THE AUSTRALASIAN

Radio World

JULY 1, 1937
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PRICE, 1/-

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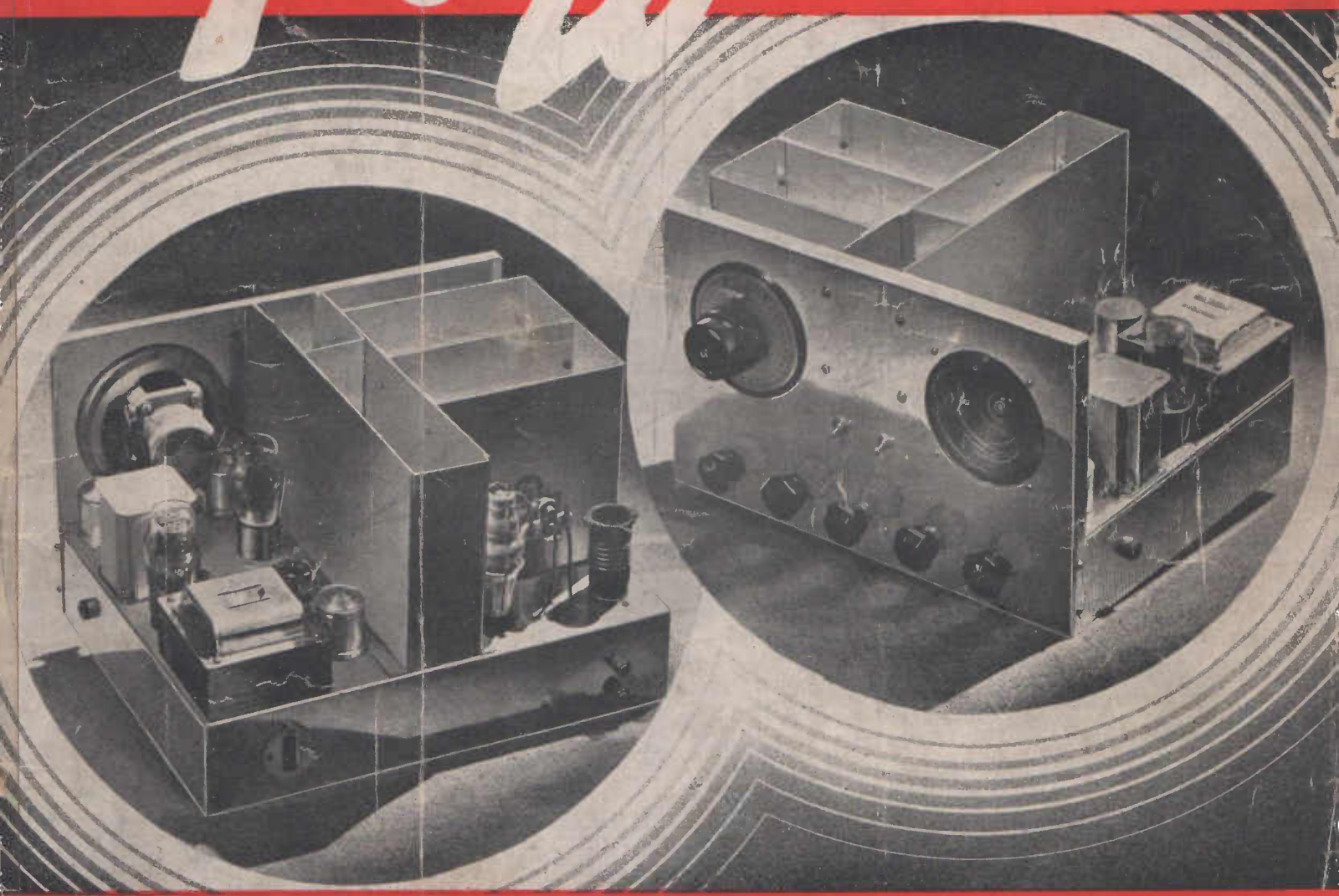
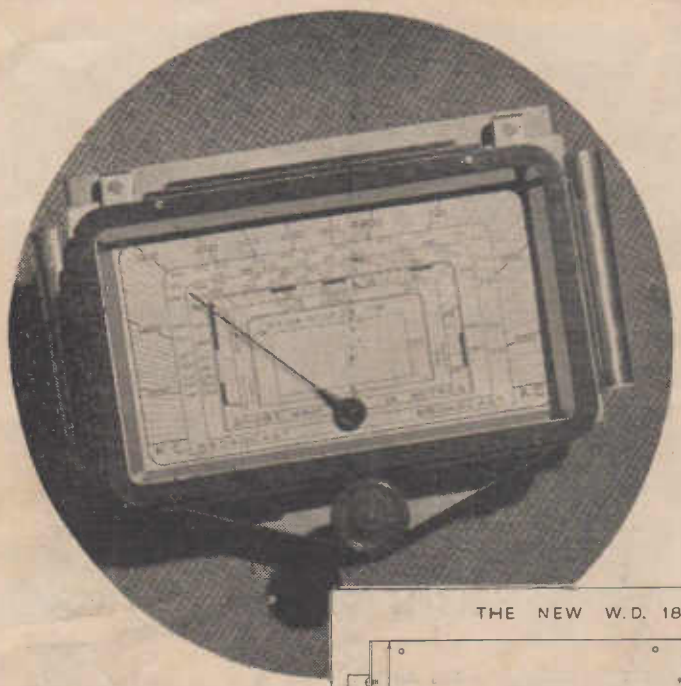


—See Page 3.

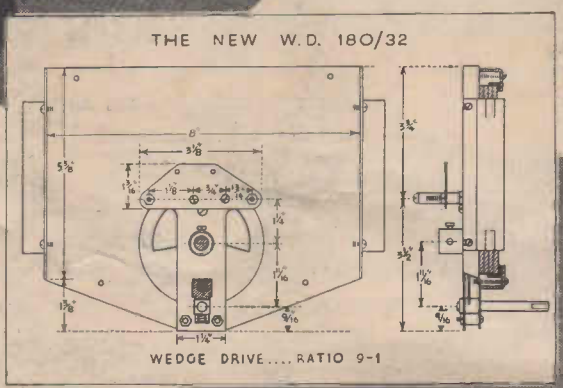
- EIGHT-VALVE AMATEUR COMMUNICATIONS RECEIVER: JONES'
- "SUPER-GAINER": WIRING THE "1937 EAGLET ALL-WAVE TWO":
- DESIGNING VIBRATOR "B" ELIMINATORS: SHORTWAVE DX CONTEST



NEW RELEASE
BY EFCO

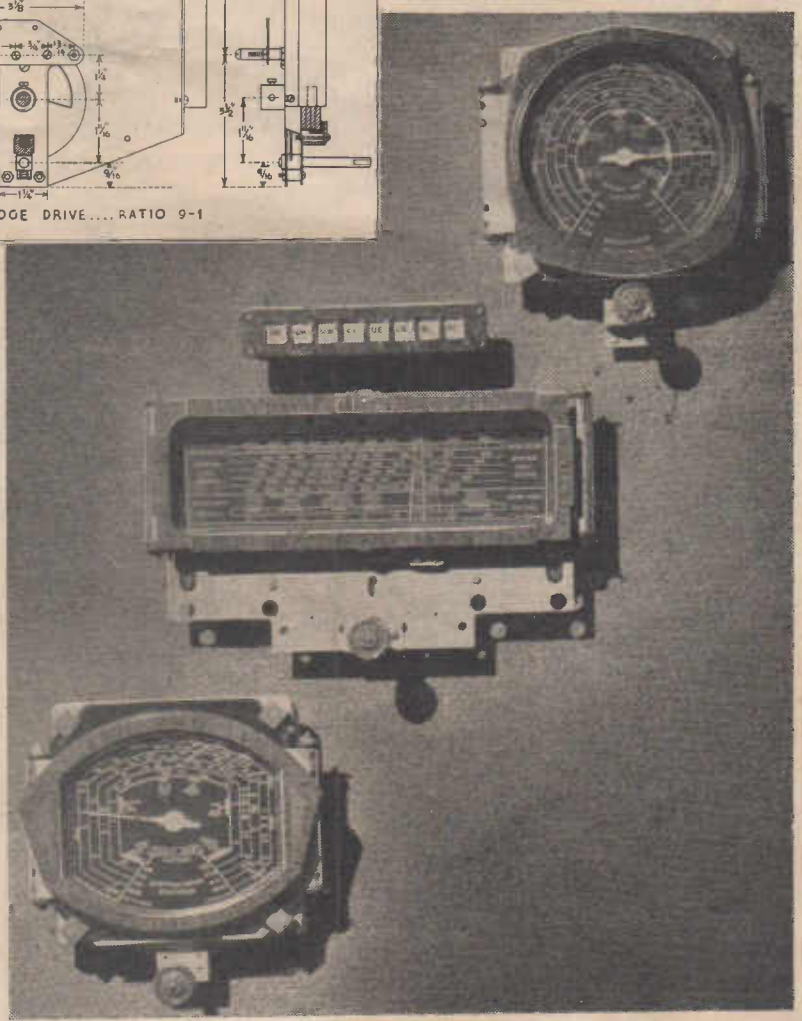
Efco is pioneering again! This time with a new wedge drive Edgelit dial for low gang mounting. The new WD 180/32 meets the needs of those who want beauty, high-efficiency, PLUS high-economy.

Smartly styled . . . easily mounted . . . smooth as velvet in operation, the new W.D. 180/32 costs far less than you would expect to pay for its quality features.



Full details of these and other Efco dials sent on request. Efco units are obtainable from any good radio dealer.

The diagram at the right shows the simplicity of the foolproof Efco wedge-drive.
The W.D. 180/32 is an Edgelit unit available in one or two glasses. Escutcheon size approx. 7 in. by 4 in.



At right, top, Model 77/280/32 — a modern Edgelit unit with large easy-to-read scale 6¼ inches in diameter, calibrated for dual-wave receivers.
At right, centre, is the new Model SLD/28—a beautiful, precision-built Edgelit unit with an 11 in. by 2 7-8 in. scale.
Features: Sliding hairline station pointer; smooth positive action: scale calibrated in Kilocycles and Metres with chief Australian stations and foreign countries clearly marked.
At right, bottom, Model 77/280/27 — fitted with 7 in. square glasses, giving two-colour effect. Employs similar unit to Model 77/280/30.
Station indicator—for use in conjunction with automatic tuning. Rugged construction. Bakelite escutcheon.

EFCO
Manufacturing Co. Pty. Ltd.
Arncliffe, N.S.W.
'Phone LX 1231.

Editorial Notes . . . .

Two cases recently reported of "gyp" radio service practices indicate the urgent need there is in this country for government licensing of servicemen. No doubt typical of thousands of similar instances, these two illustrate the necessity for protection, not only for the legitimate serviceman as well as the set-owning public, but also for reputable radio manufacturers, whose reputations must suffer considerably at the hands of the part-time "voltmeter and pliers" mechanics who attempt to service their receivers.

The first case concerns a set-owner who, when asked if his receiver used an earth, replied that a serviceman had fitted one some time previously. Investigation showed there WAS an earth lead, but it was attached to the iron grating of a nearby fireplace! In the second instance, a so-called serviceman had attempted to repair a defective wet electrolytic by filling it with water. Both cases seem so ridiculous that it is difficult to believe them true, but they are vouched for by the serviceman subsequently called in by the set-owners concerned. As well, they are not isolated instances; no doubt every serviceman practising anywhere in Australia to-day could recall similar experiences.

To-day, anyone knowing the difference between a resistor and condenser, and finding himself out of a job, can hang out a shingle and become a radio serviceman. Whether he stays in business long or not is beside the point; while he IS in he can do the servicing profession a tremendous amount of harm. And servicing IS a profession; one that needs years of specialised training and constant study if it is to be followed successfully.

In New Zealand to-day, the "gyp" serviceman is rapidly being forced out of business by the licensing system adopted some years ago. The electrical regulations as applied to radio have been tightened up considerably, so that now a salesman not holding a service ticket is not even permitted, under penalty of heavy fine, to change a power plug. And with the serviceman's licence came the serviceman's award. To-day the award wage, which has been steadily monnting during the past few years, stands at £5/16/- per week. No further arguments should be needed to convince servicemen in this country that, in both their own interests and those of the public they serve, licensing is urgently needed.

THE AUSTRALASIAN RADIO WORLD

Incorporating the

ALL-WAVE ALL-WORLD DX NEWS.

Managing Editor:
A. EARL READ, B.Sc.

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CONTENTS :

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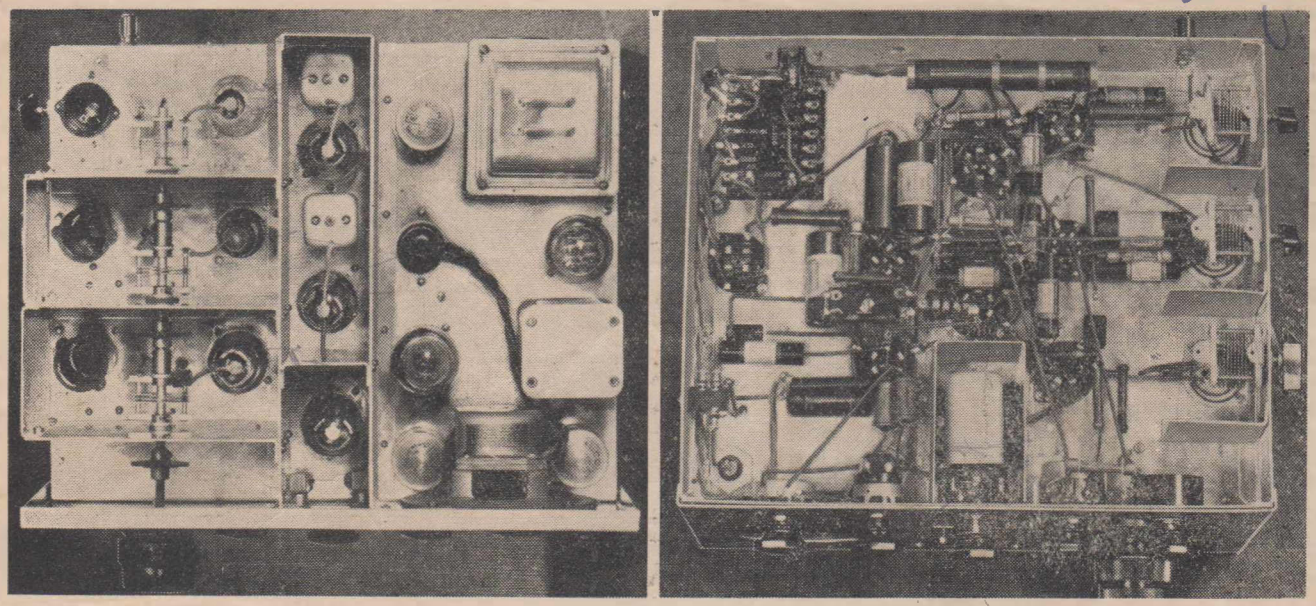


Above and under-chassis views of the completed "Amateur Communications Eight," showing the symmetrical lay-out used.

Amateur Communications Eight

An eight-valve amateur communications superhet covering from 9 to 120 metres in four bands. Highly sensitive and selective, with low noise level.

IN last month's "Radio World" was published an article by Mr. A. V. Bennett (VK2VA), a well-known Sydney amateur, describing the excellent results he is obtaining from an 8-valve amateur communications type superhet, built to a circuit published recently by the A.W. Valve Co. in "Radiotronics" No. 75. The "Radio World" version of this receiver was recently completed, and thorough tests have more than proved 2VA's statement that " . . . if the circuit is truthfully followed, the performance leaves nothing to be desired, even by the most critical of communication men or the 'DX chaser' who likes performance with comfort."

Many Attractive Features

The main requirements of an amateur receiver of this type are a high degree of selectivity, high usable sensitivity (i.e., minimum noise level), good frequency stability, and ample band-spread. All are provided by this receiver. There is an ample reserve of gain, while selectivity is such that the set will cut through severe QRM on overcrowded bands to bring in the transmission required.

For the number of valves used, and the total cost, which is particularly reasonable for a set of this type, it possesses many attractive features. Among these can be listed the following:—

(1) Continuous band coverage from 9 to 120 metres.

(2) Band spread is provided, for simple tuning on the amateur bands.

(3) Tuned r.f. stage, providing image suppression and ensuring good signal-to-noise ratio.

(4) Electron-coupled regeneration applied to mixer, giving greatly improved sensitivity and selectivity.

(5) Separate e.c. h.f. oscillator, giving high frequency stability.

(6) High gain i.f. amplifier using iron-cored intermediates for greatest selectivity.

(7) I.f. and a.f. gain controls.

(8) Anode bend detector, giving greater sensitivity and less damping on preceding intermediate than diode.

(9) Separate b.f.o. unit, with control for varying pitch of beat note.

(10) Tone control, with combined on/off switch for cutting in .0001 mfd. audio coupling condenser to reduce low frequency interference for c.w. reception of 1,000 cycle note.

(11) Provision for 'phones or speaker, latter being automatically silenced when 'phones are plugged in.

(12) Receiver and power supply built on one chassis.

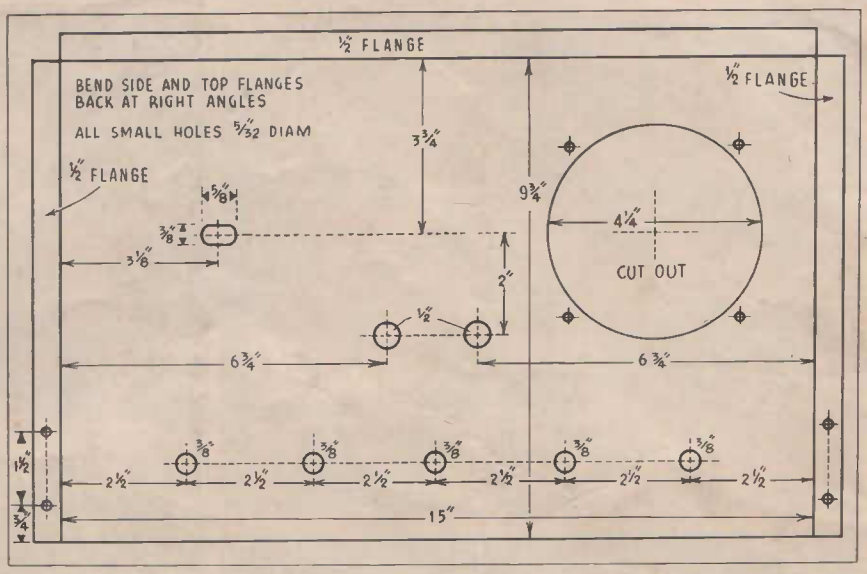
Standard Parts Used Throughout

The construction of this "Radio World" version of the Radiotron Junior amateur communications superhet cannot be completed in several hours, though if tackled systematically, there is nothing difficult about it.

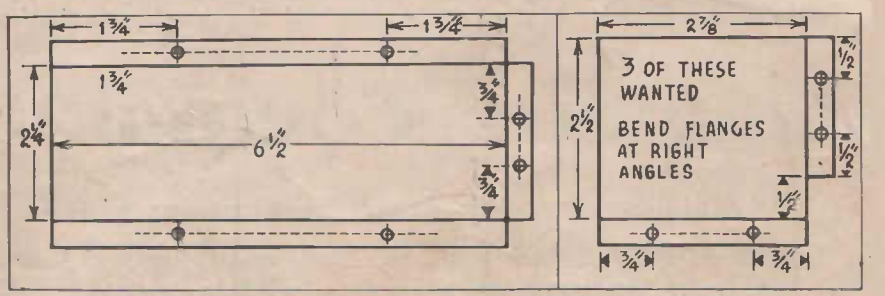
The first task is to assemble a complete kit of parts, as listed elsewhere. Wherever possible, standard makes of components have been used throughout, though the following points should be noted.

First of all, the capacity of the three midget variable bandsetters is given in the circuit as 180 mmfd. This ensures continuous coverage of the four bands listed, with a fair amount of overlap. However, those building this receiver purely for amateur work will find the new Radiokes 100 mmfd. isolantite midgets quite satisfactory, while coverage is still continuous with the 160 mmfd. band-setters specified in the list of parts.

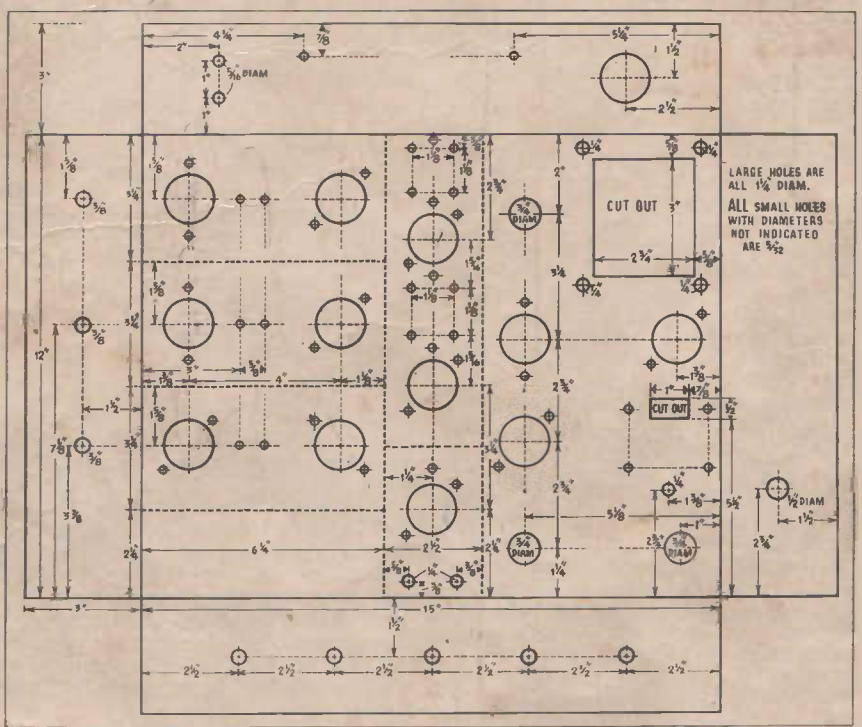
Amphenol steatite sockets are used for the coils, not only because of the high-grade insulation, but also for the positive contact provided with the coil former pins. The beat frequency oscillator coil unit is a Radiokes. It is particularly com-



Dimensions for stamping and drilling the front panel are shown above.



The sketches above show dimensions of the partition isolating the b.f.o. from the second detector (left), and of the shields separating the band-setters below the chassis (right). The chassis layout is shown below.



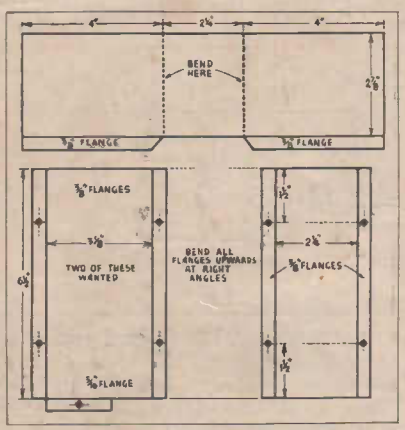
pact, and fits neatly in the small shield box provided for it under the chassis. The 3-plate midget variable to enable the beat note to be varied in pitch is an ordinary bakelite type Radiokes — the isolantite-insulated variety is too large, and as well the improved insulation is not necessary.

Commercial Coil Kit Available

The coils used for the laboratory model were wound by Standardised Products, to the specifications given in "Radiotronics" No. 75. With a set of this type, commercially-wound coils are not a luxury, and the "Rayway" kit can be fully recommended to builders. However, turns details are given for those who prefer to wind their own.

5-Inch Speaker With 1,000-Ohm Field

The speaker finally chosen for the "Amateur Communications Eight"

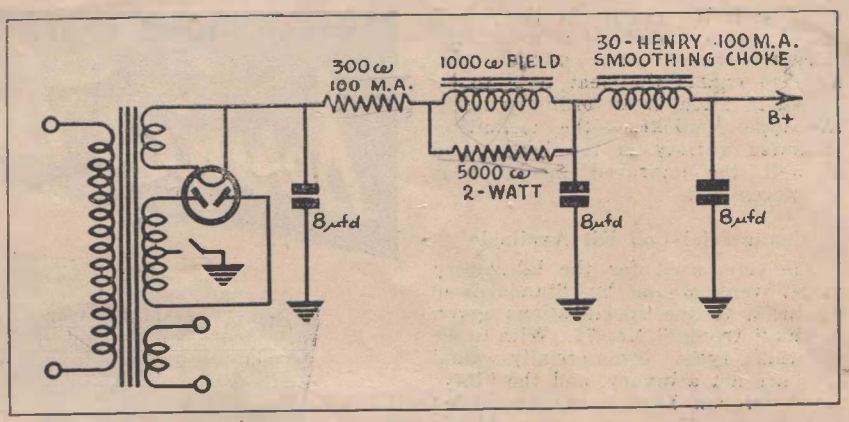


The top sketch shows the three-sided b.f.o. shield, mounted below the chassis, while dimensions for the two end partitions for the coil shields are given in the sketch below (left). The third partition (lower right) is located behind the first i.f. transformer.

was a Rola model F-4, a compact 5-inch dynamic that is ideal for the purpose. The next larger model, the DP-5-B 6¾-inch, could be used, but this would mean making the chassis about 2 in. longer, and the front panel an inch or so higher.

Total "B" current of the receiver is approximately 80 mills., which means that if a 1,000-ohm field is used, it is required to dissipate about 6.4 watts. With a 5-inch speaker this is a little too high, and so as an alternative to substituting a non-standard field, a 5,000-ohm 2-watt resistor has been connected across it.

Further alterations to the power supply portion of the circuit published last month comprise the substitution of a standard 30-henry 100 m.a. smoothing choke for the 5-henry type specified, and the inclusion on the rectifier side of the speaker field of a 300-ohm 100 m.a. wirewound resistor, to drop the "B+" voltage to 250, and to provide



This circuit shows the amendments made to the smoothing filter, as explained in the text.

a little additional smoothing. An amended power supply and filter circuit is given above.

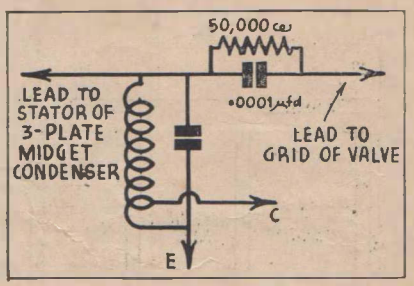
The Chassis, Panel, And Partitions

Sketches of the chassis, front panel and 13 shield partitions required are also included. Nine partitions are needed above the chassis. Three separate the coils, while another two, running from front to rear, isolate the i.f. amplifier, second detector and beat oscillator stages from the r.f. and audio sections. As well, a smaller partition is needed to enclose the 6C6 beat oscillator valve. Another of similar size forms a rear bracing for the long front-to-back partitions, while two more serve the same purpose for the three coil shields, and also eliminate any hand-capacity effects that might otherwise result when the band-setters are being adjusted.

The under-chassis view shows the locations of the three shields isolating the band-setters, and also illustrates how the b.f.o. unit is enclosed by a three-sided partition, forming a small box.

Eight Front-Panel Controls

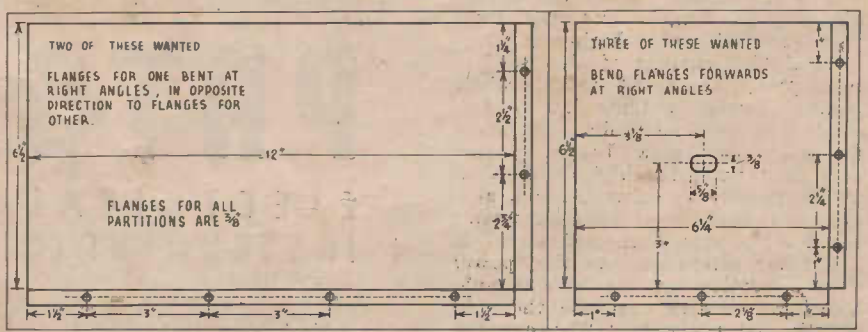
In the front view shown of the receiver, the five lower control knobs are (left to right), mixer regeneration control, i.f. gain control, b.f.o. note adjuster, tone control (combined with switch "S1"), and audio gain control. The two toggle switches are beat frequency oscillator on/off (left) and "B+" on/off. The latter is used when coils are being changed, or minor adjustments made.



The b.f.o. grid leak and condenser are mounted inside the can as shown above. The arrows indicate the four leads coming out of the can—the grid lead from the top and the remainder from the bottom.

Along the left wall of the chassis are the three band-setters (front to rear, oscillator, mixer, r.f.), while the 'phone jack is located on the right wall.

The tuning dial shown is a Utility, though provision has been made for mounting a full-vision type of dial, such as the Efco 77-280RR, if preferred.



Dimensions for the two long front-to-rear partitions are given above (left), together with those for the three coil shields (right).

COIL WINDING TABLE

	AERIAL.		R.F.			OSCILLATOR.	
Band	L1	L2	L3	L4	L4 Cathode Tap	L5	Tap
I	9 (a)	33 (b)	25 (a)	33 (b)	1½ (e)	36 (b)	10 (e)
II	5½ (a)	15¼ (c)	11 (a)	15 (c)	1 (e)	15½ (c)	4¾ (e)
III	2½ (a)	5¾ (d)	4½ (a)	5½ (d)	¾ (e)	6 (d)	2½ (e)
IV	1¾ (a)	2⅞ (d)	1¾ (a)	2⅞ (d)	⅝ (e)	3⅛ (d)	1½ (e)

(a) 30g. SWG. DSC. wire interwound in secondary starting from the bottom. (b) 28g. SWG. Enamelled wire wound 32 T.P.I. (c) 20g. SWG. Tinned Copper wire wound 10 T.P.I. (d) 20g. SWG. Tinned Copper wire wound 6 T.P.I. (e) Tap on secondary counted from bottom. All coils wound on 1¼ inch diameter ribbed formers.

The Construction Outlined

The construction of the "Amateur Communications Eight" should be divided into sections. First of all, the aluminium shield partitions should be mounted, commencing with the three that support the bandspread tuning condensers. It is particularly important that these condensers should be perfectly aligned, so that there will be no undue drag on the dial movement. If this is present, dial-slipping among other troubles will develop.

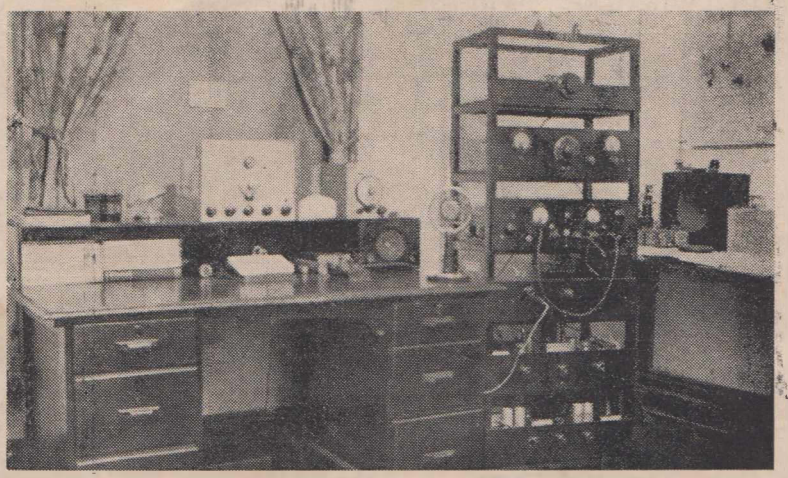
It will be noticed that the holes provided in the shields for mounting these tuning condensers are elongated to facilitate aligning. An alternative method would be to drill ¾ in. diameter holes and use small metal plates, one on either side of each shielded partition, for mounting the condensers. The flanges for all three coil shields face the front of the chassis.

Next, mount the two partitions on the left of the coil shields, and then the large partition running from front to back of the chassis, between the r.f. and i.f. sections of the receiver.

The shield that isolates the b.f.o. circuit from the second detector is mounted next, followed by the second front-to-rear shield, and the small partition enclosing the rear end. The flanges for the two long shields face outwards, and for the

Band Coverage And Amateur Band Spread

Band	Freq. Range	Amateur B. S. Deg.
I	2.35—5.3 M.C.	280
II	5.15—12.1 M.C.	108
III	10.9—26 M.C.	90
IV	14.2—33 M.C.	84



VK2VA's station, with his Radiotron Junior superhet in the centre. In 2VA's version of this receiver, the power-pack and speaker are built on a separate chassis.

two small ones, towards the front of the chassis.

The front panel is next mounted so that its lower edge and the bottom edge of the chassis are level. lastly, mount three small shields between the band-setters underneath the chassis, together with the three-sided b.f.o. shield partition. When this has been completd, all shields can be removed and a start made on the assembly.

First mount the valve, speaker and coil sockets, and the two i.f. transformers. The three coil shields with their end partitions and the left-hand front-to-rear partition are next bolted in place. Next, two leads can be soldered to each of the three band-spread condensers, and the latter then mounted loosely in their correct positions on the shields. To eliminate unwanted noise, it is a wise precaution to connect flexible pigtails to every midget variable that is not provided with them.

Leads are now soldered to each one of the two toggle switches and the latter mounted on the front panel, which is then re-bolted to the chassis. The dial is mounted next, and the couplers put in to link up the three bandspread condensers. The latter can then be lined up so that the dial rotates smoothly over the whole of the scale without any backlash.

Mounting The Speaker

Next, unsolder one lead of the speaker voice coil, solder two wires as shown in the circuit diagram, and then mount the speaker on the front panel, followed by the five controls. Be careful to insulate the latter where required.

Lastly, mount the three small shields underneath the chassis, and then complete as many coil socket connections as possible before mounting the band-setting condensers. Incidentally, if "Polar" band-setters are used, it will be necessary to mount the coil sockets about one-half inch above the chassis by means of pillars, so that the band-setters will not foul the sockets.

The main portion of the wiring can now be put in, commencing with the filament and power transformer wiring, followed by that of the smoothing filter, speaker socket, and so on. Next, commencing with the aerial terminal, systematically complete the remainder of the wiring.

Assembling The B.F.O. Unit

The shielding around the beat frequency oscillator and its associated circuits is intended to isolate this unit from the remainder of the circuit, thus avoiding unwanted coupling. This shielding is indicated by dotted lines on the circuit diagram.

The b.f.o. coil is removed from its can, and the midget .0001 mfd. grid condenser and 50,000 ohm 1-3 watt grid leak mounted inside, as shown in a sketch elsewhere. The lead for the audio note-changing condenser is taken out from the bottom of the can, while the grid lead is taken from the top straight up through the chassis.

The five pigtail components associated with the b.f.o. circuit (three 1-3-watt resistors and two paper condensers) are next mounted directly on the 6C6 socket. Small "V's" are cut out of the b.f.o. shield so that the 6C6 heater and "B+" leads can pass through. The leads to the b.f.o. switch pass upwards through the chassis, while the 5 mmfd. coupling

(Continued on page 47)

AMATEUR COMMUNICATIONS SUPERHET.

List of Parts

1 — 16 gauge aluminium chassis, front panel, and shield partitions, as per sketches.
1 — power transformer, 385v. C.T. 385v.; 6.3v. 3a.; 5v. 3a. (Radiokes, L-100).
1 — 30-henry 100 m.a. smoothing choke (Radiokes C-100).
3 — 35 mmfd. isolantite midget variable condensers (Radiokes, Raymart).
3 — 160 mmfd. isolantite midget variable condensers (Polar, Raymart).
1 — 3-plate midget variable condenser (Radiokes).
1 — beat frequency oscillator coil unit (Radiokes).
2 — iron-cored 465 k.c. I.F. transformers (Radiokes MIC-465).
1 — 5,000-ohm potentiometer (Radiokes, Microhm).
1 — 20.000-ohm. potentiometer (Radiokes, Microhm).
1 — 50,000-ohm potentiometer with switch (Microhm).
1 — .5 megohm potentiometer (Microhm).
1 — 25,000 ohm. voltage divider (Radiokes).
1 — vernier dial, panel-mounting type (Utility).
1 — closed circuit output jack (Igranic).
3 — 0-180 degree indicator plates, 2-inch diam. (Radiokes).
3 — pointers to suit.
5 — black control knobs.
2 — single-pole single-throw toggle switches.
1 — honeycomb r.f. choke (Radiokes).
2 — 4-pin, 1—5-pin, isolantite sockets for coils (Amphenol).
1 — special kit of 12 plug-in coils, covering 4 bands with 3 coils for each band (Rayway Lowloss).
1 — power socket, with plug and flex.
6 — 6-pin wafer sockets, 1—4-pin, 1—octal.
5 — goat valve shields.
hook-up wire.
5 — screen grid clips (1 midget octal type).
5 — couplers, for ganging 35 mmfd. band-spreaders (3 flexible).
1 — 8in. length of ¼in. rod (brass or bakelite).
2 — terminals, 1 red, 1 black (Dalton).

FIXED RESISTORS:

1 — 300 ohm 1-watt carbon (Bifrost)
2 — 500 ,, ,, ,, ,,
2 — 2,000 ,, ,, ,, ,,
2 — 10,000 ,, ,, ,, ,,
1 — 10,000 ,, 1/3 watt carbon (Bifrost)
4 — 50,000 ,, 1-watt ,, ,,
2 — 50,000 ,, 1/3 watt ,, ,,
1 — 100,000 ,, 1-watt ,, ,,
1 — 100,000 ,, 1/3 watt ,, ,,
1 — 250,000 ,, 1-watt ,, ,,
1 — 5,000 ,, 2-watt ,, ,,
1 — 300 ,, 100 m.a. wirewound.
1 — 400 ,, 100 m.a. wirewound.

FIXED CONDENSERS:

1 — .00005 mfd. midget mica (Simplex)
5 — .0001 mfd. midget mica (Simplex)
3 — .05 mfd. tubular mica (Simplex)
9 — .1 mfd. tubular mica (Simplex)
4 — .5 mfd. tubular mica (Simplex)
1 — 25 mfd. dry electrolytic, 25v. working (Ducon).
3 — 8 mfd. wet electrolytics, 500v. working (Ducon).

VALVES:

3 — 6D6, 2 — 6C6, 1 — 6L7, 1 — 42, 1 — 80 (Radiotron, Mullard, Raytheon, Philips).

SPEAKER:

1 — 5-inch dynamic speaker, 1,000-ohm. field, input transformer to match single 42 (Rola).

MISCELLANEOUS:

4 doz. ⅜-in. bolts and nuts; 2 doz. solder tags; 3 yards 16-gauge tinned copper wire;

FERRANTI ALL WAVE RECEIVERS

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This Magnascopic Dial is incorporated in all the new Ferranti All-Wave Superhets. It makes short-wave tuning as simple and easy as tuning on the Medium or Long Waves.

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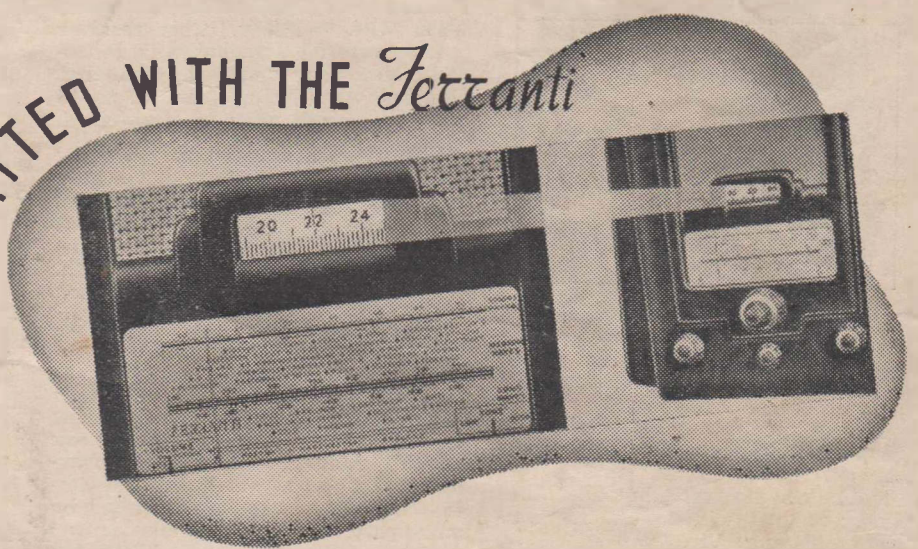

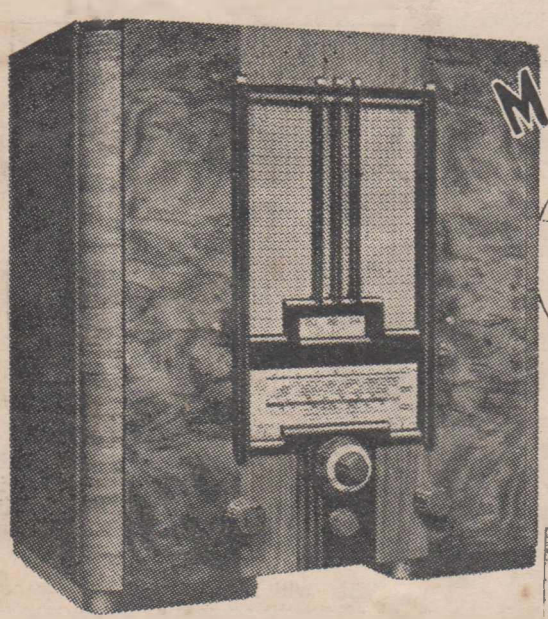

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See also Console Floor Model, and the Radiogram Combination.

It is a carefully designed though simple optical device where a scale is magnified to an effective length of over 6 FEET. The enlarged readings are seen through a window just above the main Dial with such size that the precise point at which each station is received can be seen exactly.

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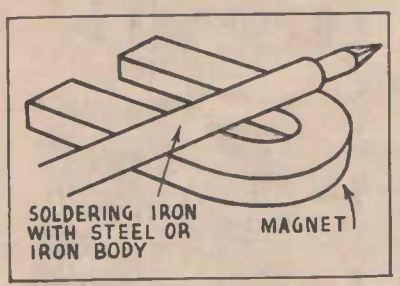
Magnet To Hold Soldering Iron

Let me once again compliment you on the wonderful standard of your magazine, "Radio World," which I am sure is in demand everywhere. I do all my dxing with a Philips 4-valve "Radioplayer," and does it pull 'em in! I also have a 1V1 Reinartz



for code only, and with it I have heard approximately 2,500 code stations. I am enclosing a hint which has proved very useful, and may be handy to other readers.

I have found that most soldering irons can be held with a large steel magnet, similar to that taken from an old Ford magneto, but any other strong magnet will do.—C. R. Londrigan, Terang, Vic.

★

Fine Battery Two Using 49's

Will you please forward a copy of the February issue of your excellent publication? I am interested in the articles "Breaking Into the Amateur Game." Though I originally bought "A.R.W." because of this series, which was brought to my notice by a friend who knew that I am interested in the subject, I have found the journal so interesting that I am now taking it regularly through my bookseller.

In particular, "Radio Ramblings" is very interesting and helpful.

I see in this month's issue that one of your readers has discovered what an excellent receiver a couple of 49's make. I have only just completed a portable using the same circuit as that published, with this difference, that as I use the set on the b.c. band, I use a .00035 mfd. tuning condenser with 90 turns of 30 enamelled on a 1¼ in. former. The tickler is wound on a smaller former to fit snugly inside, and consists of about 50 t. of 34 en. I found that oscillation was inclined to be ploppy, so I connected the grid-leak to the arm of a 400-ohm potentiometer, which is connected across the "A" battery. By adjusting this, perfectly smooth regeneration is achieved.

A 5-1 "tranny" gives appreciably better results than a 3-1, but introduces distortion—at least, mine did. I cured this by biasing the audio valve with —1½ v. This receiver will operate on 9 v., but with reduced volume as compared with that obtained when using from 12 to 15 v., above which no gain is obtained.

With a good average aerial, many Australian "B" stations have been logged at surprising 'phone strength, there being no need to force the set at all. The locals, of course, can be received at good speaker strength. A real "corker," this little bus.

Here's a tip for "Radio Ramblings." Someone placed the spout of our electric hot-water jug close to the french-polished side of my radio cabinet. Result—the steam from the boiling jug left a broad white mark on the cabinet, spoiling its appearance. I was convinced that the cabinet would have to be repolished by an expert, as polishing oils proved useless. Anyway, I finally hit on the idea of using dark brown boot-polish, which was carefully worked into the damaged surface.

As the brown polish was not quite dark enough, I mixed a little black with it, and now it takes a close examination to detect that the cabinet had been damaged. The boot polished surface blends perfectly into the french polish surrounding it.—R. Thwaites, Shannon, N.Z.

★

"Eaglet" With Special 20-Metre Coil

DX has not been too bright here lately—it is spoiled by local QRM. However, about four weeks ago I wound a new 20-metre coil for my "Eaglet 2," and was surprised by results, as I logged Germany on 19.63 m. and London on 19.82 m., besides VK6FL and about 20 other "hams" in VK5's, 2's and 4's.

In case anyone wants to try it, the coil consists of 5 turns of 24 gauge D.C.C. wire wound on an old valve base. Cathode tap is taken about ¾-turn from earthed end, spacing between turns is about 3-16 in.

I have been endeavouring to get the "Eaglet" working on the 10 m. band, but have had no luck so far; however, I'm keeping on trying. Incidentally, if anyone else has succeeded in doing so, I would be pleased to hear from them. Wishing your excellent magazine every success.—W. N. Black, Chelsea, Vic.

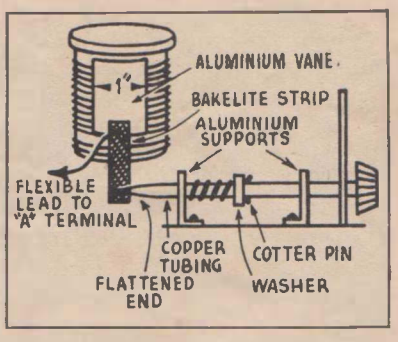
★

Novel Antenna Coupler

I am very pleased to see that the "Radio World" is still maintaining its high standard, and I greatly appreciate the articles on amateur radio—also the VK and ZL call signs.

Conditions on the air have been fairly good. W2XAF was the best station at the beginning of the Coronation broadcast (it was R8—6ME, R9). I received card and literature from RNE, using the club's report form.

Recently I visited VK3SE, in Ballarat, and met AW212DX. I would like to get in touch with anyone here in Ararat who is interested in



radio, so perhaps your magazine may bring someone. At present I am building a 3-valve set, using type 56 valves, with a range from 5 metres to 180 metres, so may be able to give you more news when it is going. Here is a hint for "Radio Ramblings," dealing with a novel antenna coupler.

This will make a small set work as efficiently as possible. The coupler, which is operated from the front panel, is not only a great help on crowded bands as a selectivity-sensitivity control, but it "smooths out" the regeneration control. A

smooth regeneration control in my opinion is the difference between a very fine receiver and just another "squealer."

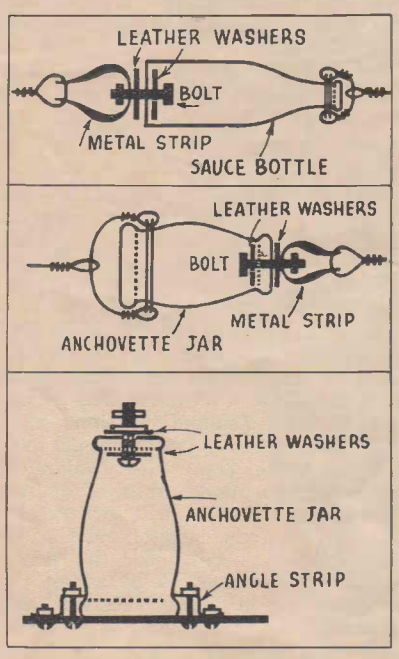
The diagram is self-explanatory and the construction simple, but be sure to use a flexible lead to the antenna vane. The length of the bakelite strip depends on the position of the tickler winding; when in an upright position the bottom of the vane should be above the tickler.

Wishing the club and magazine the very best.—Chas. R. Nelson (AW98DX), Ararat, Vic.

★

Insulators From Sauce Bottles

The "Radio World" is indeed a very fine magazine. The "Radio Ramblings" page is very interesting, and brings to light many kinks and original ideas that would otherwise



never be published. The following are details of some home-made insulators in use at VK2UJ:—

The transmitting aerial insulators are made from tomato sauce bottles; these are about nine inches long, which is nearly as long as a full-size bottle and only about half the weight. First a hole is bored through the bottom and a small bolt is passed through, to which is attached a strip of flat iron bent to the shape shown on the diagram. Leather washers are used on the bolt to prevent breaking the glass. The diagram will explain how the aerial wire is attached to the other end of the bottle. This insulator is cheap to make and extremely efficient, as well as being a novel "sky ornament."

A smaller insulator for receiving can be made from anchovette jars, using the same method of construction. Stand-off insulators can also be made from these jars by inserting a terminal through a hole bored through the bottom end, and clamping it to the baseboard with bolts through small angle brackets as shown in the sketch.

The hardest and slowest part of constructing these insulators is boring the holes, but with a little patience and practice no difficulty should be experienced.

The holes can be bored with a brace and an ordinary iron bit or a three-cornered file, but it must be frequently sharpened and lubricated with turpentine. Extreme care must be taken when the hole is almost through, as it is very easy to crack the glass if the bit is allowed to break through. A safer method is to hold a nail in the hole and very gently tap the head with a hammer to break through; then the hole can be gradually reamed larger.—H. W. Unger, Parkes, N.S.W.

★

Controlling Volume Of Extension Speaker

Thanks for including in this month's issue the tip in "Radio Ramblings" for adding 'phones to an a.c. set. A friend of mine wanted to know how to do this and was pleased to get the information.

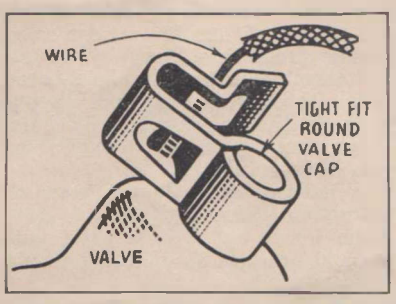
Here is another tip for controlling the volume of an extension speaker of the permagnetic type. Get an old filament rheostat, the type that was once used on so many battery sets, and connect it in series with one of the leads to the extension speaker voice coil. I have one mounted on the speaker housing, and it works quite efficiently. As it came out of the junk box, it cost nothing, and I thought its useful days had ended.—H. C. Major (AW8DX), Melbourne.

★

25-Year-Old Cockatoo Calls CQ !

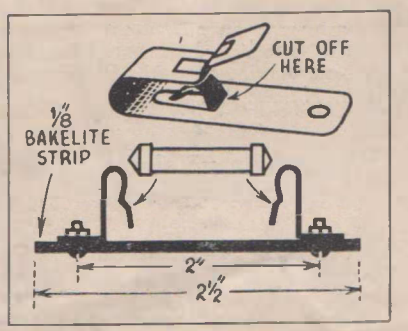
Although I have not written recently, this does not indicate that I haven't followed the magazine since it started—it gets more interesting each number. I am very interested in the series of articles on "Breaking Into the Amateur Game" and am following them closely.

I haven't done much dxing since joining the club because I have to go to work at 10 p.m. each night and am away until 8 a.m. the following morning. The aerial I have been using is a matched impedance 38 ft. high and is bringing in fair results in the afternoons on a 7-valve Radiokes kitset. I have received over 70 W's, 10 K's, 2VE's, OA4AI, LU6KE, XE2AH on 20 metres, JVN on 28.14 metres, and I2RO4 on 25.4



metres. The German and British stations are also well received.

Next door to us we have a cockatoo aged about 25 years, and it is very good at mimicking various sounds. It is only about 10 yards away from my receiver, and as I often have my set going fairly



strongly on a morse station for practice, it learnt to mimic the signals. Imagine my surprise one evening when on coming in I heard it practising. Some of the characters were perfect, too! It certainly amuses visitors by this act.

Enclosed are sketches for the "Radio Ramblings" page illustrating some uses for clips from an old "B" or "C" battery. As these are easily obtainable, the gadgets described are very cheap to make, besides being useful.—Cyril F. Frost (AW22DX), Seymour, Vic.

★

Making Blueprints Of Circuits

Here is a kink which has proved very useful to me, and doubtlessly would be to other experimenters.

When I found that the clippings of all the circuits I wished to keep for reference became too cumbersome, I bought a drawing book and on each page I made a blueprint of the circuit. Blueprints are very simple to make. Prepare a drawing of the circuit on tissue paper. Then mix 1 oz. ferric ammonium citrate with 5 ozs. water in one container, and in another mix 4-5 oz. potassium ferricyanide in 5 ozs. water. Mix the solutions, which may be kept indefinitely in a brown bottle. With a piece of cotton wool rub a small portion of solution over the page. Then place the open book in a light-tight drawer to dry. Lay the tissue tracing over the sensitive paper, and expose in the sun until paper turns a blue-brown colour. Develop blueprint by sponging with cold water.

Trusting that your excellent magazine will continue to come out each month—I wish it was each week.—K. P. Mackinnon, Rose Bay, Sydney.

★

Coil Former From Valve Bases

Here is a novel idea for making a shortwave coil former from two old valve bases. The glass is removed from both, and the connecting wires to the pins taken out. Also, from one base all but two diagonally opposite pins are removed. A piece of 16-gauge wire soldered into these two form an excellent handle. Next, the bases are placed with their tops together and cement applied.—H. Whyte-Meach (AW169DX), Artarmon, N.S.W.

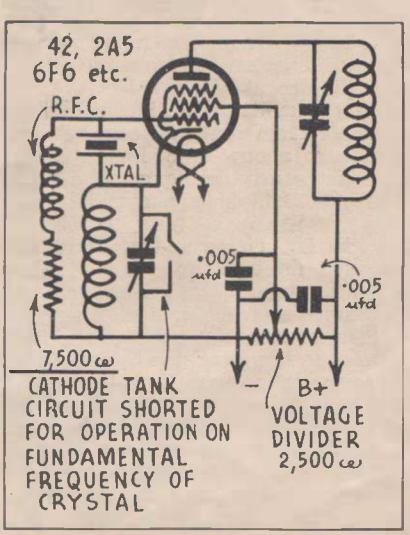
★

Novel Single Pentode Transceiver

The accompanying circuit is that of a cheap transmitter which gives excellent results. Most pentode valves will operate satisfactorily in the oscillator.

Using a 42 (2A5 or 6F6 are equivalents), with an input of 8.5 watts on 40 m. (with a 40 m. crystal, not as a tri-tet), all Australian divisions but VK6 (Western Australia) and all New Zealand divisions have been worked here. The antenna used is a full-wave Zepp with feeders 15 feet long—parallel tuning, of course.

Many new "hams" will own receivers with pentode output, and the expense of a new valve for the transmitter can be avoided by using the same valve in both receiver and transmitter. This is how it is work-



ed here: A 4-pole, double-throw switch is mounted on the panel of the transmitter, and each pole connected to a lug on the 42 socket in the transmitter (excluding heater).

A 6-pin plug is in the usual 42 socket in the receiver, and six leads are taken from it to the transmitter; the heater leads are connected to the heater lugs on the socket, while the other four are connected to their respective contacts on one side of the 4-pole switch. The four contacts on the other side of the switch are connected to their respective points in the transmitter circuit.—Eric Webb (AW14DX), Mitcham, Vic.

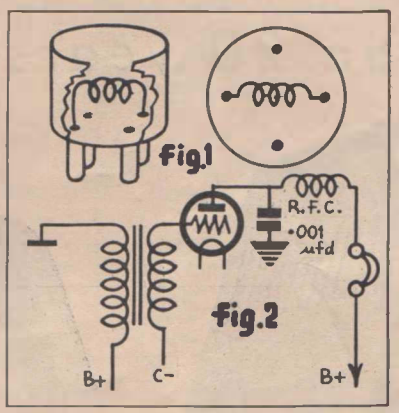
★

Four Useful Wrinkles

A handy 5-metre coil can be made from an old valve base as illustrated in fig. 1. The glass and connecting wires are removed, and the two ends of the 5-metre winding, which is approximately ¾ in. in diameter, are soldered to two of the pins.

Fig. 2 shows an effective way of curing hand capacity. An r.f. choke is connected in the plate lead to the headphones, and a .001 mfd. by-pass condenser connected between the plate side of the choke and earth.

Another tip that I have found useful when servicing receivers is to attach a torch bulb with a strip of metal to the end of one of the test prods. A pair of flexible leads runs up the handle to a torch battery. This little gadget is very handy for making tests in portions of the chassis where there is not sufficient light.



A final tip for storing valves is to obtain an empty cardboard box, and press the pins through the lid. The valves are held upright, and the risk of breakage that is present when they are left lying around is eliminated.—S. E. Molan (AW213DX), Kingaroy, Q.

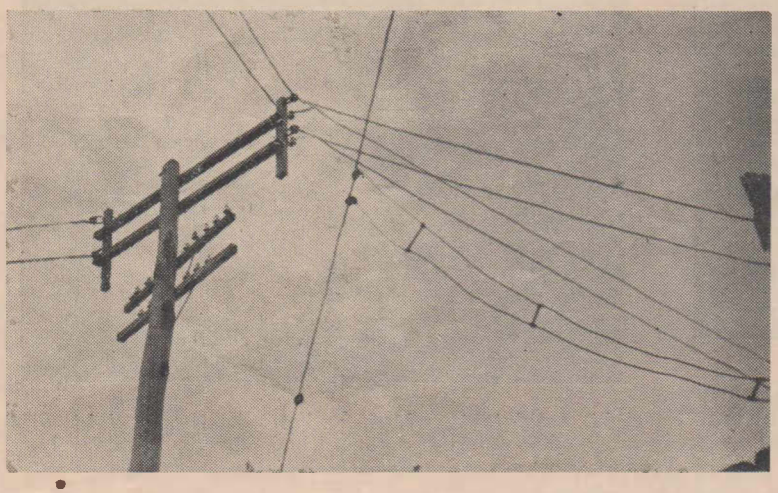
★

Makeshift On/Off Switch

Here is a tip for "Radio Ramblings"— It is a makeshift switch. Take an old torch globe and break the bulb off, being careful not to damage the wires leading to the filament. Clean up any rough edges on the remaining glass and twist the wires together. A drop of solder would improve the joint, which should then be covered with a dab of wax. Wire a bulb-holder in the circuit where the switch is required, and screw the bulb base in.

Another suggestion is to go through the "Radio Ramblings" pages in back numbers. There is always something interesting that one mightn't have bothered about before. Keep on with the good work.—Ern. Langford, Broken Hill.

New Radio Installation Regulations



An example of a badly-erected aerial system. Such an installation in close proximity to power and telephone lines is illegal.

B.B.C. Television Signals Recorded In New York: Lakemba Radio Club Notes and News.

By W.J.P.

A NEW set of regulations has been drawn up by the Standards Association of Australia in conjunction with various Government Departments, concerning the operation of radio or electro-acoustic apparatus connected to the electric supply mains. The new specifications are termed the "S.A.A. Radio Code," and are of special importance to radio enthusiasts and servicemen who may at times become a little careless in the construction or installation of their electrical apparatus.

An examination of the rules in reference to the construction, insulation, wiring, etc., of "radio apparatus" would indicate that possibly very few amateur-built transmitters meet with the required specifications.

In order to ascertain the position of licensed amateurs, communication was established with the Standards Association of Australia by the Lakemba Radio Club in the interests of the club's 43 licensed experimenters. Assurance was given that in the drawing up of such regulations as these, due consideration was always given by the Board to radio amateurs, as it was appreciated that they were doing useful work of a national asset.

A most important point which concerns all radio enthusiasts is the erection of aerials. The outside antenna or stay wires must not pass over or under electric light cables or other communication circuits, and must be so arranged as to prevent accidental contact by breaking, sagging or swinging. (See photo above). Lead-in wires must be at least 12 in. from electrical circuits, unless separated from them by a firmly fixed non-conductor. Indoor aerials must be so arranged that it is impossible for them to make contact with wires or apparatus (excluding the radio set) connected to the supply mains.

In the matter of the radio apparatus meeting with required specifications, it is as yet uncertain to what extent these rules will be enforced, but it is obvious that the electrical authorities can refuse to supply power if any equipment is dangerous.

It has been our experience that practically every licensed amateur is capable of operating his equipment with perfect safety, although admittedly he may at times take a few personal risks. Nevertheless, in his absence it is generally found that his radio room is locked or else the entire apparatus has been disconnected from the mains supply.

★

B.B.C. Television Signals Recorded

It is reported that the engineers of the B.B.C. television station at Alexander Palace were recently very much surprised to receive from America a record of the sound portion of one of their television programmes. The recording was made in New York during a period when conditions were very good, and the station was coming in with remarkable volume.

★

The Electric Trolley Bus

Early this month the new trolley bus service between Rockdale, Kogarah and Sans Souci will be officially opened. The trolley buses should be of interest to radio enthusiasts, insomuch as it is claimed that they create no electrical interference whatsoever in radio receiving sets.

Broadcast and shortwave listeners located near train or tram lines continually experience the annoyance of severe crackling and spluttering. Trains and trams, however, are not the only offenders, as various motor cars when passing by cause considerable noise around 19 metres and lower, due to the spark plugs.

Trolley buses overcome all these troubles by the use of special suppressor chokes, so residents around Sans Souci, where radio reception is excellent, need have no fear of interference from these new trackless trolleys. What a listeners' paradise will be created if the time ever comes when all electrical apparatus is fitted with means for suppressing interference!

★

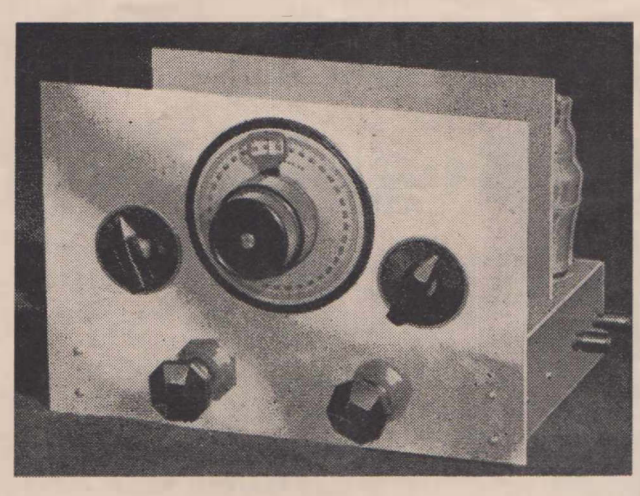
Who's CQDX?

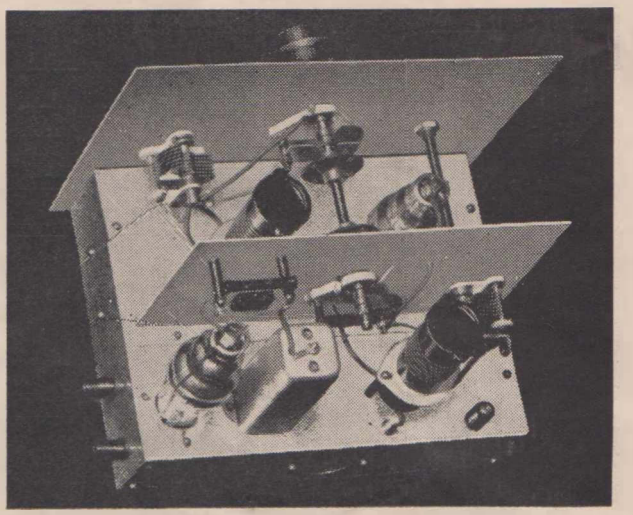
A service call was recently paid to a new shortwave listener, who proudly displayed to the serviceman a lengthy list of commercial and amateur stations logged. He enquired as to the location of various stations, and finally pointed to a "call-sign" at the bottom of the list. "This is a very popular station," he said. "I hear a lot of others calling him, but I have not been able to log him yet." The serviceman gave an inward chuckle when he observed the station in question to be "CQDX."

Biggest Amplifier Installation In Europe

A report from Geneva states that the Philips works have received an order for the supply of the complete sound amplifying installation which they have designed for the new Palace of the League of Nations.

Although no details are known yet, this will be the largest permanent electro-acoustical installation in Europe.





Two views of the completed receiver. The controls shown in the above photo are as follows:—Top centre, main tuning control; left, first detector band-setter; right, oscillator band-setter; bottom left and right, first and second detector regeneration controls respectively.

The Jones' . . . Super-Gainer Two

A two-valve shortwave superhet using a 6F7 combined regenerative first detector and oscillator, and a 79 twin triode as second detector, B.F.O., and audio amplifier.

AN all-round performance equal to that of receivers using a far greater number of valves is obtainable from this two-valve shortwave superhet, designed originally for amateur use by Frank C. Jones, the noted American radio writer. Both sensitivity and selectivity are excellent, due to the use of regeneration on the first and second detectors.

6F7 First Detector And Oscillator

With the usual 6A7 type of mixer-oscillator, regeneration applied to the pentode section would not be very satisfactory, but in the "Super-Gainer" this problem has been overcome without using a separate valve as oscillator, by employing a 6F7 in the first valve socket.

Actually the 6F7 comprises two separate valves within the one envelope—a triode and a pentode. Each is fully shielded from the other, the only element common to both being the cathode.

Regenerative First Detector

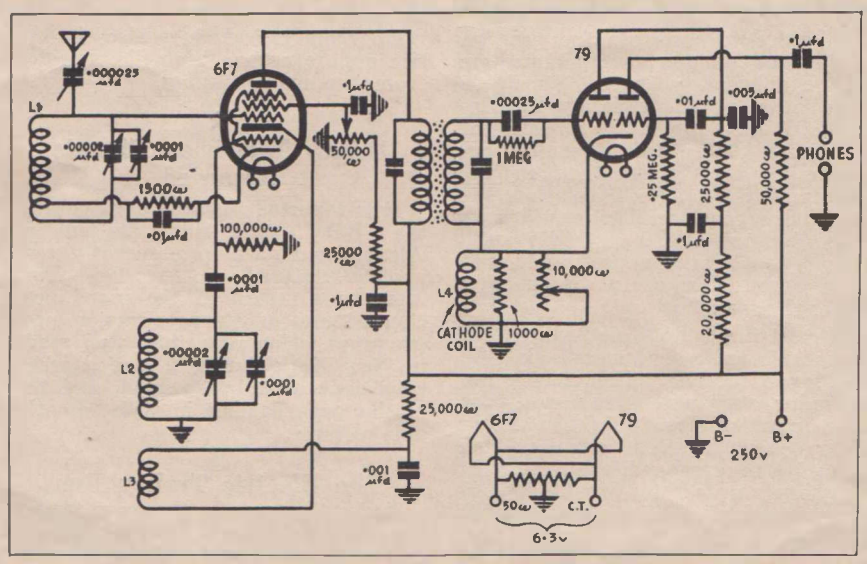
The pentode section is employed as first detector, electron-coupled regeneration being applied to it as shown in the circuit diagram. Feedback is controlled by a potentiometer which varies the screen voltage. With this adjusted just short of the "spill-over" point, both sensitivity and selectivity are stepped up considerably. This screen control also serves as a volume control.

The triode section of the 6F7 is used as the oscillator, which is tuned to a frequency about 465 k.c. higher than the first detector input. Oscillation is obtained by the reaction winding L3, coupled to the grid winding L2. Coupling between the oscillator and first detector is obtained through the 6F7 cathode, which is common to both.

Regeneration On Second Detector

After mixing has taken place, the resulting 465 k.c. signal passes through the primary of a 465 k.c. Radiokes iron-core intermediate frequency transformer. One section of the 79 double triode valve is employed as regenerative second detec-

(Continued on page 46)



The circuit of the "Super-Gainer," showing all constants.

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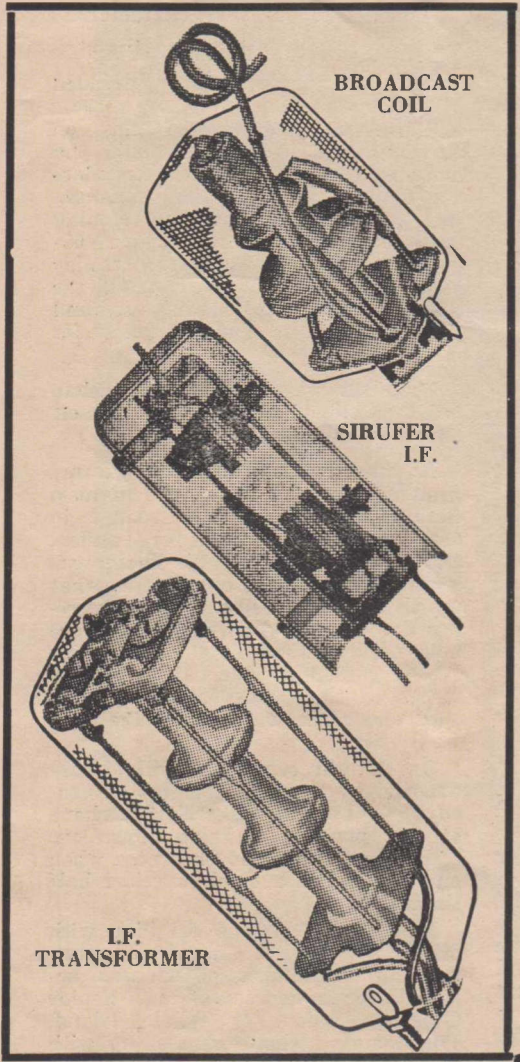

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Manufacturers! Check with your own coils and I.F. transformers these figures of the Radiokes products:—

BC2 Air core Aerial Coil, 112

BC2 Air core Oscillator Coil, 160

T-465 Iron core I.F. Transformer, 65

QIC-465 Iron core I.F. Transformer, 110

SIF-465 Sirufer Iron core I.F. Transformer, 170

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Type KPD ..... **8 Gns.**

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★ *While similar in design to the dual wave pentagrid 4, this new broadcast model offers unequalled broadcast reception at an attractive price. Quality is maintained throughout by the use of Pi-wound Litz coils and intermediates, and the finest condensers and resistors.*

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5 VALVE MONEY-SAVER (A.C.)

★ *A modern five valve A.C. operated superheterodyne receiver which incorporates inverse-feedback in the audio frequency amplifier and efficient automatic volume control on the R.F. portion of the set. Other features of this set are its simplicity of design and its remarkably low cost of construction. Complete Kit-set,*

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25 Years In Amateur Radio . 3

Some interesting war-time radio experiences are related in this instalment of a biography dealing with radio in the early days, written for the "Radio World" . . . .

By DON. B. KNOCK (VK2NO)
(Radio Editor "The Bulletin")

Familiarity breeds contempt! The author loading a 65-pound aircraft bomb during the last year of the War.

THREE weeks were spent in passing trade tests, being graded in rank, and being "kitted." The trade tests weren't easy, even though men were at a premium. Those examining naval officers knew what they wanted, and got it.

I was handed a lump of mild steel, given a few old files and a hacksaw, and told to duplicate by hand the lock of a Vickers machine-gun. It finally emerged by dint of hard work, and don't forget that one can take off in filing, but can't put on! The micrometer was put over the work, and according to accuracy men were graded. I got through with the rating of air mechanic, 1st class.

Some disciplinary training followed, and the usual working parties, and one day I found myself detailed to take charge of a squad of aircraftsmen for a rather unpleasant job better left out of print. In that party was the self-same man who had "ordered" me as an unknowing recruit to sweep out those stores. I got my own back!!

From Crystal Palace a number of us left for training, and we were drafted to Cranwell aerodrome (now the Sandhurst of the R.A.F.). As we approached that huge training school by tender from the nearby railway station, we were interested to note in the distance a semi-rigid airship rising rapidly, but apparently out of control. Three objects which we took to be sandbags dropped from it at around 2,000 feet.

On arrival we found that these were no sandbags. The ship had broken away from the mooring party and tore herself aloft with three men clinging to mooring ropes. They had no chance. One man was left on board, and the ship eventually came to earth safely 10 miles distant. Such was my welcome to my first training school.

Followed two hard months of disciplinary training; up and down the hard parade square with rifles. At the end of that time we were the picture of health and burnt brown in the heat of that unusually hot English summer.

Tests With 'Plane Radio

One day, off duty, I wandered around, and from the door of a hut near a hangar heard a familiar sound. It was a rotary gap! I peered in, and the important man inside deigned to explain that they were working with "that RE8 up there."

When the machine landed I got my first look at an aeroplane's wireless gear—a one-inch Sterling spark coil, helix, and carborundum crystal receiver. It worked over about 10 miles, and that was O.K. for artillery spotting and other purposes. I made closer contact with one of these 'plane spark installations a year or so later in an unexpected manner, as will be related.

With naval discipline well under the skin, the serious business of making us useful mechanics began, and then came a shock. A parade was called, and every alternate man ordered to take a pace forward. I was one, and then we were told that forthwith we were to be sent to Eastchurch (Isle of Sheppey) for training as armourer mechanics. Armourers! The most dangerous and least liked job of the service!

However, there was no alternative, and in due course Eastchurch was reached, and wireless seemed to slip farther and farther away. Guns, bombs, bomb-sights, gun-timing mechanisms firing through propellers; all these and more were firmly ingrained into our very characters.

An Exam. In Bomb Loading

Came the "pass-out" day, dreaded by all, and for a good reason. Hitherto we had worked only on dummy bombs; going through the motions of arming with exploders and detonators. The final examination for this part of the training consisted of wheeling a live 65-pounder on a rubber-tyred trolley hundreds of yards away from the class in the open, loading it, and bringing back to the instructor for inspection.

The idea was obvious; if a chap made a slip, he only blew himself up! We all got through.

It was at Eastchurch I got my first taste of war, when one night a German Gotha squadron roared in over the coast, headed for London, and "archies" opened up. There was a sinking feeling as one realised that up there those fellows were carrying the same kind of "toys" we were now used to handling. Familiarity breeds contempt, and after a few weeks of this, most fellows would stay under the warm blankets, come what may.

On several occasions "pills" were dropped at us as the raiders returned from London. My closest shave at this period was being blown out of bed in the port of Sheerness when on leave, when a bomb wrecked half the street.

In order to become familiar with other aspects of naval armoury training, a number of us was selected for a course at the Senior Gunnery School at Whale Island, Portsmouth. There we met up with the really rigid naval discipline, and felt proud of being counted in as "dinkum" naval ratings.

An Aerial Disaster

It was here that I witnessed a historic occurrence. One mid-day, when leaving the mess en route to

class, a 'plane was observed to fly out of a cloud near-by. Before it was realised what was happening, he crashed headlong into one of the 350-feet lattice towers of the Horsea Naval Wireless Station (BYC). The rotary engine bored into the tower, and the portion above bent over alarmingly with the weight of the huge aerials.

The pilot was thrown out of his seat, unconscious, and fell on the upturned top wing. Only his arm crooked around a strut saved him from sliding off. Two A.B.'s climbed that huge tower with ropes, slung the pilot in a bosun's chair, and lowered him to earth. They were justly decorated.

By a coincidence, that pilot was later on my commanding officer in Russia. The makers of that tower, when broadcasting commenced years after the war, used the photo of that crash in advertisements as proof of the great strength of their design of aerial support. It was well founded, too, for that was a wooden and not a metal lattice tower.

The special course finished, we were returned to Eastchurch, and then came the time for foreign draft. Mudros was the place I was picked for. The place had an unsavoury name in the service, but events turned out for the best, as will be seen.

On the appointed date, the draft lined up on Waterloo station, London, with all active service kit. Roll was called, and when competed it was found that seven of us were left apart with no names called. The C.P.O. in charge scratched his head, said there must have been some mistake and that we couldn't go. Wroth at having to be parted from our pals, we protested, but the C.P.O. pointed out that we would be wise to keep our mouths shut, as it was only a few days to Xmas. The upshot was that we reported to Wormwood Scrubs airship station and were blessed with leave home for a few days.

From amateur wireless to high explosive. The author (with pipe) and some of his "toys" during the War.

It transpired that our original draft never reached Lemnos. A day out from the Pireaus in the Aegean Sea the troop transport was torpedoed and there were only one or two survivors.

A Visit To An Old Friend

On the next draft I had the fortune to spend three weeks at Malta, after having travelled through France and Italy by train, and our quarters were slap alongside the great Rinella wireless station (BYY), a station I had often listened to on my long telephone wire aerial at home, around 2,500 metres. I got the "open sesame" from an operator and revelled in looking at the huge air-cooled gaps and massive inductances.

At night, in my quarters, I spent hours listening to that roaring spark slamming out its traffic to ships in the Mediterranean. It was all in wartime code, of course, but I got a lot of practice in keeping up my Morse by writing it down.

Some nights I had the (then) proud job of doing sentry duty around the station. My job was still nothing to do with wireless, but this station at least brought a breath of the near past. After the worst sea passage in my experience, I at last saw Mudros on a grey dawn—that place where not so long before Anzacs had camped and many were buried. I saw in the cemetery the graves of older school-fellows who had gone west in the Gallipoli campaign.

Mudros harbour, on the island of Lemnos, was now a Royal Naval Air Service base for activities against the Turk and Bulgar. It was a hotbed of sand-fly fever and other ailments to which we all eventually fell victim. It was a casual war here at this time, and the safeguarding of health was a major problem.

Further Shift To Stavros

After a month or two I was drafted to Stavros, a little harbour on the Macedonian coast, not far from the mouth of the River Struma, on the other side of which were the Bulgarian trenches and gun emplacements. There was a fair amount of action, but in a chivalrous sort of way so far as air opponents were concerned. I got my share and lived to see the beginning of the end of the war here, when the Bulgars retreated in rout before the British and French armies.

It was at Stavros I met my first wireless valve, previously only read about as a development far surpassing the crystal detector. Our wireless station found me a constant visitor in spare hours, and I would sit entranced with headphones, listening to the powerful Telefunken signals from the German warship "Goeben" up in Constantinople harbour, and all kinds of signals. Again my Morse got a chance, but it was to be some time before I got a chance to use it as a wireless amateur again.

(To be continued next month)

"Radio Aid" Explorers Track Down Noise

Valuable Free Service for German Listeners.

By M.T.H.

EVERYONE has heard of the Australian aboriginals and their tracking abilities. Their European equivalent is found in Germany, but with this difference—that the "Radio Aid," as the German organisation is known, has as its purpose the tracking of "man-made interference," that bug-bear of radio reception.

This organisation provides a valuable service to German listeners. Although there are many devices to minimise interference, these are only successful up to a point, the only satisfactory cure being to attack the noise at its source. For this, the assistance of the "Radio Aid" is sought.

Searching For Sources of Noise

After the application for help has been received, an officer of the organisation arrives on the scene, and at once thoroughly tests the receiving equipment, including earth and aerial. This is to make certain that the trouble is not caused by a loose terminal, badly soldered joint, or similar source of trouble. If everything is in order, he then starts on his voyage of discovery.

Experience has shown him the most likely sources—overhead tram lines, electric medical apparatus, domestic and kitchen electrical gadgets, and so on—and he keeps his eyes open for these. If any appliance in the house is suspected, it is tested, and if faulty, a condenser or a choke coil usually solves the problem.

Portable With Loop Aerial Used

More often than not, however, the cause has to be sought elsewhere, with greater difficulty. To go from door to door making inquiries would be asking for trouble, so the official uses a "tracking instrument," known as the Siemens Tracking Set, specially designed for this work.

This comprises a radio receiver in suit-case form for 'phone reception, and weighs only about 10 pounds, being small and inconspicuous. An on/off switch and reaction coupling can both be worked by the hand carrying the set. The actual tuning is very simple, being done almost entirely by two rotating discs on the outside of the case. Special dry batteries supply the valves, while a spare battery is carried in the case itself.

The principle on which the quest is based is that the disturbances are carried along metallic conductors—especially the electric light system—and can be traced to their source by increasing loudness in the 'phones as that source is approached.

Before starting on his search, the tracker finds the frequency on which the disturbance is most marked, and adjusts his set accordingly. He then starts out, 'phones on head, hat neatly carried in a clip provided for it (German thoroughness again!) and an exploring aerial, consisting of a small coil on a handle in his free hand. There is also a frame aerial built into the suit-case, this being suitable for very loud signals.

A journey of exploration up the street generally leads to the identification of the house containing the source of the trouble, and a tracking card describing the search and result is then carefully made out.

The tracker may have to make many calls before discovering the source, so that the task may take hours of patient search. On the other hand, the electric light switch in the listener's own room may be the cause. In the immediate neighbourhood of the trouble, the small exploring aerial is used, as small variations in signal strength are then more easily detected than would be the case if the frame aerial were employed.

Further, the set is switched on only at suitable moments and not kept in continuous operation, as the ear grows insensitive to small variations in strength. The standard distance at which the exploring aerial is held for the lighting system at the various test points is about two feet.

Curing The Trouble

Once the source of disturbance has been discovered, the next thing is to silence it. Here no general cure can be given, and each case must be treated on its merits. Often a good earth lead, or a choke coil and condenser will do the trick. Sometimes the actual receiving installation is treated—the aerial slung in another direction or a fresh earth lead, less affected by interference, is installed.

As regards the organisation and procedure, each broadcasting company runs a special office with several officials. An ordinary post-card giving details of the trouble is sufficient to set the machinery in action. The search is made and the user of the offending appliance is negotiated with; in many cases the actual means of curing the trouble is provided. In this way the ether is gradually being cleared of all such noises. It means hard work for the "Radio Aid" explorers, but ensures clear, noise-free reception for listeners.

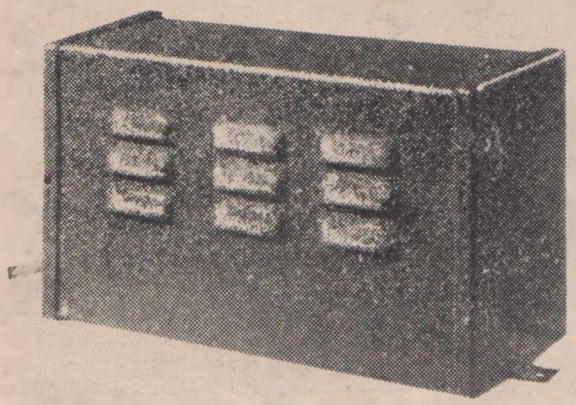
Brief Appreciations From Readers

I would like to congratulate the Club and "A.R.W." on attaining their first birthday, and I hope the magazine keeps going, for it is excellent. The articles on "Breaking Into The Amateur Game" are just what I have been waiting for.

I for one agree to the suggestion of our fellow member, AW77DX, re club stationery ,and I am sure other members of our club would also appreciate it.—R. W. Hudson (AW73-DX), Quorn, S.A.

I think the "Radio World" is a fine book, and I do not know why I did not get it sooner. I received my badge and certificate safely.—Vernon Wyatt (AW242DX), Cobram, Vic.

Designing Vibrator Type "B" Eliminators



Some precautions it is essential to take when designing vibrator "B" eliminators, in order to secure a smooth, hum-free voltage supply, are outlined in the article below . . .

By "ENGINEER"

The Radiokes vibrator type "B" unit will supply up to 40 m.a. at 150 volts. Due to elaborate filtering, the unit is noiseless in operation, even on the short waves.

THE advent of vibrator type "B" eliminators has caused much discussion among radio engineers, and much uncertainty in the minds of constructors. Much has been said against vibrator type receivers and eliminators, mainly because of the moving parts involved, and the difficulties encountered in filtering the output to secure a smooth, hum-free voltage supply.

It should be remembered here that the vibrator has no more moving parts than the small motor generators available under various trade names, and which are generally accepted as a fairly satisfactory source of "B" supply. In addition, the motor generators have delicate windings, more likely to develop faults than the comparatively simple vibrator, which is quite inexpensive to replace.

Stepping Up D.C.

The idea of utilising a low voltage D.C. source to create a high "B" voltage is comparatively simple. Certainly it is impossible to step-up D.C. voltage by a transformer to high levels, because the magnetic flux lines created by steady D.C. are stationary.

However, if we have a transformer with a six-volt primary and high voltage secondary, and we connect a 6-volt battery to the primary, the flux lines, in building up, will induce a voltage in the secondary (remembering of course that the primary inductance will cause the current to lag at first and then increase). Likewise, when the battery is disconnected and the flux lines collapse, a voltage will be induced in the secondary again. It appears then that if we connect and disconnect the voltage source at regular intervals, a constant voltage will be induced in the transformer secondary, the exact potential depending upon the design of the transformer itself.

Vibrator Provides Pulsating D.C.

In the vibrator eliminators, the 6-volt supply is disconnected and reconnected at very short and regular intervals by means of the vibrator itself. Thus we have the primary flux lines alternately building up and collapsing, and inducing a voltage in the secondary winding.

Perhaps it is as well to mention here that in order to induce a voltage in a coil, the turns of that coil must be cut by moving flux lines, or alternatively, the coil may be rotated in a field of stationary flux lines. The transformer depends for its operation on the former, while the latter explains the principle of the generator.

Now the principle of the vibrator unit is understood, the next consideration is to decide how to eliminate the various troubles encountered. One important point to keep in mind is that the high voltage supplied by the secondary of the transformer is pulsating D.C., and must be rectified and filtered as in the usual A.C. radio.

Suppressing Vibrator Interference.

Radio receivers which depend on mechanical vibrator systems for "B" supply are usually subject to a certain amount of electrical interference unless precautions are taken with the design. There are four main methods in which this interference will affect a radio set.

(1) Direct pick-up by either unshielded coils, exposed grid leads, or the aerial lead itself.

(2) Plate modulation of the radio frequency or detector valves, due to improper filtering of the "B" supply voltage.

(3) Heater or filament modulation of any of the R.F. amplifier or detector valves, due to insufficient filtering of the direct current source to the filaments and power supply.

(4) Voltage pick-up in any of the high frequency circuits (usually grid circuits), due to the chassis base being used as a common carrier of current of the desired frequency and also the interfering frequency.

It appears then that we are likely to encounter trouble in the design of a vibrator type receiver. Before considering further the possible methods of eliminating interference, the design of a vibrator power supply, with all the necessary filtering to keep interference at a minimum, will be considered.

Synchronous And Non-Synchronous Vibrators.

Refer now to Fig. 2, which illustrates the circuit of a vibrator eliminator using a non-synchronous vibrator and a type 84 rectifier, and also to Fig. 1, which shows a synchronous or self-rectifying type of vibrator.

The vibrator is shown inside the dotted lines on the diagrams. This does not mean that the vibrator need be shielded separately from the transformer, etc., when the complete unit is in a metal case. However, when the vibrator is used outside a metal case it must be shielded. Most vibrators are fitted inside a metal case which provides a satisfactory shield.

The resistors R1 and R2 in the diagrams should be 100 ohms each, if the unit is for 6-volt operation and fairly high output is desired. For outputs up to about 150 volts at 20 milliamps as in Fig. 3, R1 and R2 are not necessary. These resistors should be connected as close to the vibrator points as possible, with one end of each resistor connecting directly to the ground lead of the vibrator. A centre-tapped 200-ohm resistor is quite satisfactory, and should be capable of dissipating about 2

watts (100 mills. with a six-volt supply).

A Suitable Smoothing Choke.

The choke coils L1 and L2 must necessarily be wound with fairly heavy gauge wire and should be wound so that the distributed capacity is as low as possible. A choke which has proved satisfactory is one consisting of about 80 turns of 16 B. & S. enamelled wire wound in four layers on a ⅛in. dowel, with insulating paper between each layer. L2 may not be necessary, but it is as well to make provision for it, to keep interference at an absolute minimum.

The condensers C1 and C2 should be .5 mfd. each. They must have a very low power factor at radio frequencies, and their leads should preferably be very short for them to be effective. A condenser which has proved quite satisfactory for this purpose is a non-inductive paper type, having copper braid leads soldered to the foil. The earth return for these condensers should be as short as possible, and made directly to the chassis. The ground return for the vibrator should be soldered at the same point as the condenser returns. The choke L2 should be connected as close to the end of C2 as possible.

Refer now to Fig. 3, which shows an alternative method of filtering the primary circuit. This filter is quite satisfactory for most receivers, but naturally the circuits of 1 and 2 are more satisfactory.

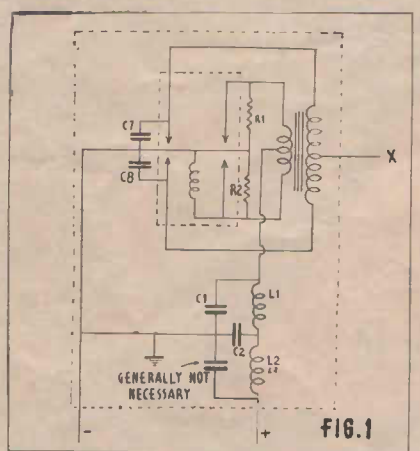


FIG.1

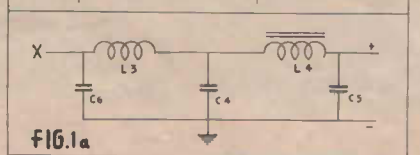


FIG.1a

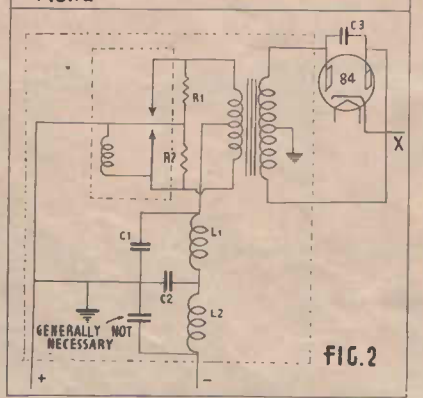


FIG.2

Figs. 1, 1 (a) and 2. The circuits shown in Figs. 1, 2, and 3, all use the smoothing filter arrangement shown in Fig. 1 (a).

The Condensers Required.

The condensers C7 and C8 should have a very low power factor at radio frequencies, and for them to be effective in eliminating interference, their leads should not be over a fraction of an inch long. Their capacity will depend on the transformers used, but about .006 mfd. is satisfactory for reasonably low output. Mica type condensers are recommended for this position. In some vibrators, these condensers are included as part of the assembly.

The condenser C6 (see Fig. 1 (a) is usually .05 mfd. to .1 mfd., depending on the value of L3. This condenser should have low power factor at radio frequencies. L3 should be 500 microhenries to one millihenry, or higher, providing the self capacity is very small. The physical dimensions of L3 should preferably be very small in order to confine its radiated field.

The condenser C3 in Fig. 2 should be about .01 to .03 mfd., but will vary with the transformer. The most suitable value is best found by experiment.

The condensers C4 and C5 may be of the electrolytic type, and 8 mfd's. each should be sufficient. To keep hum low, C4 may be 12 mfd. and C5 8 mfd. The power choke L4 may be of the small type, a standard 50 m.a. 30-henry choke being ideal for most requirements.

Regarding the synchronous type vibrators, a feature requiring close attention is the selection of the proper value of condensers across the secondary of the transformer (C7 and C8). Note here that one condenser may be used across the whole of the secondary winding if necessary, as in Fig. 2 and Fig. 3. In Fig. 3 .003 or .004 mfd. is recommended in this position (C3). In general, where the transformer exciting current is low, C7 and C8 need only be of relatively low capacity, about .006 mfd. However, with high primary currents, C7 and C8 may be increased to .02 mfd. for minimum arc at the points.

Special Transformer Required.

The transformer can be considered next. The design of a vibrator transformer is not simple, in that most vibrators function at different frequencies, and it is difficult to obtain any details on the behaviour of transformer stalloy at the higher frequencies. However, excellent transformers are available for all types of vibrators.

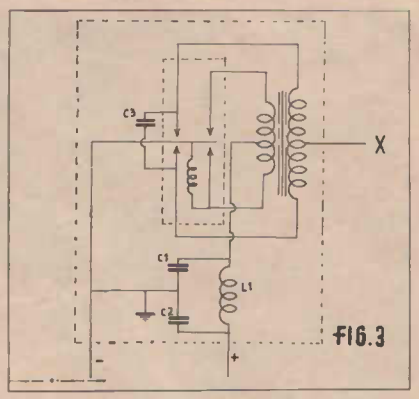


FIG.3

In general, it is as well to have a large number of primary turns on the transformer, otherwise primary current may be excessive. On the other hand, a primary with a relatively high D.C. resistance will have poor regulation, and will be unsatisfactory for class "B" circuits.

A typical transformer to deliver 200 volts at 40 m.a., using a core an inch each way, has a primary of 86 turns of 18 B. & S. centre tapped, and 3,500 turns of 32 B. & S. centre-tapped for the secondary. The primary turns may be reduced to as low as 72 if economy of space is essential, but whenever possible the larger number should be used. More than this number may be used, but there seems to be no advantage in using more than about 100 turns on this class of transformer. It has been found best to use more primary turns, even at a sacrifice in wire size, when space is at a premium.

The above transformer, with a good grade of stalloy, should be very satisfactory. It is important to note that an electro-static shield is necessary between primary and secondary windings if noise level is to be kept low.

The transformer just described, will have an exciting current of about 2.5 amperes with 6 volts across half of the primary winding. The condensers C7 and C8 in Fig. 1, with this transformer will be approximately .01 mfd.

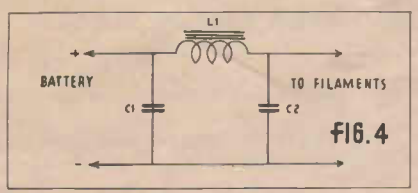
We have now considered the design of a vibrator unit in detail. Next, the troubles encountered in making a satisfactory vibrator type receiver, and methods of wiring them, can be discussed.

The four ways in which a vibrator-operated radio receiver picks up interference have already been listed. In order to eliminate direct pick-up, all high-frequency coils

should be provided with separate shields. Grid leads should be kept as short as possible. The antenna should be shielded over its entire length, from the point where it enters the receiver to the antenna coil itself. An effort should also be made to make the mechanical design of the receiver such that all the power supply components are grouped together, and are as far away from the R.F. end of the receiver as possible.

Steel Box Provides Shielding.

Whenever possible, the parts shown inside the dotted lines on the circuit diagram should be enclosed in a steel



box. In some cases it will help if the box has its own base, rather than using the chassis for this purpose. This will help to reduce radiation, and also minimise interfering currents set up in the receiver chassis. It is even a good plan to put the complete vibrator parts, as shown in the circuit diagrams, inside a steel box.

Interference due to plate modulation is easy to detect, and comparatively easy to cure. The simplest method of detecting this form of interference is to connect a resistive load equal to the load placed on the power supply by the receiver, and then supply plate voltage to the valves from "B" batteries. If there is still interference present with the battery "B" supply, and the vibrator running, then it is apparent that interference is occurring in another part of the circuit.

However, if the interference is reduced when the receiver is operated from batteries, then the R.F. choke shown as L3 in Fig. 1 (a) is either too small, or has too high a distributed capacity, or the condenser C6 is either defective or is not of sufficient capacity. Usually a .05 or .1 mfd. condenser is large enough. The choke coil should also be rotated slightly to make sure it is not coupling to either the power choke or transformer. The condenser C6 is quite often unnecessary with the valve type eliminator.

Detecting Heater Modulation.

Heater modulation is usually detected by operating the "B" power supply from a separate 6-volt battery. When arranging for this, use a shielded cable and ground the shield to the chassis, otherwise the cable may radiate so much that there would be no decrease in the interference.

It has been found that receivers having a high sensitivity will usually require two chokes between the power supply and the heaters. The use of the chassis as a common connection for all the heaters is not recommended, due to the possibility of voltage pick-up in the chassis. The heater line is best grounded at only one point on the chassis.

The usual method is to wire the heaters together, then ground one of them to the chassis. The heater to be grounded should be found by experimenting to find the best point, as this may vary considerably. Also, care should be taken to make sure there are no radiating loops formed by the heater wiring, which might couple to some portion of the R.F. amplifier.

Voltage pick-up due to improper grounding of the power supply and R.F. amplifier elements is the most common source of interference, and also the most difficult to locate. The simplest method of locating this type of interference is to short the grids of the valves, starting with the output valve, and so determine in which stage the noise is originating.

Common Source Of Trouble In Sets Using A.V.C.

A common source of trouble is found in receivers using automatic volume control. In such receivers the tuned circuits are completed through condensers by-passing the grid return to ground. If these A.V.C. by-pass condensers are grounded directly to the chassis, a voltage which is developed across the common path between the point where the condenser is grounded and the wiping contact of the variable condenser, is picked up and applied to the valve grid.

In order to eliminate this interference, the by-pass condenser should be returned directly to the wiper on the section of the variable condenser tuning that particular coil. The condenser wiper is best bonded to the chassis with a piece of heavy copper braiding. As a rule it is desirable to ground the variable condenser at only one point on the chassis.

In order to check for interference on a completed receiver, the antenna lead-in should be shorted to ground through a .00025 mfd. condenser. If the interference appears with this lead shorted, but does not appear with it open, that would indicate improper grounding of the aerial primary.

In some cases, this type of interference can be eliminated by returning the ground end of the aerial primary to the condenser wiper. In others, it will be found that there is less interference when the A.V.C. condenser on the aerial primary is grounded to some point on the chassis rather than the condenser wiper. This is apparently due to an out-of-phase voltage being picked up and balancing out the interference.

Interference Arising In Driver Stage.

In some cases, interference is located in the grid circuit of the audio driver valve. This is generally due to the return of the volume control being grounded at a point remote from the valve's cathode circuit. Also make sure that the first audio grid lead is well shielded, and does not run close to power supply or heater wiring.

No discussion on vibrators would be complete without reference to satisfactory filament filtering for directly heated battery valves, particularly when 2-volt valves are connected in series—parallel to use a six volt "A" supply.

Fig 4 shows a satisfactory filter arrangement. L1 is an iron core choke, of about 25 milli-henries inductance at 2 amps. C1 and C2 are 500 mfd. 12-volt electrolytic condensers. In some cases, C2 may not be necessary. In cases where an ordinary battery receiver is adapted for use with a vibrator, the filter in Fig. 4 will be very satisfactory. The voltage may be dropped from six volts to two with a suitable resistance, if necessary.

From this discussion so far it should be apparent that a great amount of work has been done on the design of vibrator units and receivers. There is still much more to be done, but from the details given so far it should assist constructors to build vibrator receivers with confidence.

Goal Is "Five V.A.C."

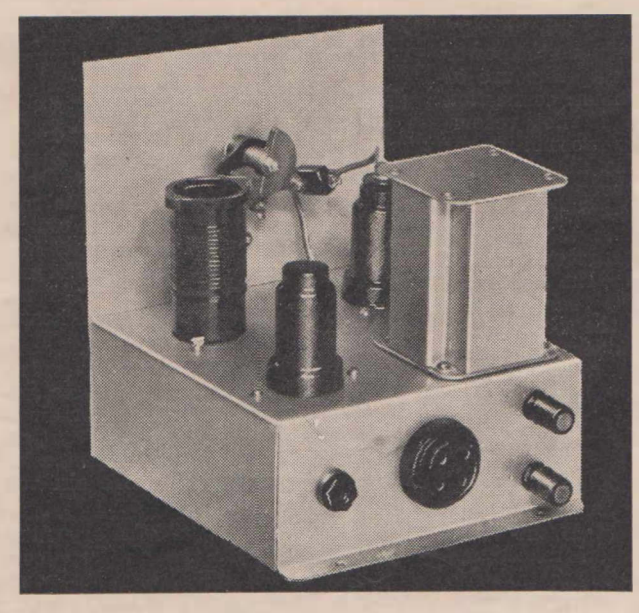
Ever since the first number of the "Radio World" was on sale in South Australia I have eagerly awaited the following issues, and have obtained much interest and enjoyment from the numbers so far published. I am particularly interested in the articles on the "Amateur Game," as when I have finished my present studies I intend to study for the A.O.P.C. examination. With this end in view I am also a member of the W.I.A. and the A.R.R.L.

The greater part of my shortwave listening has been done on the 20-metre "ham" band, but I am now putting in more time on the s.w. broadcasting stations, and I am going to try for 5 V.A.C. (see article in last month's issue). I am a keen reader of Mr. Graham's notes and articles, and hope to profit by his experience.—W. A. Howe (AW233DX), Lower Mitcham, S.A.

Assembling And Wiring The . . .

1937 Eaglet All-Wave Three . . .

The assembly and wiring of the "1937 Eaglet", the two-valve all-wave receiver featured in last month's issue, are outlined below.



A rear view of the "Eaglet"— a powerful little two valver that will give world-wide reception on the short waves.

The receiver is built on a steel chassis measuring 6 in. x 6 in., with a 2½ in. turnover all round. The front panel is of 16-gauge frosted aluminium.

The parts to be mounted first are the "A" and "E" terminals, power socket, 'phone jack, audio choke, and the valve and coil sockets. Of these, the aerial terminal and 'phone jack should be insulated from the chassis.

The front panel is next drilled according to the sketch, and is then bolted to the front wall of the chassis. The band-setting condenser, potentiometer, on/off switch, and main tuning condenser can now be mounted, and the set is ready for wiring.

Wiring Pointers

This can be carried out with 18 or 20-gauge tinned copper wire covered with spaghetti, or with "push-back." Notice particularly that all earth points have been bonded together by a common earth line, which connects directly to the earth terminal. The moving plates (or rotor) terminals of both tuning condensers, and the frame of the tuning dial, are also "tied" together and connected to the earth line.

Though the set might work quite well with all these earth connections made to solder tags placed under mounting bolts passing through the chassis, this method is not advisable, as it is difficult to secure a really good low resistance earth in this way, particularly if the chassis is of aluminium.

Full details of the wiring are shown in the above and under-chassis sketches, the heater wiring also being shown. To complete it, the heater leads from the power socket are soldered to the heater terminals of the 6C5, and another pair of twisted leads run to the corresponding terminals on the 6J7.

Two leads pass through the chassis, one from the fixed plates terminal on the band-spreader, to the corresponding terminal on the band-setter. The other lead is from the moving plates terminal on the band-spreader and also the terminal on the tuning dial, and runs to the earth line underneath the chassis.

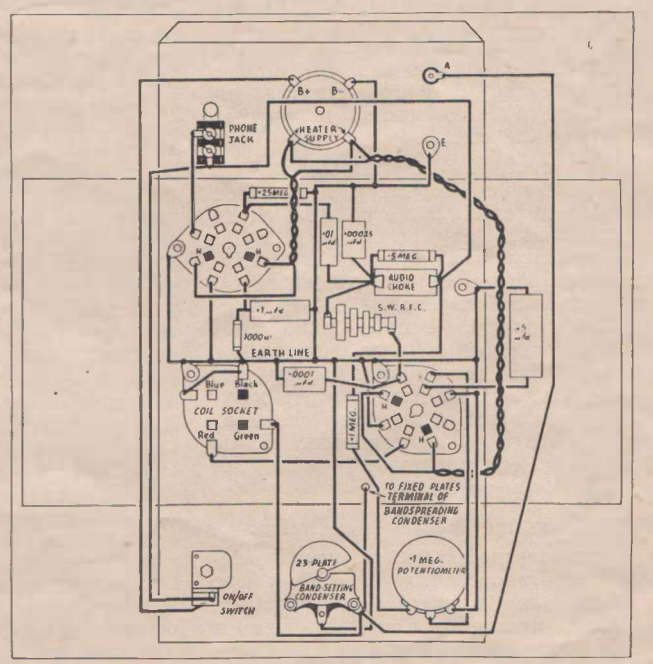
Every single joint should be well soldered, and tested afterwards by giving it a tug with the fingers or with pliers.

The First Try-Out

After a thorough check has been made of all the wiring, the knobs can be fitted, the valves, 80-metre coil and headphones plugged in, the power cable and aerial and earth leads connected up and the set switched on.

Now slowly advance the reaction control, and a faint hissing noise should be heard in the 'phones, growing stronger as the control is advanced. With the set on the verge of oscillation it is in its most sensitive condition, and if the tuning dial is rotated, a station should soon be heard.

It will be found that the set handles beautifully, and after a little practice at manipulating the reaction and tuning controls in step, plenty of real DX reception will be obtained.



This sketch shows the complete under-chassis wiring.

Radio Step By Step 10

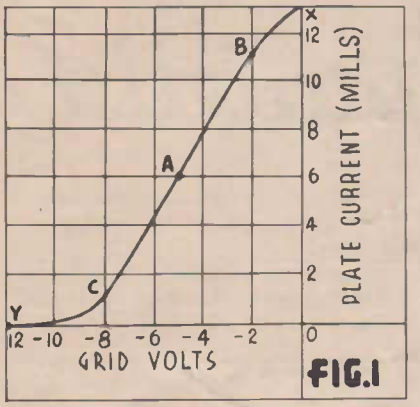


FIG.1

The Valve As An Amplifier

This instalment of a special series of articles for beginners outlines the way in which a valve operates as an amplifier.

IN the last instalment, how the potential applied to the grid controls the electron flow within the valve from filament to plate (i.e., the plate current), was explained. This action is illustrated in fig. 1, in which the plate current in milliamperes is plotted against grid bias in volts. This curve is known as a static plate-current grid-voltage characteristic curve.

How Bias Controls Plate Current

When the grid is neutral (zero grid volts), the plate current is 13 mills ("X" on fig. 1), but when a bias of -5 volts is applied, the plate current drops to 6 mills. ("A" on curve). A further increase in bias to -8 volts results in a further drop to 1 mill. ("C"), while with a bias of -12 volts on the grid, the plate current drops to zero ("Y"). This is because the repelling force exerted on the electrons leaving the filament has become so strong that none of them can pass through the negatively-charged grid to the plate beyond.

With the grid positive to filament, it begins to assist the electron flow instead of retarding it, and thus the plate current is increased. However, it cannot be increased indefinitely by making the grid more and more positive, because the grid starts collecting electrons on its own account, and current flows around the grid circuit.

With the grid becoming more and more positive, the number of electrons diverted by it steadily increases until none at all can get through to the plate, and the plate current drops to zero. This is a condition that is not wanted in radio; the function of the grid is to control the filament to plate electron stream, not divert it entirely. Acmills. ("X" on fig. 1), but when a tually, as a general rule the grid is kept negative to the filament.

How The Triode Amplifies

Next, how the triode amplifies will be considered. Imagine an alternating voltage, equivalent to a signal, is applied to the control grid, which has been given a bias of -5 volts (see fig. 2). The first peak of the curve ("S1") has a peak value of 3 volts, and so reduces the bias to -2 volts, taking the operating point of the valve from "A" to "B". The succeeding half-cycle swings the operating point in the opposite direction, to "C." In other words, the application of the signal has caused the bias to vary from its normal figure of -5 volts to first -2 volts and then to -8 volts.

This variation in grid bias is reflected in the plate current in the following way. The first positive alternation of the signal, which reduces the bias from -5 to -2 volts, results in an increase in plate current from 6 to 11 mills. (see fig. 2). The next alternation, which is negative, increases the bias to -8 volts, resulting in a decreased plate current from 11 to 1 mill. In this way, the plate current varies in sympathy with the applied signal, and so we obtain in the plate circuit an exact replica of the signal variations as supplied to the grid.

The net result, then, of applying a small alternating voltage to the grid is that it produces similar fluctuations in the plate current drawn by the valve.

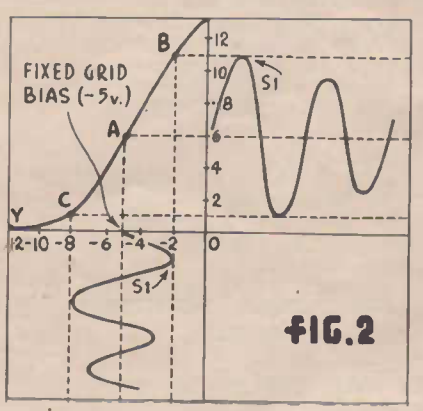


FIG.2

Corresponding Voltage Variations

When some form of load (resistance or impedance) is connected in the plate circuit, this variation in plate current flowing through it will produce a corresponding variation in the voltage drop across it. This alternating voltage is a magnified version of the original signal, and thus the valve is an amplifier.

How Overloading Causes Distortion

In this way amplification without distortion takes place. This is only true, however, if the signal voltage is not so large that the operating point passes off the substantially straight portion of the curve.

For example, from figure 1 we find that the permissible grid swing is between "B" and "C." If the signal is so great that the operating point passes off this line to the curved portions, distortion results, because then the plate current does not increase or decrease with the grid voltage variations to the same amount as it did over the straight portion.

In fig. 1 we see that a signal with a total variation of 6 volts is the greatest permissible, as the resultant swing of 3 volts each side of the centre brings the operating point to "B" and "C." Thus the negative portion of the maximum permissible signal increases the bias by 3 volts, reducing the plate current by 5 mills., and vice versa with the positive portion. If, however, we apply a 14-volt signal, with a resultant 7-volt swing to the left, it would reduce the plate current by 5 mills. for the first 3 volts, but only by 1 mill. for the next 4 volts. Obviously this would result in a distorted form of signal.

The opposite half cycle would result in an even more violent distortion, as it will be seen that 7 volts to the right of the point marked "A" brings the working point past the zero line, and the grid would become positive. This briefly explains the restriction in undistorted output which is available from a single

(Continued overleaf)

The . . . A.T.R.S. Bulletin

Conducted by the Secretary, 287 Clarence Street, Sydney, N.S.W.

★ ★ ★

From the Secretary's Pen

Here is a short review of our activities during the month.

The Victorian organiser, Mr. Mendoza, is coming to Sydney shortly to have an informal talk as to the best means of organising a Victorian branch. A report of the interview will be published next month.

Our organiser in Tasmania, Mr. J. Oliver, has recently gone into partnership with a Mr. E. Lewis, and is busy getting established at 35 King Street, Devonport, Tasmania, P.O. Box 24. Here's wishing Mr. Oliver and Mr. Lewis all the success they wish themselves. Intending members in Tasmania are invited to visit Mr. Oliver at the above address.

In Sydney, we have secured several valuable service contracts from leading radio houses, and are looking forward to more. Our membership is steadily increasing, though not fast enough considering our object — the licensing of radio servicemen — and the benefit it would prove. Why not join now by applying to your State Organiser as follows:—

Sydney:—Mr. Hook, 287 Clarence Street.
Queensland:—Mr. W. Hudson, C/o. Q'land College of Science, Old Town Hall Chambers, Queen St., Brisbane.
Victoria:—V. H. Blight, 30 Ellis Rd., Glen Iris, S.E.6.; or H. Mendoza, 161 Lygor St., East Brunswick, N.4.
Western Australia:—A. J. Gibbs, 129 Herbert St., West Subiaco.
Tasmania:—J. G. Oliver, 63 North Terrace, Burnie.

Radio Step By Step

(Continued from previous page)

valve when used as an audio amplifier.

Actually, in one application of the valve—that of detection—this partial suppression of one half of the signal is desirable. Why this is so will be explained in a later instalment.

The valve is a wonderfully versatile device in that it can be used to amplify both audio frequencies (extending from about 80 to 12,000 cycles per second) and radio frequencies, extending upwards to 100,000 k.c. (100,000,000 cycles per second) and even higher.

Next Month: How The Detector Works.

The Month In Review

Service Kinks And Wrinkles

By E. Y. HOOK (A.T.R.S. Head Office)

THIS month marks the commencement of a new series of articles in "Radio World," comprising a collection of news items and hints of interest to servicemen. Personal experiences in the service game are always interesting, and so readers are invited to send along suitable contributions.

★

Conquering Man-Made Static

A feature of the A.T.R.S. page in the past two issues was the article in each by Mr. Higgins (A.T.R.S. member for Bellevue Hill) on "Man-Made Static."

In the opinion of Mr. O'Sullivan, of the Radio Inspectors' Office, the cure for such troubles usually lies in the aerial., There is a general impression abroad that with the present-day highly-sensitive receiver an outside aerial is no longer required. Actually, with the increase in electrical noise, an efficient outdoor aerial is needed to-day more than ever before.

The present-day receiver will work with an indoor aerial, but if the district tends to be noisy, the receiver is certain to pick up this noise from the electric light and power system, and with the limited signal pick-up by the short and inefficient aerial, the signal-to-noise ratio will be very poor.

I think in all cases possible when installing a set, it is advisable to have an outdoor aerial. Also, it is advisable to have a separate earth driven into the ground, if possible.

★

Auto Radios Discourage Speeding

Auto receivers have frequently been condemned on the score that they add to dangers of driving. This contention has been proved incorrect by the facts evolved as the result of questionnaires mailed recently by General Motors Corporation to more than two million car owners. These were designed to draw direct from potential purchasers their tastes in motor cars.

Contrary to the general impression, it was learned that members of the younger generation want a top cruising speed of only 3.7 m.p.h. greater than voted for by the adults, and the general subject of safety was stressed more frequently by youths than grown-ups.

"However," states the director of the sales department of the firm, "the most outstanding point of difference between the young people and the adult group is the overwhelming majority of boys and girls who wanted radios in their cars, and it was pointed out over and over again that radio equipment in the car makes for slower and safer driving. In the words of a college youth who answered the questionnaire, "Even the fastest fox-trot doesn't blend with a speed of over 50 m.p.h., and with a slow waltz I find myself slowing down to below 30."

This certainly sounds like good sales talk for both radios and cars.

★

Earthed To a Fire-Place !

The other day I was attending a radio set in a suburban house, where the owners were complaining of noisy reception. After hearing the noise, I questioned the client as to whether there was an earth attached to the set or not. He informed me

that he had had one installed some time ago, but it had not made any difference. Tracing this earth wire, I found it led to the fire-place, where it was attached to the grating!

Moral: Join the A.T.R.S. and stamp out the racketeering which has crept into the service profession. **Hint:** With sets troubled by noisy reception, see that a good earth is attached; it often clears up the trouble.

★

Ensuring Minimum Hum

Some time ago I was building an amplifier, which incorporated an audio transformer. Also, the power supply had to be on the same chassis as the rest of the amplifier, which meant that trouble might be encountered with hum. It was then I discovered a useful hint.

I mounted the power transformer on the chassis, and then connected it to the power mains. Also, I connected a pair of headphones to the audio transformer and moved it around the chassis. In this way the best position for it was located, because any hum that was being picked up was reproduced in the 'phones.

★

To Ensure Repeat Business

When returning a set after service, I have found it a good practice to place a business card on the back of the receiver. These days, after a set has been repaired efficiently, one rarely sees the customer for some time, and when the set again needs attention, he may have forgotten you. But when the "brainy man" of the house looks to see if all the valves are alight, he sees the card with the 'phone number clearly stated.

Brief Appreciations From Readers

Enclosed please find P.N. for another four copies of Vol. 1, and the two covers. This completes my No. 1 volume and I take this opportunity of congratulating you on such a fine magazine. Since I joined the club I have not missed one copy, but have all of No. 1 and also No. 2 (so far printed). I often think of how unfortunate I was not to know of such a fine magazine before I did, and if I were forced to pay double the price for it I willingly would.

Wishing the "A.R.W." the best of good luck; it sure is the finest paper going.—O. Whitaker, Bundaberg, Q'land.

Enclosed is application form for membership to the All-Wave All-World DX Club, together with postal note to cover cost of same and 2 covers for binding the "Radio World." Your magazine is just the right thing for those who are interested in radio. American books have a long way to go before they come up to the standard of the "Radio World."

Wishing it every success.—B. R. Mitchell (AW260DX), Bundaberg, Q'land.

Would you kindly send me the "Australasian Radio World" (post free) for twelve issues, beginning with the May issue. The cash with order price of 10/6 is enclosed. I can't get this wonderful magazine quickly enough every month.—R. W. Hudson, Quorn, S.A.

I received the Club Badge and my Membership Certificate safely, and I am very pleased with them, especially the badge, which is very neat.

I have only just got the craze for dxing, so I thought it would be a good idea to join the club. I bought the December issue of the "Radio World" and immediately decided to get all the back numbers. The magazine is very interesting, and when I have bought it, I don't stop reading till I have read every word.

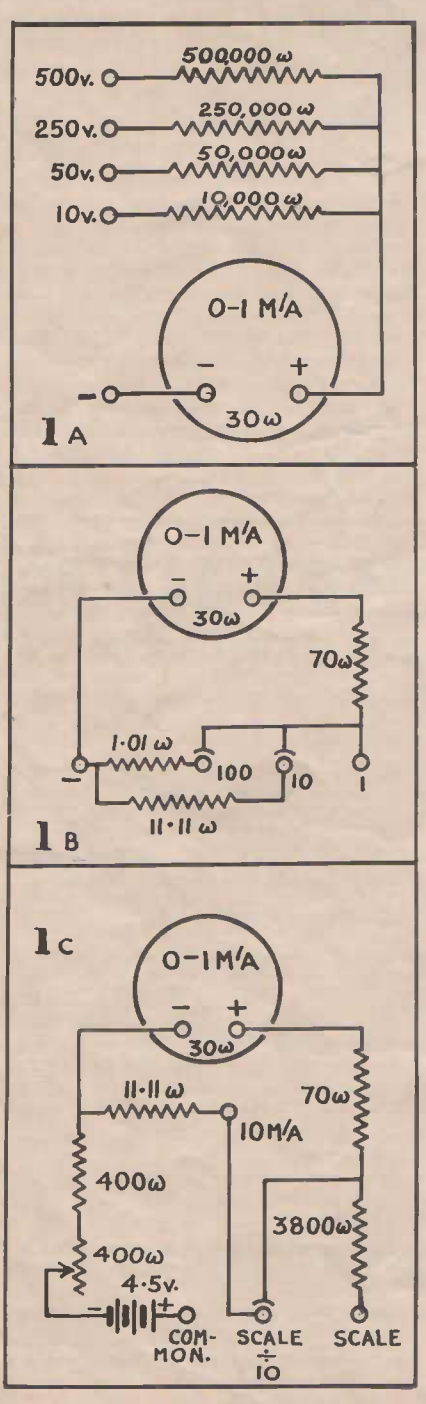
Please find enclosed a P.N. for 50 report forms; they are just the thing.—James H. Clark (AW237DX), Willoughby, N.S.W.

Breaking Into The Amateur Game...6

This instalment explains how a signal generator is used for aligning receivers, and also outlines the different measuring and test instruments that are employed by amateurs in making adjustments to their equipment.

By GEORGE THOMPSON (VK3TH)
and IVOR MORGAN (VK3DH)

IN use, the output lead from the signal generator is connected to the aerial terminal on the t.r.f. receiver, and the signal generator dial is set at a frequency near the high end of the range to which the receiver is to respond. An output meter is needed at this stage, and is really only a low-range milliampere meter provided with a dry metal rectifier and a series resistance or "multiplier."



This meter is usually connected, through a capacity, to the output valve of the set, together with the headphones or loud speaker. We then have an aural and visual indication of what is coming through the receiver.

To line up the receiver we simply tune in the signal from the generator and adjust the trimmers on the tuning condenser until maximum output is obtained as indicated roughly in the headphones or speaker, and finally for fine adjustment, by the output meter.

In the case of the superheterodyne, first set the signal generator to the i.f. frequency for which the receiver has been constructed, connect the generator output to the first detector control grid, and speaker and output meter to receiver output. Trimmers on i.f. transformers should then be adjusted to produce maximum output as indicated by the output meter.

The signal generator is then transferred to the receiver aerial and earth terminals. Then follows the same procedure as with the t.r.f. receiver, with the exception that the oscillator trimmer having been set at a point conveniently about half-way through its range, the aerial and r.f. stage trimmers are adjusted (of course, the signal generator will have been previously set to the desired r.f. position on the scale).

The signal generator dial is now swung up to the low-frequency end of the receiver's range, and the "padding" condenser adjusted to give maximum output, after which the aerial and r.f. trimmers are rechecked.

Other Testing Instruments

Other instruments for receiver testing should include a voltmeter of high resistance (1,000 ohms per volt) and a low-range milliampere meter with a few shunts to make ranges of 0 to 1 m.a., 0 to 50 m.a., and 0 to 100 m.a. The high-resistance voltmeter is actually an 0 to 1 milliammeter, used in conjunction with "series" resistors or multipliers.

Amateur Station Apparatus

The instrument that in all probability is of the greatest importance to any amateur station is the frequency meter, known in its simplest form as the absorption frequency meter.

Briefly, a coil shunted by a condenser tunable over the desired frequency range constitutes this instrument. In order to provide a crude means of indication of adjustment, a "pea" lamp is very often included in the circuit, which then consists of coil, condenser and lamp, all in series.

When the coil is loosely coupled to the transmitter tank circuit, a small amount of energy is picked up by it. The meter circuit is adjusted to resonance by the tuning condenser—maximum resonant setting being indicated by maximum brilliancy of the lamp. A greater degree of accuracy may be obtained if the lamp indicator is replaced by a thermo-couple m.a. meter. This is so on account of the greater degree of ac-

Fig. 1 (a) illustrates how multipliers, or series resistors, can be added to a 0-1 milliammeter to provide four different voltage ranges. In Fig. 1 (b) two shunts are shown connected across the meter to provide additional current ranges of 0-10 m.a. and 0-100 m.a., while Fig. 1 (c) shows a two-range ohmmeter circuit for measurement of resistance.

curacy obtainable when the resonant peak can be observed by a meter reading, as compared to the estimation of a lamp's brightness.

The main feature of this type of frequency meter is its simplicity, its major drawback being poor precision, since the necessary coupling of the two circuits upsets the tuning of both to some degree, dependent on the tightness of coupling. From this we see that for low-power transmitters the absorption meter is undesirable.

Monitor And Frequency Meter

Advancing a stage better than this, we are introduced to the monitor-frequency meter combination. A metal container housing a valve, tuned coil, feed-back coil, necessary filament and plate batteries, jack for 'phones and a finely engraved dial for calibration purposes constitute this species of instrument. Theoretically we are using nothing more nor less than a low-powered oscillator which has been calibrated in kilocycles in conjunction with dial readings.

In use, the procedure is thus:—Tune the frequency meter dial over the band in which the transmitter is known to be operating, and on tuning in the "carrier" a heterodyne whistle will be heard. Adjust frequency meter dial carefully to "zero beat" and read off the frequency of the transmitter by reference to the calibration chart.

It sometimes happens that the frequency meter has not been calibrated, but that the amateur bands are accurately known on the receiver. In this case the frequency meter is used as a miniature transmitter, and when operated in the vicinity of the receiver may be tuned in in exactly the same way as a distant station. The frequency meter dial is set at such a position as to produce a signal in the receiver on the desired frequency, then the transmitter frequency may be adjusted to this position by listening on the frequency meter to the signal produced by the transmitter, the latter being moved until its frequency is "zero beat" with the setting of the frequency meter as in the original adjustment in conjunction with the receiver.

Since, as was stipulated in the first instance, this frequency meter is entirely shielded from a radio frequency point of view, and we have found that the transmitter may be heard in the 'phones at quite reasonable level, i.e., not at such a strength as will make the signal hopelessly broad; consequently use is made of the instrument as a monitor for continuous wave (C.W.) transmissions.

In the case of a telephone transmitter, and regardless of the frequency of operation, a monitor should be provided which is capable of faithfully reproducing all modulation frequencies of which the transmitter is capable. In short, this would consist of such necessities as tuning arrangements, rectifier (diode for preference, crystal or valve) and sound reproducer ('phones or loud-speaker).

Good Shielding Essential

To illustrate this form of station instrument, we will consider an average 25-watt telephone transmitter. In the vicinity of the actual transmitter the radio frequency field will be comparatively strong. The most effective monitoring will be achieved if the instrument is completely (or as nearly so as is possible) shielded in a similar manner to the frequency meter-monitor for C.W. transmissions.

When the "fone" (telephone) monitor is sufficiently well shielded as to require a small amount of antenna to produce satisfactory signal strength, the monitoring efficiency is of a high standard. Under these conditions, unwanted modulations from the transmitter power supply or speech amplifier in the form of "noises or hums" are readily detected via the monitor.

Theoretically speaking, what we are actually doing in each of the foregoing paragraphs is to create a correct balance between transmitter and monitor. Since the job is to listen to the nearby transmitter only, and that being very many times greater in field strength than any station likely to be tuned in, the obvious inference is that a "receiver" is required, capable of faithful reproduction, but of a very low order of sensitivity.

Stability Is Essential

Referring back for a moment to the frequency meter-monitor, since the instrument is merely a valve oscillator, it has the usual drawbacks, which may be broadly defined as frequency drift, due to temperature changes, battery voltage changes and loss of calibration should the original valve be replaced.

There has been a number of improvements put into use of late, the electron-coupled oscillator being perhaps the most useful. In theory, this oscillator has inductance included in the cathode circuit, which is common to grid and plate-voltages, and changes effect the whole in such a manner that a compensation takes place, and we have as a result a more stable oscillator, less subject to frequency drift.

Another feature is the convenience of output, which may be taken from the plate circuit with practically no loading effect on the oscillating circuit, again giving greater stability. There is also an abundance of "harmonic" output, which is very useful when it is desired to cover a number of frequency bands. Output may be used on bands of higher frequency than the oscillator's fundamental, so long as they fall in harmonic relation to the fundamental of the oscillator's frequency.

In addition to these excellent electrical features, mechanical considerations are very important in a frequency meter that is to be finely calibrated and is expected to retain its calibration. Under the heading of mechanical considerations, it is obvious that in spite of a good electrical arrangement, should the coil be mechanically unsteady or the condenser plates move laterally in addition to a circular action, reliable calibration is quite out of the question.

We must, therefore, give the circuit all the assistance available by firstly mounting the component parts of our instrument in a solid metal container—cast aluminium is recommended. Secondly, the construction must be solid and permanent, and finally the dial markings and action must be positive.

Extending Voltmeter Ranges

Voltmeters are a very necessary part of a station's equipment, as without them it is not possible to make the all-important "power in watts" measurements that are definitely essential. A milliampere meter with an 0 to 1 m.a. range may be put to a variety of uses and ranges. An excellent voltmeter is constructed by the addition of a series of multiplier resistances.

Should it be desirable to read D.C. up to 10 volts, it would be necessary to use a resistance multiplier of approximately 10,000 ohms. This resistance is placed in series with the 0 to 1 range m.a. meter, the two being connected in a shunt position across the circuit where a voltage of 10 volts or UNDER is to be measured.

Theoretically the exact values are:—For 0 to 10 volts a series, or

multiplier, resistance of 10,000 ohms. minus the D.C. resistance of the 0 to 1 m.a. meter movement. From the foregoing it will be self-evident as to how the term "1,000 ohms per volt" is arrived at. In common terms it means that the meter at full scale reading or deflection consumes a current of one m.a.

Further to this, should a range of 0 to 250 volts be required, the multiplier resistance used would be 250,000 ohms, 0 to 500 volts would require 500,000 ohms, and so on, in all cases less the aforementioned meter resistance.

Ohmmeter Is Also Invaluable

An ohmmeter is another very useful instrument, and no amateur station's gear would be considered complete without it. Again, use is made of the 0 to 1 m.a. meter, but this time in conjunction with a small 3-volt dry cell and approximately 2,800 to 3,000 ohms, all components in series and provided with test prods.

If we compare this circuit with that of the 1,000 ohms per volt voltmeter, it will be seen that they are essentially the same, inasmuch as there is a resistor in series with a m.a. meter across a battery. Now if we open the circuit and insert a second resistor, its value may be measured, since we know the battery voltage and the value of series resistance less the one under measurement.

It necessarily follows that when in use and with the test points short-circuited, a reading of one m.a. is recorded, we get the first calibration marking on the ohmmeter, namely, zero resistance.

The short-circuiting bar is now removed from the test points and a 3,000-ohm resistor substituted. The meter should now read .5 m.a. From these tests, calibration is straightforward, i.e., at .25 m.a. the resistance on test would be 9,000 ohms.

Test oscillators or signal generators, as mentioned in last month's article, do not apply to transmitting test equipment, but for telephone transmissions it is often very convenient to be able to test the frequency response of the audio equipment alone or in conjunction with the modulator, and so test the frequency range of the whole transmitter. For this job the two most important instruments are a beat frequency oscillator, to produce the necessary range of audio frequencies, and either a vacuum tube voltmeter or a cathode ray oscillograph for the purpose of measuring the peak voltages at the transmitter output.

How The B.F.O. Works

Briefly, the beat frequency oscillator consists of two radio frequency oscillators operating, for preference, at a low radio frequency. One oscillator is fixed on, say, 80 kilocycles, and the other left free to tune per medium of a fine tuning condenser from 80 to 68 k.c., which gives a range of 12 k.c. (or 12,000 cycles) to zero, covering the audio frequency to an extent that is more than sufficient to meet most requirements.

These oscillators are coupled together, the resultant "beat note" is detected, and after amplification is fed into the audio frequency (A.F.) amplifier under test.

For straightforward amplifier checking, a rectifier voltmeter is sufficient, and consists of a rectifier (metal or valve) and D.C. milliammeter with multiplier. Allowing a correction for the rectifier, the remaining portion of this A.F. voltmeter is precisely the same as the straight-out D.C. instrument.

During this discussion of audio frequency voltage measurements, it may be mentioned that this arrangement will function equally well on 25 or 50 cycle A.C., and is therefore suitable for all A.C. power circuit measurements.

DX Club Inquiries.

All inquiries concerning the All-Wave All-World DX Club should be addressed to The Secretary, All-Wave All-World DX Club, 214 George Street, Sydney, and must be accompanied by a stamped, addressed envelope.

Another important instrument for the "ham," and, incidentally, one that they are supposed to know all about, is the "peak volt meter." A triode valve circuit is set up with a 1 megohm grid resistor, filament and plate supply, 0 to 1 m.a. meter, and additional bias to be switched in. The input circuit is at least 1 megohm D.C. resistance and may be greater; therefore this type places a very small load on the circuit under test. As a matter of fact, for A.F. and R.F. readings, where it is undesirable to load the circuit, connection is made on one side via a condenser.

Using a V.T. Voltmeter

In operation, the valve plate current is set at approximately .01 m.a. by suitable bias voltage (m.a. in plate circuit). When an A.F. or R.F. voltage is applied to the grid, plate current will rise, and then bias is added to the grid circuit from the additional supply until the plate current falls to .01 m.a. By measurement of the extra bias that was found necessary, by ordinary D.C. means, we have the value of the peak voltage, either A.F. or R.F.

In practice, a measurement of the A.F. voltage is made at the input of the amplifier and then at the output, at each frequency over audio range, as the test is carried on through the scale of the audio frequency range desired. By a comparison between the input and output, a curve may be plotted of the "frequency range" of the amplifier.

Should it be desired to check the modulation of a transmitter at various audio frequencies, a reading is taken of carrier peak voltage at the transmitter through a suitable R.F. coupling to the transmitter output under normal loading conditions. Then the steady modulation at various frequencies is applied, and the peak voltage again checked. If 100% increase is noted at each frequency, then the transmitter modulation may be considered linear and 100% modulated at these frequencies.

The Cathode Ray Oscillograph

Finally, the cathode ray oscillograph. This is the most ambitious instrument that any amateur is likely to have at his disposal.

Briefly, the tube consists of heater and cathode combined, a control grid, an anode and a second anode common to one each of two pairs of deflecting plates. The electrons emitted from the cathode are controlled and directed by these plates, and when they meet the fluorescent screen at the extreme end of the tube, there is a bright green glow at the point of impact. Consequently the tube, when viewed from the large screen end, is seen to trace a green pattern wherever the electron beam is directed by the deflecting plates.

In order to get a pattern traced on the screen of the wave form to be viewed, it is necessary to move the "spot" back and forth across the screen horizontally, and for this purpose an A.C. voltage is applied to two of the deflecting plates. The voltage to be studied is then applied to the other pair of plates, and we have a movement back and forth, and also up and down, simultaneously. Such movement gives a pattern of the wave form.

For ordinary observations, a horizontal sweep voltage of about 150 volts from the 50-cycle mains is satisfactory. A D.C. potential of approximately 1,000 volts must be applied to the anode, which is common to both the deflecting plates, but since the current is controlled by the grid voltage and is never high, the power supply is not at all unwieldy. A lower D.C. potential is applied to the anode nearest the control grid, and the ratio of these two voltages determines the sharpness of the focus to the spot as seen on the fluorescent screen. The focus may be controlled by the voltage variation on this first anode (nearest grid).

Any extensive discussion on the application of this exceedingly useful instrument would be quite out of place in these articles, and from the point of view of obtaining the A.O.C.P. quite unnecessary.

Next month's instalment will deal with actual transmitters, firstly for C.W. transmissions.

What's New In Radio

A monthly review of latest releases in sets, kit-sets, and components

Replogle World Globes For Amateurs and Dxers

A world globe is not only a particularly useful adjunct to any amateur or shortwave enthusiast's "shack," but it also greatly increases the fascination of listening to overseas stations.

A wide range of Replogle globes, some models being specially designed for dxers in that the main shortwave stations of the world are indicated by call-signs, is now available from Messrs. Reg. Rose & Co. Ltd., of Sydney. There are table, floor library, and clock models, the last-

named type having a clock ingenuously built into the base, so that the time in any part of the world in comparison with local time can be read off at a glance. Several other models are provided with time converters adjustable by hand.

The Standard Full Meridian models range in size from 7 to 12 inches in diameter, and are printed in rich colours with a washable, scratch-proof finish. Besides leading radio stations, air and ocean routes, countries, etc., as well as over 5,000 cities and towns, are clearly depicted.

Interested readers who cannot obtain further details from their local radio dealers are invited to write Messrs. Reg. Rose & Co. Ltd., Kembla Building, 58 Margaret St., Sydney, for a free illustrated folder.

Radiokes Parts For 100-Word Letters

Radiokes components to a total value of £10/10/- are offered as prizes in a simple and attractive contest arranged by Radiokes Ltd. for users of their products. The rules of the competition, which closes on July 31, are given below:—

1. Write a letter of 100 words, or less, telling either—
   (a) "Why I built a Radiokes 1937 Kit-Set."
   (b) "Why I used Radiokes 1937 parts."

and name of dealer from whom you and name of dealer from whom you bought your Radiokes Kit-Set or the Radiokes components.

2. All letters will be judged on their fairness, sincerity and interest. Literary ability is of no value. Just write as if you were writing to a friend. (You may submit as many letters as you wish).

3. The contest closes on July 31, 1937, and all letters must be in the mail before midnight of that date. Winners will be notified of the results.

4. The judges will be the management of Radiokes Ltd.

5. Prize winners may be required to submit their receivers for inspection by Radiokes Limited.

6. Anyone is eligible to enter the contest, provided Radiokes 1937 Kit-Set or Radiokes 1937 components have been purchased. (Employees of Radiokes Ltd. or their advertising agency are not eligible).

7. All entries become the property of Radiokes Ltd.

8. An open order for Radiokes products to the value of the undermentioned prizes will be awarded:—

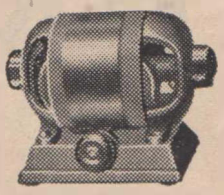
First Prize	£7	17	6
Second Prize	£2	2	0
Third Prize		10	6

★

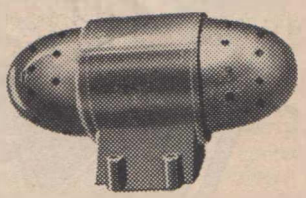
U.R.D. Now Distributors For Gilco Rotary Converters

United Radio Distributors Pty. Ltd. advise that they have been appointed sole distributors for N.S.W. for Gilco rotary converters, which are manufactured in Adelaide, S.A.

Of the two types available, the Gilco radio converter is a quiet running and efficient rotary transformer designed for connection to 32-volt, 110-volt and 240-volt D.C. farm lighting systems. An output of 120 watts at 220 volts, 50 cycles, enables even the largest a.c. receiver to be powered by this unit.



The Gilco amplifier converter is a 300-watt model designed primarily for public address work. Operating



from 32 volts d.c., a full 240 volts of 50-cycle a.c. is available on the output side.

In both models, all conversion and transformation is carried out in the one moving part, the armature. Both converters are designed to give high efficiency and noiseless operation, combined with long life. All commutator noises are completely filtered out, ensuring high quality, interference-free reception.

Further details, together with prices, etc., are available from United Radio Distributors Pty. Ltd., 234 Clarence St., Sydney.

★

Latest Stromberg-Carlson Battery Receiver is Outstanding Performer

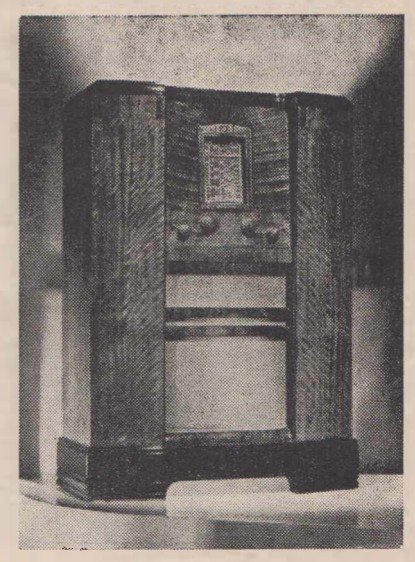
The latest addition to the Stromberg-Carlson range of receivers is the model 607 six-valve dual-wave battery console illustrated overleaf. Prominent among its many attractive features are extremely low background noise and very high sensitivity on both wavebands, both ensured by the use of one r.f. and two i.f. stages.

Latest American type low-consumption valves have been used throughout to ensure economical operation. The tuning range on the broadcast band is from 195 to 570 metres, while on the short waves the receiver covers the international channels, between 16.8 and 51 metres.

Outstanding features include the single low-consumption pentode output system, non-microphonic condenser gang, automatic volume con-

trol, silver-plated switch contacts and motor body steel chassis. A switch is provided so that the dial lights can be switched off when not in use, resulting in an appreciable saving in "A" current.

Accurate tuning on both wavebands is ensured by the vertical straight line tuning dial, which has a dual drive ratio of 10-1 and 60-1 through a large vernier control knob. The four controls shown are, left to right, battery switch and tone control, volume, tuning and wave-change switch.



The Stromberg-Carlson Model 607 six-valve dual-wave battery console.

An Excellent Performer

Recently tested at Melton, some 30 miles from Melbourne, the 607 proved remarkably sensitive, interstate, national and distant "B" class stations being received with the utmost ease and clarity. In the night, no difficulty was experienced in separating 5CK from 3AR, although, as the crow flies, 3AR was less than 20 miles distant from the receiving point. Short wave was then tested, London and Berlin coming through at tremendous strength.

The 607 chassis is housed in a Stromberg-Carlson upright frame cabinet, and from the point of view of appearance and performance is a receiver it would be difficult to equal. The retail price is 35 guineas.

Do You Know?

That the reproduction from a magnetic cone speaker can often be improved by painting the cone with a collodion (or cellulose) paint.

That a hydrometer is more essential than a voltmeter for testing the condition of an accumulator.

That the natural wavelength of an aerial is roughly four times its length.

The All-Wave All-World DX News

Official Organ of the All-Wave All-World DX Club

★ ★ ★

Zero Beat Radio Club Holds Annual Meeting

By "Ragle"

ON Friday, May 28, the Zero Beat Radio Club held its annual general meeting in the club rooms, 54 Station Street, Newtown, when the following office bearers for 1937-38 were elected:—**President:** R. Miller. **Vice-Pres.:** Elgar Treharne (VK2AFQ), R. Torrington (VK2TJ). **Secretary:** T. R. Priestley. **Asst. Sec.:** R. Torrington. **Chief of Transmitters:** R. Treharne (VK2IQ). **Chief of Receivers:** H. Whyte-Meach. **Council** to consist of: R. Miller, T. R. Priestley, R. Torrington, R. Treharne, Elgar Treharne, H. Whyte-Meach, L. Stocks. **Publicity Officer:** Elgar Treharne.

In his annual report, the president said:—"This year the numerical strength of the club is 74, made up of 36 city members and 38 country members. Seventeen are licensed transmitters.

"In reviewing the activities of the club during the past year, I find that the four field days were fairly successful. These meetings should be patronised by all, including A.O.C.P. candidates, who are afforded an excellent chance of thus adding to their knowledge of radio. The exhibition of gear by the club at David Jones was a fair display. The prizes were all worth winning, and my congratulations are offered to successful competitors. The W.I.A. exhibition was one of the finest displays of gear I have seen.

"I wish to thank the members for the courteous way they received me during the year; I very much appreciate their help . . . . "

Following are extracts from the report of the general secretary, made at the annual general meeting:—

" . . . . One very important change in the right direction was the change of address . . . . The club transmitter is now able to make outside contacts . . . . The club was not successful at the recent W.I.A. exhibition, but we will only be spurred on to greater efforts next year . . . ."

The notice of motion given at a previous general meeting regarding the admission of YL's as members of the club was further discussed, and at this annual meeting was carried, so that YL's who wish to qualify for the amateur's ticket may attend lectures on radio theory and morse code practice classes, which are held at the club rooms.

Presentation Of Prizes

Several prizes were then presented to those members winning the various competitions organised by the club. Of special interest was the President's Cup, won by Trevor Walters, who narrowly defeated Roger Torrington (2TJ) in the direction-finding tests held at a series of four field days.

The next field day will be held at Carramar (Lansdown Bridge, Liverpool Road) on Sunday, June 2[illegible] and anyone attending is guaranteed a fine day's outing.

Morse Code Transmissions For Beginners

The club transmitter (VK2ZB) will conduct morse practice transmissions on 80 metres (3,690 k.c.) on Tuesday and Friday evenings. This service has been continued in response to numerous requests from country members and others. Arrangements are at present being made for the construction of a new club transmitter to operate on 20 and 40 metres.

ALL-WAVE ALL-WORLD DX CLUB
Application for Membership

The Secretary,
All-Wave All-World DX Club,
214 George Street,
Sydney, N.S.W.

Dear Sir,

I am very interested in dxing, and am keen to join your Club. The details you require are given below:

Name.....

Address.....

[Please print both plainly.] .....

.....

My set is a.....

[Give make or type, number of valves, and state whether battery or mains operated.] .....

.....

I enclose herewith the Life Membership fee of 3/6 [Postal Notes or Money Order], for which I will receive, post free, a Club badge and a Membership Certificate showing my Official Club Number.

(Signed).....

[Note: Readers who do not want to mutilate their copies of the "Radio World" by cutting out this form can write out the details required.]

Trans - Pacific DX On 10 Metres

American Amateur, Broadcast and Police Stations on Ultra High Frequencies Logged and Verified by "Radio World" Shortwave Editor

Probably the first card of its kind received by an Australian dxer—Mr. Graham's verification card from W8XJ, Detroit, Michigan.

EARLY last year, when the 20-metre amateur band had become so popular that its main characteristic seemed to be a series of heterodyne whistles, a move was made down to 10 metres, where American and Hawaiian amateurs were coming through on 'phone at good strength.

Accidentally tuning below the amateur band on the morning of Saturday, May 30, the writer heard quite strong signals from the Los Angeles ultra high-frequency transmitter W6XKG, which was then operating on an announced frequency of 31,600 k.c., or 9.494 m.

First Verified Overseas Report

A report to this station was promptly verified, and in their reply W6XKG stated that the report was the first received from overseas they had been able to verify.

W6XKG was heard occasionally during June, but then faded out completely until the end of the year, when an improvement in high frequency reception saw the reappearance of the station just before noon on December 14.

This was but a fleeting appearance, for the 9-metre band went "dead" almost immediately, and remained quiescent until early in February, when sudden activity on the 10-metre amateur band gave some hint of the better things to come.

Nine Stations On 9.49 Metres

On February 5, weak signals were heard on 31,600 k.c. They were, however, badly marred by a heterodyne whistle, which made it clear that more than one station was using the frequency in question.

As a matter of fact, no fewer than nine stations broadcast on 9.49 metres. They are: W2XDU, New York; W4XCA, Memphis; W8XAI, Rochester; W8XWJ, Detroit; W9XPD, St. Louis; W1XKA, Boston; W8XKA, Pittsburgh; W3XKA, Philadelphia; and W9XHW (?), Minneapolis.

By constant listening a number of call-signs were distinguished through the barrage of QRM. Obtaining sufficient details of reception for reports was rendered extremely difficult on account of the bewildering rapidity with which one or other of the stations faded in or out. It was quite a common occurrence for an R7 signal at say 11.55 a.m. to have faded to R1 by noon, when a call-sign would be given.

DX On 10 Metres

A new and fascinating field for DX enthusiasts is revealed by this account of dxing for 10-metre Americans, written for the "Radio World" by—

ALAN H. GRAHAM
(Shortwave Editor)

Four More 10-Metre Loggings

The first station to be definitely identified was W9XPD, St. Louis, whose signals reached R8 on February 10. On the 12th of the same month, W8XWJ was logged: and next day a call was heard from W1XKA. No further progress was made until April, when W9XHW (?) was heard. Of these stations, W9XPD was by far the most consistent.

W6XKG Now Heard Regularly

During the time spent on 9.4 metres the fact that there was no sign of W6XKG caused some surprise, but this mystery was cleared up on February 11, when this station was found on 25,950 k.c., or 11.56 metres.

At first their signals on this new frequency were very weak, but during April and May they have improved very considerably, and are now heard quite regularly between 8.30 a.m. and 5 p.m., at times reaching a good R8, QSA5. Not far from W6XKG (on the high-frequency side) a weaker signal is occasionally audible on 26,400 k.c., or 11.3 metres. This is W9XAZ, the station of the "Milwaukee Journal," Milwaukee. Their signals seldom exceed R4.

Police Stations Active

The peak period for this high-frequency reception was during the second week of February, when a certain amount of activity was noted on the 7 and 9-metre police radio bands.

Eventually, at 10.30 a.m. on February 11, a definite call was heard on 9.9 metres. This was W2XEM, Police Radio in Newark, N.J. Signals were R6, QSA4. On the following day at 10.50 a.m., W9XEH in Evansville, Indiana, was logged on the same wavelength.

It can be readily understood that the mornings of subsequent days were spent in a comprehensive examination of the two police bands; especially on 7 metres, where weak signals were first heard on Feb. 13. Patience was finally rewarded when W8XAU, Huntington (West Virginia police) was logged on Feb. 17.

W2XEM At Speaker Strength

During the remainder of this month the 9-metre band remained quite steady, **W2XEM** being heard regularly at fair speaker strength. In addition, a new station, W4XAL, Charlotte, N.C., was logged.

March saw no appreciable falling off in conditions, and on the 2nd, **W5XB**, Fort Worth, Texas, was heard on 7 metres. Since that date no new police transmitters have been definitely identified, although on one occasion a Spanish-speaking station was logged on 7 metres—possibly a Mexican.

Reports Sent To All Stations

Reports were immediately sent to all the stations mentioned above. So far, verifications are to hand from two b./c. stations.

The first of these is from **W6XKG** for their 11-metre transmission. From their letter the following information was gathered. Using a power of 100 watts, they relay long-wave station KGFJ for 24 hours daily; hence their slogan "The Twenty-Four Hour Station."

The transmitter is a composite job, and the antenna in use at present consists of two quarter-wave verticals two wavelengths above ground, fed with transposed feeders.

W6XKG will speedily and courteously verify all reports. Their address is 1417 South Figueroa St., Los Angeles, California.

The second b./c. "veri." is from **W8XWJ** (9.49 m.). This transmitter, owned and operated by the "Detroit News," Detroit, is located on top of the Penobscot Tower in that city.

The equipment in use at present is all R.C.A., the transmitter being an R.C.A. 100-F with an output of 100 watts. The antenna is a Western Electric half-wave vertical, with a quarter-wave matching stub at the lower end, where it is fastened to the top of the big ball on top of the tower.

The transmission line is a concentric line about 200 ft. long and filled with nitrogen gas to keep out moisture and reduce the flash-over point.

Verifications From Police Stations

Some doubt was felt when reports were sent to the police stations as to whether the operators would be sufficiently interested to verify. These fears were soon proved to be quite groundless, as replies were speedily received from **W2XEM** and **W9XEH**, in which the writers said that the staffs of the stations were extremely interested to hear that their low-power signals were being heard as far away as Australia.

The reply from **W2XEM** was written by one of the "dispatchers" attached to the station, and as he holds only a 3rd class radiotelephone licence, and is a police officer rather than a radio engineer, he was unable to give any technical information concerning the equipment used.

However, the report to the Evansville Police Department was answered by Chief R. E. McConnell, Chief Radio Engineer (and incidentally an amateur with the call **W9HBS**). In his letter he stated that only one other overseas report of reception of **W9XEH**'s signals had been received, it being from a listener in England.

Australian Hears Local Radio Call

Under this heading the following article recently appeared in an Evansville (Indiana, U.S.A.) newspaper, the cutting being sent to Mr. Graham by the chief engineer of police radio station W9XEH.

"The Evansville police station's radio voice has been heard in far-off Australia, more than 9,000 miles away. Roy McConnell, chief police radio operator, received a letter on Friday from Alan Graham, of Victoria, Australia, reporting that he heard the station give its call letters, W9XEH, on February 12.

"Mr. Graham, a member of the Short Wave League, stated that he has heard a number of United States police radio stations, but that he has been able to identify only two, the local station and one in Newark, N.J.

"'Reception of your station represents such an unusual feat in Australia (I have never known any other shortwave listener to claim similar reception) that I would consider it a great favour if you will kindly acknowledge this report,' Mr. Graham wrote.

"He said he used a home-built five-tube receiver. The local police transmitter has a power of only 50 watts."

Details Of Evansville Police Radio Equipment

In addition to verifying the report, Chief McConnell forwarded a considerable amount of information regarding the equipment of **W9XEH**, portion of which is reproduced below.

Evansville was the first city in the United States to instal the new Western Electric ultra-high-frequency two-way police radio communication system. The fixed station, **W9XEH**, located on the top floor of the Police Headquarters Building, was placed in operation on January 8, 1935. This transmitter is a Type 16-A 50-watt unit operating on a frequency of 30,100 k.c. (9.9 metres).

Flag-Pole As Aerial Mast

A 100-foot hollow steel flagpole mounted on top of the Police Headquarters Building serves as the support for the vertical antenna. A concentric transmission line runs through this pole to the antenna.

The line consists of two copper tubes, one within the other, the outer being a little less than an inch in diameter and the inner tube about the size of a pencil. The outer tube is grounded and the inner tube insulated from the outer.

The antenna portion is a brass tube 22 feet long with a 7-foot brass tube paralleling it at the lower end. This sets up an electrical effect which prevents current from surging back into the transmission line, and maintains a uniform current in the line. The remaining 15 feet of the brass tube becomes the actual radiator, being a half-wavelength antenna.

W9XEX Is Mobile Station

The call **W9XEX** has been assigned to the car transmitter, which was placed in operation on March 15, 1935. This transmitter is housed in a case 11 inches long, 7 inches high and 6½ inches deep. For mobile use the filament power is supplied directly from the car's 6-volt storage battery, and plate power is supplied from a 300-volt dynamotor.

The antenna for **W9XEX** consists of a vertical tool-steel rod, chromium plated. It is a quarter-wave radiator approximately 7½ feet long. This is mounted on insulators fastened to the licence plate bracket and car body, and located on the left rear part of the car.

The receivers used in all cars are six-tube superheterodynes. They incorporate automatic gain control and automatic noise suppression features.

Tests Ensure Adequate Coverage

Extensive tests have been made with both the fixed and mobile transmitters to determine signal-strength coverage.

Evansville is a city of 103,000 people, and is situated along the Ohio River. The topography of the eastern part of the city is flat, while the western part is exceedingly hilly. The area of the city is 10 square miles. The longest distance east and west is 5 miles, and from north to south 4 miles.

Reliable two-way communication can be carried on between the fixed and mobile transmitter from any point within the city, and up to a distance of 7½ miles in any direction from headquarters. A depend-

able signal is audible from the fixed station up to a distance of 12 miles; and in some directions the signal is readable over 20 miles from the station.

How Calls Are Handled

Station and operating procedure is more or less standardised. The telephone switchboard is located in an adjoining room. Incoming calls are routed to the various departments by the switchboard operator, and the commanding officer of that particular department involved calls "Radio," after determining disposition to be made, and gives the order for assignment to a particular car or cars. The radio operator then transmits the message.

Each car's radio patrolman is required to keep a log of time checks and runs assigned to his car. In this log is kept the time check numbers, the nature of assignments addressed to his car only, along with the time of the assignment and the time of completion and disposition of same.

The station log is made in duplicate on a typewriter by the radio operator. The original is kept at the station, and the duplicate goes to the Captain. He, in turn, checks his officers' logs against this duplicate for accuracy.

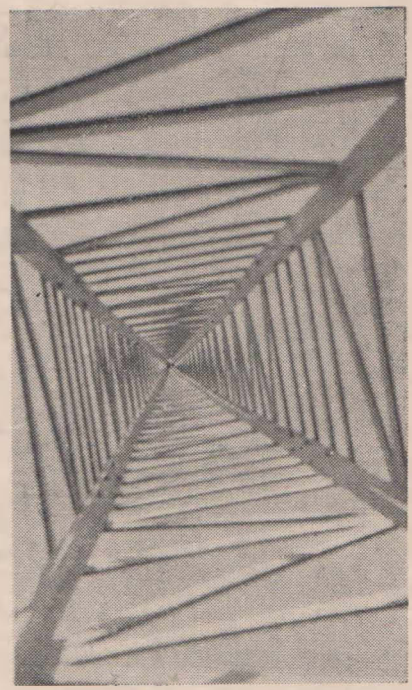
The radio operators are not part of the police force. They are employed by the city through the Department of Safety, and are responsible to the Director of Safety. The operating personnel consists of three operators and a chief engineer.

Receiver And Antenna Used

In conclusion, readers may be interested in a few details of the equipment the writer uses for this high-frequency reception.

The receiver is a 5-valve superheterodyne, using a 57 mixer, 57 osc., 58 int. amp., 2B7 reflexed as an int. amp., second det., and audio amp., and 47 audio.

The antenna is of the ordinary inverted "L" type, being approximately 40 feet high, 80 feet long, and running in a W.-E. direction.



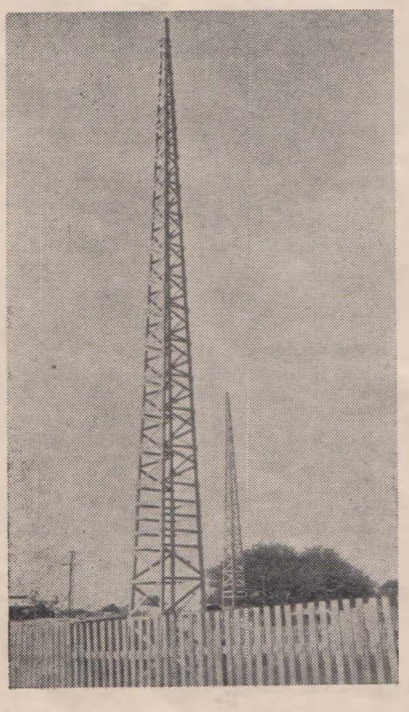
This view, taken looking up inside a mast, illustrates the construction.

Erecting 45 Foot Masts

Simple Lattice Construction

By C. WATTS (AW28DX)

I am just writing these few lines to let you know I am still very keen on dxing, and am a constant reader of the "Radio World." It certainly is a very fine magazine.



This photograph shows the finished masts after erection.

You may recall some time ago I wrote mentioning I was constructing a 60-foot lattice mast. Well, I have since changed this to two 45-foot masts (snaps enclosed). They certainly look very well, and are admired by many. The aerial is an 80-foot flat top with a 30-foot twisted lead-in, all wire used being covered.

Here are a few constructional details re the above masts. Each mast consists of four lengths of 2 in. x 2 in. pine, each piece being 45 ft. long, while the timber used for slats is 2 in. x ½ in. pine. Each mast was built in two separate pieces. Firstly, two pieces of the 2 in. x 2 in. are placed in the form of a long, narrow "V," 3 ft. 4 in. wide at the lower end. The top ends are bolted together. Slats were then placed horizontally from top to bottom, about 22 in. apart. Then between each of these, two more are placed to form a horizontal "V." When two of these sides are completed, they are joined together in exactly the same way as followed for constructing each separate side, thus completing a mast forty inches square at base and four inches square at top. (The accompanying photos show the method of construction).

The mast is bolted to four lengths of angle iron set in a concrete base, 4 ft. 6 in. square. Eight guys hold the mast in position, each guy being fixed to the mast with eye bolts, and insulated before being attached to eye bolts set in 12 in. concrete blocks in the ground. Hoping the above will be of interest to other Club Members.—C. Watts (AW28DX), Bowen, Q'land.

ZL4GF Wants Reports

I am very pleased to tell you that we find "Radio World" a very fine magazine. We use the list of ZL hams at the shack for mail, and keep it handy when on the air. We would appreciate it if you would insert a small note in your magazine that ZL4GF (George Borthwick, 62 Cutten St., Dunedin, S.1, N.Z.) would appreciate reports. 4GF is active mostly on the 3.5 meg. band, and is a 100% QSL station to QSO's and genuine reports.

Conditions here in Dunedin during the last few weeks have been very poor. There is a high noise level, and very few VK's on 3.5 meg. are coming through, but hope to work some when conditions are better.

By the way, I am assistant and correspondence manager for ZL4GF —Jack Lunn, Dunedin, N.Z.

Short-wave Review

CONDUCTED BY

ALAN H. GRAHAM

South American Station Changes ★ KZRM On The Air ★ Rabaul Contacts Sydney ★ 20-Metre Amateurs Good ★ Daventry Will Now Verify

SPEAKING generally, conditions have been quite satisfactory this month, except on 49 metres. An improvement was expected on this band, but as yet it has failed to materialise.

On the ultra-high-frequencies conditions have remained much the same as last month: 9.4 metres has been very poor, while fair signals are still heard on 10 and 11 metres. Of the police stations there has been little trace.

The greatest improvement has been on the 20-metre amateur band, where conditions have been very good, any number of South Americans being audible in the early mornings and afternoons.

11 Metres Still Holds On

Although the dead period still continues on 9.4 metres, steady signals are being heard from the two American broadcasters on 11 metres. Of the two stations, W6XKG is still the louder and more consistent, although its morning signals are not as loud as during the previous month.

A verification card just received from the other 11-metre station, W9XAZ, Milwaukee, Wisconsin, gives the following information concerning this transmitter.

It is owned and operated by the "Milwaukee Journal," and relays WTMJ on a frequency of 26,400 k.c., or 11.3 m., using a power of 500 watts. The antenna is of the half-wave type, suspended above the roof of the Schroeder Hotel, 275 feet above street level. The schedule of the station is from 4 a.m. till 3 p.m. daily (Aust. E.S.T.).

Signals from W9XAZ are heard only occasionally—usually between 9 and 11 a.m.

Rabaul Calling

The highlight of the month's reception was the logging of the A.W.A. transmitter in Rabaul, following on the volcanic upheaval in that locality.

The station was first heard on June 7 on a wavelength of 21.7 metres, calling Sydney (who were using their 17.3 m. allocation). During the transmission the Administrator, Brig.-Gen. McNicoll, discussed the position in Rabaul. The station was heard again on the morning of June 9.

On both occasions signal strength was extremely good, which was rather remarkable considering the fact that the transmitter had been buried for several days under a thick coating of pumice dust.

Solar Eclipse Expedition Station Again

In last month's notes reference was made to ship station WMEF, which was located with the American Solar Eclipse Expedition at Canton Island in the South Pacific Ocean. WMEF was first heard on 17,310 k.c. (17.3 m.). However, on Sunday, June 6, tests were heard on two other frequencies—12,862 k.c. (23.3 m.) and 8,655 k.c. (34.6 m.). In each case signals were very loud.

As previously mentioned, WMEF is an N.B.C. transmitter on board the U.S.S. "Avocet." Any reports should be sent to the N.B.C., 30 Rockefeller Plaza, New York.

South Americans—Many Station Changes

In several of the South American countries, drastic revision of the shortwave allocations has taken place, with the result that quite a number of new stations are now on the air at a time when reception from this continent seems to be exceptionally good.

PERU

Following is an official list of shortwave stations now operating in Peru:—

Call.	Location.	K.C.	Metres.
OAX5A	Ica	11,800	25.42
OAX4T	Lima	9,562	31.38
OAX4I	Lima	9,340	32.12
OAX4K	Lima	6,425	46.69
OAX4G	Lima	6,230	48.15
OAX1A	Chiclayo	6,150	48.78
OAX7A	Cuzco	6,128	48.96
OAX4P	Huancayo	6,122	49.00
OAX6A	Arequipa	6,122	49.00
OAX4Z	Lima	6,092	49.24
OAX5C	Ica	6,000	50.00
OAX4D	Lima	5,780	51.90

Of the above stations, OAX4I on 32 metres (previously known as OAX4J) has been widely reported during the past two months. OAX1A was heard one Sunday afternoon in May, closing just after 6 p.m. with the "Good-night Melody." OAX5A on 25 m. has not been heard for over a month.

VENEZUELA

With the re-allocation of call-signs as mentioned in the last issue, some confusion now exists as to the correct calls of a number of YV stations. When this uncertainty is cleared up, a full list of Venezuelans will be published.

CHILE

The new station heard on 12,300 k.c. continues to be reported at good strength. The call of this station remains somewhat of a mystery; it was thought to be CEB, but later information would indicate that it is CB615. It is owned and operated by Luis Desmaras and Cia Ltd., Casilla 761, Santiago.

ECUADOR

And still more confusion. This time it is regarding the frequencies being used by the Ecuadorian stations. In many cases, information from three different sources gives some of the stations on three different frequencies!

However, it seems certain that HCJB, Quito, are working on 8,948 and 4,107 k.c. (33.5 and 73.05 m.). With a projected increase in power to 1 k.w., good signals should soon be audible on the first-mentioned frequency.

Central America-Mexican Changes

A complete reorganisation of short-wave transmitters has brought several new Mexicans on the air. No less than six new stations have recently commenced transmissions, and it is rumoured that a seventh is in course of construction.

Three of these stations have been reported in Australia. They are XEDQ, Guadalajara, on an assigned frequency of 9,520 k.c., XEBR, Hermosilla, on 11,820 k.c. (just above W2XE), and XEWW, Mexico City, on 9,500 k.c.

As yet, no information has been received concerning the logging of XECU, Guadalajara, 6,075 k.c. (below W8XAL); XEPW, Mexico City, 6,110 k.c., or XEYU, National University, Mexico City, on 9,600 k.c. (the same frequency as RAN).

The station reported to be coming on the air shortly is XETW, Tampico. It will relay long-wave station XEFW on a frequency of 6,045 k.c. (49.6 m.).

Guatemala—No I.R.C. Needed For TGWA!

Readers will remember that it was rumoured in last month's notes that Reply Coupons were unnecessary in reports to TGWA and associated stations, as these transmitters had governmental franking privileges. It now appears that this is indeed correct. However, apparently not many dxers are aware of this fact, as the Director of the station is said to have amassed a most interesting collection of I.R.C.'s from practically every country in the world.

Incidentally, in addition to being able to secure a veri. from TGWA without cost, dxers who forward reports will quite probably receive a gift of Guatemalan coffee. Long live TGWA!

HP5I Is Latest Panama Station

HP5I, Aguadulce, is the latest station in the Republic of Panama to be heard in Australia. The call-sign and slogan ("La Voz del Interior") are announced in English at the beginning and closing of programmes. Three three-note chimes are given at the hour and half-hour. Reports are requested, and the station has announced that return postage need not be enclosed. Frequency used is 11,895 k.c.

HP5K, Panama City, on 6,005 k.c., continues to be one of the only consistent 49 m. stations.

West Indies—Cuba and Dominican Republic

The four Cuban stations, COCH, COCX, COCQ and COCD, continue to be heard well, especially COCQ, which must be one of the most consistent stations on the air.

HIX, Ciudad Trujillo, D.R., has extended its activities considerably. With new call letters, they are now using three frequencies. HI1X is on 6,340 k.c.; HI2X is on 11,960 k.c.; and HI3X is on 15,270 k.c.

DX Contests For Short-Wave Enthusiasts

This month we have pleasure in announcing the inauguration of a series of three competitions for those interested in short-wave DX reception.

These competitions will be conducted on the following lines:—

1. Every two months a trophy will be awarded to the reader who submits the best individual verification.

2. Verifications from any shortwave station between 5 and 100 metres may be submitted. Thus cards from broadcast, commercial, radiophone and amateur transmitters are all eligible.

3. All verifications must bear a date (a post-mark on the card or envelope will suffice where no date is given on the actual verification); and the frequency on which the station has been received must be clearly indicated.

4. Entries for the first competition will close on August 1, and only verifications of reception between January 1 and June 31 will be eligible.

5. In judging the entries, the judges will take into account the power of the station received, the frequency on which the station was heard, and the type of receiver used.

6. There is no limit on the number of verifications which may be submitted by any entrant.

7. The decision of the judges will be final; and the result of the first competition will be announced in the September issue of "A.R.W."

8. All entries should be addressed to the Shortwave Editor, and should be endorsed "DX Competition." All verifications submitted will be returned as soon as possible after the closing date.

—The Shortwave Editor.

The East—KZRM Testing

During the past month KZRM, Manila, P.I., has been testing on two frequencies. For the greater part of the time the station has been logged on the 31 m. band, using the same frequency as W1XK, namely 9,570 k.c. On several occasions, however, they changed to 25 m. or 11,840 k.c. On both frequencies, signals were of excellent strength and quality.

Radio Tananarive, Madagascar

Radio Tananarive (FIU?) has been reported as testing on a number of frequencies—6,010 k.c., 9,440 k.c., 9,530 k.c. and 11,855 k.c. (which correspond to 49.92, 31.78, 31.48 and 25.32 m.). Just before closing, a few bars of the "Marseillaise" are always played.

Southern Rhodesian Stations

Several stations in Southern Rhodesia, under the control of the Postmaster-General in Salisbury, are now operating on regular schedules. They are ZEA, 5,882 k.c., and ZEB, 6,147 k.c. The former is located in Salisbury and the latter in Bulawayo. The latest schedule to hand is:—Sundays, 6.30-8 p.m. (Aust. E.S.T.); Tuesdays, 4.15-6.15 a.m.; Wednesdays, 2-3 a.m.; Thursdays, 4.15-6.15 a.m.; Fridays, 1-3 a.m.; Saturdays, 4.15-6.15 a.m.

Many of the Italian African 'phone stations continue to be reported. The best of them appear to be Asmara on 14,500 k.c., ITK, Mogadiscio, It. Somaliland, on 16,385 k.c., and IUG, Addis Ababa, on 15,450 k.c. No trouble will be experienced in obtaining verifications for these stations. Even incorrect reports will be acknowledged!

Russia Restricts Verifications

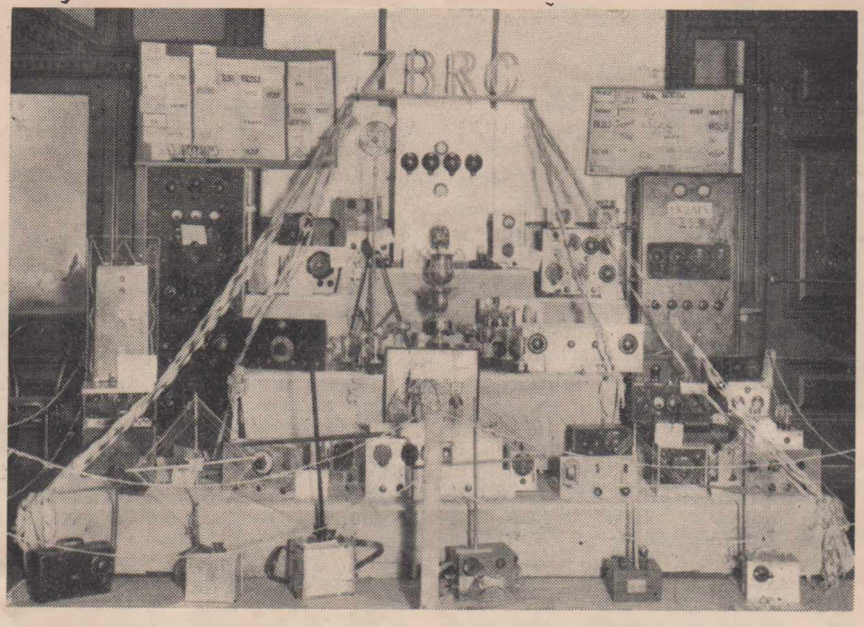
A communication just received from the Central Radio Committee of the U.S.S.R. contains the dismal news that they have discontinued sending verifications of reports on reception of telephone stations. They now verify only programmes transmitted through the Moscow broadcasting stations (RNE, RAN, RKI, RW96, etc.)

RAN are now being heard very well in their daily broadcast from 10 a.m. till noon, when the same programme may also be heard on RKI (just above GSF).

The two "mystery" stations on 16 and 35 metres, which are believed to be Russians, are still being logged. The 35-metre station is very consistent.

European Jottings—Spanish War Stations

A considerable number of Spanish stations are being used by both parties in the Spanish Civil War for the



This fine display of amateur equipment by the Zero Beat Radio Club was a feature of this year's Amateur Radio Show.

disseminating of propaganda. These stations use a variety of call-signs, and are accordingly rather hard to identify. All Government stations appear to sign with the "Internationale." A full list of all these stations recently reported is given below—it should be noted, however, that the information on which this list is based may not be quite correct in all cases.

EA2FP, "The Popular Front of the Biscay Country," has been operating from Bilbao on 41.7 metres. With the fall of this city, it is unlikely that anything further will be heard of this transmitter, unless the insurgents convert it to their own use.

EAQ and **EAQ2**, in Madrid, are to be heard daily around 7 a.m. on their respective frequencies of 9,860 and 9,490. The quality of the transmission from **EAQ** has been steadily declining over the last few months, and is now very noisy.

EAJ, San Sebastian, Tenerife, Canary Islands, 7,203 k.c., and **EDR-4**, Palma De Mallorca, Balearic Islands, are two of the insurgent stations now on regular schedules. The frequency of **EDR-4** is not known for certain, but is believed to be 6,480 k.c.

"Radio Requete" is believed to be the slogan of a station in San Sebastian, which has been heard on 7,200 k.c.

EGP-1, Barcelona, on 6,995 k.c.; **EF-1**, Valladolid, on 7,010 k.c.; and **EAJ33**, Caramaca, on 10,350 k.c., have also been reported, but little information is available concerning them.

Finally, no calls are as yet known for two additional stations recently heard on approx. 28.6 and 29.8 metres. Both of these are Government stations, and are usually badly QRM-ed—apparently deliberately.

Norwegian Stations Logged

In the stop-press section of last month's review it was mentioned that the station heard in the mornings between GSB and **W2XAF** was a new Norwegian transmitter. The call is now thought to be **LKJ-1.**

Not long after this station was first heard, another Norwegian transmitter made a brief appearance on the 25-metre band—on 11,800 k.c.

Both of these stations are remarkable for the suddenness with which they closed down just after 8 a.m.

Daventry Will Now Verify

Rumour has it that Daventry will now verify all correct reports.

W2XAF And W1XAL Best Americans

Reception of the American stations still continues to be rather indifferent. **W2XAF** and **W1XAL** are generally the best, on 31 and 25 metres respectively.

A recent communication from the General Electric Co. gives the following information concerning **W2XAD-W2XAF.** The former has now been operating on 15,330 k.c. for 11 years—at present a power of 18 k.w. is being used. Two antennas are used, one, a vertical dipole, is essentially non-directional, while the beam antenna is directed towards London, England.

W2XAF has been on 9,530 k.c. for about 12 years. The power used is 25 k.w. The same types of antenna are used as in the case of **W2XAD**, but in this case the beam is directed towards Buenos Aires.

The 'Phone Stations

In last month's notes it was stated that the American 'phone stations located at Dixon, Calif., would still verify reports. This is not the case, as recent reports on reception of **KWE, KWO** and **KWU** have been answered with references to the obligations of secrecy imposed by International Radio Convention.

Dxers on the lookout for a new country should try for **JZB-TDB**, Shinkyo, Manchukuo, which calls Tokyo on 10,065 k.c. (29.18 m.). It is usually on the air around 9 p.m.

Included among the 'phone stations logged within the last few weeks are:—

JVA (18,910 k.c.), working Berlin.
XTB (26 m.), works XTV.
JVE (15,660 k.c.), working Shanghai.
XOJ (15,795 k.c.), working Tokyo.
CGA (13,285 k.c.), working London.
GBB (13,595 k.c.), working CGA.
WMF (14,470 k.c.), working London.

20-Metre Amateur Band Best On The Air

Results obtainable on the 20-metre amateur band are truly amazing at times. Over the past month, reception has been steadily improving and in the early mornings and afternoons quite a number of South American and European amateurs have been logged. Only the Africans remain comparatively scarce.

Calls heard include:—**G8AZ, G2HK, G5ML, G6XR, G6DL, G6LK; F3IX, F3JD, F3CP; PAOWV; J2NF, J2MI, J7CR; SM5SD; PK1JR, PK1MX, PK3GD, PK1ZZ, PK3WI; VE3ABD, VE3QZ, VE4KZ; XE1HA, XE1LC, XE2JK, XE2AH; YV4AM, YV5AK; CE3DW; OA4AI, OA4AK, OA4AL; HP1A; VP5PZ; ZE1JY; K4SA; HC-1FG; CO6OM, CO2AY; PY2EJ; CX2AK; VP9R; LU1EC, LU4BL, LU8AB; XU8HW.**

Verifications Received

(This list is compiled so that readers may know which stations speedily verify reports).

Broadcast Stations:—**W9XAZ** (11.3 m.); **W2XAD** and **W2XAF; W3XAL** (16.87 m.); **TGWA; HP5K; OLR4A, OLR3A,** and **OLR2A,** Prague; **CSW** (27 and 30 m.); **JZI** and **JZJ.**

'Phone Stations:—**IUD; DFD** (20.46 m.); and **ZSS.**

Amateur Stations:—**VE4GD; W2-TP, W1GGJ, W1JIE, W4EEV, W5CQJ, W7EMP, W3FSD, W8EUK, W3FXC; G6WY, G6XR, G5BJ, G2XV; PK3WI; LU1HI; EI2J;** and **ON4VK.**

Acknowledgement

Many thanks to AW112DX for the information supplied. The stations to which you refer are most probably CSW and JVT.

DX News and Views

A page for letters from DX readers

★ ★ ★

"The Ones That Got Away!"

I have just finished perusing your admirable radio magazine, the "Australasian Radio World," and I hasten to congratulate you; the club section interests me greatly. I am copying AW224DX and enclosing 5/- subscription, plus cost of 50 report forms.

I am only a new listener and have contacted with all States here, U.S.A., Hawaii, Philippine Islands, Germany, Holland, France, England, Hong Kong, Japan, but, like the fisherman who took up wireless, "you should have heard the stations that got away!"—Gordon Young (AW-245DX), Brisbane, Q'land.

Wants To Exchange QSL's

G. M. Anselme (AW250DX), of 16 Hartley Street, Rozelle, N.S.W., would like to exchange QSL cards with other readers.

Club Stationery Suggestion Popular

With reference to Club stationery, etc., the suggestion of Maurice Tierney (AW77DX) in the June "R.W." is in my opinion a very good one. Strange to say, I was thinking about something similar myself.

I suggest for a letterhead, small double-fold pages, with a small reproduction of the Club badge top centre, and above it, in small print, "Member of the—." As for the envelope, a small club badge on bottom left corner, address side of envelope, would be suitable.

I hope other Club members are sending in their ideas, etc., as it is something I for one would like to see materialise.—W. Haynes (AW247-DX), Croydon, N.S.W.

[Yours is only one of several dozen replies from members, all endorsing the idea of Club stationery being made available. A supply is now being printed, and will be on sale shortly.—Ed.]

Dxing With a Super Comet Pro

I have to congratulate you on your excellent magazine. It is well-printed, with good diagrams, and excellent articles on the cathode ray oscillograph and other subjects.

I must also take this opportunity of congratulating the Australian amateurs on the 20-metre 'phone band. I am sending a list of a few I have heard clearly with the aerial switched off. I have heard praise for them also from America. The receiver is a Hammarlund Super Comet pro; and the transmitter a Collins 30FXB.

Stations received April 10 to May 10, 1937, with aerial switched off (20-metre 'phone band):—G6LK, G2NA, G6JQ, G2QT, W6CQI, W7BL, W7AO, W5BE, W2IXY, HA8N, KA-1MM, K6JLV, K6OQE, F3CP, VE-5OT, ON4SS, CE1AQ, K6JCD and VK's 4PK, 3QR, 3GO, 5AI, 2VB, 2HF, 3AL, 3HY, 3ZJ, 7CL, 3XJ, 7YL, 4JU, 2AZ, 2BQ, 2ADV, 4GG, 2OQ, 4JX, 7LZ, 3KR, 3ES, 2ZH, 2QM, 2VV, 2XU, 4XM, 2AJ, 3WA, 3KX, 3PL, 2LX, 3IW, 2ABG, 2TI, 20B, 3ZL, 3GC, 5WG, 3MR, 3ZZ, 4LA, 5AW.—Neil C. Gilchrist (ZL4DG), P.O. Box 36, Oamaru, New Zealand.

Amateur Loggings On 20 Metres

On May 28, between 4 p.m. and 7 p.m., I logged the following amateurs on 20 metres:—VE5EF, Vancouver, Canada; W6's, AL, ICH, EQI, MVI (?), ATH; W4DSY, K6LD. Also XE2AH, Tiwana, Mexico, and KA1HS in the Phillipine Islands. On the following evening I logged, in addition, K6BNR, W6YU, W8NKY, W5DB, W7FQK, W7QK and K6GAZ. K6BNR and W7FQK were R6-7, Q5. W7FQK says he uses a modest 600 watts input!—and by the way he gets out, I thing K6BNR must use about the same power.—W. N. Black, Chelsea, Vic.

Log-Book Is Needed

We wish to thank you very much for the fine magazine which you publish. According to us, however, there is just one thing lacking as far as the DX Club is concerned. We suggest that you bring out a log book, on the lines of the enclosed form, for the benefit of Club members. Suggested headings for the twelve columns are as follows:—Date, station, QRA, time, QSA, R, T, QRM, QRN, QSB, WX, remarks.

The log could either be in the form of a bound booklet of about fifty sheets of foolscap size paper, or could be made on the loose-leaf system, both types, of course, being on lined paper. We feel sure that this idea will gain the approval of all members, as well as helping them to record their efforts.

Wishing you all the best in the future for the paper.—Graham M. Hart (AW151DX), A. E. Bruce (AW171DX), Adelaide, S.A.

[Many thanks for an excellent idea, which, however, like that for DX Club notepaper proposed last month by another member, depends for its adoption on whether there is sufficient demand. Perhaps members interested would send along their ideas.—Ed.]

Dx On The Broadcast Band

I have been listening in lately, but have only heard Australian stations. I have heard all of the South Australian and Victorian stations at fairly good volume these last two nights, and can get all the N.S.W. stations except 2CR, 2DU, 2NR, 2LV, 2AD, 2KA, 2RG, 2BE. I have also received 6WF and 6PR, Perth; 6AM, Northam, W.A., 4QG, 4RK, 4GR, Queensland, and all of the Tasmanians. I could get some Japanese or Chinese stations about a month ago, but cannot get them now.

Well, the "Radio World" is the finest magazine I have ever seen, and I wish it the best of luck.—Keith Lehmann (AW235DX), Nhill, Vic.

6ME Heard Well In Auckland

I wish to say that the June "R.W." is once again a first-class number, and the Editor is to be congratulated on the fine list of s.w. stations supplied. This has been really needed, and I feel other dxers will add their thanks also.

Dxing on shortwave over here has not been too good, owing to bad weather and fairly noisy conditions, but here are a few stations logged during past weeks. COCX, COCH, XEW and DJA. VK6ME was heard again at good R5, QSA5, and comes in well over here after midnight. Among the hams I have heard are VK's 2NY, 2ADV, 4JU and 4PK, who puts over a good R5 signal here. In the late afternoon the W's are thick on 20 metres, and it takes some very fine tuning to obtain calls. I would like to mention here that I have a batch of photos of outfit and self and will exchange with any dxers who will send theirs over.

I will sign off now with thanks to "R.W." for another splendid issue.—Alfred Green (AW181DX), 16 Chester St., Mt. Eden, Auckland, S.2., N.Z.

Dxing With a One-Valver

Since my last report I have heard quite a bit of DX. The Americans have been coming through well, W6's and K6's between about 5 to 6.30 p.m., W8's and 9's later in the evening, when an occasional W1, 2 or 3 may also be heard. The W5's, 4's and 7's seem to be scarce. KA's and PK's are heard after about 9 p.m.

My receiver is a 1-valve job with a 19. The antenna has been somewhat changed, and seems to give slightly better results. It is now a full-wave 20-metre matched impedance, and not very high. Here is a list of DX heard since my last report.

'Phone:—W1AXA, 1BQQ, 1ARC, W2IKV, 2AKK, 2GO, 2OJ, 2CVI, W3ANH, 3CC, 3EOZ, W4DSY, 4HX, W5AHK, W6CZ, 6BKY, 6ISH, 6CQI, 6AH, 6AL, 6RUZ, 6MKX, 6CLS, 6BGH, W7FQK, 7AO, W8ANO, 8LIY, 8LSA, 8LPI, 8MDU, 8CNA, W9RUK, 9GIC, 9ELL, 9BBU, 9UVC, 9TSR, K6OQE, 6BAZ, 6BNR, PK1MX, 1VM, KA1AP, 1HS, 1MM, XE2AH, VE-5OT, OA4R.

C.W.:—W4CBY, W6LYM, W8ELP, 8CRA, W9FFR, ZL1BR, 1FE, ZL2OK, 2NJ, 2LB, 2KY, 2FA, 2AE, ZL3FZ, ZL4AH, F3MN. All these hams were heard on 20 metres, with the exception of a couple of ZL's.

Dozens of VK's have been heard—to be exact, about 209 within about three months. The total number of W's heard is 55, total countries 11.—Bill Plant (AW152DX), Newcastle, N.S.W.

Americans On The B.C. Band

Further "veries" to hand include CKLW, Canada, WIOD, Florida, KOMA, Oklahoma, WNBX, KMJ, WLAK, WMAS, KMTR, KGER, KALE, WTAM, WJJD, LR3, Buenos Aires, KFPY, WA3C, WOA1, KECA, KWK, WLNH, HAL, Budapest, CMCY, Havana, Cuba, KFAC, WJR, WOW, KGVO.

HAL, Budapest, and CMCY, Havana, Cuba, were heard in November and December respectively, decidedly off season.—H. Doherty, 64 Wing's Line, Marton, N.Z.

Berlin Overwhelmed With Reports

Here is an extract from a letter recently to hand from Berlin, in reply to a report of mine on their transmissions:—

"Regarding your countryman's experience of writing to us and having no patience to wait for a somewhat belated reply from us, most probably he received a confirmation that his letter had been passed on to us. It is a great pity that we cannot keep up, but no matter how many assistants we have here, the mail increases so that it is quite impossible to keep up. And one day we eventually do reply, as you see for yourself."

★

This DX listening post belongs to Tom D. Dowling (AW97DX), of Geelong. His log comprises 83 amateur QSL's from 5 continents and 12 countries.

★

This should interest dxers who have sent reports to Germany, and who perhaps have now given up hope of ever receiving a reply.—G. O. La Roche, S. Perth.

"Veries" From 5 Continents

Since writing last in March I have found conditions to be fairly good, but falling off a little since April. At present I have 83 QSL's from 5 continents and 12 countries. (These are all amateurs). My latest cards are from ZMBJ, W5BEE, OA4AI, VE1DQ, ZL's 1BR, 3GR, DJL, and VK's 2EX, 2PE, 2XU, 2ABT, 2ADV, 2DD, 3EP, 3TL, 3KI, 4LX, 4SA, 5AW and 6SA. Also J6DO, YV1AP.

I still have QSL's out to many overseas amateurs who have not had time to answer them yet. I have also logged the following DX stations on 20 metres, 'phone or C.W.:—CE's 1AO, 1AE, 1AH, 3DW, 3AG, F3JD; G's 6LK, 6AG, 6WX, 6JJ, 6WY, 5NS, 2TR, 8IL, GM2DA, GM6RG, HI7G, HI4T; J's 2MH, 2KJ, 3FK, 6DO, CO7CX, CO2KY. KA's 1ER, 1BH, 1BA; LA1G; LU's 1QA, 6AI, 9BV; NY2AE. OA's 4R, 4N, 4AK, 4AI, 4AL. PK's 1MX, 3GD, SU1KG, SU1CH, TI2KP, HK1Z, XE-1AG, XE2AH, XU8JR, XU8HW, YU-1AP, VP9R, VS7RM and G5BJ. Also VK's, VE's, ZL's and W's.

I am unable to read C.W. conversations yet, but can get calls easily. —Tom D. Dowling (AW97DX), Geelong, Vic.

31 Stations Logged In 60 Minutes

My set is a 6-valve mains-operated shortwaver, using the following valves: 6D6 R.F. amplifier, 6L7 mixer, 76 oscillator, 6D6 I.F. amplifier. 75 detector (triode portion used as an anode bend detector), 42 output, 80 rectifier.

Please accept my congratulations on a particularly fine magazine, although I suppose you are getting tired of being congratulated. I am enclosing 1/6 for 50 report forms, and am hoping to write you another letter soon about the reception down in Victoria, as I have only just built my set. Previously I have been using a 5-valve dual-waver with only mediocre results. However, I hope to do better now.

On May 23 I gave the set its first trial, with completely gratifying results, logging 31 stations in 60 minutes. They were as follows:—On 20 metres, VK's 2UC, 3ZI, 3GQX, 3ZL, 3LR, 3ME, 4UC, 5GM, 5JC and 5GL. W's 9BEZ, 6CQI, 6LWN, 5DQ, 6BKY, 2AYJ, 8LSA. OA4AI, VE-3ABP, CO2JG. Broadcast stations: VK's 3LR, 3ME, DJB, DJQ, GSO. On 40 metres, VK3SM. On 80 metres, VK's 4GG, 3PR, 2ADH, 2KK; ZL's 3HU, 2JO and 4CU.

This reception was done at Moss Vale, N.S.W., but I will be returning to Victoria shortly.—D. Medley (AW255DX), Corio, Victoria.

S.W. Station List Appreciated

The latest "Radio World" was one of the best I have received. Lately I have been busy revising my list of s.w. stations, and Mr. Graham's pages of details were a wonderful find; especially as my list was to hold exactly those details given. What is more, the "S.W. Review" will keep this list up to date as time goes on. By the way, I feel sure that all "R.W." readers would like a description of Mr. Graham's gear as used for his past and present fine s.w. DX items.

Now regarding Club Stationery: I for one will place my order whenever it is available.

Reception here is now more or less at a standstill, a slight improvement if any. KZRM is back on the air again after a long absence; they are testing on 31.35 m. approx. and 25.33 m.—strength good in both cases. VPD2 on 31.45 m. has once more broken through at fair strength. Rangoon on 49.94 m. is good, although I have not tuned it in during the past week. Generally speaking, evening reception is fair, while morning and afternoon reception is excellent.—G. O. La Roche (AW155DX), Perth, W.A.

Amateur DX On 20 And 40

All my listening of late has been done on the amateur bands, and I am

well satisfied with the performance of my receiever since re-building it. In regard to Club stationery, I am in favour of this, as I think it will give the Club a more official bearing.

I am enclosing a list of amateur stations tuned in here on June 8, on the bands as set out below:—

40-metre 'phone:—VK4LQ, 2ADE, 4UX, 4FE, 2ADK, Sandy Cape Lighthouse, 2DK, 2YW, 2YQ, 2YF, 4LW, 4JU. **40-metre C.W.:**—2AGD, 2IW, ZL1BR, W9RRY, W4DYY, K6GY, VK2AFP, 6MNX, W7FZA, VK2ACP, W6FDF, ZL2BV, VK2AFP, 7RC, VE-5IR, VK3RY, ZL3AH, VK2ACP and 4HM. **20-metre 'phone:**—VK4JU, VK5GM. **20-metre C.W.:**—VK5JS, 4LX, 5HD, 5LL, 5ML, 4VJ, 4NP, 4RF, 4HR, ZL1GI, W6LY and VK4AP.—C. W. Marley (AW150DX), Q'land.

Russian 'Plane Logged?

While tuning on the 20-m. amateur band at about 5.30 p.m. this afternoon (June 20), I heard VE5OT having a QSO with a Sydney "ham," and 5OT told the latter that the Russian 'plane which was flying from Moscow to San Francisco was in the vicinity of Vancouver. He said the 'plane's frequency was 5,500 k.c. and that its call was RETET.

I tuned my receiver to about that frequency and heard two stations at R1-2. One sounded American, whereas the other was a foreign voice (speaking English). They were both practically on the same frequency and were working each other. I listened to this off and on for about three hours, the QRN being terrific.

Following were some of the odd phrases I heard:—"Visibility hazy . . . fog in valleys . . . west of Pittsburgh 494, time 1.45 (out time 6.45 p.m.) . . . west wind 2 (?) miles per hour, travelling 120 m.p.h., hazy (then numbers were given which sounded like positions—latitude and longitude) . . . Indiana 73 . . . New York City 1529 . . . 430 gallons . . . temperature 65° . . . Indianapolis 23." Both stations disappeared at 8 p.m. (our time). Whether this was the Russian 'plane or not I cannot say, but it sounded very much like it to me. I would greatly appreciate hearing from other readers who may have heard the transmission.—Jamie Ferrier (AW129DX), Winninburn, Coleraine, Vic.

Latest Loggings And Verifications

The following S.W. stations have been verified since last August:—ZMB5, VK's 9MI, 2ME, 3ME, 6ME, and 3LR, VPD2, ZBW, JVN, PCJ, RNE, OLR4A, W2XAF, Rad. Col. 25.24, Rad. Col. 25.60, and COCQ. 20-metre amateurs: W4DLH, W3DQ, VE3ACK, VK's 2QY, 2GX, 2XU, 2RJ, 3HL, 3HM, 3PL, 3WA, 3KX, 5AW, and 5CB. Reports are out to HS1ABP, T1PG, W9XF, W3XL, RAN, CT1AA and 20-metre amateurs: W1ADM, W6ITH, W4AXZ, LU6KE, HI7G, and a number of VK's. Broadcast conditions are very bad here, and the only veries are 2LM, 2CR and 3WW. My total number of veries is 112.—AW130DX, Christchurch, N.Z.

Jones "Super-Gainer"

(Continued from page 16)

tor, the regenerative control being the 10,000-ohm potentiometer connected in parallel with a 1,000-ohm resistor across the cathode coil L4, The latter consists of an ordinary broadcast secondary winding — 100 turns of 30 gauge enamelled wire close-wound on a 1¼-inch former being suitable. Alternatively, the same number of turns of the same gauge wire can be jumble wound on a ½-inch diameter rod, over a winding length of 3-8 in.

B.F.O. For C.W. Reception

This regeneration control serves two purposes. Not only does it greatly increase sensitivity on 'phone reception, but it also makes possible beat-frequency c.w. reception. For the former, the control is set just below the oscillation point, but for the latter it is turned slightly beyond, so that the second detector is oscillating.

The second detector portion of the 79 is resistance-coupled to the second triode section, the first plate circuit being de-coupled in order to prevent motor-boating. To reduce the plate voltage on the audio stage to a value suitable for operating the valve at zero grid bias, a 50,000-ohm plate resistor is used. This also enables the 'phones to be isolated from "B+" by incorporating a .1 mfd. coupling condenser.

Bandspread Ensures Easy Tuning

Parallel bandspread tuning is used, a pair of 20 mmfd. midget condensers being ganged together with flexible couplings to provide the main tuning control. A 100 mmfd. "tank" condenser is connected in parallel across each section of the gang. These not only act as bandsetters, but are also used to ensure full resonance between the two tuned circuits when regeneration is being used. Four pairs of coils are needed to cover the 10, 20, 40 and 80-metre bands.

The amount of coupling provided between the aerial and first detector is important, as if this is too great the latter will not oscillate. In the "Super-Gainer" illustrated, a 25 mmfd. midget mica trimming condenser is used, and is adjusted until smooth regeneration is obtained up to the point of oscillation. An alternative method of coupling is to twist the lead-in around the lead to the 6F7 grid cap several times.

Some Constructional Details

The receiver shown in the photographs was assembled on a 10 in. x 7½ in. x 2¼ in. chassis, with a front panel measuring 11 in. x 7½ in. Both are of 16-gauge aluminium.

A shield partition to separate the first detector and oscillator tuning circuits is essential, to prevent interlocking. As shown in the photographs, this runs parallel with the front panel, and is located 2¾ in. behind it.

Next month full constructional details of the "Super-Gainer" will be given, together with hints on operation.

Communications Eight

(Continued from page 8)

condenser shown is formed by twisting two flex leads together several times (one from the plate of the 6C6 b.f.o. valve, and the other from the grid of the 6C6 second detector).

The b.f.o. coil is replaced in its can, and the latter mounted horizontally on two pillars bolted to the front of the chassis, one on either side of the 3-plate midget variable.

Testing The Completed Receiver

After the wiring is completed, it should be thoroughly checked over. Next, the valves and coils can be plugged in and the set switched on. The three band-setters are adjusted until resonance is obtained, indicated by an increase in the noise level, and then the main tuning dial is brought into operation. The i.f. gain control can be fully advanced, but the mixer regeneration control should be kept turned well back until required —when extra gain and selectivity are needed to "lift" a station out of severe QRM.

As this receiver is intended only for experienced builders, a detailed wiring plan will not be given. However, readers requiring further information on any points connected with the assembly are invited to write in, enclosing a stamped, addressed envelope.

VK AMATEUR STATIONS . . . Additions and Amendments

Additions.

CALL SIGN.	NAME.	ADDRESS.
3SC	Sargent, W. G. H.	Manifold St., Camperdown, Vic.
2AGA	Quodling, H. N.	40 Copeland St., Beecroft, N.S.W.
2AGB	Hooper, C. J.	34 Burwood Road, Concord, N.S.W.
3LV	Malone, L. E. P.	Mologa, Vic.
2XC	Cuffe, I. D.	21 Redan St., Mosman, N.S.W.
3FI	Fitzsimmons, R. H.	849 Burke Road, Camberwell, E.6, Vic.
9DK	Davis, C. E. P.	Sicacui Plantation, Kavieng, New Guinea.
5MO	McGrath, E. P.	42 Robsart St., Parkside, S.A.
2AGC	Henry, R. C.	36 Piper St., Tamworth, N.S.W.
2AGD	Lee, G. L.	34 Carrington St., Mayfield, N.S.W.
2AGE	O'Donnell, A. L.	126 Alt St., Ashfield, N.S.W.
4EB	Butcher, E. W.	Richmond St., Kedron, Qld.
3PB	Boyd, J. P. A'B.	40 Grant St. East Malvern, S.E.5, Vic.
3VY	Dudman, W. H. G.	36 Hopetoun Grove, Ivanhoe, N.21, Vic.
3PC	Purvis, C. W.	77 Sutherland Road, Armadale, S.E.3, Vic.
2AFU	Broadley, D. H.	99 Homer St., Undercliffe, N.S.W.
2AGF	Kelso, A. J. B.	25 Walker Avenue, Haberfield, N.S.W.
3KQ	Benwell, G. T.	27 Bendigo Avenue, Elwood, S.3, Vic.
3NF	Herman, L. G.	38 Aintree Road, Glen Iris, S.E.6, Vic.

Alterations to Call Signs.

3CQ—Canning, F. G., 434a Toorak Road, Toorak, S.E.2, Vic. Now VK2AFW. (See also Changes of Address).
6KE—Nicholls, A. H., Corrigan, W. A. Now VK3NI. (See also Changes of Address).
5CH—Haines, C. L. H., Millicent, S.A. Now VK3QM. (See also Changes of Address).
5MC—Coulter, J. M., 26 Brighton Road, Glenelg, S.A. Now VK3MV. (See also Changes of Address).
2AER—Vale, L. H , Darling St., Wentworth, N.S.W. Now VK3MK. (See also Changes of Address).

Changes of Address.

3CQ—Canning, F. G., 155 Victoria Road, Bellevue Hill, N.S.W. (See also Alterations to Call Signs).
4HR—Scholz, H., Station St., Coorparoo, Qld.
3KL—Philpot, C. H., Horsham, Vic.
6LW—Petersson, W. M., 108 Hill St., East Perth, W.A.
6KE—Nicholls, A. H., 27 Morang Road, Hawthorn, E.2, Vic (See also Alterations to Call Signs).
2XU—Pollock, G., Medlow Bath, Blue Mountains, N.S.W.
2ACH—Oxenford, L. G., 83 Victoria St., Lewisham, N.S.W.
5XA—Stacey, H. K., 10 Howard Terrace, Knightsbridge, S.A.
3GE—Every, G. E., King St., Queenscliff, Vic.
4XU—Laurie-Rhodes, M. C., C/o W. Connolly, 128 Flinders St., Townsville, Qld.
7AB—Fisher, D. H., 6 York St., Launceston, Tas.
7CW—Walch, C. A., 10 Osborne Avenue, Sandy Bay, Tas.
3XG—Page, B. F. D., Sladen St., Birregurra, Vic.
6OR—Hoar, J. C., 65 Dalgety St., East Fremantle, W.A.
2ABR—Kimpton, F. W., Don St., Byron Bay N.S.W.

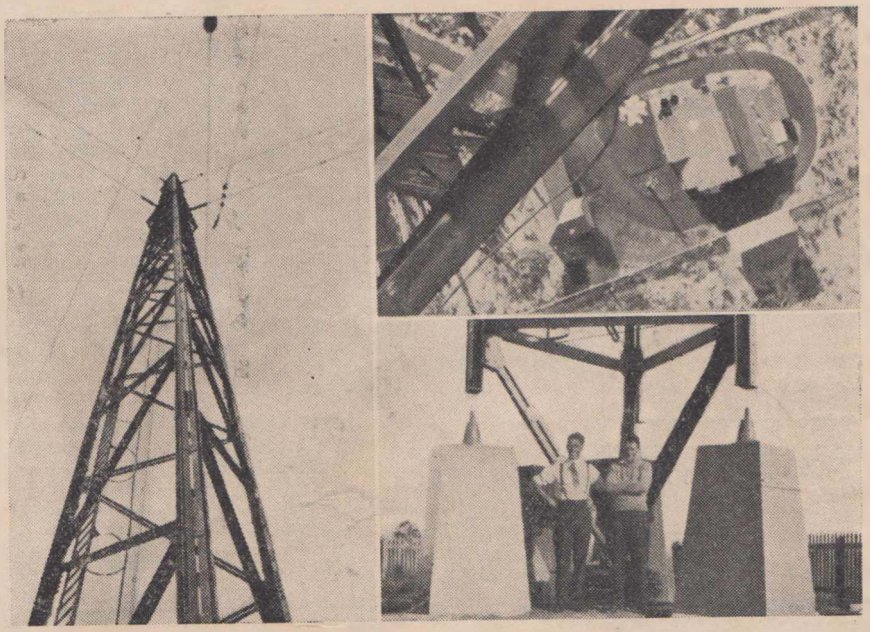
CALL SIGN.	NAME.	ADDRESS.
5UX	Wallbridge, L. W.	38 Railway Terrace, Peterborough, S.A.
3SU	Edwards, S. G.	99 Queen St., Melbourne, C.1, Vic.
2XY	Maguire, S. W.	164 Hastings Parade, North Bondi, N.S.W.
3DH	Morgan, I.	489 Hampton St., North Brighton, S.5, Vic.
4RT	Thorley, R.	Bower St., Annerley, S.3, Qld.
3OU	Williams, J. O.	28 Grosvenor St., Middle Brighton, S.5, Vic.
3JN	Young, L. G.	1 Martin Crescent, East Malvern, S.E.6, Vic.
2ACO	Hunter, A. D.	44 Denham St., Bondi, N.S.W.
2NV	Truman, R. P.	8 Lorne Avenue, Killara, N.S.W.
3UX	Smith, A.	191 Hoddle St , Abbotsford, N.9, Vic.
2JO	Caldwell, R. C.	10 Simpson St., Bondi N.S.W.
3AM	Forecast, A. M.	22 Neerim Road, Caulfield, S.E.8, Vic.
2BM	Martin, B.	114 Kurraba Road, Neutral Bay, N.S.W.
5CH	Haines, C. L. H.	97 Roslyn Road, Belmont, Vic. (See also Alterations to Call Signs).
5MC	Coulter, J. M.	20 Howitt Road, Caulfield, S.E.7, Vic. (See also Alterations to Call Signs).
2TF	Cohen, R. F.	78 Cheltenham Crescent, Cheltenham, N.S.W.
6XL	Miles, H. R.	34 Learoyd Street, Mt. Lawley, W.A.
2FL	Lee, F. H. S.	57 Currie St., Merewether, via Newcastle, N.S.W.
2WR	Shipley, A.	No. 5 Wirringulla Flats, St. Neot Avenue, Pott's Point, N.S.W.
2AER	Vale, L. H.	Cnr. Pine Avenue and 8th St., Mildura, Vic. (See also Alterations to Call Signs).
3XZ	McGregor, R. R.	C/o Mrs. Harvey, South Road, Warragul, Vic.

Cancellations.

4NR—Richards, N. H., Wooloowin Avenue, Wooloowin, Qld.
2GP—Partridge, G. J. W., 1 Llewellyn St., Marrickville, N.S.W.
7BN—Reddrop, J. W., 34 George St., Launceston, Tas.
5FI—Giddings, A. H., 39 Second Avenue, Nailsworth, S.A.
2EZ—Green, R. A., Brittanic Mansions, Raglan St., Mosman, N.S.W.
3RZ—Clarke, J. R., 380 Auburn Road, Auburn, E.2, Vic.
4KX—Cran, M. R., 228 Boundary St., West End, Brisbane, Qld.
3BI—Callaby, C. J., 48 Humffray St., Ballarat, Vic.
4DB—Brown, G. D., Bale St., Ascot, Brisbane, Qld.
4SA—Smith, A. S., "Winalar," Burns St., Indooroopilly, Qld.
2EJ—Branson, G. H., 2 Anderson Road, Concord, N.S.W.
4LI—Morse, N. P., "Becana," 89 Russell St., Clayfield, Qld.
2NE—Nunn, M. S., 62 Merlin St., North Sydney, N.S.W.
6FM—May, F., Post Office, Esperance, W.A.
4FK—Kenna, V. F., 41 Allen St., Hamilton, Qld.
5LR—Lester, J., 15th St., Renmark, S.A.
3AH—White, A. R., Manya State School, Mulcra, via Murrayville, Vic.
6AS—Wood, A. D., "Kia Ora," Ormond Road, Mt. Barker, W.A.
7DR—Devonport Radio Club, Webb's Building, Esplanade, Devonport, Tas.
3EQ—Ridgway, E. K., Hasset St., Leongatha, Vic.

Amendment.

2AFV—Templeman, G. J., shown in April, 1937, Supplement, as "Roseleigh," Bellarive, N.S.W. Should be "Roseleigh," Bellarwi, N.S.W.



Three views of 6ME's mast. The left photograph shows the ladder running up within the mast, and the guy wires located at approximately 160 and 230 feet from the ground. The top right-hand photograph was taken from the top of the mast, which is 400 feet high, while below is a view of the base. The tapered projections on the concrete pillars are jacks used to lift the mast vertically during renewal of the special glass insulators.

Climbing 6ME's 400-Foot Mast

A DX Club Member's Impressions

By G. O. La ROCHE (AW155DX)

I am enclosing three photographs of the steel mast used by VK6ME, situated at Applecross, a suburb of Perth, W.A. I recently went over the plant and had the pleasure of a 400-foot climb to the top of the mast. A friend who works at the station was kind enough to take myself and friend around, and it was indeed an experience well worth while.

We drove from South Perth to Applecross per Baby Austin owned and op. by my friend, Mr. Chas. Cooper. The "Baby" was parked quite near the mast, and while the sun was shining we doffed coats and prepared to do some climbing. The mast itself is supported centrally by three girders tapering to a point, and rests on specially-prepared glass insulators.

Our guide closed the earthing switch to prevent shocks from static charges, and after scrambling up the lower tapered section, we reached the steel ladder which runs right up the inside of the frame. The first rest of the climb was at about 160 feet. Here there is a wooden platform, but there is little room, as the huge insulated steel guy shackles take up nearly all the space. We were warned not to touch these, as a shock might result.

After a few minutes we proceeded on our way to the next platform—a further 160 feet up. Between these two landings there is a small folding seat provided, I presume, for emergency purposes. However, I passed it by and safely reached the 320-foot landing, where a longer rest was necessary. At this point the shackles for the guy wires do not take up so much room, and we could sit down in comfort for another spell.

There are two sets of guy wires going in three directions, one set at each landing; that is, at 160 feet and 320 feet. The remainder of the mast (80 feet) is self-supporting. We had our rest and made a final dash up the last 80 feet, eventually reaching the top railed-in platform, which at a squeeze would hold 15 to 20 men. After having smokes all round, we proceeded to take snaps and enjoy the breeze, for we were well warmed up after the climb.

The suburbs of Perth were all plainly seen, and the river could easily be followed till it reached Fremantle, which, by the way, seemed quite close, though it was actually seven miles away. There was a very slight sway in the mast, though I believe in a good wind there is a distinct movement. Our Baby Austin took some locating, and as my friend said, "Did we come here in that?" We really wondered if we had after viewing it from the mast top. Various experimental aerials were everywhere, with their feeders clearly showing from the top; the buildings and cars below were all miniatures.

After nearly half an hour we descended and took a look through the commercial transmitting room (VIP), the transmitting rooms of 6ME (S.W.), 6PR (medium wave), the emergency engine room, generator room and studios. One thing that must impress all visitors here, and that is the compactness, tidiness and cleanliness of all the apparatus in use — a typical impression left on one's mind after viewing any A.W.A. equipment.

Four W.I.A. Contests Before End Of Year

No less than four contests for amateur transmitters will be held before the end of 1937, according to advice received from the federal publicity officer of the W.I.A.

The first contest to be held is the VK-ZL 80-Metre Phone Contest, which incidentally includes a receiving section. It takes place from July 17 to August 1.

Next is the 1937 VK-ZL DX contest, which is divided into three sections, Senior, Junior and Receiving. The Senior section of the contest will be held on October 2, 3, 9 and 10, and the Junior on October 23, 24, 30 and 31.

Then follows the 1937 All-Band C.W. Contest, on September 4, 5, 11 and 12, while, finally, a National Field Day Contest will be staged on December 4 and 5.

Further details re the above competitions are available from the W.I.A., Box 2127 L, G.P.O., Sydney, and also, in the case of VK-ZL contests, from the N.Z.A.R.T. Inc., Box 489, Wellington, C.1., New Zealand.

W.A.S. Certificate

A Worked All States (W.A.S.) Certificate is now available to financial members of the W.I.A. who can prove contacts, on either 'phone or C.W., with six States on all of any four bands (thus 24 cards are required).

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