Wilts. Starts at 10 a.m.—don't miss it!

July issue: due to appear Friday, June 29th. Single copies at 90p post paid will be sent by first-class mail for orders received by Wednesday, June 27th, as available. — Circulation Dept., Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

For Sale: RA-17L, as new, £250; another needing slight attention, £150. Solartron SWR meter, £20. Wayne-Kerr RF bridge and bridge source, £30. Taylor 191A audio oscillator, £15. Eddystone 730/4, immaculate, £150. Codar preselector, £20. Restored HRO, £85. Ex-service wrist watch, £10 inc. p/p. — Ring Ashley, Stroud (0453) 882164. (Glos.)

Sale: LAR Modules SWL Omni-Match ATU, £30. Yaesu FRT-7700 antenna tuner, £38. — Ring Wood, Clochen 378.

Wanted: Pre-war Eddystone 4-pin and 6-pin plug-in coils, formers and bases. — Ring Wright, G3AER, 0502-64864. Or write QTHR.

Sale: Hammarlund SP-600, £125. Kenwood R-820, £530. JRC NRD-515, £725. National Panasonic DR-43, £150. Bang & Olufsen Becosystem, £70. Buyers to inspect and collect. — Ring Wilson, Crewkerne 73208.

Selling: FT-101ZD, FM board fitted, with FV-101 VFO, SP-101 speaker, £475. KW Vespa Mk.I transmitter, £50. Microwave Modules converters, 2m., 4m. and 70cm., £15 each. HRO coils, GC £5 each, BS £7 each. — Tibbert, G3RKZ, 32 Prescot Close, Mickleover, Derby. (Tel: Derby 515212)

For Sale: FT-290R with nicads and charger, mounting bracket, excellent condition, £200. TS-520SE HF transceiver, with mic., excellent condition, £325. FT-101ZD(FM) with mic. and blower, mint, £380. Icom IC-R70 receiver, mint condition, £410. NRD-515 receiver, fitted 300 and 600 Hz filters, perfect, £750. Datong FL1, £50. Trio 9R-59DS general coverage receiver, with speaker and calibrator, excellent, £65. All with manuals. Prefer buyers inspect and collect. (North London). — Box No. 5803, Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

Wanted: T-1083, T-1115, your price or swaps. Also T-1083 coils, R-1082 coils, J/switch plugs, R.A.F. cast W/plugs. — Parsonage, 52 Bramble Lane, Mansfield, Notts.

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(ENGLISH AND AMERICAN)

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