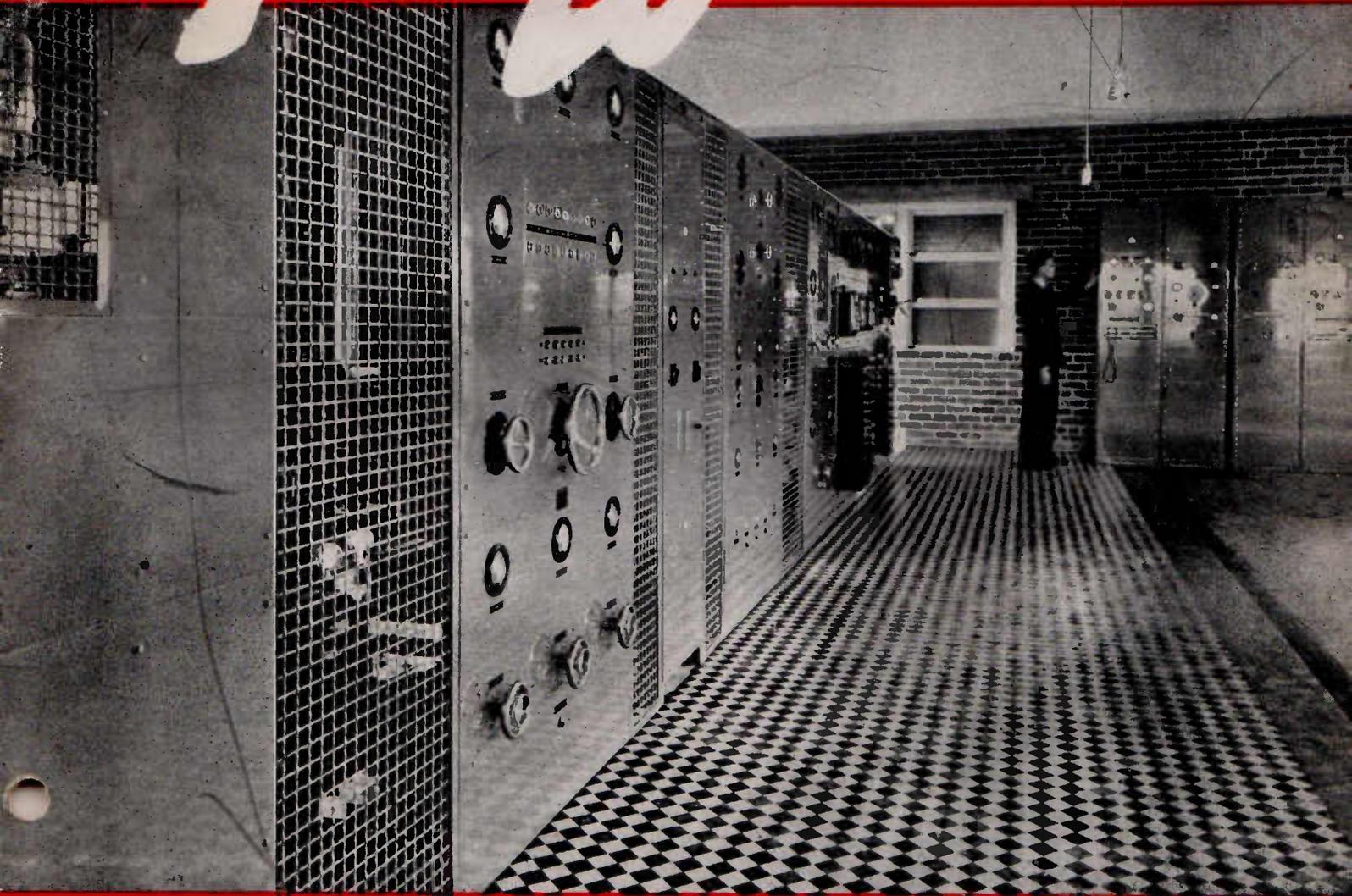


THE
AUSTRALASIAN

OCTOBER 1, 1937
VOL. 2 — NO. 6
PRICE, 1/-

Radio World

Registered at the G.P.O.
as a newspaper for transmission
as a periodical.



—See Page 8.

- "1937 OUTDOOR PORTABLE FOUR": MORE ABOUT THE "TOM THUMB
- TWO": A.C./D.C. SUPERHET: RADIOKES "ADVANCE DUAL-WAVE
- FIVE": LATEST OFFICIAL LIST OF VK AMATEUR TRANSMITTERS.

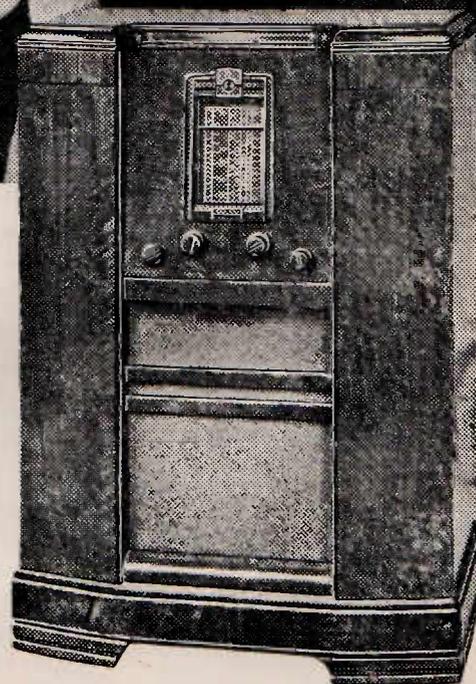
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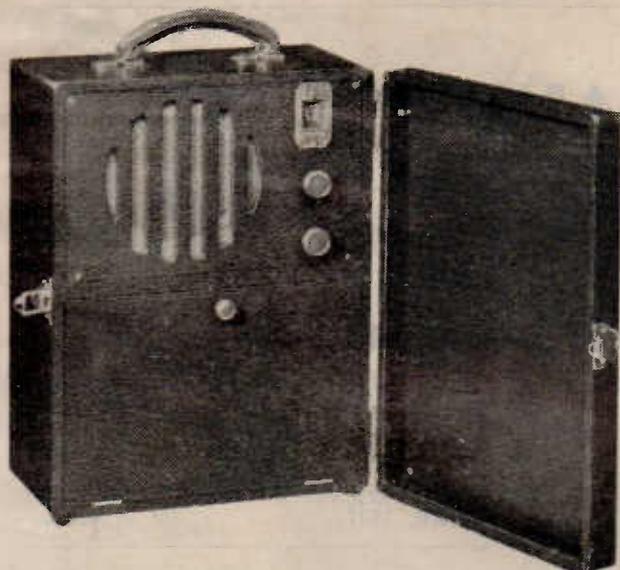
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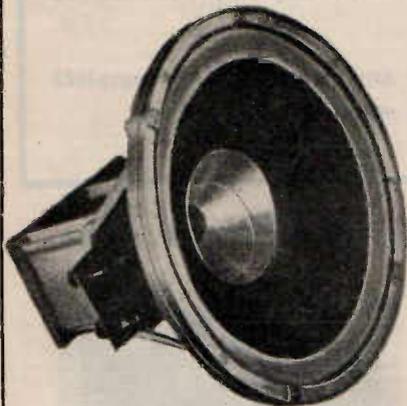
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THE AUSTRALASIAN RADIO WORLD

Incorporating the
ALL-WAVE ALL-WORLD DX NEWS.

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

Vol. 2.

OCTOBER, 1937.

No. 6.

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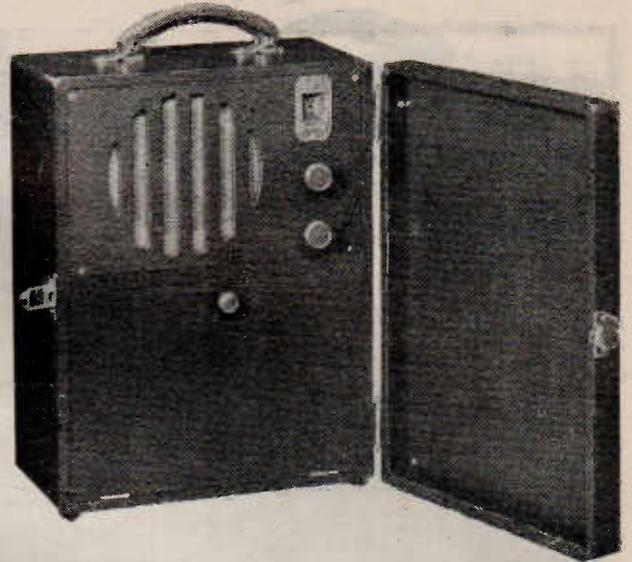
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The 1937 Outdoor Portable Four

**Many New Features ★ Automatic
Volume Control ★ Economy
Switch ★ Smaller Case ★ Better
All-Round Performance . . .**



THE most important features of any portable radio are high sensitivity, low running cost, and compactness. These are the main standards by which a set of this type is judged, and they were kept well in mind when this year's "Outdoor" was being planned.

Light Duty Batteries Essential

To ensure portability, light duty "B" batteries are the heaviest that can be used. This means that if the set is to be economically run, the total "B" drain must not be more than about 8 mills.

While the drain is around 8 mills. with a set of this type when the

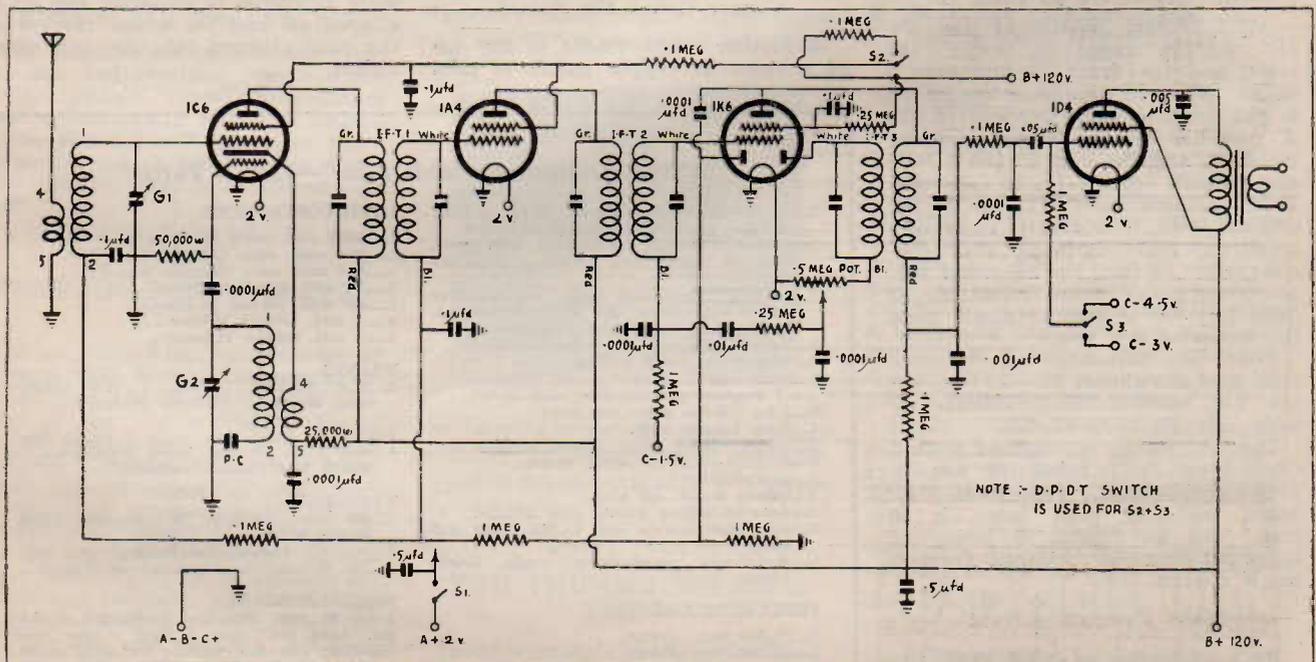
batteries are new, however, as the voltage drops so does the drain, until at 95 volts it is down to a little over 5 mills. Sensitivity also falls off considerably, and in last year's "Outdoor" this was compensated for by including a sensitivity switch, which when brought into action after the set had been in use a while, increased the screen voltage on the first two valves, largely restoring the original sensitivity.

However, this still left the output pentode operating with about 95 volts on the plate and still using the original bias of $-4\frac{1}{2}$ volts. Thus it became seriously over-biased, and reproduction suffered in consequence.

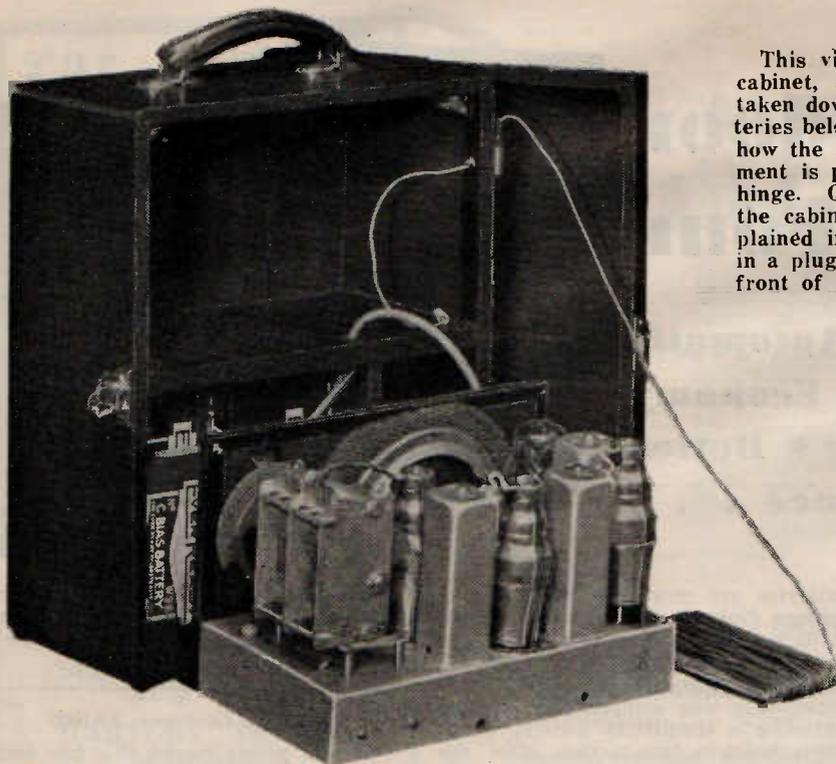
The completed receiver. There are only two controls—tuning, and combined volume control and on/off switch.

D.P.D.T. Economy Switch

In this year's model this has been overcome by using a double-pole double-throw toggle switch, which, incidentally, is mounted on the chassis instead of the front panel, so that it cannot be switched over accidentally. One section takes care of the screen voltage, and the other the bias on the output pentode. When the two 60-volt Ever-Ready light-duty "B" batteries are new, $-4\frac{1}{2}$



The circuit of the "1937 Outdoor Portable Four," which incorporates automatic volume control. "S2" and "S3" are sections of the double-pole double-throw economy switch, referred to in the text.



volts is applied to the 1D4 grid, and as well there are two .1 megohm resistors in series between "B+" and the screens of the first two valves. Under these conditions the total drain is just over 8 mills., and as well, both sensitivity and tone are excellent.

Will Operate On 60 Volts "B"

After several months of use, the "B" voltage drops to, under 100 volts, and the drain to just over 5 mills. When this happens the switch is put over, shorting out one of the .1 megohm screen voltage-dropping resistors, and the bias on the 1D4 is also reduced from $-4\frac{1}{2}$ to -3 volts. This increases the "B" drain to the original level, thus greatly increasing sensitivity and improving tone considerably. In fact, the all-round performance under these conditions is little inferior to that obtained when the batteries are new.

Thus the batteries can be used until they are almost flat—in fact, the set will operate fairly satisfactory with only 60 volts of "B."

The "A" supply is obtained from a Clyde type 2VS7 2-volt 40 ampere hour accumulator. The total "A" drain, including pilot lamp, is .6 amp., and so nearly 70 hours of operation can be obtained from a single charge.

More Compact Layout

In a portable of this type the dimension that matters most is not the width or height, but the depth. If this is too great, the set becomes awkward to carry. External dimen-

sions of last year's portable were $14\frac{1}{2}$ " x $11\frac{1}{4}$ " x $9\frac{1}{8}$ ". In this year's model the height and width remain the same, but the overall depth has been reduced to $7\frac{1}{2}$ " instead of $9\frac{1}{8}$ ". As well, a shelf has been included on which the set rests, and a partition put in separating the accumulator from the "B" batteries.

Copper Gauze For Aerial

A further improvement is the use of a sheet of copper gauze to take

This view shows the receiver removed from the cabinet, and illustrates how the battery cable is taken down through the horizontal shelf to the batteries below. The lid has also been removed to show how the aerial carried in the accumulator compartment is plugged into the socket portion of the top hinge. One end of the short length of flex inside the cabinet connects to the $\frac{5}{8}$ " hinge bolt as explained in the text, while the other end terminates in a plug that fits into the aerial socket mounted in front of the condenser gang.

the place of the aerial wound in the lid, the connection from the gauze to the set being made via the top metal hinge. The top wood screw in each section of this hinge is replaced by a $\frac{5}{8}$ " bolt, a short length of flex being connected from the gauze to one bolt, and a further length of flex from the other bolt inside the cabinet terminates in a banana plug. This fits into the aerial socket mounted in front of the condenser gang, as shown in the plan view of the completed set.

Connecting An External Aerial

The hinges for the lid are arranged so that the latter can be lifted off at will. In the accumulator compartment is carried an extra aerial, consisting of about 8 yards of rubber-covered flex, wound round a piece of three-ply $2\frac{3}{4}$ " wide by 6" long. A hole is bored in the centre of this, one end of the aerial passed through, and a knot tied. A banana plug is mounted on the other end of the aerial. In locations where interstate reception is required, the lid is slipped off and the aerial carried in the case plugged into the top hinge socket.

"1937 Outdoor Portable Four"—List of Parts

- 1—16-gauge aluminium chassis, 10 $\frac{1}{2}$ in. x 5 $\frac{1}{2}$ in. x 1 $\frac{1}{2}$ in., stamped and drilled as shown.
- 1—leatherette-covered carrying-case, with panel, built to specification (Western Manufacturing).
- 1—coil kit, comprising aerial and oscillator coils, with three 465 k.c. air-core i.f. transformers, and padder (Radiokes).
- 1—2-gang condenser (Stromberg-Carlson).
- 1—midset tuning dial (Elico).
- 2—small bakelite knobs.
- 1—.5 megohm potentiometer, with switch.
- 4—2-lug bakelite strips (see text).
- 1—7-lug bakelite strip.
- 1—7-wire battery cable (2-foot length).
- 2—6, 1—5, 1—4-pin wafer sockets.
- 3—goat shields.
- 1—banana socket and plug.
- 1—sheet of copper gauze, 10in. x 12in.
- 6— $\frac{3}{16}$ in. brass spacers and 6— $\frac{3}{16}$ in. bolts and nuts.
- 1—double-pole double-throw toggle switch (Alpha).

FIXED RESISTORS:

- 1—25,000 ohm, $\frac{1}{2}$ -watt.
- 1—50,000 ohm, $\frac{1}{2}$ -watt.
- 5—.1 megohm, $\frac{1}{2}$ -watt.
- 2—.25 megohm, $\frac{1}{2}$ -watt.
- 4—1 megohm, $\frac{1}{2}$ -watt.

FIXED CONDENSERS:

- 6—.0001 mfd. mica (Simplex type PT).
- 1—.001 mfd. mica (Simplex type PT).
- 1—.005 mfd. mica (Simplex type PT).
- 1—.01 mfd. tubular (Chanex).
- 1—.05 mfd. tubular (Chanex).
- 4—.1 mfd. tubular (Chanex).
- 2—.5 mfd. tubular (Chanex).

VALVES:

- 1—1C6, 1—1A4, 1—1K6, 1—1D4 (Radio-tron, Raytheon, Mullard, Philips).

SPEAKER:

- 1—5in. P.M. speaker, input transformer to match 1D4 (Rola, Amplion).

BATTERIES:

- 2—.60 volt light-duty "B" batteries (Ever-Ready W.P.60).
- 1—.9v. "C" battery (Ever-Ready).
- 1—2v. 40 amp. hour accumulator (Clyde).

MISCELLANEOUS:

- 2-volt 60 m.a. dial light (optional); 2 doz. $\frac{3}{16}$ in. bolts and nuts; $\frac{1}{2}$ yard copper braid shielding; insulating washers for aerial socket; push-back (solid and flexible); solder tags; 3 grid clips; 8 yards rubber-covered flex, with banana plug, for external aerial.

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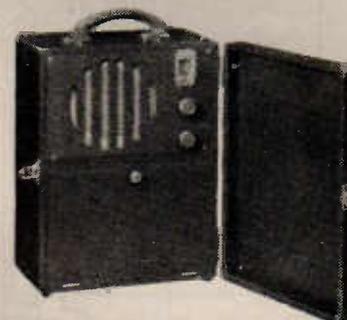
An Advertisement inserted by F. J. W. FEAR & CO., New Zealand.

Many New Features In Latest "OUTDOOR PORTABLE"

Exceptional sensitivity, excellent tone and smart appearance make the "1937 Outdoor Portable Four" a set you will be proud to own. Many important improvements are embodied in the latest model. The case is more compact and much easier to carry, while a revised chassis layout makes the set simpler to assemble and wire. Latest circuit features include auto-

matic volume control and an ingenious economy switch which enables the last ounce of power to be obtained from the batteries.

Why not build an "Outdoor Portable" for the Christmas Holidays? Start now by writing for our detailed quote. Every part guaranteed as specified by the Editor.



DX JUNIOR TWO-BAND C.C. TRANSMITTER

The DX Junior Transmitter described last month is the ideal rig for the man wanting the most DX at the cheapest cost. Crystal-controlled and using a single 6L6, up to 20 watts output can be obtained.

WRITE FOR OUR DETAILED QUOTE.

"JONES' SUPER-GAINER"

The straightforward, simple construction and excellent results given by the famous "Jones' Super-Gainer Two" (described in July and August "Radio World") will appeal to those looking for a high-performance short-wave receiver that is inexpensive to build.

WRITE FOR OUR DETAILED QUOTE.

"SKY-KING DUAL-WAVE FIVE"

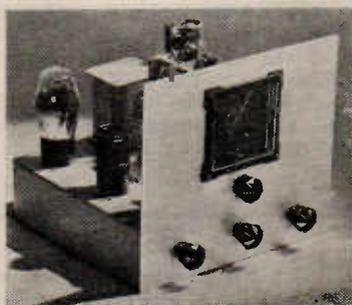
The a.c. "Sky-King," a newcomer to the dual-wave field, is fully described in the August and September issues of the "Radio World." For a receiver costing so little, it has many desirable features for the home builder. Construction is extremely simple, using an inexpensive coil-kit, and first-class results are guaranteed.

In the original "Sky-King," performance left nothing to be desired; selectivity is excellent, and sensitivity is equal to that of many commercial "sixes." We can supply a complete kit of parts, with valves and speaker, for £9/15/-

"EMPIRE ALL-WAVE THREE"

Described in the May and June issues of the "Radio World," the "Empire All-Wave Three" is proving exceptionally popular.

Tunes from 12 to 600 metres with standard two-gang condenser. Uses latest 1K4 screen-grid detector with electron-coupled regeneration. Low "A" and "B" drain, giving low initial



and running costs. Automatic bias is used, no "C" battery being required. Complete kit of parts £10/- (including batteries, valves, speaker and phones).

"TOM THUMB PORTABLE TWO"

Those wanting a portable for head-phone reception only will find the "Tom Thumb" ideal.

Compact, and weighing under 12 pounds complete, it can be taken anywhere—to the city, seaside or bush—and is instantly available for use. With low "A" and "B" drain, the batteries will last for months, and are cheap to replace.

Our kit of parts for the "Tom Thumb Portable Two" is exactly as specified by the designer, and includes everything listed—case, batteries, valves, and all accessories.

WRITE FOR OUR DETAILED QUOTE.

"MICROMATIC ALL-WAVE MIRACLE SIX"

The "Micromatic Miracle Six" featuring the amazing Micromatic All-Wave Tuner is breaking all sales records for receivers in its class. A metal-valve all-wave superhet of latest design, it is simpler to wire than a four-valve broadcast set. No coil connections to worry about, no wave-change switch to wire, and best of all, no alignment difficulties.

Super-selective, exceptionally powerful, and giving all-wave coverage, the "MICROMATIC MIRACLE ALL-WAVE SIX" is a set you'll be proud to own.

Complete Kit of Parts £13/15/-
less valves and speaker

Complete Kit, with valves and Magnavox speaker £19/10/-

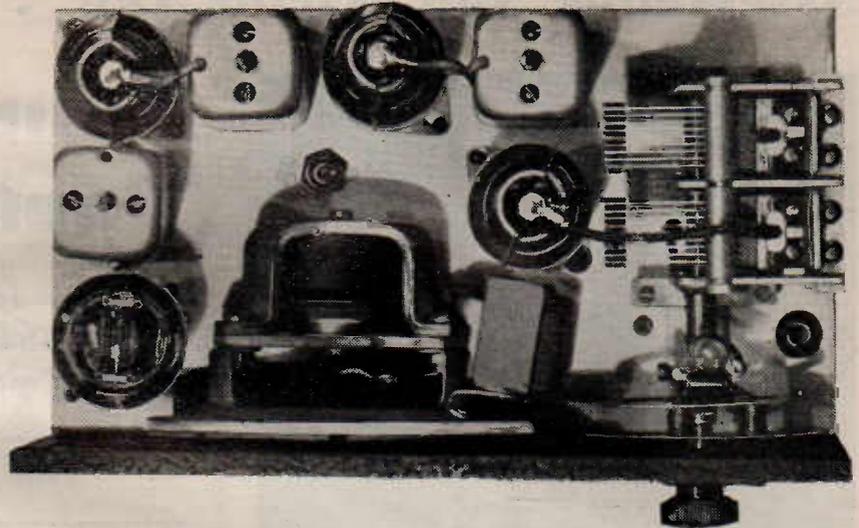
(Detailed assembly instructions, with photographs and diagrams, are supplied with every kit).

of the 1A4 has obviated the need for the extensive shielding used in last year's model. In fact, the only shielding used is that for the volume control leads, which is standard practice.

Improved Tone And Sensitivity

The tone of this year's model has been improved considerably by using a 5½" grille for the 5" speaker. The latter is mounted on the chassis directly over the centre of the grille, which means that there is a ¼" air-gap right round the circumference of the speaker. Thus the speaker is not entirely "boxed in" as before, and the drumminess apparent in last year's model has been eliminated.

The latest model has amazing sensitivity—even greater than that of last year's receiver. Tested on the road at 10 o'clock one night, about four miles from Katoomba, in the Blue Mountains, which is regarded generally as a poor location for reception, more than forty stations were tuned in, most of them at overloading speaker volume. For this test the set was placed on top of a small car, the aerial being thrown on a nearby bank, only about four yards of it being unwound.



A plan view of the chassis, showing the layout for this year's model. The economy switch is located behind the speaker.

Further Details Next Month

A complete list of the parts required to build the "1937 Outdoor" is given elsewhere. Also, the circuit, wiring diagram and photographs will enable readers who have had some

experience in set-building to complete the receiver without further instruction. However, for those whose experience is limited, an article outlining the wiring and alignment will be published next month.

Build Your "1937 Outdoor Portable"

With Full-Vision Station-Calibrated Dial!

For the past two years we have specialised in the manufacture of portable receivers, for distribution right throughout the Commonwealth. Many letters of appreciation of the amazing and dependable performance of our "My Companion" portable bear testimony to the excellence of its design and assembly.

We are now offering to "Radio World" readers a special kit of parts for the "1937 Outdoor Portable," described in this issue. Every part is guaranteed exactly to the Editor's specifications, or, alternatively, a special full-vision station-calibrated dial of our own design, together with a condenser gang using dual-reduction drive, will be supplied at **NO EXTRA CHARGE.**

Complete kit of parts, with battery, valves, cabinet and speaker, £12/-/-
Receiver, assembled, aligned and fully tested £13/5/-

WE GUARANTEE RESULTS.

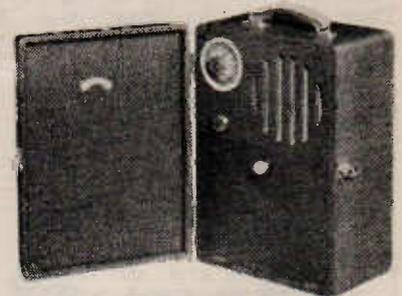
If you have any difficulty in obtaining satisfactory operation, we will re-build the receiver for you at a nominal charge.

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'Phone

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Completely assembled, aligned and tested £17/10/-
Installation charge (built in aerial extra £1/10/-

**Results Guaranteed —
Write for details.**

Assembling And Wiring The . . .



Tom Thumb Portable Two

The assembly and wiring of the "Tom Thumb" Portable Two described last month, are outlined below.

A rear view of the completed receiver.

THE assembly of the "Tom Thumb Two" is commenced by mounting the chassis components, which include the valve and coil sockets, audio transformer, battery cable bush and the aerial and earth terminals.

Six-inch leads of flexible push-back are then soldered to the fixed and moving plates terminals of the tuning condenser, to the fixed plates terminal of the reaction condenser, and to the terminal of the rheostat not connected with the moving arm. These components can then be mounted on the aluminium front

for reference when the batteries are being connected up.

Winding The Coils

The five coils can be wound next. Four-pin plug-in formers are required, the pin connections being shown in a sketch elsewhere. Details regarding the number of turns required for each and gauges of wire are also given in an accompanying panel. The grid windings of the 20 and 40-metre coils are space-wound, i.e. the turns spaced so that the distance between them is roughly equivalent to the diameter of the wire. The remainder of the coils are close-wound.

The First Test

When these are completed, a broadcast coil can be plugged in, together with the two valves, and the set tested. The two 9-volt bias batteries used for "B" supply and the two 1½-volt "A" cells are connected in series, and the battery leads then connected to them. The rheostat is then advanced until the voltage applied to the valve filaments is 2 volts. A mark is then made on the front panel, and the rheostat never advanced beyond this until the batteries have had a fair amount of use.

With the aerial and earth connected up and the 'phones plugged in, slowly rotate the reaction control until the set is just on the verge of oscillation. Next, rotate the tuning dial, and a station will soon be picked up.

If the set does not oscillate, then the wiring and voltages should be checked up until the error is found.

Mounting The Set In The Cabinet

With the set operating satisfactorily, the batteries can be discon-

nected and the chassis then bolted to the baseboard by means of two 1½" brass bolts and nuts. Special holes are not drilled in the chassis for these, as they can be used for bolting the audio transformer to the chassis as well.

(Continued on page 48)

The Front Cover

This month's front cover photograph shows the transmitter recently designed and built by Amalgamated Wireless (A'sia) Ltd. for station 2SM, Sydney.

The transmitter, which is located at the A.W.A. Radio Centre, Pennant Hills, has been built in accordance with the latest technique in broadcast station design. Series modulation is employed, while frequency stability is ensured by the use of a temperature-controlled crystal oscillator. The output valve is artificially cooled by a circulating water system, and is capable of delivering 1,000 watts continuously to the aerial. The transmitter is equipped with an elaborate system of relays which would automatically switch off the power in the event of a fault developing in any part of the apparatus. Special indicating lamps reveal to the engineers which particular circuit is out of order.

The whole transmitter is brought into operation by the pressing of a button, time relays switching in the various units in their proper order.

A latest type vertical radiator is used, consisting of a 450-foot steel mast—the highest in Australia.

COIL DETAILS

Band.	Grid.	Reaction.
20 m.	8	8
40 m.	17	12
80 m.	28	18
220-350 m.	102	40
340-520 m.	160	64

Shortwave grid and reaction windings are wound with 22 and 28 enam. wire respectively. The 220-350 m. broadcast grid winding is put on with 30, and the 340 to 520 m. with 32. 35 is used for both broadcast reaction windings. All wire used is B and S enamelled.

panel, which is then bolted to the front of the chassis. Lastly, the 'phone jack can be mounted.

Putting In The Wiring

The chassis can now be inverted and the set wired in accordance with the wiring diagram published last month. When this has been completed, the leads from the battery cable can be soldered in place, the colours and designations being jotted down

MANY . . .
a good programme
can be heard on
an old radio set
and heard
very well
indeed
if you . . .



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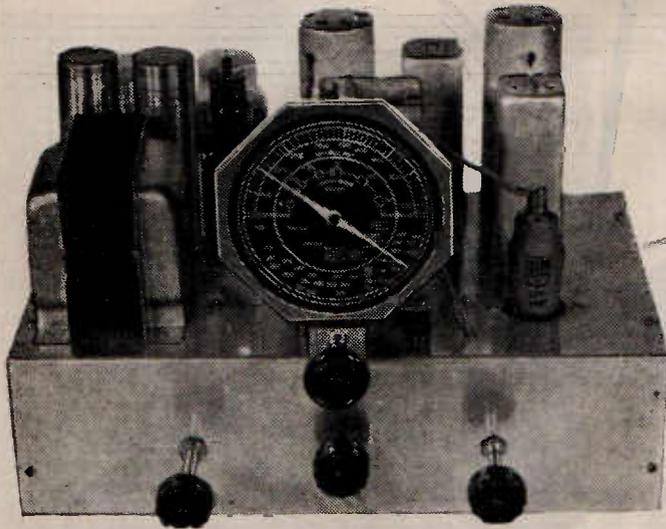
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ADVERTISEMENT OF AMALGAMATED WIRELESS VALVE CO, PTY, LTD.

Latest Radiokes Kit-Set Is The . . .



“Advance 1937”

Simplicity of assembly and alignment, coupled with excellent all-round performance on both wavebands, are features of the “Advance 1937”

THE latest Radiokes kit-set release is the “Advance 1937,” a 4/5 dual-wave superhet that can be relied upon to give excellent results on both wavebands.

The Valve Line-Up

As shown in the circuit below, a Philips EK2 Octode is used as mixer-oscillator, followed by a 6D6 as i.f. amplifier. Next follows a 75, with one diode acting as second detector and the other providing automatic volume control. The triode section is used as audio amplifier, driving a 42 in the output socket.

Outstanding Circuit Features

Higher output with lower distortion than that obtainable from a 42 used in the conventional connection is ensured by the application of inverse feedback. (This feature has been used in several “Radio World” receivers, and several articles dealing with its advantages have been published in earlier issues).

Back bias is used throughout, all cathodes being at earth potential.

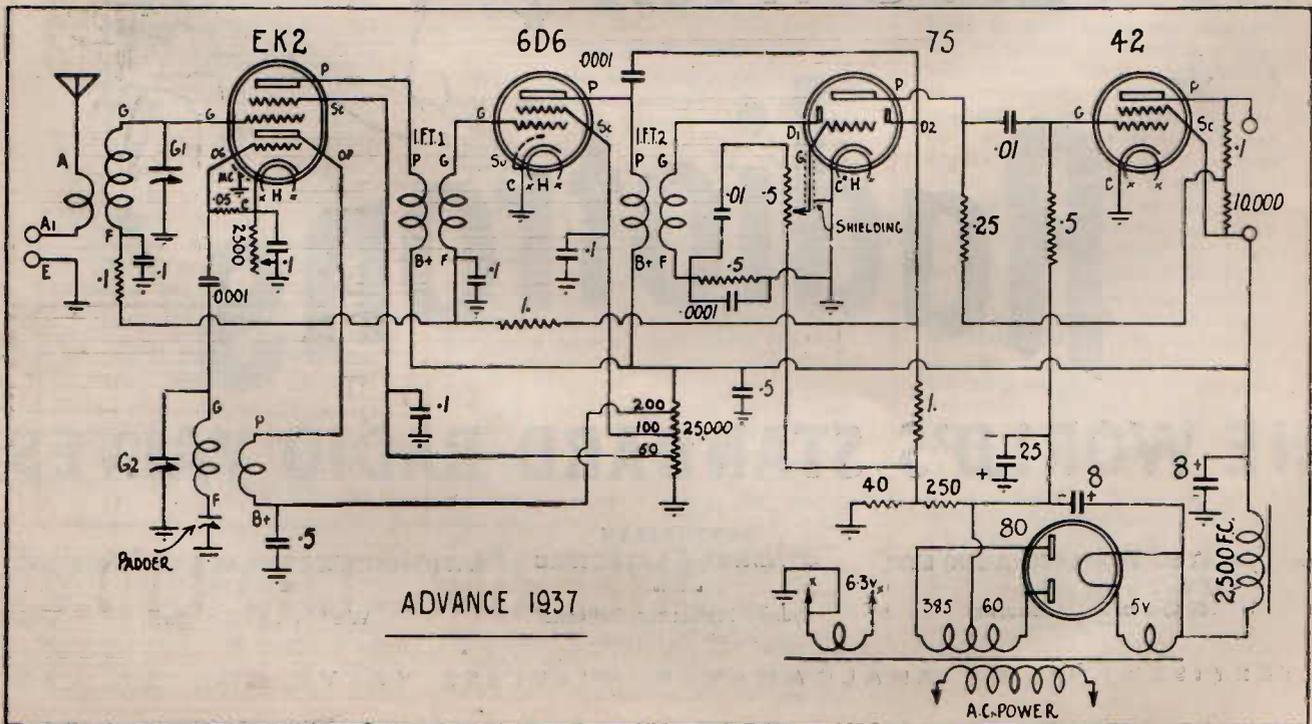
For use on local stations, and to eliminate inter-station noise when local reception only is desired, a sen-

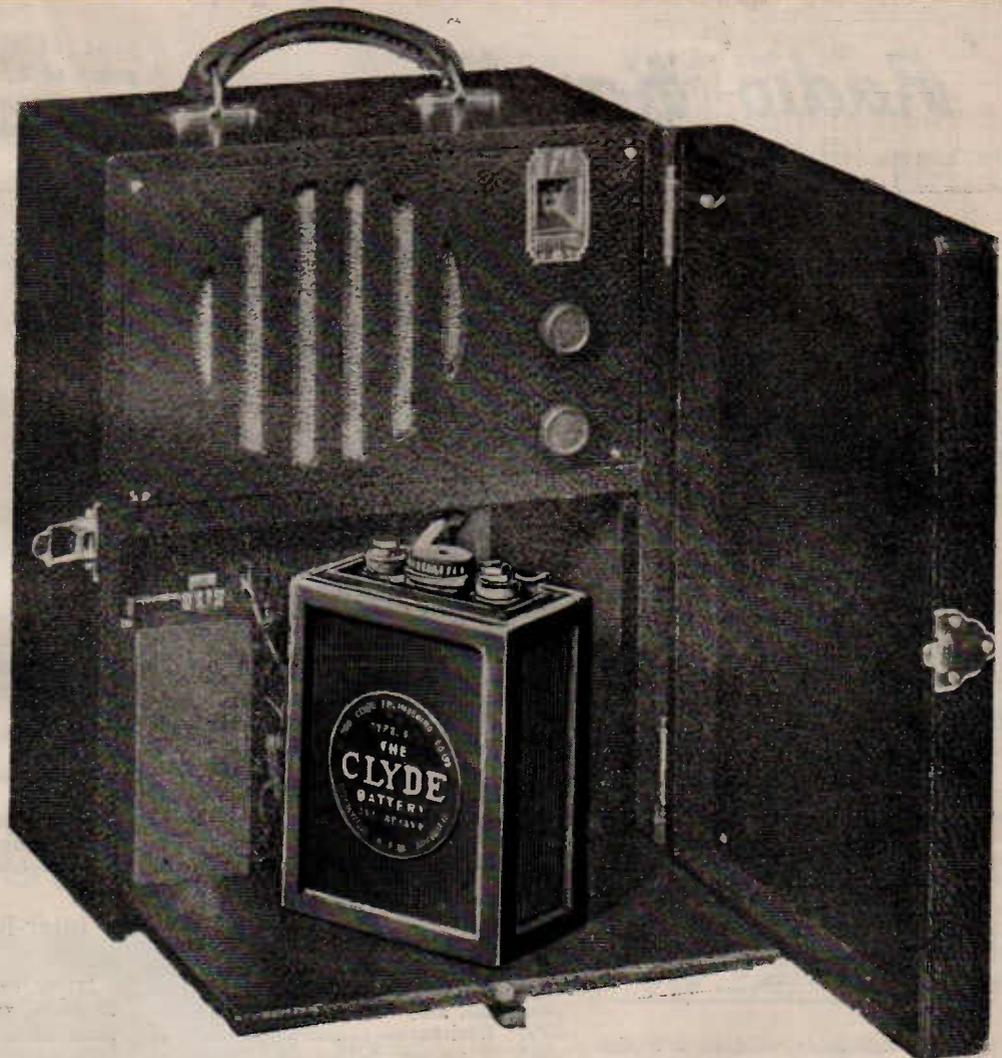
sitivity control in the form of a 2,500-ohm potentiometer has been fitted in the cathode lead of the EK2.

Assembly And Alignment Simple

The “Advance 1937” is particularly simple to assemble, wire, and align. Every step is covered in a four-page pamphlet, which includes photographs of the completed set as well as the circuit and wiring diagrams.

Readers can obtain copies free and post free by writing Radiokes Ltd., Box 10 P.O., Redfern, N.S.W.





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CLYDE BATTERIES

(type 2VS7) are specified exclusively for the 1937 Outdoor Portable Four described in this issue (Page 3).

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Obtainable from all Leading Garages and Radio Dealers throughout Australia.

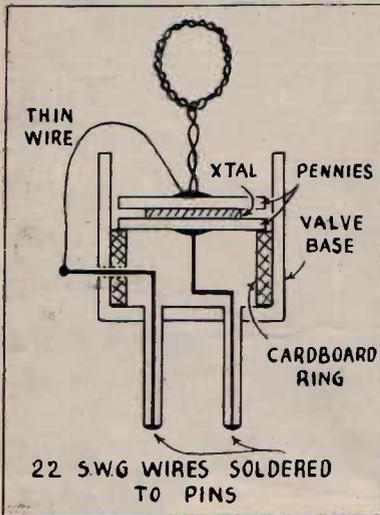
Radio Ramblings

A page for letters from readers. A prize of 2/6 will be awarded for every technical contribution published.

Improvised Holder For Transmitting Crystals

Here are details for an economical and reliable holder for quartz crystal plates for a c.c. transmitter.

With the aid of a file and some sandpaper, take off one face of each of two pennies. The best way to use the sandpaper is to lay it, rough side



up, on a flat table, and to rub the coin over it. Now a small area on the reverse side of each coin is cleaned with sandpaper and two wires are soldered to one coin, one wire to the other coin, as shown. As the coins have most likely bent a little due to the heat of soldering, the face on each coin is again rubbed down a little on the sandpaper, after which each is "finished off" with the conventional carborundum powder, water and plateglass used for grinding quartz plates.

Now a hole is drilled in the side of an old valve base, just above one pin, as shown, and a strip of cardboard bent to form a circle and slipped into base; a hole is made in the cardboard to coincide with the hole drilled in the side of the base. The parts now prepared are assembled as shown in the sketch, which should be self-explanatory.

By the way, I am anxious to receive reports and would like to hear from any reader tuning in VK3EX on the 20, 40 or 80 metre bands.—Eric Webb (AW14DX), 297 Mitcham Rd., Mitcham, Victoria.

Reminiscences Of The Early Days

I bought my first copy of the "Radio World" last month (August), and I found it very interesting. I have been a radio enthusiast since 1923, 14 years ago, when I was 13 years of age, and I have watched wireless in Australia develop from what it was then—in the days of crystal and one-valve sets, using the old P1 circuit.

In fact, I still have the old Philips D11 bright emitter valve which I used in those days, and although I have not tried it for some time, I think it will still work; it did the last time I tried it, two years ago. I remember in those days using this valve in a single valve regen. circuit, and with a good high aerial and sensitive headphones, I could receive old 2FC and 3LO quite well. I am interested in the series by Don. B. Knock, and can remember reading articles by him in wireless papers years ago.

I now have an 8-valve electric set which I assembled and wired myself. The audio end is similar to the "Wireless Weekly" £50 prize-winning circuit, in which the diode is followed by a 53 twin triode as a push-pull driver, driving a pair of 45 triodes in push-pull, and with fixed bias on the 45's. Resistance capacity coupling is used, of course. Although I have not measured the undistorted output, I would like to bet it is 10 watts with no more than 3% harmonic distortion at this level.

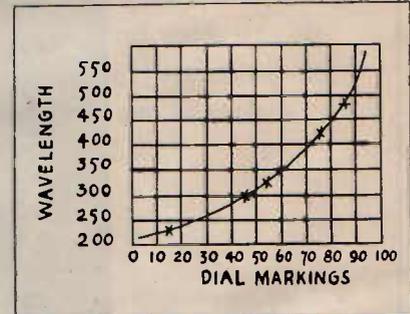
I was very interested in the high fidelity amplifier using push-pull 2A3's, especially the frequency response curves, which are excellent, although I think that my audio amplifier could rival it.—J. B. Stewart, Bundamba, Queensland.

Preparing a Tuning Curve

Here is a kink that should prove useful to anyone using a tuning dial graduated in degrees (either from 0-100 or 0-180). It provides a very simple method of locating on the dial the exact position of any station.

A piece of graph paper is prepared as shown in the sketch, the wavelength in metres being plotted against degrees. The points shown are obtained by plotting the wavelength of known stations against the dial numbers at which they come in, enough points being plotted to en-

able a smooth curve to be drawn. Now, if the wavelength of a station is known, this point is located on the upright scale, and a horizontal

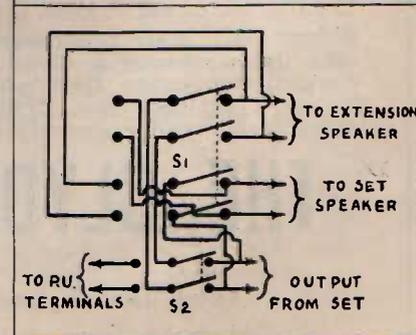
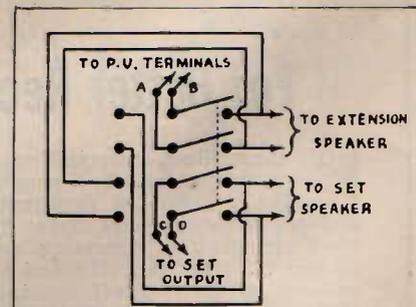


line is taken from it to the curve. A vertical line dropped down to the horizontal "dial markings" scale will give the number at which the wanted station will be found.

Conversely, if the number at which a station comes in is known, its wavelength can be found by reversing the above process.—K. P. MacKinnon (AW189DX), Bondi, N.S.W.

Inter-Room Communication System

Many country listeners would like to have radio in any room of the



house at will, but they are denied the city listener's solution of using a small A.C. receiver that is easily transportable. An excellent substitute is to use a length of twin flex, one end being connected to the output of the set and the other to an extension speaker mounted on a board, so that it can be placed in any room as desired.

If the set uses pick-up terminals, then by using a four-pole double-throw switch, as shown in the top sketch, the flex, speaker and receiver can be wired up to provide a simple inter-room communication system. In our family we find this of great use, as, though one member is an invalid, by means of the hook-up shown he can talk with us at dinner, although he is several rooms away. When it is desired to have reception from both speakers, a pair of leads should be run from terminals "AB" to "CD".—D. Hogan, Epping, Sydney, N.S.W.

[To avoid the necessity of connecting and disconnecting leads when reception from both speakers is required, a good scheme is to add a double-pole double-throw toggle switch and wire it as shown in sketch "b." With "S1" and "S2" over to the right, both speakers will operate. This will also be the case when "S1" is over to the

left and "S2" to the right. With both switches over to the left, the set speaker acts as a microphone, while the extension speaker is connected to the set's output. Lastly, with "S1" to the right and "S2" to the left, the extension speaker acts as a microphone, speech coming from the set speaker.—Ed.]

Is Building The "Outdoor"

I have enclosed 2/- P.N. for a copy of both the October and November, 1936, "Radio World." I have only just been introduced to your excellent paper, and congratulate you on the publication. I had several copies lent to me, and require the back numbers in order to construct the "Outdoor Portable Four." The reports on this receiver are very satisfactory.

I have been interested in wireless since 1922, when only morse code was to be heard, but owing to lack of time have not done much for some time. I contemplate building a three or four valve shortwave A.C. receiver, but have not come across a suitable circuit to date. If you could help me in this matter it would be greatly appreciated.—H. H. Young, Angaston, South Aust.

[The circuit of a three valve s.w. receiver has been forwarded to you.

By the way, why not build the latest "Outdoor" described this month, instead of last year's model? Glad to know you like "R.W."—Ed.]

Address Wanted

Would G. F. Syer please forward his full address to the Editor?

For Bending Aluminium

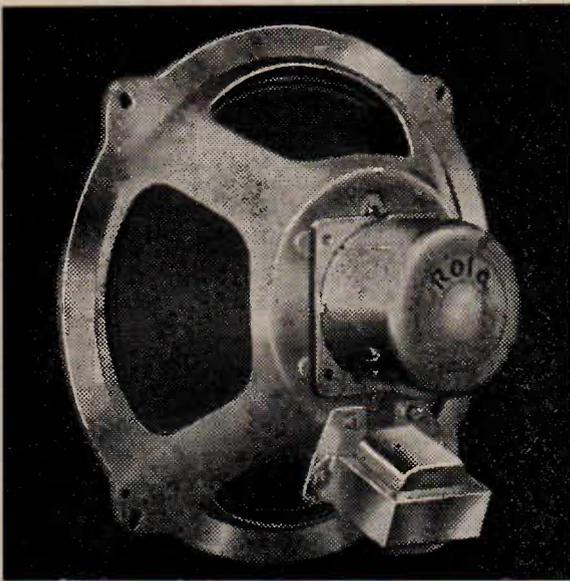
I have not missed a copy of the "Radio World" since January last, nor do I intend to. I particularly like the "Shortwave Review," while the "Radio Ramblings" page is also very interesting.

A handy gadget for bending aluminium is illustrated in the accompanying sketches (Figs. 1a and 1b), and consists of three blocks of wood, "A," "B" and "C." "A" and "B" are hinged as shown, "C" being mounted on "A" by means of bolts and two wing nuts. To use the device, the sheet of aluminium is pushed through as far as is required and the wing nuts tightened down. The handle is then lifted upwards.

The second sketch (Fig. 2) shows a way of making insulators from bottle necks. The top of a bottle is cut off and a wire attached as shown, while a hole is bored through the

"PER MAGS" *second to none for* Performance and Service

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Above, the recently released Rola "10-21." Making full use of a new magnet alloy, this Rola 10-inch permanent-magnet speaker affords every advantage of the remarkably high flux obtainable from its new magnet. This unit is capable of handling large power inputs and is priced retail at 50/- complete with exclusive Rola dust-proof assembly.

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The 8-inch "8-20" Rola permanent-magnet speaker shown below has remarkable sensitivity owing to its having an unusually large magnet of new Alni steel. This unit is effectively and permanently proofed against dust while its transformer is adequately sealed against moisture and battery fumes.

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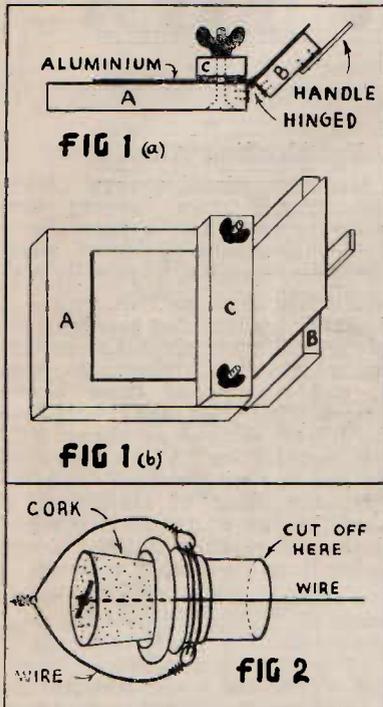
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cork and a second wire anchored to it, as illustrated, by means of a crossbar.—J. L. Shannon, Ayr, Queensland.



"1937 Empire All-Waver"

I have built three "1937 Empire All-Wave" sets for friends, all of whom are very pleased with results, so you see the "Empire" is popular here. I have now started on my fourth.

My own model is working in great style, and the S.A. stations come in without any effort whatsoever. I had a little trouble with 4QG, which, as it is almost next door, took more than its share of the dial. However, I soon settled that with a wave trap, and 4QG is now nearly as sharp as the others.

I am keenly looking forward to reading about the "1937 Outdoor Portable."—R. Cook, Brisbane.

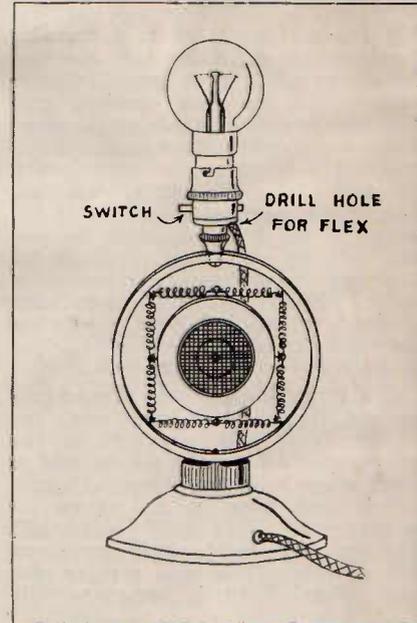


Microphone And Reading Lamp

The enclosed sketch shows a way of adding a socket to a table microphone, making an attractive reading lamp. A small hole is bored through the top of the "mike" holder, and the socket bolted to it. A hole is then bored in the side of the socket near the bottom for the cord to pass through (the usual cord hole is used to pass the mounting bolt through). A suitable shade is added, making a very attractive reading lamp, the total cost being only a few shillings.

The September issue of "R.W." is the best yet, and each number seems

to get better than the last. Reception here is difficult lately, mainly because of local interference. The only stations which come in at any strength at all are the Daventry transmitters. The Germans, together with VPD2, ZBW3 and K6BNR, are the strongest 20-metre amateurs.—Cyril F. Frost (AW22DX), Seymour.



3 NEW

AMPLION

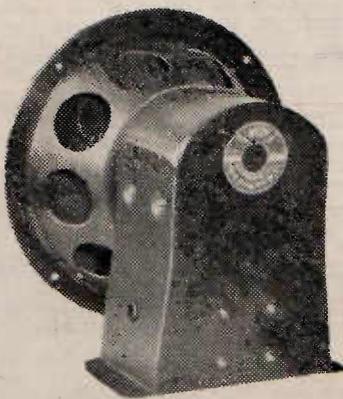
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This new auditorium speaker is Amplion's latest and finest product and is a masterpiece of Australian design and manufacture.

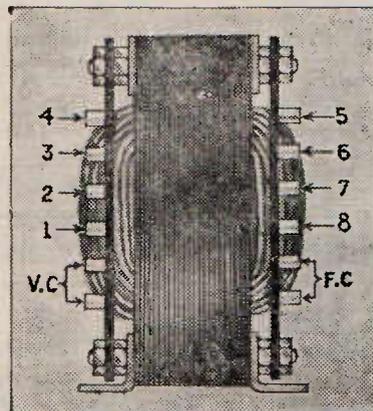
A beautiful reproducer, taking full care of the whole frequency range and with an undistorted output of 10 to 12 watts.

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MULTI-IMPEDANCE TRANSFORMER
Impedances available from 2500 to 12,000 ohms single or push-pull Standard equipment on all "SA" and "T" Model Speakers.

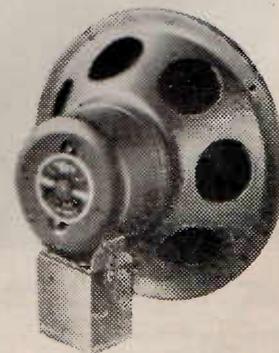
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Ask for publication No. 55 giving full details of these new Amplions.

MODEL "SA"

An improved 10in. speaker fitted with the new Multi-Impedance Transformer. Extended low frequency response with entire absence of boom. New process enables waterproofing of cone during fabrication.

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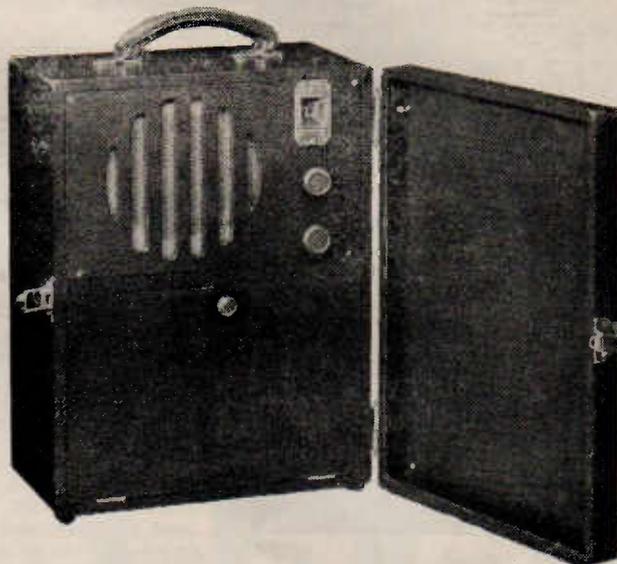
TYPE "SA"

AMPLION (A'ASIA) PTY. LTD., 66 Clarence Street, Sydney.

We Thought It Was Impossible

. . . but

the "Aust. Radio World" managed to do it



So great was the success of the 1936 Outdoor Portable 4 we thought it an impossibility to improve it . . . we were wrong. The new 1937 model, designed by the "Australasian Radio World" and described in this issue, is a winner. Improvements in design . . . in

performance . . . in ease of building . . . make it an outstanding receiver. Hundreds of readers built and were pleased with the 1936 model . . . Thousands will build the 1937 Portable and be more than delighted. You, too, can be thrilled—order a kit to-day.

The 1937

OUTDOOR PORTABLE 4

Anyone can successfully build the new 1937 Outdoor Portable Four from the complete details given in this issue. Read the easy to follow constructional article and order your kit from Veall's. For only £12 Veall's will supply the complete outfit, including stamped chassis, ready-built cabinet, valves, speaker and batteries—nothing else to buy. Freight Paid to your nearest Victorian Railway Station. Take advantage of this special offer, build your Portable early in the season and take full advantage of it . . . use it anywhere . . . at home . . . in the car . . . the country . . . at the seaside. The ideal receiver—sensitive—economical and reliable.

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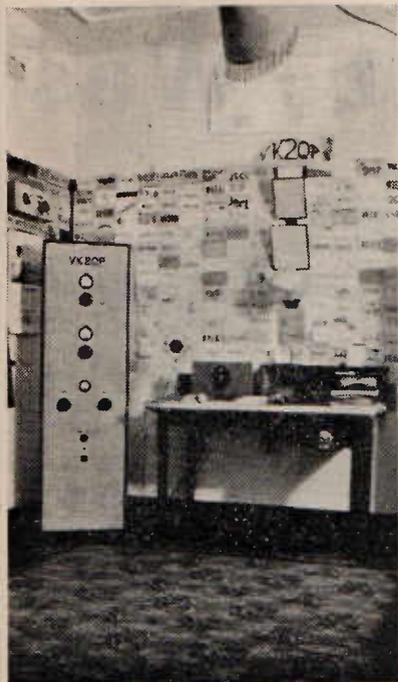
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Central 3059 (7 lines), 10524, Wind. 1605, W 1188.



THE Lakemba Radio Club meets every second Tuesday at the club rooms, "Sunrise Hall," near Canterbury Station, the meetings for October being on the 12th and 26th. Visitors are welcome at any time, and are always assured of a hearty reception.

The Club has now been in existence for over seven years, and has grown into the largest suburban radio club in Australia. The membership at present totals about 72, 45 of whom hold transmitting licences. The Club affords an excellent opportunity for radio enthusiasts of the district to get together and discuss ideas in common, or air their differences in a friendly manner, thus bringing about a better spirit of co-operation and understanding, to the advantage of all concerned.

The DX amateur enthusiast is catered for in a special way by the Club's outward QSL Bureau, whereby any number of QSL's may be dispatched, irrespective of destination, for a very small additional monthly fee. This service is open to financial members only, and definitely is not extended to those outside the Club.

The success of any club appears to rest a great deal on the activities of office bearers, in particular the secretary. The untiring efforts of our foundation members and early secretaries are now bearing fruit, as very shortly we hope to reach our half-century in the transmitting field, and thus become: "Lakemba Radio Club—The Voice of 50 'Hams'."

★

"Joey's" Beware!

One of our early club members, Mr.

Radio Club Caters For Transmitters And Shortwave Listeners

Unlicensed N.Z. Transmitter Prosecuted: Slow Morse Transmissions : Lakemba Radio Club Notes And News.

By W. J. P.

W. Picknell, writing from New Zealand, informs us that an unlicensed transmitter was detected at Auckland recently, and the offender prosecuted on two charges. The station in question was operating on 81 metres and using the call signs ZLIXK and VPK. The latter is the call sign allotted to the Cocos Island station.

The N.Z. Radio Inspector got on the trail and in four hours had located the offender, who expressed surprise that the transmissions were getting out. He stated that he was only operating as a hobby and was just sending calls to friends in a nearby street. Needless to say, the transmissions were received as far south as Napier and New Plymouth!

★

Slow Morse Transmissions

In reply to many enquiries, VK2DL wishes to advise that the Sunday evening A.O.P.C. and slow morse transmissions will be continued as soon as possible. A new transmitter is under course of construction, which, when completed, should provide a much more efficient transmission. It should be on the air by November.

★

VK2QP' An Up-To-Date Station

The above photograph shows the layout of amateur station VK2QP, of Punchbowl, N.S.W., owned and operated by Mr. L. Hughes. 2QP has been on the air since Dec. 26, 1933. The first transmitter was a self-excited rig using a single 45 valve with an input of 18 watts. The present transmitter is a four-stage affair, 47 c.o., 42 f.d., 46 buffer, and P.P. 46's in the final, with crystals oscillating on frequencies of 7,140 and 7,211 k.c. The popular method of link coupling is used throughout. For

telephony work, single choke Heising is used, with a pair of 42 valves in parallel. The speech amplifier consists of a 56 resistance-coupled to a 56, transformer-coupled to the 42's.

The 40-metre band is the one that is mostly used, although about 20 countries have been worked on 20 metres. Seventy countries have been QSO'd altogether, Europe and South America being required for W.A.C. 'phone on 40 metres. On C.W., W.A.C. and W.B.E. have been worked several times.

The power supplies consist of two packs, each of 400 volts, using 80 rectifiers in both. Several antenna systems have been tried, the best being a half-wave 40-metre zepp, 60 feet high at the western end, 33 feet at the eastern end, with 45-foot feeders spaced 4½". The receiver is a five-valve T.R.F., using a 58, 57, 56, 42 and 80, with a 15-foot indoor aerial. VK2QP is always ready to QSO and QSL.

Incidentally, Mr. Hughes has been QSL officer for Lakemba Club for the past four years. The activity of club members is illustrated by the fact that he handled 9,500 QSL cards during the 12 months ending May, 1937.

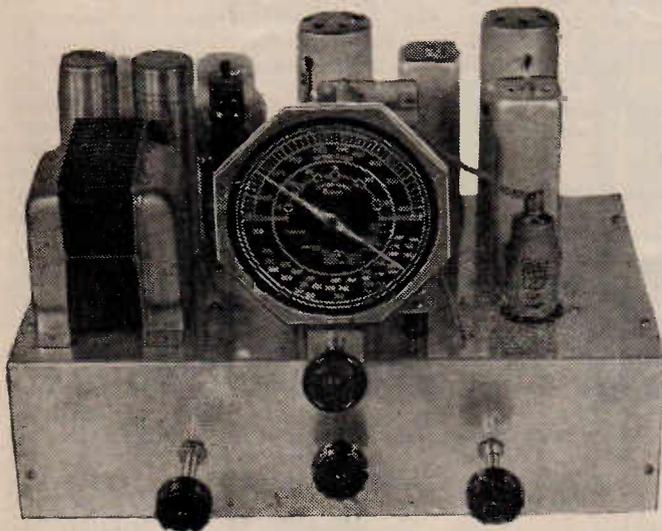
Ensuring a Good Earth

A good earth connection is essential to the proper working of a set, but where this is made on an iron pipe, it is difficult to make the solder "take." If the pipe is first cleaned in the usual manner and then dampened with a solution of copper sulphate (bluestone), which should be allowed to dry, copper in a thin film is deposited on the pipe.

This provides an excellent surface to take the solder, and a good joint will result.—E. P. Twynam (AW299-DX), Taralga, N.S.W.

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THIS LOW-PRICED, EASY-TO-ASSEMBLE
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**COMPLETE—ANYONE CAN ASSEMBLE THIS
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| 1 Stromberg-Carlson 2-gang Condenser | 1 .5 meg. Potentiometer |
| 1 Radiokes DC1 Colourvision Dial | 1 25,000 ohms Voltage Divider |
| 1 Radiokes MU-60 Power Transformer—385v. at 60 m.a., 6.3v. at 3a., 5v. at 2a. | 1 25 mfd. Electrolytic Condenser |
| 2 Ducon 500-Volt Electrolytics, 8 mfd. | 2 .5 mfd. Tubular Condensers |
| 3 1 meg. Resistors | 5 .1 mfd. Tubular Condensers |
| 2 .5 meg. Resistors | 2 .01 mfd. Mica Condensers |
| 1 .25 meg. Resistor | 2 Valve Cans |
| 2 .1 meg. Resistors | Sockets—1 "P" type, 3 6-pin, 2 4-pin |
| 1 50,000 ohms Resistor | Hook-up wire, Nuts and Bolts, Knobs, Power Flex, etc. |

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The 1937 Advance is the most brilliant and efficient 4/5 Dual-Wave Superhet ever designed. And the low-priced Radiokes 1937 Advance Kit-set is the most satisfactory and easiest to assemble Kit-set Radiokes has ever made available.

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Remember the price—only £9/9/- list—complete to the smallest nut and bolt—ready packed for instant assembly with complete instructions.

Order yours now from your nearest Radio Dealer or from any Wholesale Distributor in any capital city.

Write to Radiokes Pty. Ltd., Cnr. Cleveland and George Streets, Sydney, for free booklet describing this wonderful Kit-set in full detail.

25 Years In Amateur Radio . . (6)



The sixth instalment of a biography covering the early days of radio, written for the "Radio World" . . .

By DON B. KNOCK

The author in the radio room at Wyndham, North-West Australia, in 1930.

THE "All Empire" receiver as introduced in 1928 was the first to use the newly-developed screen-grid valve as R.F. amplifier for the short waves, and it worked so well that at least two Sydney radio dealers "made hay while the sun shone." Also, a boom in aluminium followed, for after this the familiar wooden baseboard and bakelite panel were "out."

Radio On Trans-Pacific Flight

It was with the original "All Empire" receiver that I had one of the greatest thrills of my life. Hardly was it completed when news came of the start of the most magnificent trans-ocean flight of all in the history of aviation. The late Sir Charles Kingsford Smith, then relatively unknown to the general public, had pulled the old "Southern Cross" into the air from Oakland airport, U.S.A., with full tanks, and with his co-pilot, Charles Ulm, navigator Lyons and wireless operator Warner, was heading for Australia via Honolulu and Fiji.

In those days the shortwave bands were not so congested with the vast number of commercial stations as now, and a few hours after leaving Oakland, the I.C.W. signal from KHAB, the "Southern Cross," was heard giving flying conditions and position reports. KHAB carried a special T.P.T.G. transmitter of 50 watts rating, designed by Heintz and Kaufman, and the signal was received consistently in Sydney throughout the whole of the flying time to Australia.

One could visualise the 'plane forging through bad weather as the signal varied owing to the swing of the trailing aerial. On several occasions the signal was picked up and re-broadcast by 2BL, Sydney, and it was amusing to hear subsequent opinions of listeners to the effect that they "could distinctly hear the roar

of the engines." What they heard was the rise and fall in pitch of the wind-driven alternator.

Getting Out On "10"

It was around 1928 that Australian amateurs began to take a serious interest in 10 metres, and several made a start with transmitters of sorts. In Sydney, Clive St. John (VK2RX) co-operated with myself, and together we succeeded in putting signals between Rockdale and Randwick. Nothing was heard of interstate stations until 1929, when 4th, 5th and 3rd districts began to break through, followed by New Zealanders, Hawaiians, and finally Americans. Contacts speedily followed.

The great turning point in amateur radio affairs had also arrived about this time, when the rulings of the 1927 Washington Conference came into action. It was good-bye to 32 metres, the most useful band amateurs had ever enjoyed, or are ever likely to. The big advantage of 32 metres, apart from its wonderful DX capabilities, was the fact that one could chat to overseas fellows with little or no QRM. Most overseas stations, with the exception of a few favoured Englishmen and Europeans, were on 45 metres, or 39 to 42 metres.

Australians and New Zealanders enjoyed immunity from congestion, and QSO's were rarely of the "73 CUL OM" variety. The rag-chews were long and interesting. To give up 32 metres and wedge into 7,000-7,300 k.c. was quite a blow, but the amateur has a habit of clearing obstacles, and with "QST" showing the way, transmitters and receivers were cleaned up to meet the new conditions. We still had 20 metres, however, and that band has since proved to be the band of bands for easy DX.

In 1930 an opportunity presented itself to undertake radio communi-

cation work in the "wide open spaces," and so I accepted an appointment at Wyndham Meatworks, North-West Australia, to instal and maintain a system of shortwave radio telephone communication. The scheme was to link up cattle-drafting centres and stations with the works. The apparatus was constructed in Sydney, and consisted of a 100-watt key and 'phone station, signing VIX on 55 metres, a launch station (VJQX), and a mobile station (6JU) for inland testing.

Static "One Continuous Roar"

Arriving at Wyndham in early March, I got an inkling of the hopelessness of radio reception there during the rainy season. I had heard static before, but never anything like that. It was one continuous roar. The receiver was stowed away until such time as the weather gods relented and the blaze of lightning around the sky disappeared.

Before leaving the East, I had arranged for an amateur call-sign, which was granted as VK6NK. How useful this was to prove I little realised at the time. During the bad weather the station VIX was connected up and tested, and aerials erected. The receiver was modelled on the lines of the faithful "All Empire," and proved very sensitive, so sensitive that a bad snag was encountered from the start.

It had been necessary to site the station in a large store quite close to the works power house. When the two 100 k.w. D.C. generators about 150 feet distant were in action, the din can be well imagined! Something had to be done about it, and for certain reasons the station could not be moved. Came a headachy period of testing special receiving aerials. With a vertical aerial consisting of lead-covered cable, with the sheathing earthed, it was possible

to hear the stronger amateurs on 40 metres.

Doublet Solves The Problem

During a contact with VK6MO, he described to me in detail particulars of a doublet referred to in "QST," using twisted flex feeders, and suggested I try it. This was erected, with one half of the doublet vertical and the other half directly underneath and horizontally in the form of a circle. The results were amazing. The din from the generators subsided to a low level, and R4 signals could be heard on 40 metres. On 20, results were even better. No wonder that in recent years radio journals have popularised the transposed feeder doublet as an aid to overcoming radio-inductive QRM.

The transmitter for VK6NK consisted of a T.P.T.G. oscillator using a Philips MB1/50, power being taken from a rotary converter running from the works 230 volts D.C. supply. When not engaged in working with VIX and the other stations, VK6NK practically lived on the air on 20 and 40 metres, using a 40 metre "Zepp" with series and parallel tuned 50-foot feeders.

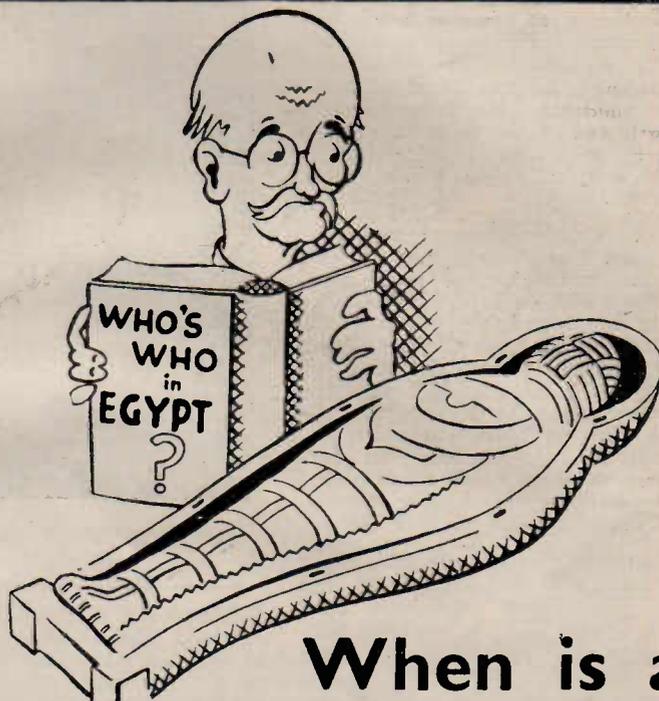
Reception conditions were peculiar at this location, for right behind Wyndham Meatworks is the vast hill known as the Bastion. On lower frequencies, this huge mass of ironstone effectively blocks off all signals from the south in a direct line. So complete is the cut-off that ships approaching Wyndham are able to hear southern broadcasters quite well until within 200 yards of the jetty, when signals completely disappear.

One refrigeration engineer, owner of a very fine American all-wave receiver which he used for entertainment in his cabin, came to me in perplexity to find out what was wrong with the receiver. All he could hear when tied up at the jetty were Japs, Chinese, and the Philipinos. Short waves, however, are no respecters of hills, and have a habit of leaping them, and so 20 metres proved the stepping stone to Sydney for amateur contacts from VK6NK.

Toward the end of April that year I was informed by VK2RX on 20 metres that a Ryan monoplane, "City of Sydney," was leaving Mascot aerodrome on a flight to England via Wyndham, and that she carried radio. Would I look out for signals? A request like that gives added interest to radio, and so the receiver went into action with long periods of searching for VMZAB, known to be somewhere around 34 metres.

Signals Fade Out

One day, about noon, I picked up a strong carrier wave, varying some-

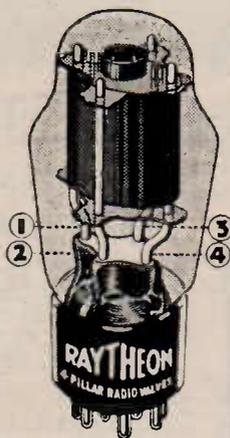


When is a MUMMY a DADDY?

Maybe the Egyptians knew . . . maybe they started winding the other way to establish the distinction—but to us they're all just mummies!

Metal valves are causing the same difficulty with valves. They all look alike—nothing to distinguish one from the other—they're all just valves to the average radio owner. Now, with glass it's different—or even glass-metal. The buyer can look inside and, if he's shrewd, make SURE he's getting the valve with the four pillars. But with metal valves, the inside story is as untold as the identity of the Egyptian mummy.

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what. Then it was interrupted to slowly sign "VMZAB," with information to the effect that the 'plane had left Newcastle Waters and was heading for Wyndham. The signal was held strongly for two hours or more, when suddenly it decreased in strength and at the same time crept along the dial slowly. Eventually it faded completely out. What had happened?

Some intuition warnèd me that the 'plane had made a landing, and that the weakening of the signal, plus the variation of frequency, was due to the increasing proximity of the earth as she came down. An hour elapsed, and then came the weak but certain "SOS de VMZAB" repeated several times. The signal was obviously in the "skip" area for reception at my location, but fortunately, at this lunch time period for the works, much of the machinery closed down for an hour or so.

Eventually the text following the SOS calls was deciphered, and was to the effect that "we have been forced down with a broken camshaft. Believe somewhere near Rosewood. Not far from a river."

That was enough for action. Hurriedly putting VK6NK on the air on



Another view of the author and his radio shack at Wyndham.

20, an "SOS Sydney" call was sent out and was immediately answered by VK2NS in Bathurst. Details were passed on and Evans telephoned Mascot aerodrome. At this stage it became necessary to keep in touch

both with the signals from VMZAB and the 20-metre band, so two receivers were used, with one headphone from each, and connected to separate aerials.

Meanwhile, the attention of VK2JP in Sydney had been attracted, and a lengthy period of emergency traffic commenced. The works officials were notified, and local police and bushmen studied maps in an endeavour to place the possible location of the 'plane.

(To be continued)

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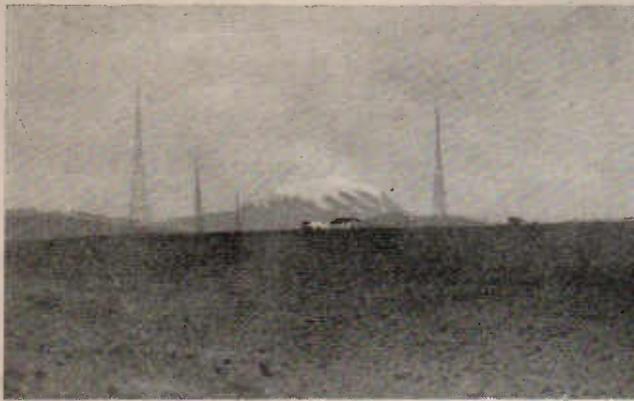
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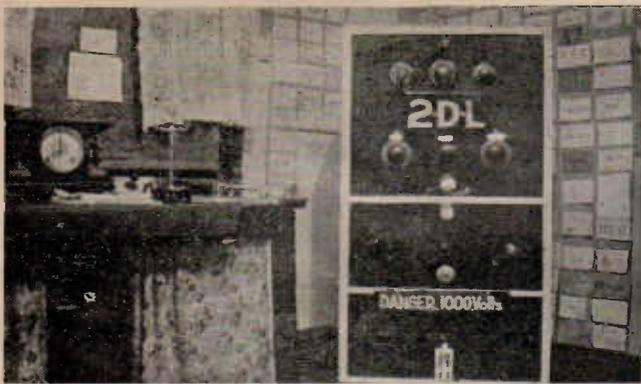
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 2CI—Kempton, C., 10 Clapton Place, King's Cross.
 2CJ—Johnston, W. C., Moonee Street, Coff's Harbour.
 2CK—Warner, G. A., Wilyama, Wyong.
 2CL—Taylor, L. H., 45 Hardy Street, Ashfield, N.S.W.
 2CM—Maclurcan, C. D., "Namanula," Agnes Street, Strathfield.
 2CN—Moginie, C. K., "Chezales," Jacobson Avenue, Nth. Brighton.
 2CP—Cooper, O. E., 2 Corona Flats, Glebe St., Randwick.
 2CS—Swain, L. T., 6 Frederick Street, Waratah.
 2CT—Kerkin, E. J., 221 Victoria Road, Drummoyne.
 2CU—Campbell, D. D., Ulmarra, Clarence River.
 2CV—Ferrie, R. J., 171 O'Sullivan Road, Rose Bay.
 2CW—Pearce, W., 30 High Street, Cessnock.
 2CX—Evans, J. T., "Aberteifi," Adelaide Street, Paxton.
 2CY—Alsop, J. G., 59 Ernest Street, Lakemba.
 2CZ—Australian-New Zealand Amusement Company, 160 Castle-
 reagh Street, Sydney.
- 2DA—Caldecott, H. W. S., 77 Seaview Street, Manly.
 2DB—Davies, H. A., 139 Lyons Road, Drummoyne.
 2DC—Sellenger, D. C., 9 Cecil Street, Hurstville.
 2DD—Dawson, D., 307 Marius Street, Tamworth.
 2DE—Ronshaw, W. P., "Waimea," Lord Street, Roseville.
 2DF—Cocks, L. S. W. J., 20 Stewart Street, Eastwood.
 2DG—Rudkin, K., Lismore St., Abermain, N.S.W.
 2DH—Hammer, W. C., 99 Francis Street, Bondi.
 2DI—Cole, G. F., 20 Ewos Parade, Cronulla.
 2DJ—Cooke, F. B., 28 Central Avenue, Mosman.
 2DK—Clunne, E., 35 Brunswick Street, Merrylands.
 2DL—Phelps, W. J., 14 Watkin Street, Canterbury.
 2DM—Maclaren, D., 83 Hawthorne Parade, Haberfield.
 2DN—Parris, J. E., George Street, Deniliquin.
 2DO—Raynor, R. H., Adele Street, Yass.
 2DP—Webb, M., 98 Duntroon Street, Hurlstone Park.
 2DQ—Nourse, J. C. D., 218 Pell Street, Railway Town, Broken Hill.
 2DR—Reed, D. W., 8 The Avenue, Waitara.
 2DS—Davis, R. R., "Palomar," Drumalbyn Road, Bellevue Hill,
 N.S.W.
- 2DT—Harrison, A. R., 49 Harrow Road, Stanmore.
 2DV—Hodder, F. A., Flat No. 1, 380 New South Head Rd., Double
 Bay.
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 rickville.
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 Waverley.
- 2EA—Fitzgerald, E. F., 25 Wallace Street, Waverley.
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 2ED—Bell, W. J., 5 Second Avenue, Campsie.
 2EE—Llewellyn, J. L., 9 Allison Avenue, Lane Cove.
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 2EK—Kenny, E. F., 13 Good Street, Granville.
 2EL—Colyer, E. L., 3 Woods Street, Manly (P.Q., Box 1884K,
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- 2EM—Sutton, A. F., 28 Elva Avenue, Gordon.
 2EN—Hulme, E. C., 42 Kennedy Street, South Kensington.
 2EP—Watson, E., 80 Stanley Street, Burwood.
 2EQ—McNamara, J. S., 35 Woronora Parade, Oatley.
 2ER—Adams, F. A., 26 Neil Street, Carlingford.
 2ES—Simpson, E. M., 128 Bellevue Road, Bellevue Hill.
 2EU—Phibbs, A. R. A., 410 Townsend Street, Albury.
 2EV—McCredie, E. S., 219 Burwood Road, Burwood.
 2EW—Webster, W., 126 Pittwater Road, Gladesville.
 2EX—Outtrim, A. H., Windsor Street, Richmond.
 2EY—Junk, G. P., 103 Napoleon Street, Sans Souci.
 2FD—Davidson, W. F., 29 Scott Street, Croydon.
 2FE—Retallick, J. M., Mary Street, Bellingen. (Portable through-
 out New South Wales.)
- 2FF—Bracken, I. C., 8 Parraween Street, Cremorne.
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 2FY—Vaughan, D. E., 3 Hampden Street, Lakemba.
 2FZ—Reid, G. W., de Boos Street, Temora.
- 2GA—McKenzie, Mrs. F. V., 26 George Street, Greenwich Point.
 2GC—Charles, G. B., Dalry House, Richard Avenue, Bishops Court,
 Coogee.
- 2GD—Edgcombe, G. H., 64 Clanville Road, Roseville.
 2GE—Edwards, G. J., 13 Nicholson Street, West Maitland.
- 2GG—Gue, J., 12 Llewellyn St., Lindfield, N.S.W.
 2GH—Gibson, R. L., Alstonville, Richmond River.
 2GI—Blanch, C. K., Woodstock, Leigh, Clarence River.
 2GJ—Jones, G. E., 5 Oakley Road, North Bondi.
 2GK—Le Cornu, O. C., 64 Spring Street, Lismore, N.S.W.
 2GL—Richmond River Listeners' League, 83 Orion Street, Lismore.
 2GM—McDowell, G., 97 Rookwood Road, Bankstown.
 2GO—Mackay, C. S., High Street, Coff's Harbour.
 2GQ—Barlow, E., Flat No. 2, 51 Spit Road, Mosman, N.S.W.
 2GR—Robinson, A., 190 March Street, Richmond.
 2GS—Simmonds, A. G., James Street, Murwillumbah.
 2GT—Bruce, G. T., Capper Street, Tumut.
 2GV—Fenton, A. S. G., 26 Muttama Road, Artarmon.
 2GW—Woolnough, W. L., 31 Ordinance Avenue, Lithgow.
 2GX—Woollahra Amateur Radio Club, Rear 47 Queen Street, Wool-
 lahra.
- 2HA—White, E. B., 221 Greenwich Road, Greenwich Point.
 2HB—Choules, G. H., 38 Wentworth Road, Homebush.
 2HC—Carter, H. R., Yarraman North Station, Quirindi.
 2HE—Miller, H. E., 7 Kent Street, Belmore.
 2HF—Furze, J. A., "Alkoomie," Edgecliffe Esplanade, Seaforth.
 2HG—Mackel, J. F., "Alster," Devonshire Street, Chatswood.
 2HH—Sandel, O., 248c Oxford St., Woollahra, N.S.W.
 2HJ—Harll, N. J., 46 Northcote Avenue, Killara.
 2HK—Powell, E. G., 3 Wilfield Avenue, Vaucluse.
 2HL—Lapthorne, H. C., 1 Bowen Street, Chatswood.
 2HM—Marshall, H. A., 94 Francis Street, Bondi.
 2HN—Nottingham, H. A. J., "House of David," Lane Cove Road,
 North Ryde.
- 2HO—Hart, H., 70 Lord Street, Roseville.
 2HP—Peterson, H. F., "St. Mena," Hamilton Street, Coogee.
 2HQ—Pottier, N. C., 6 Veret Street, Hunter's Hill.
 2HS—Fanker, E. M., 11 Rosslyn Street, Bellevue Hill.
 2HT—Thomas, H. K. R., 2 Kahibah Road, Mosman.
 2HU—Huey, R. M., 18 Bay St., Croydon, N.S.W.
 2HV—Hutton, H. V. J., Henderson Street, Inverell.
 2HW—Holt, R. A., Cr. Market and Fraser Streets, Tahmoor.
 2HX—Jinks, E. W., 144 Gaffney Lane, Railway Town, Broken Hill.
 2HY—Stacey, R., 14 Hume Street, Crow's Nest.
 2HZ—Moore, W. M., 34 Sutherland Street, Cremorne.
- 2IA—Handel, K. F., 16 Culwulla Street, Hurstville.
 2IB—Sproule, A. L., Henry Street, Werris Creek.
 2IC—Clarke, A. I. K., 76 Fricourt Avenue, Earlwood.
 2IE—Cox, P., Lidsdale, via Wallerawang.
 2IF—R9 Radio Club (C. Winch), 281 Victoria St., Drummoyne.
 2IG—Ross, R. W., 673 David Street, Albury.
 2IH—Moore, M. J., 70 Church Street, Dubbo.
 2IJ—Gray, A. H., 5 Flat, "The Maples," Killara.
 2IK—Brown, A. J., 12 Gretchen Avenue, Earlwood.
 2IL—Brown, R. A., Lucasville Road, Glenbrook.
 2IM—MacLean, J. D., Farm 444, Leeton.
 2IN—Ayles, J. A., 112 Jersey Road, Woollahra.
 2IO—Barlow, A. E., 21 Ewart Street, Marrickville.
 2IP—Thornton, G. W., 8 Gredden Avenue, North Sydney.
 2IQ—Trehorne, R. F., 5 Waimea Street, Burwood.
 2IR—Hannam, H. W., 34 Seymour Street, South Hurstville.
 2IT—Free, G. B., 42 Robert Street, Willoughby, N.S.W.
 2IU—Brown, A. T., 36 Pacific Highway, St. Leonards, N.S.W.
 2IW—Wallace, R. I. G., Hill Farm, Robertson.
 2IX—Green, B. H., 62 Bay Road, Waverton.
 2IY—Myers, J. G., 128 Wycombe Rd., Neutral Bay, N.S.W.
 2IZ—Wood, G. A., 11 Waimea Street, Woollahra.
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 2JG—Maynard, F. S., 80 Brighton Street, Croydon.
 2JH—Hutchison, J. V., 25 Holbrook Avenue, Kirribilli.
 2JJ—Jennison, J. W., "Wallaroo," Mathoura.
 2JK—Brown, J. H. S., "Shadwell," Chelmsford Avenue, Botany.
 2JL—Young, J. L., Cowabbie, Coolamon.
 2JN—Keane, J. P. J., 42 Stoney Creek Road, Bexley.
 2JO—Caldwell, R. C., 10 Simpson St., Bondi N.S.W.
 2JP—Pike, J. H. A., 14 Sarner Road, Greenwich.
 2JQ—Nell, Rev. G. A. M., The Rectory, Binda.
 2JR—Reed, J. G., 24 Kenilworth Street, Croydon.
 2JS—Kitto, T. C., c/o Airsales Broadcasting Co., Newcastle.
 2JT—Luckyman, C. F. A., 66 Chandos Street, Ashfield.
 2JU—Moyle, J. M., 882 Pacific Highway, Chatswood.
 2JV—Roberts, C. D., 49 Greenwich Road, Greenwich.
 2JW—Williams, E. J., 51 Ocean Avenue, Edgecliff.
 2JX—Adams, P. H., 39 King Street, Waverton, N.S.W.
 2JZ—Mather, A. S., 14 William Street, Singleton.
- 2KB—Fairhall, H., 86 Bruce Street, Cook's Hill.
 2KC—Fry, R. H., 45 Kembla Street, Wollongong.
 2KD—Pearson, A. W., 111 Baker Street, Temora.
 2KE—Watson, W., Cr. Lang & Gillies Streets, Kurri Kurri.
 2KF—Field, C. J., 88 Francis Street, Leichhardt.
 2KG—Greenhalgh, K. N., 20a Gregson Avenue, Mayfield West.
 2KH—Nelson, W. P., 5 Magill Street, Randwick.
 2KI—Pickering, A. V., "Ocean View," Blair Street, Bondi.
 2KJ—Cramond, W. H., 59 Bridge Street, Lane Cove.
 2KK—Dodds, J. W. M., 1 Maitland Street, Kurri Kurri.
 2KL—Maguire, E. N., 146 The Boulevard, Dulwich Hill.
 2KN—Driscoll, A. E., jnr., Abbott Street, Quirindi.
 2KP—Fox, A., 28 The Avenue, Rose Bay.
 2KQ—Early, J. H., 11 View Street, Temora.



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 2KS—Meyers, L. S., 289 Wardell Road, Marrickville.
 2KT—Seccombe, L. M., 4 Haybourn Avenue, Rockdale.
 2KU—Archibald, I. W., 49 Fraser Street, Dulwich Hill.
 2KV—Bodkin, H. B., 290 Unwin's Bridge Road, St. Peters.
 2KW—Grant, A., Taylor's Arm Roadside, Macksville.
 2KX—Gray, T. A., 35 Hill Street, Manly.
 2KZ—Austin, E. M., Stanford Street, Kurri Kurri.
 2LA—Adams, L. K., 37 McClelland Street, Willoughby.
 2LB—Hackney, A. J., Bradman Street, Cootamundra.
 2LC—Glasscock, N., 9 McMahon Street, Willoughby.
 2LD—Dodds, L. H., 3 Anthony Street, Chatswood, N.S.W.
 2LG—Wallace, J. W., 87 Faithfull Street, Goulburn.
 2LH—Soraghan, D. St. J. P., 2 Spencer Street, Rose Bay.
 2LJ—Rayner, J., 8 Everson Street, Belmore, N.S.W.
 2LK—Harkness, K. L., 36 Carlotta Road, Double Bay.
 2LL—Lane, L. S., Weethall.
 2LN—LeNevez, A., 289 Annandale Street, Annandale.
 2LO—Higgins, C. S., 44 Ettalong Road, Pender Hill.
 2LP—Bean, L. P. R., "Rochester," Orana Avenue, Pymble, N.S.W.
 2LQ—Millen, D. R., 22 Hume Street, Wollstonecraft.
 2LR—Lakemba Radio Club, 334 Old Canterbury Road, Canterbury.
 2LS—Todd, L. V. G., 117 Denison Street, West Tamworth.
 2LU—Prentice, E. T., Sydney Radio Centre, Carlingford.
 2LW—Wagh, L. W., 12 Belgrave Street, Burwood.
 2LX—Crisp, H. C., 91 Curranulla Street, Cronulla.
 2LY—Bischoff, W. E. C., 180 Chandos Street, Crows Nest.
 2MA—A.W.A. Limited, 47 York Street, Sydney.
 2MB—A.W.A. Limited, Radio Electric Works, Parramatta Road, Ashfield.
 2MC—A.W.A. Limited, "Althorne," Beaconsfield Parade, Lindfield.
 2MD—A.W.A. Limited, 47 York Street, Sydney. (Portable).
 2ME—A.W.A. Limited, Pennant Hills.
 2MF—A.W.A. Limited, La Perouse.
 2MG—A.W.A. Limited, 12 Muston Street, Mosman.
 2MH—Sinclair, L. E., 19 Griffiths Street, Hurlstone Park.
 2MI—A.W.A. Limited, "Birtley Towers," Elizabeth Bay Road, Elizabeth Bay.
 2MJ—Crisp, A. J. T., 46 Rawson Avenue, Bexley.
 2MK—Elphinstone, L., Cr. Wrexham & Main Roads, Thirroul.
 2ML—McLaughlin, W. R., 16 Cliff Street, Watson's Bay.
 2MM—Long, R. H., 1 Jeffrey Street, Canterbury, N.S.W.
 2MN—Burke, H. E., 174 Bland Street, Haberfield.
 2MP—Winkler, M. H., 158 Morgan Street, South Wagga.
 2MQ—McGowan, W. E. C., 120 Queen's Road, Five Dock, N.S.W.
 2MR—Manly District Radio Club, 2 Fairy Bower Road, Manly.
 2MS—Spitzkowsky, M., 65 Everton Street, Hamilton.
 2MT—Hedley, C., 7 Gordon Street, Mayfield.
 2MU—Nangle, J., Observatory, Sydney.
 2MV—R.C.S. Radio, 21 Ivy Street, Darlington. (Portable.)
 2MX—Holmes, D. E., 33 Tamworth Street, Dubbo.
 2MY—McGregor, J. F., 61 Holdsworth St., Woollahra, N.S.W.
 2MZ—Hurstville Radio Club, 27 Neirbo Avenue, Hurstville, N.S.W.
 2NA—Callaghan, A. T., 45 Cottenham Avenue, Kensington.
 2NB—Buchanan, N. T. O., 206 Sydney Road, Manly, N.S.W.
 2ND—Dahl, N. L., 29 Cleveland Street, Wahroonga.
 2NE—Nunn, M. S., 62 Merlin Street, North Sydney.
 2NF—Musgrave, J., 28 Brighton Street, Petersham, N.S.W.
 2NG—Gough, N., "Remuera," Martin Street, North Manly.
 2NH—Gibbings, W. E., 31 Tupper Street, Marrickville.
 2NI—Johnson, A. K., 10 Duncan Street, Punchbowl.
 2NK—Ball, C. W., 520 Railway Parade, Hurstville.
 2NL—Squire, L. L., Thornton.
 2NM—Milton, H. W., 100 Church Street, Mudgee.
 2NN—Cortis-Jones, B., 62 William Street, Roseville.
 2NO—Knock, D. B., 14 Yanko Avenue, Bronte.
 2NP—Fryar, C. F. L., 113 Tennyson Street, Gladesville.
 2NQ—Pieremont, N. S., "St. Elmo," Dodson Ave., Cronulla, N.S.W.
 2NS—Evans, T. F., 193 Rockett Street, Bathurst.
 2NT—Tomkins, N. S., "Fredalma," Hammers Road, Northmead.
 2NU—Knock, D. B., 14 Yanko Avenue, Waverley. (Portable).
 2NV—Truman, R. P., 8 Lorne Avenue, Killara, N.S.W.
 2NW—Austwick, E. D., No. 1, Holbrooke Flats, Holbrooke Avenue, Kirribilli.
 2NX—Brooks, D. D., 14 Fitzwilliam Road, Vaucluse.
 2NY—Berry, R. J., 54 Bacon Street, Grafton.
 2OA—Winch, R. M., 35 Hermitage Road, West Ryde, N.S.W.
 2OB—Mashman, L. W., 12 Halley Avenue, Bexley.
 2OC—Chapman, O. G., Rankin Street, Wyong.
 2OD—O'Donnell, T. M., Commonwealth Bank, Hurlstone Park.
 2OE—Allworth, W. M., Cooma St., Yass, N.S.W.
 2OF—Francis, J. W., 337 Beryl Lane, Broken Hill, N.S.W.
 2OG—Menon, G. J., 11 Macartney Avenue, Chatswood.
 2OH—O'Brien, N. B., 81 Brook Street, Coogee.
 2OI—Bower, G. G., 346 Homer St., Earlwood, N.S.W.
 2OJ—Arnold, E. N., Forrest Hill Avenue, Albury.
 2OL—Watson, H. L., Tallagala Street, Unanderra.
 2OM—Springett, A. J., Red Cross Farm, Exeter.
 2ON—Douglas, R. L., "Aloha," Murray Street, Tamworth.
 2OO—Lovering, G. F., 11 Allibone Street, Ashfield.
 2OP—Roy, A. B., 8 Bronte Street, Waverley.
 2OQ—Capsev, H., 33 Gordon Street, Brighton-le-Sands.
 2OR—Brown, M. A., 15 Rawson Street, Epping.
 2OS—Young, I. N. C., Rockleigh Street, Thornton.
 2OT—Sobels, M. D., Hogarth Avenue, Dee Why, N.S.W.
 2OU—Wardle, S. W. L., Imperial Buildings, Beady St., Armidale.
 2OV—Dimmock, B. L., 9 Canterton Street, Hurlstone Park.
 2OY—Harrison, M. H., 168 Paddington Street, Paddington.
 2OZ—Olle, J. D., 17 Eccles Avenue, Ashfield.
 2PC—Proving Radio Club, 29 Blairgowrie Street, Dulwich Hill.
 2PE—Perooz, J. P., Hope Street, Bourke.
 2PF—Carruthers, F. A., 4 Fripp Street, Arncliffe.
 2PG—Gosnell, R., 234 Alt Street, Haberfield.
 2PH—Petith, J. R. F., 1 Loftus Crescent, Homebush.
 2PK—Hainsworth, P. T., "Roselea," Castlereagh Street, Penrith.
 2PM—McLeod, N. J., 107 Artarmon Road, Artarmon.
 2PN—Weeden, R., "Clifford," Capper Street, Tumut.
 2PP—Phillips, J. P. C., 22 East Crescent, McMahon's Point.
 2PS—Stephon, P. G., 144 Croydon Road, Croydon, N.S.W.
 2PT—Richardson, C. A., 78 King's Road, Five Dock.
 2PV—Vesper, J. P., jnr., 779 Military Road, Mosman.
 2PW—Wise, W. G., 44 Nowranie Street, Summer Hill.
 2PX—Ackling, H. D., 76 Market Street, Bankstown.
 2PY—Nancarrow, R. S., 46 St. Marks Road, Randwick, N.S.W.
 2PZ—Cowan, C., 106 Aberdare Street, Aberdare.
 2QA—Russell, G. J., Nyngan.
 2QB—R.C.S. Radio, 21 Ivy Street, Darlington.
 2QC—Best, G. B., 64 Western Road, Parramatta.
 2QD—Dixon, R. H., 477 Olive Street, Albury.
 2QE—Fietz, A. A., 641 Young Street, Albury.
 2QF—Shelley, G. H., 10 Berry Road, Crow's Nest.
 2QG—Lillie, R. C. B., 17 Beresford House Flats, Belgrave Street, Manly.
 2QH—Moore, E. A., 92 Princes Highway, Arncliffe.
 2QI—Davies, L. E., 10 Russell Street, Vaucluse, N.S.W.
 2QJ—Peppercorn, A. E., 33 Regent Street, Bexley.
 2QK—Preston-Smith, C., "Winchcombe," Violet St., Balgowlah.
 2QL—Hine, F. T., 19 Albert Street, Campsie.
 2QM—Light, C. E., 79 Beach Street, Coogee.
 2QO—Dale, T. C., 17 Richmond Avenue, Cremorne.
 2QP—Hughes, L. W., 69 The Broadway, Punchbowl.
 2QR—Burstall, J. E. R., 7 Wandean Avenue, Beecroft.
 2QS—Small, E. G., 35 Church Street, Mayfield, Newcastle.
 2QT—Mutton, A. H., 31 Stafford Street, Stanmore.
 2QU—Waldock, G. A., 17 Park Parade, Lithgow.
 2QV—Pickle, E. J., Edward Street, Fennell's Bay.
 2QW—Shipley, A., 82 Brighton Boulevard, North Bondi.
 2QX—Warren, J. C., 50 Arthur Street, Punchbowl.
 2QY—Moss, A. M. L., 45 Oxford Street, Paddington.
 2QZ—Black, R. H., 16 Alice Street, Harris Park.
 2RA—Priddle, R. A., 18 Park Street, Marrickville.
 2RB—Brown, R. A., 174 Park Road, Auburn.
 2RC—Chilton, R., Chilton Avenue, Wahroonga.
 2RD—Longworth, R., 9a Marshall Avenue, North Wollstonecraft.
 2RE—The Aust. School of Radio Engineering (A. Middleton), Wembley House, Railway Square, Sydney.
 2RH—Reynolds, R. P., 118 Kincaid St., Wagga, N.S.W.
 2RJ—Fagan, R. J., Sunnyridge, Mandurama.
 2RK—Carpenter, N. D., Austral Building, Commercial Road, Murrumbidgee, N.S.W.
 2RL—Litchfield, A. R., "Springwell," Cooma.
 2RM—MacFarlane, R. A., Wakaden Street, Griffith.
 2RN—Hentze, P. R., 14 Stanhope Road, Killara, N.S.W.
 2RO—Turnbull, R. W., 2 Ethel Street, Burwood.
 2RP—Purdie, R. R., Milcham Street, Windsor.
 2RQ—Foley, J. P., Port Hacking Road, Port Hacking.
 2RS—Jones, W. H., 1 Hastings Street, Marrickville.
 2RT—Felton, W. R., c/o R. H. Jones, 319 Princes Highway, Kogarah, N.S.W.
 2RU—Collett, M. E., Excelsior Road, Lisarow.
 2RV—Huband, R. W., c/o Railway Station, No. 9 Cottage, Werris Creek.
 2RW—Cusiter, R. W., 38 Victoria Street, Lewisham.
 2RX—St. John, H. C., 82 Gibbes Street, Rockdale.
 2RY—Brown, I. L., 7 Day Street, Drummoyne.
 2RZ—Atkinson, J. M., 27 Pine Street, Chippendale.
 2SA—Salmon, W. E., "La Paloma," Frederick Street, North Bondi.
 2SB—Bapks, S. W., 19 Arcadia Street, Coogee.

- 25C—Municipal Council of Sydney Electricity Department, Oxley Street, Crow's Nest.
 25D—2nd Divisional Signals Radio Club, Engineers' Depot, Park Road, Paddington.
 25E—Wright, A. E., Louth, via Bourke.
 25F—Jones, D. A., Mountain Road, Austinmer.
 25G—Tonkin, S. G., C/o Station 2LM, Ballina Road, Goonellabah, via Lismore.
 25I—Scholtz, R. J., 23 Stapleton St., Wentworthville, N.S.W.
 25J—Jacobs, S., 20 Horton Street, Marrickville.
 25K—Kaufman, S. D., 23 Isabel Street, Belmore.
 25L—Hoare, P. M., 17 Cathcart Street, Lismore.
 25N—Nelson, S. S., 4 Albion Street, Marrickville.
 25O—Cowell, G., 117 Mitchell St., Merewether, N.S.W.
 25P—Pemberton, S. T., 58 Bowden Street, Ryde.
 25Q—Inglis, S. D., 15 Percival Rd., Stanmore, N.S.W.
 25R—Emmelhainz, A. E., 251a Pitt Street, Sydney.
 25S—Fussell, R. M., 39 Tulloh Street, Willoughby.
 25T—Tatham, S. E., 160 Castlereagh Street, Sydney.
 25U—Middleton, A., 96 Spencer Road, Cremorne.
 25V—Peters, C. W., 7 Highgate Road, Lindfield.
 25W—Southwell, C. L., C/o H. Jackson, Baroona Avenue, Church Point, N.S.W.
 25X—Slade, C. W., "Rockleigh," Lang Street, Croydon.
 25Z—King, N. S., 43 Bent Street, North Sydney.
 2TA—Thackeray, A. M., Wootoona, via Young.
 2TB—Knight, J., 14 Mary Street, Lakemba.
 2TC—Taylor, H. J., Bonnie Doon, Monteagle.
 2TD—Buzacott, R. N., 2 Dennistoun, 3 Perry Avenue, Nth. Sydney.
 2TE—Boyd, A., 27 Bridgewater Street, Rozelle.
 2TF—Cohen, R. F., 78 Cheltenham Crescent, Cheltenham, N.S.W.
 2TG—Goldie, A. T., 18 Kintore Street, Dulwich Hill.
 2TH—Heimann, T. R., 36 Gurwood Street, Wagga Wagga.
 2TI—Ryan, W. G., 2 Tunstall Avenue, Kingsford, N.S.W.
 2TJ—Torrington, R. N., 21 Dellview Street, Bondi.
 2TK—Croke, T. L., 73 Bridge Street, Lithgow.
 2TL—Watson, T. W., 70 Calero Street, Lithgow.
 2TN—Bailue, I., "Glamis," Pitt St., Randwick, N.S.W.
 2TO—Ansell, L. C., C/o Police Wireless Station, Georgetown Rd.,
 2TP—Wickham, A. N., 50 Burra Road, Artarmon.
 2TQ—Sherlock, K. H., 47 Lancaster Avenue, Ermington.
 2TR—Conrad, R. E., 6 Connemarra Street, Bexley.
 2TS—Scottney, H. R., 48 Hay Street, Leichhardt.
 2TT—Todd, T. A., "Loloma," Vimiera Road, Eastwood.
 2TU—Bosher, A. T., 324 West Street, North Sydney, N.S.W.
 2TV—Lenon, R. J., Fitzroy Street, Cowra.
 2TW—Bushby, T. R. W., 2 "Davellin," Oakley Road, North Bondi.
 2TX—Levenspiel, P., "Braeside," Rankin Street, Wyong.
 2TY—Best, R. W., 57 Hunter Street, Newcastle.
 2TZ—Tamworth Amateur Radio Club, "Northern Daily Leader" Buildings, Tamworth, N.S.W.
 2UA—Heathers, C. J., 40 Raymond Street, Bankstown.
 2UB—Bastow, G. C., 105 Sutherland Street, Paddington, N.S.W.
 2UC—Maloney, K. A., 29 Hindmarsh St., Lismore, N.S.W.
 2UD—Archer, R. W., 7 Fulbourne Avenue, Pennant Hills.
 2UF—Tarrant, F., 7 Tooke Street, Cook's Hill, via Newcastle.
 2UG—George, Dr. C. W., 2 Edwards Bay Road, Mosman.
 2UH—Scott, F. L., 16 Bangalong Street, Naremburn.
 2UI—Wallbridge, A. L., 17 Henson Avenue, Mayfield East.
 2UJ—Ungor, H. W., "Rocky View," Alectown, via Parkes.
 2UK—Freeman, L. J., 122 Francis Street, Lidcombe.
 2UL—Broomhead, S. V., 29 North Parade, Campsie.
 2UM—Colton, G. C., 97 Clarendon Road, Stanmore. (Portable).
 2UO—The Wagga Amateur Radio Club, Fire Brigade Station, The Esplanade, Wagga Wagga.
 2UP—London, J. W., "Palomar," West Street, Manly.
 2UQ—Manley, P. J., 15 Princess Avenue, Vaucluse.
 2UR—Henry, C. J., Bridge Street, Uralla.
 2UU—Waddle, E. M., Nimbin.
 2UV—McElrea, W. J., 7 Jacka Street, Daceyville.
 2UX—Goyen, F. M., 2 Brucedale Avenue, Epping.
 2UY—Clay, H. V., 255 Blaxland Road, Ryde.
 2UZ—Browne, B. B., 62 Clifford Street, Goulburn.
 2VA—Bennett, A. V., 14 Park Avenue, Concord.
 2VB—Wood, R. E., 483 Anzac Parade, South Kensington.
 2VC—Cahill, W. B. V., 4 Woodford Road, Rockdale.
 2VE—Smith, N. J., 26 Reserve Road, Artarmon.
 2VG—Corthorn, R., 39 Ronald Avenue, Greenwich.
 2VH—Colville, S. V., 8 Small Street, Broadway.
 2VI—Gay, V. J., 30 Archer Street, Chatswood.
 2VJ—Jarvis, V. J. E., 49 Rocket Street, Bathurst.
 2VK—Fuller, H. J., 573 Englehardt Street, Albury.
 2VL—Nutman, J. T., 24 Cleland Road, Artarmon.
 2VN—Meyers, M. H., 96 Cabramatta Road, Mosman.
 2VO—McPherson, C. J., 3 Sparke Street, West Maitland.
 2VP—Morris, G. W., 31 Hotham Parade, Artarmon, N.S.W.
 2VQ—Paton, J. W. A., 260 Pacific Highway, Artarmon.
 2VR—Wheeler, A. R., "Winston," Malton Road, Epping.
 2VS—Stanley, V. E., Radio Station, Carlingford.
 2VT—Calvert, J. G., 27 Neirbo Avenue, Hurstville.
 2VV—Lofberg, O., 30 Albany Street, Bexley.
 2VW—Worswick, V., 67 Consett Street, West Concord.
 2VY—Hartley, A., 33 Sproule Street, Lakemba.
 2WA—Dwyer, J. T., "Beulah," Young.
 2WB—McKenna, A. M., "Youanmi," Henley Marine Drive, Five Dock.
 2WC—Norville, C. H., 11 Hollywood Crescent, Willoughby.
 2WD—Dukes, G. W., 43 Arundel Street, Forest Lodge.
 2WE—Standard Telephones & Cables (Aust.) Ltd., 258 Botany Rd., Alexandria, N.S.W.
 2WF—Faulks, R. W., 9 Modern Avenue, Canterbury.
 2WH—Stitt, W. H. R., "Kywong," Marsden Road, Forbes.
 2WI—Wireless Inst. of Aust. (N.S.W. Division) (P.O. Box 1734JJ, Sydney), 2 Brucedale Avenue, Epping.
 2WJ—Peell, W. J., 49 Alma Road, Maroubra.
 2WK—Kennedy, Rev. W. D., 62 Lennox Street, Rockdale.
 2WM—Piggott, W. L., 45 The Promenade, Sans Souci.
 2WN—Lusby, M. Macl., 10 Leeton Avenue, Coogee.
 2WQ—Wilkins, R. T., 108 Henry Street, Werris Creek.
 2WR—Shipley, A., 5 Warringulla Flats, St. Neot Ave., Pott's Point.
 2WS—Small, T. A., Austral Building, Murwillumbah.
 2WT—Watt, C. R., Warrenfels, Tenterfield.
 2WU—Macdonald, L., 10 Ada St., Waratah, Newcastle, N.S.W.
 2WV—Pacey, W. H., 28 Canberra Street, Lane Cove.
 2WW—Nash, W. R. C., 255 West Street, Crow's Nest.
 2WX—Wray, R. M. P., "Esma," Jellicoe Street, Hurstville.
 2WY—Butters, W. L., Karoola Street, Brooklyn, Hawkesbury River.
 2WZ—Maddison, E. V., 12 Fairlight St., Manly.
 2XA—James, H. K., Flat 4, "Branxton," Arden St., Coogee, N.S.W.
 2XC—Cuffe, I. D., 21 Redan St., Mosman, N.S.W.
 2XD—Williams, K. J. W., Commercial Bank of Aust., Tamworth.
 2XG—Gray, C., 41 Kissing Point Road, Turramurra, N.S.W.
 2XH—Manley, W. M., 16 Gladesville Road, Gladesville.
 2XI—Craig, W. A., 22 Irrara Street, Croydon.
 2XJ—Broome, F. M., Bay Rd., The Entrance, Tuggerah Lakes, N.S.W.
 2XK—Heavey, J. A., 221 Boyce Road, Maroubra.
 2XO—Retallick, J. N., Mary Street, Bellingen.
 2XP—Thompson, J., "Moorabinda," Wyong Creek, N.S.W.
 2XQ—Traill, R. J., 47 Regent St., West Maitland, N.S.W.
 2XR—Halloran, A. T., "The Kraal," Whitton and Sutherland Rds., Chatswood.
 2XS—Gillanders, B. C., 62 Bellevue Road, Bellevue Hill.
 2XT—Hall, W. C., Hay Street, Aberdeen.
 2XU—Pollock, G., Medlow Bath, Blue Mountains, N.S.W.
 2XV—Cameron, R. M., "Chyandra," Richmount Street, Cronulla, N.S.W.
 2XW—Voysey, A. J., "The Gables," 85 Alt Street, Ashfield, N.S.W.
 2XX—Dale, B., 8 Gladstone Street, Kogarah.
 2XY—Maguire, S. W., 164 Hastings Parade, North Bondi, N.S.W. Bondi.
 2XZ—Delmar, E. C., 175 Victoria Street, Ashfield.
 2YA—Black, R. C., "Esperanza," Lansdowne Street, Greenwich.
 2YB—Lewis, W. J., C/o J. B. Corbin, 39 Mitchell St., McMahon's Point.
 2YC—Corbin, J. B., 39 Mitchell Street, McMahon's Point.
 2YD—Pettitt, W. S. B., 26 Croypley Street, Rhodes.
 2YE—Davey, J. A., 23 Avenue Road, Glebe Point.
 2YF—Caldwell, F. D., 46 Gipps Street, Concord.
 2YG—Litchfield, Miss L. N., 4 Yeo Avenue, Willoughby.
 2YH—Hannam, W. H., 201 Mowbray Road, Willoughby.
 2YK—Abbott, R. E., Telegraph Point.
 2YL—Hawkins, H., 27 Comfort Avenue, Cessnock.
 2YM—Brown, H. M., C/o 2BH, Broken Hill.
 2YO—Younger, G. H., Wallsend Street, Pelaw Main.
 2YP—Hutchinson, C. D., 12 Selwood St., Brighton-le-Sands, N.S.W.
 2YQ—Pollock, G., c/o E. Davies, Colliery Office, Abermain No. 2, Kearsley, N.S.W.
 2YR—Ringrose, W. S., 9 Victoria Street, Epping.
 2YS—Flood, J. S., 131 Good St., Granville, N.S.W.
 2YT—Woodward, G. R., "Neath," Oxford Street, Sutherland.
 2YU—Chessell, J., 2 Esplan Court, The Esplanade, Ashfield, N.S.W.
 2YV—Littlefair, G. T., 20 Church Street, Randwick.
 2YW—Pitman, D. H., 49 Macleay Street, Wagga Wagga.
 2YX—Riley, W. J., 9 Turner Street, Balmain.
 2YY—Watson, W., 32 Pritchard Street, Annandale.
 2YZ—Johnston, W. D., 1 Searle Street, Ryde.
 2ZA—Slight, A. A. B., Kable Street, Windsor.
 2ZB—Zero Beat Radio Club, 38 Sydney Arcade, Sydney, N.S.W.
 2ZC—Cowan, J. G., 90 Bridge St., Waratah, N.S.W.
 2ZD—Hands, R., 28 Reddall St., Manly. (Portable).
 2ZE—Woodman, J. H., Leeton.
 2ZF—Southwell, N. L., 103 Allen Street, Leichhardt.
 2ZG—Cooper, I. H., 13 Selwyn Street, Wollstonecraft.
 2ZH—Macnaughton, N., 47 Shirley Road, Roseville.
 2ZI—Glasscock, A. L. K., 44 Little Street, Lane Cove.
 2ZJ—Temby, H. M., 321 William Street, Broken Hill.
 2ZK—Henry, A. G., Clareville Avenue, Sandringham.
 2ZL—Otty, W., Bolton Point, Toronto.
 2ZM—Wood, J. H. C., 110 Bacon Street, Grafton.
 2ZN—Cottrell, J. W. M., "Barrington," Kissing Point Rd., Dundas.
 2ZO—Bridgewater, F. H., 17 Alexander Street, Moore Park.
 2ZP—Yates, A. G., Prince Alfred Hospital, Camperdown.
 2ZQ—Phillips, F. J. M., 2 Moray Court, Blair Street, Bondi.
 2ZR—Pinnell, J. C., 47 Sloane St., Summer Hill, N.S.W.
 2ZS—Stubbs, H., 2 Grandview Parade, Epping.
 2ZU—Gilmour, N. S., 75 William Street, Sydney.
 2ZV—Hands, D., 28 Reddall Street, Manly.
 2ZX—Grimmett, S. U., 101 Tudor Street, Hamilton.
 2ZY—Lumbewe, E. W., Byron Street, Inverell.
 2ZZ—Cotterill, H. S., 43 Epping Avenue, Eastwood.
 2ABA—LeNevez, A., 61 Marrickville Road, Marrickville.
 2ABB—Varnes, H. H., 95 Corlette St., Merewether, Newcastle, N.S.W.
 2ABC—Stirk, F. J., 221 Gale Road, Maroubra.
 2ABD—Galbraith, C. C., 43 Bulka Road, Bellevue Hill.
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- 2ABI—Barnes, T. W., 25 Bayview Avenue, Undercliffe.
- 2ABJ—Evans, T., 193 Rocket Street, Bathurst. (Portable.)
- 2ABK—Shelley, G. H., 10 Berry Road, Crow's Nest. (Portable.)
- 2ABM—Jenner, J. I., "Yallambec," Chichester St., Maroubra Junction, N.S.W.
- 2ABN—North, W., Robinson Crescent, Marrickville, N.S.W.
- 2ABO—Bell, J., Green's Avenue, Dundas.
- 2ABP—Broken Hill Amateur Radio Club, 499 Radium St., North Broken Hill.
- 2ABQ—Lumsdaine, J. C., 54 Chiltern Road, Willoughby.
- 2ABR—Kimpton, F. W., Don St., Byron Bay N.S.W.
- 2ABS—Howes, J. W., 465 Pacific Highway, Artarmon, N.S.W.
- 2ABT—Buchanan, D. A., Hume Highway, Yerrinbool.
- 2ABU—Dan, A. M., 11 Kingsclere Flats, Macleay St., Potts Point.
- 2ABV—Scotland, L. H., 28 Figtree Avenue, Randwick.
- 2ABY—Gardiner, I. D. R., 228 Queen Street, Ashfield.
- 2ABZ—Bardin, W. F., "Univille," Church Street, Ermington.
- 2ACA—Hart, W. J., 56 Premier Street, Marrickville.
- 2ACB—Houseman, A. A., 24 Kent Street, Epping.
- 2ACD—Hipwell, R. A., 357 Iodide Street, Broken Hill.
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- 2ACF—Welzel, K., 23 Woonona Road, Northbridge, N.S.W.
- 2ACG—Morris-Rees, A., "Gwys," Black's Road, Paxton, via Cessnock.
- 2ACH—Oxenford, L. C., 83 Victoria St., Lewisham, N.S.W.
- 2ACI—A.M.G., 53rd Battalion, 2nd Military District Drill Hall, Addison Road, Marrickville.
- 2ACK—Roberts, J. M. D., 37 Kingston Street, Haberfield.
- 2ACL—Burghard, H. A. B., Royal Hotel, Deniliquin.
- 2ACM—Newcastle Radio Service (W. T. Bradford), 102 King St., Newcastle.
- 2ACN—Moore, B., 225 Rankin Street, Bathurst.
- 2ACO—Hunter, A. D., 44 Denham St., Bondi, N.S.W.
- 2ACP—Zech, W. J., 38 Simmons St., Enmore, N.S.W.
- 2ACQ—Chesterfield, J. H., 45 High Street, Strathfield, N.S.W.
- 2ACR—Heimann, T. R., 91 Curwood Street, Wagga Wagga, N.S.W. (Portable.)
- 2ACS—Cole, V. L., 2 Robertson Street, Croydon, N.S.W.
- 2ACT—Paton, C. C., 7 Marshall Avenue, North Wollstonecraft.
- 2ACU—Pike, R., 75 Arthur Street, Wellington, N.S.W. (Portable.)
- 2ACV—Ace Amplifiers Limited, 10 Grosvenor Street, Neutral Bay.
- 2ACW—Welch, C. W., 69 Salisbury Road, Stanmore.
- 2ACY—Rickaby, L. D., c/o Mrs. C. C. Hopkins, 44 Gillies Street, Lakemba.
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- 2ADC—Wreford, R. N., 230 Mica Street, Broken Hill, N.S.W.
- 2ADD—Rooks, J., 7 Selmon Street, Sans Souci, N.S.W.
- 2ADF—North Suburban Radio Club, cnr. Brown Street and Pacific Highway, Chatswood, N.S.W.
- 2ADG—Finlayson, F., 61 Gosford Road, Broadmeadow, Newcastle, N.S.W.
- 2ADH—Deaman, F. C., 2 Martin Street, Haberfield, N.S.W.
- 2ADI—Williams, J. B., "Carberry," Blair St., Bondi North, N.S.W.
- 2ADK—Pugh, E. G., Moonee Street, Coff's Harbour, N.S.W.
- 2ADL—Kinscher, E. W. D., Bushman's Hill, Parkes.
- 2ADN—Gerard, J. W., Lister Street, Coff's Harbour, N.S.W.
- 2ADO—Arthur, R. W., 96 Hudson Street, Hurstville, N.S.W.
- 2ADP—Richter, R. W., 15 Macquarie Road, Auburn, N.S.W.
- 2ADQ—Park, E. J., 5 Grace Street, Lane Cove, N.S.W.
- 2ADR—Roy, A. R. J., 26 Macquarie Street, Mascot, N.S.W.
- 2ADS—Davies, T. J., 58 King Street, Rockdale, N.S.W.
- 2ADT—Hill, J. H., 17 Allen Street, Lismore, N.S.W.
- 2ADU—Cooper, F. C., 83 Orion Street, Lismore, N.S.W.
- 2ADV—Phillips, S. J., 28 Murdoch Street, Cremorne, N.S.W.

- 2ADW—Hay, P. W., 63 Church St., Lidcombe, N.S.W.
- 2ADX—Cottrell, J. W. M., "Barrington," Kissing Point Road, Dundas, N.S.W. (Portable.)
- 2ADY—Vaughan, D. E., 10 Dreadnought Street, Lakemba, N.S.W. (Portable.)
- 2ADZ—Wilson, V. H., 1 Onslow Court, Onslow Avenue, Pott's Point.
- 2AEB—Tibbett, E. S., 41 Balmoral St., Waitara.
- 2AEC—Anthony, T. R., 1A Clifton Avenue, Burwood.
- 2AED—Crowley, C., Chapple St., Broken Hill.
- 2AEE—Walter, E. T., 47 Albert Crescent, Burwood.
- 2AEF—Oswald, A. G., 46 Farr Street, Rockdale, N.S.W.
- 2AEG—East, W. L., 8 Perry Street, Marrickville, N.S.W.
- 2AEH—Atherden, F. A., 119 Garnet Street, Broken Hill, N.S.W.
- 2AEJ—Smith, J. W., "Karoo," Baradine, N.S.W.
- 2AEK—Chaffer, E. M., 2 Kinniel Court, Elizabeth Bay Road, Pott's Point.
- 2AEL—Bailue, I., "Glamis," Pitt St., Randwick, N.S.W. (Portable.)
- 2AEM—Wiltshire, A. J., 10 Norris St., Lismore, N.S.W.
- 2AEN—Joyce, V. S., 50 Clements St., Five Dock, N.S.W.
- 2AEO—Polmear, O. S. R., 92 Thorne St., Wagga Wagga.
- 2AEQ—Lever Amateur Radio Club—C/o Lever Bros. Ltd., Reynolds St., Balmain, N.S.W.
- 2AES—Wilson, D. D., Blair Street, Teralba.
- 2AET—Havvatt, A., "Orion," Cnr. Kiaora Rd. and Court St., Double Bay.
- 2AEU—Aked, E. L. J., 142 Zadoc St., Lismore, N.S.W.
- 2AEV—McMurray A., 26 North St., Auburn, N.S.W.
- 2AEW—Moss N., 19 Fremont St., Concord West, N.S.W.
- 2AEX—Reddcliff, L.A., 78 Ryde Rd., Gladesville, N.S.W.
- 2AERY—Eagling, R. W., 149 High Street, Taree, N.S.W.
- 2AEZ—Marstella, E. A., 49 Mackie Avenue, New Lambton, New castle, N.S.W.
- 2AFA—Gray, H. R., Awaba St., Teralba, N.S.W.
- 2AFC—McDonald, A. H., 6 Little Villiers St., Grafton, N.S.W.
- 2AFD—Kerr, A. A., Thurgoona, N.S.W.
- 2AFE—Magennis, A. E. A., 38 Pine Road, Auburn, N.S.W.
- 2AFF—Roberts, P., 3 Turner St., Wagga Wagga, N.S.W.
- 2AFG—Patterson, J. H., 54 Birrell Street, Waverley.
- 2AFH—Tarrant, H. J., R.A.A.F., Richmond.
- 2AFI—Ewing, J. D., 5 Cairo Street, North Sydney.
- 2AFJ—Fraser, J. H., 8 Deakin Avenue, Haberfield.
- 2AFK—Kenny, F. H., 13 Fullers Avenue, Canterbury.
- 2AFL—Swanson, W. W., 24 Bengalong Street, North Sydney.
- 2AFM—Dickson, E. J., 31 Station Street, Guildford.
- 2AFN—Stawson, G. T., 69 Lawrence St., Harbord.
- 2AFO—Toakley, T. T., "Kieta," Merriwa St., Katoomba.
- 2AFP—Cream, R. L. C., Diary Street, Casino South.
- 2AFQ—Trebarne, E. D. L., 5 Waimea Street, Burwood.
- 2AFR—Reynolds, R. J., 190 Trongate St., Granville, N.S.W.
- 2AFS—Wilson, R. V., Edward St., Moree, N.S.W.
- 2AFT—Hilder, R. H., Fort Bourke Station, Bourke, N.S.W.
- 2AFU—Broadley, D. H., 99 Homer St., Undercliffe, N.S.W.
- 2AFV—Templeman, G. J., "Roseleigh," Bellarwi.
- 2AFW—Canning, F. G., 155 Victoria Road, Bellevue Hill.
- 2AFX—McMurtrie, S. A., 45 Wyrallah Road, Lismore.
- 2AFY—Davis, J., 20 Northland Road, Bellevue Hill.
- 2AFZ—Johnson, J. E., 338 Birrell Street, Bondi.
- 2AGA—Quodling, H. N., 40 Copeland St., Beecroft, N.S.W.
- 2AGB—Hooper, C. J., 34 Burwood Road, Concord, N.S.W.
- 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.
- 2AGF—Kelso, A. J. B., 25 Walker Avenue, Haberfield, N.S.W.
- 2AGG—Jones, H., Main Road, Boolaroo.
- 2AGH—Hall, G. C., 15 Rosebery Avenue, Five Dock.
- 2AGI—Bailey, G. E., 148 Grand Parade, Kogarah.
- 2AGJ—Mitchell, R. J., 34 Moore St., Roseville.
- 2AGK—Hainsworth, P. T., "Roselea," Castlereagh Street, Penrith.
- 2AGL—Braddock, G. S., Auburn Street, Moree.
- 2AGM—Berry, W. C., Bay Street, Byron Bay.
- 2AGN—Manahan, F. G., Myrtle St., Murwillumbah.
- 2AGP—Leyden, F. M., 56 Bland Street, Ashfield.
- 2AGR—Hughes, A., 50 Norton Street, Ashfield.
- 2AGX—Enmore Activity School, Metropolitan Rd., Enmore, N.S.W.
- 2AGY—Meyer, F. C., 19 Johnston St., Annandale, N.S.W.
- 2LMW—Wilson, L. M., Malboona Station, via Mudgee.

Victoria.

- 3AB—Leonard, J. W., 18 Love Street, Black Rock, S.9.
- 3AC—Chandler, H. G., 52 Gray Street, Hamilton.
- 3AD—Dixon, A. G., 216 Rathmines Road, Hawthorn East, E.3.
- 3AF—Bent, A. F. W., 33 Girtton Crescent, West Geelong.
- 3AG—Glover, A. J. G., c/o 3YB, Spring Gardens, Warrnambool.
- 3AI—Kruger, F. A., Armstrong Street, Charlton.
- 3AL—Kerr, A. D., 1214 Sturt Street, Ballarat.
- 3AM—Forecast, A. M., 22 Neerim Road, Caulfield, S.E.8, Vic.
- 3AN—Newberry, A., Indi Avenue, Red Cliffs.
- 3AO—Allison, C. M., 33 Arnold Street, North Carlton, N.4.
- 3AP—Bowley, A. H., 5 Caroline Street, Hawthorn East, E.3.
- 3AQ—Marist Brothers' College (Bro. Gonzales), Kilmore.
- 3AS—Stow, A. F., 187 St. George's Road, North Fitzroy, N.7.
- 3AT—Taylor, A. F., 4 The Ridgeway, Ivanhoe, N.21.
- 3AU—Milligan, S. H., 44 West Melbourne Road, Geelong West.
- 3AV—Ternes, H. M., 92 Willesden Road, Oakleigh, S.E.12.
- 3AX—Boast, H. D., 105 Cochran Street, Elsternwick, S.4.

3AY—Jenvey, W. W., Draper Street, Ormond, S.E.14.
 3AZ—Avard, A. E., 1 Hawthorn Road, Northcote, N.16.
 3BB—Brown, W. F., 441 Church Street, Richmond, E.1.
 3BE—Reid, J., Salisbury Street, Werribee.
 3BF—Carnahan, J. M., 27a Logie Street, Oakleigh, S.E.12.
 3BG—Jones, R. B., 11 Mitchell Street, Bendigo, Vic.
 3BH—Whitelaw, C. R., Gordon Street, Mornington.
 3BJ—Hanham, F. S., 161 Napier Street, Essendon, W.5.
 3BK—Baker, S. C., 44 Mowbray St., Albert Park, S.C.6.
 3BL—Fitchett, J. C., 13 Holmwood Avenue, Brighton, S.5.
 3BM—Mann, B. R., Quambatook, Vic.
 3BP—Hood, J. H., 9 Tintern Avenue, Toorak, S.E.2.
 3BQ—Howdon, W. F. M., 13 Balwyn Road, Canterbury, E.7.
 3BR—Billan, L. J., Dargo Road, Briarolong.
 3BS—Splatt, A. B., Mountain View rd., Montmorency, Vic.
 3BT—Barthold, G. L., 72 Union Street, Malvern, S.E.3.
 3BU—Brownbill, W. A., 71 Gheringhap Street, Geelong.
 3BV—Burston, L. R., 93 Rowan St., Wangaratta, Vic.
 3BW—Woolnough, A., Fenwick Street, Portarlington.
 3BX—Halley, T. W. A., 558 Centre Road, Bentleigh, S.E.14.
 3BY—Holst, H., 27 Bambra Road, Caulfield, S.E.7.
 3BZ—Morris, G. I., Boundary Road, Mordialloc, S.12, Vic.
 3CA—Hughes, C. A., 1 Vera Street, Williamstown, W.16.
 3CB—Sievers, W. F., 26 Lesney Street, East Richmond, E.1.
 3CC—Radio Research Board, University of Melbourne, Carlton, N.3.
 3CD—Rich-Phillips, J., "Peri," Murraydale.
 3CE—McNally, R. C., Berriwillock.
 3CF—Falconer, C. I., 13 Norris Street, Surrey Hills, E.10.
 3CG—Brogan, J. P. H., Box Street, Merbein.
 3CH—Harris, A. C., Cumming Avenue, Birchip.
 3CJ—Manning, C. J., 18 Avoca Avenue, Elwood, S.3.
 3CK—Shenfield, C. K., Sunny Banks, Cobden.
 3CL—Long, C. R. W., "Edgecliffe," Cliff Road, Frankston.
 3CM—Jenkin, F. C., Oxford Road, Croydton.
 3CN—Harrison, C., 2 Marungi Street, Shepparton.
 3CO—Conry, W. H., Centre Road, Brighton, S.6.
 3CP—Pritchard, A. C. J., 3 Loch Street, Kew, E.4.
 3CR—Doyle, H. L., 1 Talbot Crescent, Kooyong, S.E.2, Vic.
 3CS—Matheson, C. R., 2 Richardson St., Essendon, W.5.
 3CT—Graf, R. G., 19 Bloomfield Road, Ascot Vale, W.2.
 3CU—Wilson, J. T., 79 Park Road, South Camberwell, S.E.6.
 3CV—McKeone, J. C., 13 Forbes St., Essendon, W.5, Vic.
 3CW—Walters, C. A., 18 Cape Street, Heidelberg, N.22, Vic.
 3CX—Brown, A. G., 8 Mangarra Road, Canterbury, E.7, Vic.
 3CZ—Berry, A. I., 15 Kembra Street, Hawthorn, E.2.
 3DA—Webber, H. P., 37 Lucerne Crescent, Alphington, N.20, Vic.
 3DC—Embling, S. A., 296 Williams Road, Toorak, S.E.2.
 3DD—Swaby, M. J., 35 Glenferrie Road, Hawthorn, E.2.
 3DE—Hale, D. E., Buninyong, Vic.
 3DF—Irvine, C. J., 9 Park Street, Ivanhoe, N.21.
 3DG—Giddings, A. W. J., c/o Commercial Bank of Australia Ltd., Stratford.
 3DH—Morgan, I., 489 Hampton St., North Brighton, S.5, Vic.
 3DI—Chilver, J. D., Tarwin.
 3DJ—Gleeson, J. L., 675 Rathdown St., North Carlton, N.4, Vic.
 3DK—Baker, T. D., Railway Station, Boonoonar.
 3DL—Leber, D., 402 Bridge Road, Richmond, E.1.
 3DM—McDonald, D. C., 16 Railway Avenue, East Malvern, S.E.4.
 3DN—A.W.A. Ltd., 47 York Street, Sydney. (Station at 167 Queen Street, Melbourne, C.1.)
 3DO—Dobbyn, J. M., 6 Wills Street, Glen Iris, S.E.6.
 3DP—Were, R. W., 196 Melville Road, West Brunswick, N.12.
 3DQ—Morris, J. D., 31 Davey Avenue, Oakleigh, S.E.12.
 3DR—Bennett, W. J. J., Alexandria Street, Mooroopna.
 3DS—Spencer, D. D., Cr. Queen and Bayview Streets, Altona, W.18.
 3DT—Petruchenia, V. V., 25 The Parade, Ascot Vale, W.2.
 3DU—Bowie, L. D., 65 Noone Street, Clifton Hill, N.8. (Portable.)
 3DV—Bremner, T., 20 Esplanade, Clifton Hill, N.8, Vic.
 3DW—Tacey, D. W., Wyndham Street North, Shepparton.
 3DX—Kermond, L. J., 4 Lava Street, Warrnambool.
 3DY—Dyer, C. A. R., 162 Rosenath Street, Clifton Hill, N.8.
 3DZ—Ryan, C. J., 3 Hartington Street, Northcote, N.16.
 3EA—Anderson, E., Port Welshpool, Vic.
 3EB—Endacott, J. M., 24 Cumming St., West Brunswick, N.12, Vic.
 3EC—Cook, E., Kimberley Avenue, Swan Hill.
 3ED—Jones, D. O., 24 Francis St., Ascot Vale, W.2.
 3EF—Faull, A. E., 56 Anderson Street, Warracknabeal.
 3EG—Miller, I. V., Towong Street, Tallangatta.
 3EH—Foot, E. H. S., 19 Knutsford Street, Balwyn, E.8.
 3EK—Bell, R. J., 10 Banks Avenue, Hampton, S.7.
 3EL—Boyd, N. J., 105 Ormond Road, Elwood, S.3.
 3EM—Manifold, E. C., 267 Jasper Road, McKinnon, S.E.14.
 3EN—Pearce, H. R. J., 43 Cromwell Street, Caulfield, S.E.7, Vic.
 3EO—Duff, D. H. B., Crib Point.
 3EP—Perkin, E., Queen Street, Rochester.
 3ER—Read, E. H. W., 5 Fordham Avenue, East Camberwell, E.6.
 3ES—Yorston, E. S., 184 Hawthorn Road, Caulfield, S.E.7.
 3ET—Asmus, H. J., 153 Buckley Street, Footscray, W.11.
 3EW—Wheller, E. C., 6 Sleeth Avenue, Dandenong.
 3EX—Webb, E. K., 297—Mitcham Road, Mitcham.
 3EZ—Moyle, J. R., Oxford Club, Te Arai Avenue, East St. Kilda, S.2.
 3FA—Falkenberg, B., "Bonnie Hills," Byaduk.
 3FB—Oldfield, F. B., 14 Gordon Street, Hampton, S.7, Vic.
 3FC—Clark, F. T., 14 Nelson St., St. Kilda, S.2, Vic.
 3FD—Longmore, H., Sobroan Street, Shepparton.
 3FF—Speer, J. F., "Viewfield," Corop.
 3FG—Ince, F. G., 10 Eskdale Road, Caulfield, S.E.7.
 3FH—Huo, H. F., 41 Westbury St., St. Kilda, S.2, Vic.



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 3FJ—Edgerton, A. F. J., 9 Athol Street, Moonee Ponds, W.4.
 3FK—Kerr, F. J., 27 Monomeath Avenue, Canterbury, E.7, Vic.
 3FL—Johnson, A. L., 44 Carramar Avenue, Camberwell, E.6, Vic.
 3FM—Wildman, C. G., 59 Blair Street, Moreland, N.13.
 3FN—Ferguson, B. M., Court House Hotel, Nathalia.
 3FO—Olsen, F., 10 New Street, Hampton, S.7.
 3FR—Smith, G. L. F., 62 Beavers Road, Northcote E.16, Vic.
 3FS—O'Brien, A. J., 215 McKean St., North Fitzroy, N.7, Vic.
 3FT—Randell, B. F. H., c/o R.A.A.F., Laverton.
 3FU—Briggs, D. E., 21 Service Street, Coburg, N.13.
 3FW—Fulton, W. A., 24 Logan Street, Canterbury, E.7.
 3FX—McCarthy, J. K., 59 Orlando Street, Hampton, S.7.
 3FZ—Maher, F. A., 102 McKean Street, North Fitzroy, N.7.
 3GA—Douglas, W. G., State School, Curdie Vale.
 3GB—Baker, H. G., 12 Clive Road, Hawthorn, E.2.
 3GC—Carter, G. R., Campbell Street, Camperdown.
 3GD—Downing, W. G., Stanhope.
 3GE—Every, G. E., King St., Queenscliff, Vic.
 3GF—Auld, J. R., 76 Parker St., Williamstown, W.16.
 3GG—Guest, E. I. G., 9 Mulgoa Street, Brighton, S.5.
 3GH—Williamson, H. G., Edward Street, Rainbow.
 3GJ—Hoy, A. J., 22 Pickles Street, Albert Park, S.C.6.
 3GK—McLean, S. C., 14 Stewart Street, Brunswick, N.10.
 3GM—McCulloch, G. R., 511 Havelock Street, Ballarat.
 3GO—McGowan, R. C. G., Foster Street, Sale.
 3GP—Shields, A. J. E., 22 Ash Grove, East Malvern, S.E.5, Vic.
 3GQ—Emeny, T. F., Bowen Street, Camperdown.
 3GR—Rowland, R. G., 29 Inkerman Street, Ballarat, Victoria.
 3GS—Semmens, G. S. C., 18 Shaftesbury Street, Essendon, W.5.
 3GT—Thompson, C., 9 Rennie Street, Thornbury, N.17.
 3GU—Chapman, H., 1 Noel Street, Ivanhoe, N.21.
 3GV—Gooby, A. T., Hilton Street, Glenroy, W.9.
 3GW—Williamson, H. G., Rainbow.
 3GX—Gibson, P. R., 13 Federation Street, Ascot Vale, W.2.
 3GY—Day, C. J., 88 Pentland Parade, Yarraville, W.13.
 3GZ—Oliver, K. W., 22 Verner Street, South Geelong.
 3HB—Bain, H. M., Dixon Avenue, Werribee.
 3HC—Cliff, H., 3 Riverview Road, Essendon, W.5.
 3HD—Ward, H. D., 6 Epsom Avenue, Mordialloc, S.12.
 3HE—Hodge, H. G., 13 Albert Street, Surrey Hills, E.10.
 3HF—Fuller, H., 15 Woolley Street, Essendon, W.5.
 3HG—Templeton, N. M., Willima, Coleraine.
 3HH—Maughan, F., 15 Staniland Avenue, Malvern, S.E.4.
 3HJ—George, V. H., 199 Rosanna Road, Heidelberg, N.22.
 3HK—Heitsch, K., 305 Mitcham Road, Mitcham.
 3HL—Hutchings, A. T., "Bryn Avon," Callawadda.
 3HM—Hutchings, Mrs. E. L., "Bryn Avon," Callawadda.
 3HN—McCandlish, J., Hannan Street, Sea Lake.
 3HO—Hodges, R. A., Disraeli Grove, Pascoe Vale South, W.7, Vic.
 3HP—Martin, E. W., Lock 15, Robinvale.
 3HQ—Hutchings, Miss M. L., "Bryn Avon," Callawadda.
 3HR—Roberts, H. C., Box 79, Sea Lake.
 3HT—Marr, J. N., 31 Bloomfield Road, Ascot Vale, W.2.
 3HU—Blackman, H. H., Closter Avenue, Ashburton, E.13.
 3HW—Hattam, F., 18 Greenhill Street, Castlemaine.
 3HX—Hogan, T. D., Learmonth Street, Charlton.
 3HY—Andrews, H. L., River Road, Murchison.
 3HZ—Clyne, E. M., c/o Station 3UL, South Road, Warragul.
 3ID—Davies, I. J., Talbot Avenue, Bentleigh, S.E.14.
 3IH—Burton, R. F., Clifton St., Charlton, Vic.
 3IL—Jordan, R. F., Gabo Island Lighthouse.

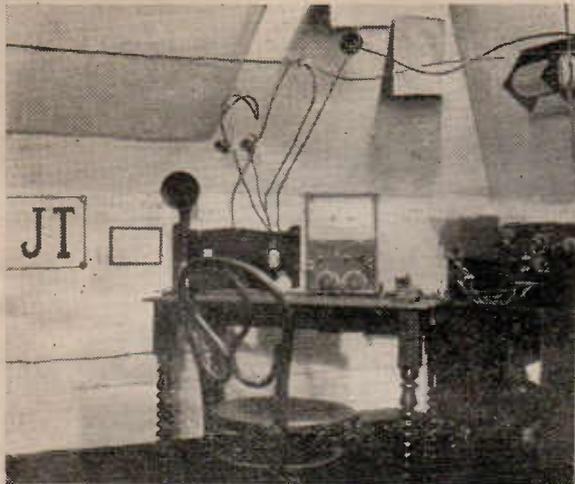
- 3IR—White, H. B., 36 Osborne Avenue, Glen Iris, S.E.6, Vic.
 3IT—Argoon, A. J., 3 Jervis Street, Burwood, E.13.
 3IW—Fayle, B. J., 20 Adam Street, Burnley, E.1.
 3JA—Anderson, J. F., Nullawarre.
 3JB—Kling, J. R., 41 Myrtle Street, Hampton, S.7.
 3JC—Cassidy, J. J., 362 Riversdale Road, Camberwell, E.6.
 3JD—Davies, J. C., 50 Park Road, Middle Park, S.C.6, Vic.
 3JE—Alder, W., c/o W. Collins, Commercial Road, Yarram.
 3JF—Wilson, A. L., 85 Asling Street, Gardenvale, S.4.
 3JH—Hurley, A. L. J., 9 Bellevue Street, Coburg, N.13.
 3JJ—McMath, J. J., 136 Kerferd Road, Albert Park, S.C.6.
 3JK—Herd, J. K., 1 Murdoch Road, Wangaratta.
 3JL—Osborne, C. G., 5 Kalang Road, Hartwell, E.6.
 3JM—Martin, J. F., 19 Dudley Street, North Fitzroy, N.7, Vic.
 3JN—Young, L. G., 1 Martin Crescent, East Malvern, S.E.6, Vic.
 3JO—Stevens, H. N., 33 Auburn Grove, Hawthorn East, E.3.
 3JP—Mitchell, H. E. H., Land Office, Hamilton.
 3JQ—Brebner, W. J. A., 2 Cambridge Street, Belmont.
 3JR—Rainbow, C. J., 18 Arthur Street, Preston, N.18.
 3JS—Schultze, J., 18 Invermay Grove, Hawthorn East, E.3, Vic.
 3JT—Symons, J. L. G., 47 Elizabeth Street, Malvern, S.E.4.
 3JU—Phillips, H. E. J., 389 Victoria St., Abbotsford, N.9.
 3JV—James, A. G., Macorna.
 3JW—Bruce, R. W., 51 Tooronga Road, East Malvern, S.E.5.
 3JX—Sydow, J. F., 184 Nelson Road, South Melbourne, S.C.5.
 3JZ—Lafferty, J. A., Kyabram.
 3KA—Sharp, J. J. C., 3 Seach Street, Caulfield, S.E. 8.
 3KB—Kissick, A. L. H., 85 Moreland Road, East Coburg, N.13.
 3KC—Wilcox, S. J., 43 Gladstone Avenue, Croxton, N.16.
 3KD—Carlyle, A. K. H., 24 McLlwraith Street, North Carlton, N.4.
 3KE—Kilborn, E. H., 425 Riversdale Road, Hawthorn, E.3.
 3KF—Carroll, J. M., 2 Lewis Street, Mordialloc, S.12.
 3KG—Green, K. L., 32 Cunningham Street, South Yarra, S.E.1.
 3KH—Anderson, E. W. A., 9 Clark Street, Glen Iris, S.E.6.
 3KI—Mabbitt, J. M., "Long Lake," Lake Boga.
 3KJ—Stalker, D. C., 16 McDonald Street, Colac.
 3KL—Philpot, C. H., Horsham, Vic.
 3KM—McGuire, L. P., Post Office, Myrtleford.
 3KN—Kinnear, H., 16 Moule Avenue, Brighton, S.5.
 3KO—Scarff, W. J., 9 Willis Street, Malvern, S.E.3, Vic.
 3KP—Ayre, D. R., 6 Sidwell Avenue, East St. Kilda, S.2, Vic.
 3KQ—Benwell, G. T., 27 Bendigo Avenue, Elwood, S.3, Vic.
 3KR—Rankin, K. R., Boundary Street, Kerang.
 3KS—Cannon, A. C., Victoria Street, Cobden.
 3KT—Williams, A. E., 18 Park Street, Elsternwick, S.4.
 3KU—Love, H. K., 7 Valency Road, East Malvern, S.E.6.
 3KV—Solomon, C. C. H., 113 Clarendon St., South Melbourne, S.C.5.
 3KW—Keillor, W., 9 Pakington Street, West Geelong.
 3KX—Tandy, R., 76 Rae Street, Colac.
 3KY—Mann, S. G., 44 Ludstone Street, Hampton, S.7.
 3LA—Bollas, G., 18 Chambers Street, Footscray, W.11.
 3LB—Amor, H. R., 24 Clifton Grove, Preston, N.18.
 3LC—Knyvett, E. L., 12A Douglas Street, East Malvern, S.E.5.
 3LD—Richardson, L. R. N., 75 Rose Street, Armadale, S.E.3.
 3LE—Lockhart, L., 17 Normandy Road, Elwood, S.3, Vic.
 3LF—Bunn, M. K., 86 Alexander Street, East St. Kilda, S.2.
 3LG—Glew, L. G., 22 Elphin Street, Newport, W.15, Victoria.
 3LH—James, H. R., 79 Barkley Street, Mordialloc, S.12.
 3LI—Rogers, L. C., 14 Greig St., Seddon, W.12, Vic.
 3LJ—Simmons, L. J., State School No. 1059, Rheola.
 3LL—Kelly, K. M., Queen's College, Carlton, N.3.
 3LM—Lee-Archer, E. L., 11 Marlborough Street, Caulfield North, S.E.7.
 3LN—Moncur, L. P., 235 Union Road, Ascot Vale, W.2.
 3LP—Paul, L. A., 76 Princes Street, Ascot Vale, W.2.
 3LQ—Sheppard, W. H., 25 Florizel Street, Burwood, E.13.
 3LS—Busch, R. T., 20 Wordsworth Street, Moonee Ponds, W.4.
 3LT—Thompson, L. N., 590 Point Nepean Road, Carrum.
 3LU—McPherson, C. T., 34 Pickett Street, Footscray, W.11.
 3LV—Malone, L. E. P., Mologa, Vic.
 3LW—Hiam, C., 27 Ontario Street, Caulfield North, S.E.7.
 3LX—Harding, L. G. H., 31 Charles Street, Footscray, W.11.
 3LY—Schmidt, R. F., York Street, Sale.
 3LZ—Ellis, C. A., 552 Glenhantly Road, Caulfield, S.E.8.
 3MC—A.W.A. Limited, Rockbank.
 3MD—A.W.A. Limited, Portable Station.
 3ME—A.W.A. Limited, Braybrook.
 3MF—A.W.A. Limited, 167 Queen Street, Melbourne.
 3MH—Stuart, M. H., Beam Station, Rockbank.
 3MI—Alsop, J. R., 11 Weir Street, Kew, E.4.
 3MK—Vale, L. H., Cnr. Pine Avenue and 8th Street, Mildura.
 3ML—Cunningham, R. H., 397 High Street, East Malvern, S.E.6.
 3MM—Hooper, E. M., 223 Auburn Road, Auburn, E.2.
 3MN—A.W.A. Limited, Ballan.
 3MP—Hosken, S. V., 3AR Broadcasting Station, Broadmeadows.
 3MR—Campbell, M. R., 194 O'Heas Road, Coburg West, N.13.
 3MT—The Melbourne Technical College, Latrobe Street, Melbourne, C.1.
 3MU—MacKay, R. R., 54 Patterson Street, Princes Hill, North Carlton, N.4.
 3MV—Coulter, J. M., 20 Howitt Rd., Caulfield, S.E.7.
 3MW—White, S. G., 5 Cairnes Crescent, East Malvern, S.E.5, Vic.
 3MX—Sebire, P. J., Howell Street, Moorabbin, S.20.
 3MY—Money, L. D., 8 Maling Road, Canterbury, E.7.
 3NA—Gardner, Dr. J. K., Royal Melbourne Hospital, Lonsdale St., Melbourne, C.1, Vic.
 3NB—Nickson, A. F. B., 58 Wattletree Road, Malvern, S.E.3.
 3NC—Bennett, P. C., 37 Gray St., Hamilton, Vic.
 3NF—Herman, L. G., 38 Aintree Road, Glen Iris, S.E.6, Vic.
 3NG—Gunter, N. E., 7 Harrison Crescent, Hawthorn, E.2, Vic.
 3NI—Nicholls, A. H., 27 Morang Road, Hawthorn, E.2.
 3NJ—Colvin, N., Everard Road, Ringwood East.
 3NK—Ballinger, J. W., "Monterey," Curdie Street, Camperdown.
 3NL—Lewis, C. E., 181 Boundary Road, North Melbourne, N.7.
 3NM—McLeod, N., 61 Narrawang Rd., Caulfield, S.E.8, Vic.
 3NN—Brown, H. R., Yanac.
 3NO—Noite, G. E., 39 Mitford St., Elwood, S.3, Vic.
 3NP—Marshall, M. J., 8 Hilda St., East Malvern, S.E.5, Vic.
 3NQ—Watson, J. D., "Wattleville," Darlington, via Camperdown.
 3NR—Mathieson, I. H., Diggers Road, Werribee.
 3NS—Levings, S. B., 32 Rona Street, Regent, N.19.
 3NT—Martin, J. L. A., 14 Hemming Street, Dandenong.
 3NU—Coffin, R. G., 9 Dickens Street, Glen Iris, S.E.6, Vic.
 3NW—McTaggart, F. K., 11 Ulupna Road, Ormond, S.E.9.
 3NX—Daniel, G. W. H., 76 Anderson Street, Warracknabeal.
 3NY—Marsland, J. G., c/o National Bank, Coventry Street, South Melbourne, S.C.5.
 3NZ—Murfett, N. C., Swanston Street, Terang.
 3OB—Burrows, L. T., 4 Park Street, Moonee Ponds, W.4.
 3OC—Ohrbom, R., 22 Gordon Street, Coburg, N.13.
 3OD—O'Connor, J., 121 Melrose Street, North Melbourne, N.1.
 3OF—O'Dwyer, F. P., 6 Duffy Avenue, Gardenvale, S.4, Vic.
 3OG—Sawers, T. V., 40 Brisbane Street, Ascot Vale, W.2.
 3OH—O'Hara, J. B., 20 Napier St., Maryborough, Vic.
 3OI—Collins, R. J., 4 Emmaline Street, Croxton, N.16.
 3OJ—Stevens, R. E., 17 Jervis St., Burwood, E.13, Vic.
 3OL—Bibby, F. C., 9 Pleasant Road, Hawthorn East, E.3.
 3OM—Parr, J. G., 16 Wentworth Avenue, Canterbury, E.7.
 3ON—Niven, J. C., 191 Kooyong Road, Caulfield, S.E.7.
 3OO—Stuart, J. A., 41 Regent Street, Brighton, S.5.
 3OR—Orr, M. D., Lake Meran, Kerang.
 3OS—Scott, R. O., "Mt. Buninyong," Scotsburn.
 3OT—Barnes, V., 166 South Road, Brighton East, S.6.
 3OU—Williams, J. O., 28 Grosvenor St., Middle Brighton, S.5.
 3OV—Perry, R. E., 25 High Road, Camberwell, E.6.
 3OW—Templeton, G. L., Carinya, Coleraine.
 3OX—Cook, R. H., 34 Judd Street, Camberwell, E.6.
 3OY—Quin, A. K., 12 Grace Street, Camberwell, E.6.
 3OZ—Evans, P. E., 5 Howitt Street, Glen Iris, S.E.6.
 3PA—Anderson, P. J., 5 Collins Street, West Preston, N.18.
 3PB—Boyd, J. P. A., 40 Grant Street, East Malvern, S.E.5.
 3PC—Furvis, C. W., 77 Sutherland Road, Armadale, S.E.3.
 3PE—Thornley, P. E., Gnotuk, Camperdown.
 3PH—Williams, N. G., 33 Middle Crescent, Brighton, S.5.
 3PI—Pearson, L. F., 43 Youngman Street, Preston, N.18.
 3PJ—Smyth, V. L., 465 Hargreaves Street, Bendigo.
 3PK—Smith, C. H., 96 Harp Road, East Kew, E.5.
 3PL—Colthrup, J. F., 139 Spensley Street, Clifton Hill, N.8.
 3PM—Frew, G., 2 Gould Street, Brighton Beach, S.5.
 3PN—Tozer, P. J., 346 Barkly Street, Elwood, S.3.
 3PP—Payne, Captain A. E., 554 Toorak Road, Toorak, S.E.2.
 3PQ—Wilkinson, J. E. M. A., 148 Plenty Road, Preston, N.18.
 3PR—Jardine, W. R., "Dunlodon," Old Korumburra Road, Leongatha.
 3PS—Powers, L. A. T., 16 Holyrood Street, Camberwell, E.6.
 3PT—Peterson, R. C., 88 Eglinton Street, Moonee Ponds, W.4.
 3PU—Jackson, R. G., 19 Charles Street, North Williamstown, W.16.
 3PW—Webber, H. P., "Hillcrest," Hillcrest Avenue, Eltham.
 3PX—Finnigan, H. M., 193 Ninth Street, Mildura.
 3PY—Watson, P. R., Molyneux Street, Warracknabeal, Vic.
 3QA—Mackie, A. E., 55 Tooronga Road, East Malvern, S.E.5.
 3QB—Mills, W. J., Carpenter St., Maffra Vic.
 3QH—Feldman, J. F., Forest Street, South Geelong.
 3QJ—Roseblade, R. K., 23 Macartney Avenue, Kew, E.4.
 3QK—Jenkins, E. H., 415 St. Kilda St., Elwood, S.3, Vic.
 3QM—Haines, C. L. H., 97 Roslyn Road, Belmont.
 3QP—Peterson, W., c/o 554 Toorak Road, Toorak, S.E.2.
 3QR—White, R. L., 27 Wattle Tree Road, Malvern, S.E.4.
 3QX—O'Brien, C. R. H., 16 Turner Avenue, Glenhantly, S.E.9.
 3QZ—Cooper, H. N., 6 Grey Street, Deepdene, E.8, Vic.
 3RA—Parker, R. A., Flat 5, Coppin Court, Coppin Grove.
 3RB—Buring, R., 32 Camp Street, Ballarat, Victoria.
 3RD—Day, R. F., 19 Hotham Street, Oakleigh, S.E.12.
 3RE—Hehir, W. J., 14 Raven Street, Kew, E.4.
 3RF—Field, R. W., 42 Orrong Crescent, Caulfield, S.E.7.
 3RG—Blake, R. L. G., 29 Doveton Street, Castlemaine.
 3RH—Hodder, I. R., "Eromanga," Glenorchy.
 3RI—Victorian Railways Institute, Victorian Railways Institute Building, Flinders Street, Melbourne, C.1.
 3RJ—Jones, R. E., 23 Landale Street, Box Hill, E.11.
 3RK—Evans, T. E., 3 Heliopolis Street, Pascoe Vale, W.7.
 3RM—Easterbrook, R. W., 97 Osborne St., South Yarra, S.E.1, Vic.
 3RO—Brennan, W. E., 31 Lindsay Avenue, Murrumbena, S.E.9.
 3RP—Payne, R. L., 39 Retreat Road, Newtown, Geelong.
 3RQ—Quick, M. R., 15 Tasman Street, West Preston, N.18.
 3RR—Hall, C., 212 Harold Street, Thornbury, N.17, Vic.
 3RS—Shortell, R. C., Congupna Road, near Shepparton.
 3RT—Tozer, R. H., 92 Yarra Street, Alphington, N.20.
 3RV—McConnell, J. H., 3 Brighton Avenue, Preston, N.18.
 3RX—Serle, C., 2 Ormsby Grove, Toorak, S.E.2, Vic.
 3SA—Breen, J. H., 2A Oak Grove, Ripponlea, S.2, Vic.
 3SB—Brehaut, A. L., 29a Clyde Street, Oakleigh, S.E.12.
 3SC—Sargent, W. G. H., Manifold St., Camperdown, Vic.
 3SE—Widgery, S. E., 515 Lydiard Street North, Ballarat, Vic.
 3SF—Jones, S. W., 405 Lyons St., South Ballarat, Vic.
 3SG—Hourigan, J. B., 23 Jordan St., Malvern, S.E.4, Vic.
 3SI—Marriott, R. J., 187 Kooyong Road, Toorak, S.E.2.
 3SJ—Riches, S. J. W., 62 James St., Northcote, N.16.

35L—Southwell, L. W., Oak Street, Seymour.
 35M—Simpson, B., 2 Prince Patrick Street, Richmond, E.1.
 35N—Bell, J. B., 139 Skene Street, Shepparton.
 35O—McCubbin, B. L., 41 Chestnut Street, Richmond, E.1, Vic.
 35P—Coath, S. P., 6 Symon Street, West Preston, N.18.
 35Q—Bond, F. W., 134 Bastings Street, Northcote, N.16.
 35S—Scott, K. V., Stratford Road, Maffra.
 35T—Coghlan, J. L., 39 Jackson Street, St. Kilda, S.2, Vic.
 35U—Edwards, S. G., 99 Queen St., Melbourne, C.1, Vic.
 35W—Gadsden, S. W., 20 Fellows Street, Kew, E.4.
 35X—Wellington, S. H., 2 Arthur Avenue, Brighton, S.5, Vic.
 35Y—Mathews, J. C., 71 Fairview Avenue, Newtown, Geelong.
 35Z—Errey R. O., 48 McGregor St., East Malvern, S.E.5, Vic.
 3TA—Hardinge, B. E., Natimuk Road, Horsham.
 3TB—Barnes, T. W., 8 Capulet St., Moonee Ponds, W.4, Vic.
 3TC—Bowie, L. D., 65 Noone Street, Clifton Hill, N.8.
 3TD—Buzacott, R. N., C/o Herald Relay Station, Lubeck.
 3TE—Rose, B. L., 1a Clapham Road, Oakleigh, S.E.12.
 3TH—Thompson, G. F., 104 Bamba Road, Caulfield, S.E.8.
 3TI—Godden, C. A., 54 Seventh Street, Mildura.
 3TJ—Gray, J. T., 16 Canberra Street, Coburg, N.13.
 3TL—Trebilcock, R. E., Victoria Street, Kerang.
 3TM—Buck, A. H., McKinnon Street, Terang.
 3TN—Riley, M. R., Gray St., Hamilton, Vic.
 3TO—Rogers, J. E., 15 Dominic Street, Camberwell, E.6.
 3TP—Prentice, T. F., 158 Wattletree Road, Malvern, S.E.4.
 3TQ—Reading, L. W., 9A Agg Street, Newport, W.15.
 3TS—Speer, T. P., Corop, Vic.
 3TT—Tallent, W. D., Dean, Vic.
 3TU—Irvine, J. F., 9 Park Street, Ivanhoe, N.21.
 3TW—Weir, G. L. D., 264 Gray Street, Hamilton, Vic.
 3TX—Tregear, W. S., 22 Cole Street, Upper Hawthorn, E.3.
 3TY—Murden, W. H., 1 Gillingham St., West Preston, N.18, Vic.
 3TZ—Manks, T. E., 66 Victoria Street, Sandringham, S.8.
 3UB—Byrne, H. L., 21 Wolseley Grove, Brighton, S.5, Vic.
 3UD—Denholm, I. H., 36 Royal Parade, Coburg, N.13.
 3UF—Thompson, R. R., Water Commission, Tatura.
 3UH—Allen, K. G., 517 Lower Malvern Road, Glen Iris, S.E.6.
 3UJ—Roudie, A., 6 Arthur Street, Fairfield, N.20.
 3UK—Marshall, V. E., 75 Argyle Road, Kew, E.4.
 3UM—Magee, K. W. M., 17 Mason Street, Hawthorn, E.2.
 3UO—Harvey, C. G., 43 Dandenong Road, Malvern, S.E.3, Vic.
 3UR—Logan, E. G., 12 Burke Road, East Malvern, S.E.5.
 3UW—Burrage, J. A., 12 Terry Street, Deepdene, E.8.
 3UX—Smith, A., 191 Hoddle St., Abbotsford, N.9, Vic.
 3UY—Nilsen's Broadcasting Service Pty. Ltd., 45 Bourke Street, Melbourne, C.1.
 3VB—Hughes, E. W., 5 Marwal Avenue, North Balwyn, E.9.
 3VF—McKenzie, B. A., 17 Yann Street, Preston, N.18.
 3VH—Hoobin, L. W., 18 Bent Street, Bentleigh, S.E.14.
 3VJ—Adams, A. W., Point Nepean Rd., Moorabbin, S.20, Vic.
 3VK—Bowen, M., 44 Marks Street, Coburg, N.13.
 3VL—White, V. W., 7 Kinlock Avenue, Surrey Hills, E.10, Vic.
 3VN—Evans, P. E., c/o Y.M.C.A., Cr. Sturt Street and City Road, South Melbourne, S.C.4.
 3VP—Baker, C. W., Cr. Sternberg and Condon Streets, Bendigo.
 3VS—Spicer, V. J., 92 Freeman Street, North Fitzroy, N.7.
 3VU—Chippindall, J., 5 Collins Street, Coburg West, N.13.
 3VW—Stobie, G., Bell Street, Heidelberg, N.22.
 3VX—Clyne, A. H., 231 Glen Eira Road, East St. Kilda, S.2.
 3VY—Dudman, W. H. G., 36 Hopetoun Grove, Ivanhoe, N.21.
 3WA—Wilson, W. A. G., 215 Raglan Street, Ballarat.
 3WB—Black, W. H., 20 Wheatland Road, Malvern, S.E.4.
 3WC—Cavanagh, W., 69 Douglas Parade, Williamstown, W.16.
 3WD—Mather, W. D., 230 Lyons Street, Ballarat.
 3WE—Williams, A. R., Post Office, Box 7, Omeo.
 3WF—Fitzpatrick, W. P., 205 Coppin Street, Richmond, E.1.
 3WG—Gronow, W. R., 2 Anthony Street, Glen Iris, S.E.6.
 3WH—Chandler, A. W. H., 35 Aileen Avenue, Caulfield, S.E.8.
 3WI—Wireless Inst. of Aust. (Vic. Division), 191 Queen Street, Melbourne, C.1.
 3WJ—Sandford, S. M., "Roslin," Welsh Street, Kyneton.
 3WL—Nye, W. L., 16 Berry Street, Coburg, N.13, Vic.
 3WM—Wilson, W. M., 131 Wood Street, East Preston, N.18.
 3WN—Lambart, J. M., Best Street, Sea Lake.
 3WP—Kenderdine, C. W., 35 Macartney Avenue, Kew, E.4.
 3WQ—Quin, C. C., 25 Faussett Street, Albert Park, S.C.6.
 3WR—Temby, F. K., 26 St. George's Rd., Malvern, S.E.3, Vic.
 3WS—Sweeney, W. M., 52 Brighton Road, St. Kilda, S.2.
 3WW—Matters, W. L., 7 Ellerslie Grove, Warrnambool.
 3WY—Anderson, R. A. C., 18 St. Andries Street, Camberwell, E.6.
 3WZ—Whalley, R. P., Post Office Box 26, Myrtleford.
 3XA—Groves, G. W., 3 Nicholson Street, Hawthorn East, E.3.
 3XB—Stafford, I., State School, Lallat North, via Rupanyup.
 3XD—Dowling, R., 6 May Street, North Fitzroy, N.7.
 3XE—Doherty, F., 17 Palermo St., Mentone, S.11.
 3XG—Page, B. F. D., Sladen St., Birregurra, Vic.
 3XH—Johnson, S. W., 73 York St., Sale, Vic.
 3XI—Duggan, H. G., 194 Liebig Street, Warrnambool.
 3XJ—Manning, G. W., Newstead Street, Maribyrnong, W.3.
 3XK—Coleston, S. R., 6 St. Vincent Street, Glenhuntly, S.E.9.
 3XL—Sydserff, W. H. B., 10 Suffolk Road, Surrey Hills, E.10.
 3XM—Jackson, W. L., 23 Malane Street, Ormond, S.E.9.
 3XN—Cumming, M. C., 3 Howitt Road, Caulfield, S.E.7.
 3XO—Adams, F. J., 9 Moule Avenue, Middle Brighton, S.5.
 3XP—Sankey, R. E., 7 Pembroke Street, Surrey Hills, E.10.
 3XQ—Baldoock, A., 516 Plenty Road, Preston, N.18.
 3XR—Winton, J. H., 43 Clyde Street, Surrey Hills, E.10.

3XS—Prowse, R. R., 4 Larch Street, Caulfield, S.E.8, Vic.
 3XT—Millerd, G., 18 Ward Street, South Melbourne, S.C.5.
 3XU—Weynton, A. G., 29 Bull Street, Castlemaine, Vic.
 3XV—Mikkelsen, G. C., 1 Kerford Street, Coburg, N.13.
 3XW—Blyth, O. E., 12 Hartwell Hill Rd., Camberwell, E.6, Vic.
 3XX—Research Laboratories, Postmaster-General's Department, Little Collins Street, Melbourne, C.1.
 3XZ—McGregor, R. R., C/o Mrs. Harvey, South Road, Warra-gul, Vic.
 3YA—Young, A. R., 17 Lethbridge Street, Moonee Ponds, W.4.
 3YF—Johnson, L. W., 157 Whitehorse Road, Deepdene, E.8.
 3YG—Smith, G. E., 37 Carpenter St., Brighton, S.5, Vic.
 3YJ—Wookey, G. W. L., 26 Pine Avenue, Elwood, S.3.
 3YK—Douglas, G. C., Hakea Hill, Bayswater.
 3YL—Marshall, Miss M., 650 Dandenong Road, Murrumbena, S.E.9.
 3YM—Thompson, S. A., 3 Tuppen St., Yarraville, W.13, Vic.
 3YO—Woodward, C., 2 Wattle Grove, Moreland, N.13.
 3YP—Patterson, C. I., 82 Burke Road, East Malvern, S.E.5.
 3YS—Bail, F. G., 62 Shannon Street, Box Hill North, E.12.
 3YT—Costello, A. D., 10 Grant Street, Ballarat.
 3YW—Waring, C. C., 1161 Burke Road, Kew, E.4, Vic.
 3YX—Hardie, B. N. K., 3A Bowen Crest, Melbourne, S.C.2.
 3YZ—McKeown, A. M., 7 Grandview Grove, Northcote South, N.16.
 3ZA—Sims, E. L. A., c/o Post Office, Apollo Bay.
 3ZB—Brown, H. M., 8A Darling Street, Oakleigh, S.E.12.
 3ZC—Tutton, J. K., 31 Denham Street, Hawthorn, E.2.
 3ZF—Martin, E. H., 61 Addison St., Elwood, S.3, Vic.
 3ZG—Lelliott, H. W., 30 Edgar Street, Glen Iris, S.E.6.
 3ZJ—Salmon, J. E., 80 St. George's Road, Elsternwick, S.4.
 3ZK—Stevens, J., Gray Street West, Swan Hill.
 3ZL—Thomas, D. E., 13A Rowe Street, Ballarat East, Vic.
 3ZM—Doble, A. M., 18 Rosella Street, Murrumbena, S.E.9.
 3ZN—Israel, M. S., 13 Station Street, Burwood, E.13.
 3ZO—Cunliffe, J. A., 12 Yann Street, Preston, N.18.
 3ZP—Richardson, R. J., 97 Vere Street, Collingwood, N.5, Vic.
 3ZQ—Hutchinson, H. K., 446 Racecourse Road, Flemington, W.1.
 3ZR—Moody, G. C., 88 Hudson Road, Spotswood, W.14, Vic.
 3ZW—Lelliott, T., 8 Agnes Street, Mont Albert, E.10.
 3ZX—Oppenheim, O. G., 33 Saturn Street, Caulfield, S.E.8.
 3ZY—Borgeest, W. F., 24 Charnwood Road, St. Kilda, S.2.
 3ZZ—McLeod, G. S., Milne Street, Crib Point.

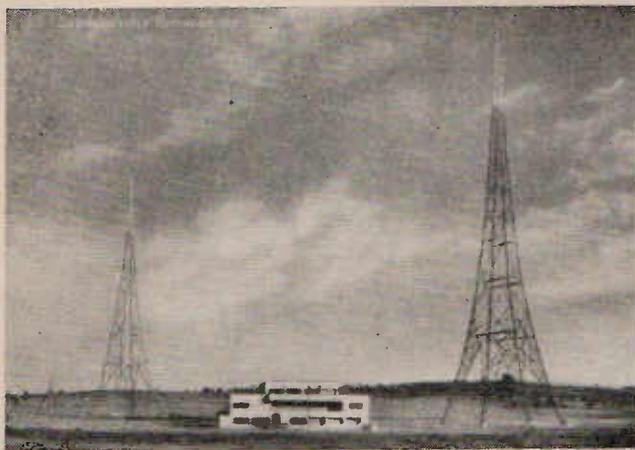
Queensland.

4AB—Bryce, R. A., 21 Musgrave Street, Ipswich.
 4AD—Dixon, A. L., "Daron," Agnew Street, Norman Park.
 4AE—Stratford, L. S., Marshall Street, Goondiwindi, Qld.
 4AF—Marshall, A. F., Fisher Street, Clifton.
 4AG—Greenham, A. J., C/o National Bank of A/asia Ltd., Innis-fail, Qld.
 4AH—Hadley, A. L. T., 3 Deighton Road, Dutton Park, Qld.
 4AL—Munro, B. W., McConnell Street, Bulimba.
 4AM—Minchan, W. A., 63 William Street, Rockhampton.
 4AP—Guildford, A., 36 Bramston Terrace, Helston.
 4AR—Tonge, A. E., Salisbury Street, Indooroopilly.
 4AS—Soden, A. W., Ipswich Road, Annerley.
 4AU—Milner, J., 44 Woodland Street, Ashgrove.
 4AW—Walz, A. E., Cr. Eton Street and Sandgate Road, Nundah.
 4AX—Denby, H. R., Goulburn St., Kedron, N.3, Qld.
 4AZ—Sharpe, F. V., "Avening," Kandanga Road, Ashgrove.
 4BA—Brookes, A. A., Cr. Greenwood and Qandong Streets, Kelvin Grove.
 4BB—Beatson, R. J., 179 Sussex Street, Maryborough.
 4BG—Glassop, R. J., C/o Mrs. D. B. Stewart, 565 New Sandgate Road, Clayfield.
 4BJ—Brown, J. G., 45 Baden Powell Street, Rockhampton.
 4BM—Morrow, A. C., 177 Kennedy Terrace, Paddington.
 4BN—Newell, A. J., Racecourse Road, Mill Hill, Qld.
 4BS—Grummitt, G. F., Hunt Street, Hamilton.
 4BW—Couper, A., off Lloyd Street, Mareeba.
 4CB—Caswell, A. H., Fryar Street, Murgon.
 4CD—McDonald, C., 96 Archer Street, Rockhampton.
 4CE—Connor, E. B., Gindie.
 4CF—Fortescue, C., "Matlock," Arthur Street, Toowoomba.
 4CG—Gold, C. H. Y., c/o Gold Radio Service Ltd., Ruthven Street, Toowoomba.
 4CL—Waterworth, L. C., Smith Street, The Range, Rockhampton.
 4CM—McDowall, Dr. V., Observatory Tower, Wickham Terrace, Brisbane.
 4CO—Langfield, H., 95 Elizabeth Street, Rosalie.
 4CP—Parry, C. A., Gordonvale.
 4CR—Hewitt, C. R., 121 Fernberg Road, Rosalie.
 4CU—Walker, C., East St., Clifton.
 4CX—McDowell, J. E. D., 22 Duke St., Ascot, Qld.
 4CY—C.Y.M.S. (Gordonvale Branch), Catholic Presbytery, Gordonvale, Qld.
 4DB—Brown, G. D., Bale Street, Ascot.
 4DO—Hobler, H. L., 202 Campbell Street, Rockhampton.
 4DR—Laws, D. A., Mt. Cootha Road, Taringa.
 4DX—Queensland DX Radio Club, 73 Payne Street, Torwood.
 4EY—Wright, E. J., Ekibin Road, Annerley, S.3, Qld.
 4EA—Ashlin, E. R., c/o Rosentengels Ltd., Ruthven Street, Toowoomba.
 4EB—Butcher, E. W., Richmond St., Kedron, Qld.
 4EC—Cagney, E. W., Bracker Street, Rockhampton.
 4EE—Mathews, J., 143 George St., Rockhampton, Qld.
 4EF—Fell, E. F., 191 Waterworks Rd., Ashgrove, Qld.
 4EG—Gold, E. E., Lindsay Street, Toowoomba.



The latest in DX equipment—in 1920. The loose-coupled receivers on the right were widely popular in those days.

- 4EI—Belstead, R. L., 2 Park Lane, Hyde Park.
 4FK—Kenna, V. F., 41 Allen St., Hamilton, Qld.
 4EL—Lake, E. J., 47 William Street, Kangaroo Point.
 4EM—Mars, E. B., "Lorraine," Burke Street, Charleville.
 4EN—Neale, E. D., Emu Street, Longreach.
 4ER—Reilly, E. H., Ryan Street, Hill End, South Brisbane.
 4ES—Sprenger, H. E., 32 Burnett Street, South Bundaberg, Qld.
 4EW—White, E. H., Vowles Street, Red Hill.
 4FB—Beech, F. S., Bennetts Road, Coorparoo.
 4FE—Burton, A. R., 33 Leichhardt Street, Brisbane.
 4FH—Hansen, H. W., Forest Hill.
 4FJ—Baxter, S. R., Old Cleveland Road, Camp Hill.
 4FM—Moody, F. P., 34 Lake Street, Cairns.
 4FN—Nolan, F. M., 25 Park Road, Wooloowin, N.3, Qld.
 4FO—Hoe, F., Killarney Street, Yeronga.
 4FS—Starr, F. J., Corundum Street, Stanthorpe.
 4FW—Woolley, L. R., 22 George Street, Newtown, Ipswich.
 4GA—Shearer, G. A., State School, Quamby, via Cloncurry.
 4GE—Ginn, E. G., 26 Macrossan Street, Townsville, Qld.
 4GF—Foreman, E. G., Airdmillan Road, Ayr.
 4GG—Heilbronn, G., "Euroa," Clayton Street, Chinchilla.
 4GH—Harley, G. N., "Brooklyn," Didcot, Gayndah Line.
 4GJ—Arthur, C. J. G., Dayboro, Qld.
 4GK—MacKenzie, A. H., Fire Station, Wynnum.
 4GS—Strofeldt, G., Cr. Guthrie and Isaac Streets, Paddington.
 4GU—Chadwick, R. H., "Te Whare," Clifton Street, Wilston.
 4GW—Ham, G. W., 248 Cavendish Road, Coorparoo, S.E.2.
 4GX—Barraclough, F., Gail Street, Kedron, N.3, Qld.
 4HA—Angel, H. B., Sisle Street, St. Lucia.
 4HB—Bremerman, H. F., 51 Wellington Street, Wooloowin.
 4HF—Shortt, R., c/o Post Office, Camooweal.
 4HG—Brown, H. G., Cr. Fifer Street and Menzies Lane, Ipswich.
 4HJ—MacKenzie, A. A., c/o J. McFetridge, Granville Station, Jericho, via Rockhampton.
 4HK—Kinzbrunner, H. C., Tully, Qld.
 4HL—Lynch, H. J., 198 Wickham Street, Valley.
 4HM—Murphy, H. J., Post Office, Ilfracombe, Qld.
 4HN—Nicholson, H. G., Paga Hill, Port Moresby, Papua.
 4HR—Scholz, H., Station St., Coorparoo, Qld.
 4HS—Scott, H. G., Mahalla, cr. Lindsay and Argyle Streets, Toowoomba.
 4HT—Todd, A. H., Graham Street, Ashgrove.
 4HU—Hughes, G. H., Eildon Road, Windsor, N.3.
 4HX—A.W.A. Limited, 47 York Street, Sydney. (Station at Radio Station, Pinkenba.)
 4JA—Abbiss, J. E. F., Wilson Street, Morningside.
 4JB—Alder, O. E., 16 Old Sandgate Road, Albion.
 4JC—Bailey, J. H., 18 Thomas Street, Redhill.
 4JE—Edgar, J. M., 57 George Street, Kangaroo Point.
 4JF—Files, J. C., 43 Rialto Street, Coorparoo.
 4JG—Grant, C. J., cr. Victoria Parade and Old Sandgate Road, Wooloowin.
 4JH—Humphry, Mrs. I. J. L., Poopoonbah, via Giru, N.C. Line.
 4JJ—Jordan, J., c/o Wyper Bros., Bundaberg.
 4JK—Humphry, J. L., Poopoonbah, via Giru, N.C. Line.
 4JL—Love, J. P., "Glen Kedron," 1st Avenue, Kedron.
 4JM—McDermott, J. W., Rosemount, via Nambour.
 4JN—Augustesen, G. G., Sussex Street, Mitchelton.
 4JO—Fittell, S. L., City Buildings, Mary St., Gympie, Qld.
 4JP—Gray, G. H. B., 18 Henry St., Ascot, N.E.2, Queensland.
 4JT—Boileau, J. G., Port Moresby, Papua.
 4JU—Nolan, F. W., 110 Wharf St., Brisbane, Qld.
 4JW—Larsen, H. P. C., off Cambridge Street, Charters Towers.
 4JX—Heine, J. F., 18 Henry Street, Ascot.
 4KH—Argaet, W. S., "Kingsley," Kingsley Terrace, Wynnum South.
 4KK—Bradford, A. K., "Bonville," Bringalily, via Millmerran, Qld.
 4KL—Johnson, I. U., 197 Esplanade, Cairns, Nth. Qld.
 4KO—Hart, N. V., 67 Glebe Road, Newtown.
 4KR—Edward, H. J., and Oliver, Willis Island.
 4KX—Cran, M. R., 228 Boundary Street, West End.
 4KY—Martin, M., Pantton Street, Wood End.
 4KZ—Couchman, C. C. Mc., Kaimkillenbun, via Dalby.
 4LA—Smith, S. D. P., Arthur Street, Corinda.
 4LB—Bowen, J. L., 33 Nudgee Road, Hamilton.
 4LC—Currie, J. L., 133 Bourbon Street, Bundaberg.
 4LD—Gunn, K. C., "Inverness," Patrick Street, Laidley.
 4LE—Greenhill, G. A., 39 Whynot Street, West End.
 4LH—Hitchcock, L. F., 128 Kedron Park Road, Wooloowin.
 4LJ—Feenaghty, L. J., cr. Aloomba Road and Amarina Avenue, Ashgrove.
 4LK—Kerr, V. L., Post Office Box 103, Cloncurry.
 4LL—Lumb, L. J., Devonshire Street, Ashgrove.
 4LM—McMahon, L. H., Old Sandgate Road, Toombul.
 4LN—Grey, J. L., "Birkhill," Agnew Street, Norman Park.
 4LO—Nolan, Mrs. V. E., 110 Wharf Street, Brisbane, Qld.
 4LQ—Johnston, R. W., 23 Bell Street, Petrie Terrace, Brisbane.
 4LR—Thomas, R. H., Vine St., Bulimba, N.E.1.
 4LS—Williams, L. S. B., Toogoolawah.
 4LW—Morris, C. R., Exeter Street, Ashgrove.
 4LX—Grey, E. E., 18 Circe Street, Ascot.
 4MA—Bull, F. G., "Cozydell," River Park, Fairfield.
 4MC—MacPherson, A. D., "Cluny," Old Sandgate Road, Nundah.
 4MI—Goford, T. W., Radio Hut, South End, Mt. Isa, Qld.
 4ML—Merchin, L. G., Hillier Street, Richmond.
 4MM—O'Brien, M. M., Villa Street, Annerley, S.3, Qld.
 4MR—Stewart, J. E., "Braemar," Rode Road, Nundah.
 4MW—Wratten, M. J., Clem Street, Brassall, Ipswich.
 4MX—Martin, J. R., 71 Brock Street, Toowoomba.
 4ND—Dahl, N. L., Airdmillan Road, Ayr.
 4NF—Dangerfield, J. H., 36 Wills St., Townsville, Queensland.
 4NL—Dangerfield, N. G., Pioneer Estate, Lower Burdekin, Nth.
 4NM—Mills, N. G., Ipswich Road, Moorocka, S.4.
 4NO—Thuge, N., Parsons Point, via Gladstone.
 4NP—Phillips, R. W., 93 Nicholas Street, Ipswich.
 4NW—Starkie, T. W., "Langthorne," Rode Road, Nundah.
 4NLO—O'Loughlin, F. P., 37 Kennedy Terrace, Red Hill.
 4OO—Bright, W. H. H., 52 Hume Street, Toowoomba.
 4PC—Chapman, P. C. L., P.O. Box 130, Babinda.
 4PH—Hardgrave, P., 285 Montague Road, South Brisbane.
 4PJ—Jessop, P. F., Hambleton, via Cairns.
 4PK—McIntosh, S., "Kia Ora," O'Sullivan Street, Woodend.
 4PN—Roberts, R. F., "Deeander," Ipswich Road, Annerley.
 4PW—Wood, P., Nicholas Street, Ipswich.
 4PX—Johnson, A., Croker Avenue, Hendra, N.E.2.
 4PY—Clarke, P. F., "Jarvisfield," Ayr, Queensland.
 4QL—The Queensland Listeners' League, 157 Enoggera Terrace, Paddington.
 4RA—Atkinson, R. A., King Street, Annerley.
 4RB—Browne, R. J., 25 Church Street, Toowong.
 4RC—Campbell, R., 30 Prospect Terrace, Kelvin Grove.
 4RD—Moffatt, R. D. G., Northside, Mackay.
 4RF—Lubach, F. J., 90 Prince Street, Thompson Estate, South Brisbane, S.3, Qld.
 4RG—Ryan, G. E., 15 Russell Street, South Brisbane.
 4RH—Howe, R., Perry St., Bundaberg, Qld.
 4RJ—Delbridge, Rev. R. J. R., Glebe Rd., Booval, Ipswich, Qld.
 4RL—Central Technical College, George Street, Brisbane.
 4RM—Meadows, R. C., 60 George Street, Mackay.
 4RP—Carne, R. L., c/o C.S.R. Co. Ltd., Goondi Mill, Innisfail, Qld.
 4RQ—Rose, R. W., Eagle Street, Longreach.
 4RS—Stacey, R. E., Main Street, Proserpine.
 4RT—Thorley, R., Bower St., Annerley, S.3, Qld. Brisbane.
 4RV—Vickary, R. M., 59 Palmerin Street, Warwick.
 4RW—Rhode, W., "Maranoa," McCook Street, Red Hill.
 4RX—Blades, R. A., Hursley Road, Glenvale, Toowoomba.
 4RY—Harston, W. L., 72 Riverton Street, Clayfield.
 4SA—Smith, A. S., "Winalar," Burns Street, Indooroopilly.
 4SD—Sharland, A. H.—Boondall, N.E.6, Sandgate Line, Qld.
 4SL—Luckman, T. S., cr. Shaw and Lodge Roads, Kalinga.
 4SM—Smart, A., Willow Street, Barcaldine.
 4SR—Shoring, T. S., Burnett Club, Quay St., Bundaberg, Qld.
 4ST—Tumbridge, S. H., Post Office, Stanthorpe.
 4SU—Sherriff, E. G., "Maricia," Russell Street, Fairfield.
 4TA—Alexander, T. M., Murray Street, North Ward, Townsville.
 4TH—Hewitt, T. G., 8 MacKenzie Street, Cairns, Qld.
 4TK—Stack, R. P. C., Owen Street, Innisfail, Qld.
 4TS—Shorten, E. W., 11 Wilden Street, Paddington.
 4TW—Tarling, A. W., Henry Street, West End, Townsville, Qld.
 4TY—Tyas, N. R. W., Kingaroy.
 4UJ—Dubois, P. L., 55 Baroona Road, Rosalie, Qld.
 4UK—Herschel, H. V., Westminster Road, Indooroopilly.
 4UL—Hubsher, L. P., 98 Commercial Road, Bulimba.
 4UR—Bates, J. L., 233 Arthur Street, Teneriffe.
 4UU—Chitham, W. N., 32 Doggett Street, Valley, Qld.
 4UW—Ferricks, M. B., 28 John Street, Valley.
 4UX—Singleton, C. P., Theodore.
 4UZ—Buzacott, A. H., 44 Campbell Street, Toowoomba.
 4VD—Bell, V. S., 200 West Street, Rockhampton.
 4VH—Wooster, H. M., Cnr. Kingsbury and Power Streets, Norman Park, S.E.1.
 4VJ—Jeffs, V., 170 Bowen Terrace, Brisbane.
 4VW—Wilson, V. J., 58 Newstead Terrace, Newstead.



The 100 k.w. station at Beromunster, Switzerland.

- 4VZ—Garth, R. Mackay, Qld.
 4WA—Goldsworthy, W. J., 27 Brunswick Street, Valley.
 4WB—Berry, W. J., cr. Wingarra and Crichton Streets, Yerongapilly.
 4WD—Hepton, W. D., 115 Milton Road, Milton.
 4WG—Clayton, W. G. G., Benwell St., East Innisfail, Qld.
 4WH—Hagarty, W. E., Crane Street, Longreach.
 4WI—Wireless Inst. of Aust. (Qld. Division), Celtic Chambers, George Street, Brisbane.
 4WJ—Farrell, J. H., "Braeside," Palmer Street, Windsor.
 4WL—Irving, C. L., Bower Street, Annerley.
 4WM—McNichol, R. W. E., 37 Florence St., Teneriffe, N.I., Qld.
 4WO—Thse, H., Avoca Street, Yeronga.
 4WS—Sebley, W. J., 3 Birdwood Street, Ipswich.
 4WT—Wishart, W. T., cr. Long and Dan Streets, Graceville.
 4WU—Grant, W. P., Ward Street, Indooroopilly, S.W.2.
 4WW—Radford, W. D., Elimatta Drive, Ashgrove, W.3, Qld.
 4XF—Mantle, J. P. T., Norman Street, Ascot.
 4XK—Richards, G., Burnett Street, Ipswich.
 4XL—Chapman, F. W., "Lotus," Park Road, Yeronga.
 4XM—Worrall, L. A., C/o Bank of New South Wales, Cairns.
 4XN—Nissen, E. L., Condamine Street, Dalby.
 4XU—Laurie-Rhodes, M. C., C/o W. Connolly, 128 Flinders St., Townsville, Qld.
 4XW—Harmer, C., Ashton Street, Coorparoo.
 4YA—Kemp, A. A., Yangan.
 4YG—Young, I. H., 212 Sandgate Road, Albion.
 4YJ—Sainsbury, R. H., "Warrego," Franz Road, Clayfield.
 4YL—MacKenzie, Miss F. M., Fire Station, Wynnum.
 4YM—Cohen, D., City Hall, Brisbane.
 4ZL—Pembleton, T. E., 167 Denham Street, Rockhampton.
 4ZO—Hillhouse, J., Collinsville.
 4ZT—McDonald, W. N., 267 Main Street, Kangaroo Point, S.E. I, Queensland.
 4ZX—Bullock, A. F. W., 20 Primmer Street, Coorparoo.
 4ZY—Burns, C. E. J., Knight Street, Kingaroy.

South Australia and Northern Territory.

- 5AC—Cook, V. R. P., 86 Windsor Avenue, Kilkenny.
 5AF—Ives, C. A., 12 Ramsgate Street, Glenelg.
 5AG—Smith, W., 5 Burnleigh Mansions, Esplanade, Henley Beach, S.A.
 5AI—Reilly, E. D., 53 Stanley Street, Woodville.
 5AK—Lawrie, K. A., 3 Gertrude Street, Lockleys, S.A.
 5AM—Kennedy, P., 77 Edmund Avenue, New Parkside.
 5AP—Morrissey, B. J. M., 40 Ballville Street, Prospect.
 5AR—Richardson, A. K., 11 South Road, Everard Park.
 5AT—Taylor, A. W., 128 Main Road, Lomomtown.
 5AW—Kelly, A. W., Lindale Winery, Lyndoch.
 5AX—Traeger, A. H., 11 Dudley Rd., Marryatville, S.A.
 5AY—Haynes, T. A. J., 408 Cross Road, Black Forest Estate, Adelaide.
 5AZ—A.W.A. Limited, 47 York Street, Sydney. (Station at Radio Station, Rosewater.)
 5BC—Lloyd, H. F., 5 Mary Street, Hindmarsh.
 5BD—Briggs, D. R., Iona Street, Broadview, Walkerville.
 5BF—Miller, F. G., Eleanor Terrace, Murray Bridge.
 5BH—Blunden, L. W., 58 Shelly Street, Firls.
 5BJ—Bruce, R. A., 1 Henry Street, Glenelg.
 5BK—Grivell, I., Cr. 3rd and 5th Streets, Gladstone, S.A.
 5BM—Willoughby, E. L., Knight Street, Penrhyn.
 5BP—Caldwell, R. B., 53 Hughes Street, North Unley.
 5BR—Blackwood Radio Club, c/o G. Ragless, South Road, St. Marys.
 5BU—Bourne, F. F., 8 Edmund Avenue, Unley.
 5BW—Phillips, J. G., Madge Terrace, Somerton.
 5BY—Whitburn, D. R., 77 Wattle St., Fullarton, S.A.
 5CB—Brimble, C. C., 27 Scarborough Street, Somerton.
 5CM—Anthony, R. M., 3 High Street, Unley Park.
 5CP—Laver, C. P., Cape Borda Lighthouse, Kangaroo Island.
 5CR—Cheel, C. R., 40 Clifton Street, Maylands.
 5CX—Moule, C. E., 146 Young Street, Parkside.
 5CY—Henry, R. C., Cook, S.A.
 5DA—Buckerfield, S. R., 38 Queen Street, Knoxville.
 5DB—Berry, L. D., 24 Moulden St., Norwood, S.A.
 5DC—Shepard, A. E., 33 Queen Street, Norwood.
 5DI—5AD-PI Radio Club, 313 Young Street, Wayville.
 5DK—Robbins, T. F., 11 Moorhouse Avenue, Fullarton Estate.
 5DL—Linklater, D. C., Railway Terrace, Pinnaroo.
 5DP—Brock, H. E. E., 2A Marlborough Street, Malvern.
 5DR—Deer, P. W., 9 Arundel Road, Brighton.
 5DX—Taylor, D. G., 67 Victoria Street, Forestville.
 5EM—Mann, J. E., 149 Military Road South, Semaphore, S.A.
 5FA—Anderson, F. B., Elizabeth Street, Tanunda, S.A.
 5FB—Brandon, E. F., Post Office Box 80, Wilmington.
 5FC—Collins, C. H. J., 12 Hackett Terrace, Marryatville.
 5FG—Rogers, B. S., C/o F. R. Radestock, Blackwood, S.A.
 5FL—Harris, R. C., 9 Giles Avenue, Glenelg.
 5FM—Bowman, H. N., 24 Lambert Road, Royston Park.
 5FW—Halliday, E. T., Wonga Avenue, Hectorville.
 5GA—Anderson, G. R., Baulderstone Road, Myrtle Bank.
 5GC—Burgess, G. T., 39 Airlie Avenue, Prospect.
 5GF—Farmer, M. G., 134 LeStrange, Street, Knoxville.
 5GK—Carter, F. P., 55 Roebeck Street, Mile End.
 5GL—Tilbrook, C. D. L., 16 Carlisle St., Camden, S.A.
 5GM—Anderson, A. R., 16 Hauteville Terrace, Eastwood, S.A.
 5GP—Pitts, R. G., 65 Carlton Parade, Torrensville.
 5GR—Ragless, G. B., South Road, St. Marys.
 5GU—Gregory, R. W., Hutchinson Street, Mount Barker.
 5GW—Huppertz, W. G., McCoy St., Naracoorte, S.A.
 5GY—Farmer, M. G., 134 Le Strange Street, Knoxville. (Portable).
 5HB—Johnson, H. B., 429 Esplanade, Henley Beach, S.A.
 5HD—Lloyd, W. E., 5 Mary Street, Hindmarsh.
 5HG—Cooper, H. M., 51 Hastings Street, Glenelg.
 5HK—Backler, E. L., Kingston.
 5HL—Lunn, H. V., 10 Morphet Road, Morphettville.
 5HM—Goldsmith, G. W., 15 Goldfinch Avenue, Cowandilla.
 5HR—Heinrich, W. L., Post Office Box 9, Bute.
 5HW—Wheeler, H. W., Wiepena Street, Eden Hills.
 5IT—Thomas, I., 15 Eynesbury Avenue, Kingswood Park, Mitcham.
 5IV—Dennett, P. R., Coneybeer Street, Berri.
 5JA—Brewer, P. J., 21 Douglas Street, Parkside.
 5JB—Bergin, J. T., 11 Sifton Street, Largs Bay.
 5JC—Cawthron, E. J., 18 Flinders Street, Kent Town.
 5JG—Georgeson, J., 67 Moseley St., Glenelg, S.A.
 5JH—Chennell, V., 37 Hounslow Avenue, Cowandilla.
 5JK—Kidman, I. M., Robertson Street, Naracoorte, S.A.
 5JN—Henderson, S. A., 19 North East Road, Walkerville, S.A.
 5JO—Reimann, A. A., 26 College Road, Kent Town, S.A.
 5JR—Smith, J. A., 41 Queen Street, Alberton.
 5JS—Strafford, J., 71 Ann Street, Stepney, S.A.
 5JT—Kilgariff, J., Todd Street, Alice Springs.
 5JU—Berry, H. A., 38 William Street, Norwood.
 5JW—Wilkin, J. W., "Willow-Bend Stud Poultry Farm," North Walderville, S.A.
 5JX—Golley, J. C., 15 Pier Street, Glenelg.
 5KB—Bowen, H. K., 44 Augusta Street, Maylands.
 5KD—Davey, R. W., 199 Torrens Road, North Croydon.
 5KG—Brooks, A. H., 13 Surrey Street, Grange.
 5KH—Ring, K. N., 8 May Terrace, Kensington Park.
 5KL—Castle, C. H., 21 Harrington Street, Prospect.
 5KO—DeCure, J. E., 25 Farrell Street, Glenelg.
 5KR—Ireland, L. K., Chute St., Mount Gambier, S.A.
 5KW—Wadhom, K., 96 Pirie Street, Adelaide.
 5KX—Bulling, W. J., 617 Esplanade, Grange.
 5KY—Stapleton, J. W., 125 Commercial Road, Port Adelaide.
 5LA—Atkins, L. M., 96 Hewitt Avenue, Rose Park.
 5LB—Badenoch, J. H. L., 46 Hereford Avenue, Trinity Gardens.
 5LC—Catford, L. E., Gladstone.
 5LD—Deane, L. A., 21 Davenport Terrace, Hazelbrook Park, S.A.
 5LF—Sawford, L. F., 107 Wills Street, Largs.
 5LG—Cotton, L. S., Post Office, Iron Knob.
 5LJ—Davies, R. R., 8 Gurr Street, Goodwood Park.
 5LL—Lucas, G. F., 19 Wilpena Terrace, Kilkenny.
 5LN—Drew, A. J., 19 Dimboola Street, Kensington.
 5LO—Loeser, H. E., 2 Clifton Street, Goodwood, S.A.
 5LP—Phillips, L. V., 5 Luhrs Road, South Payneham.
 5LY—Hodder, C. W., 72 Porter Street, Parkside.
 5MD—Barbier, E. A., Stockade Reserve.
 5MF—Smythe, A. C., 15 Northcote Street, Torrensville.
 5MH—Baty, R., Addison Road, Pennington.
 5MK—Bentley, F. E., 20 Neil Street, Cowandilla.
 5ML—Coombe, G. S., 6 Manton Street, Hindmarsh.
 5MO—McGrath, E. P., 42 Robsart St., Parkside, S.A.
 5MP—Porter, L. G., Huddleston.
 5MV—Barber, S. G., 505 North Esplanade, Henley Beach.
 5MW—Atkins, K. J., 29 Park Avenue, Semaphore South.
 5MX—White, C. R., 69 Curran Street, Kilkenny.
 5MY—Roberts, H. M., 58 Fourth Avenue, Alberton East.
 5MZ—Lawrence, J. H., 17 Sheffield Street, Malvern.
 5NO—Knock, D. B., 14 Yanko Avenue, Bronte, N.S.W. (Portable, for use in Central Australia).
 5NW—Bailey, R. H., Mitchell St., Crystal Brook, S.A.
 5OJ—Green, H. R., 5 Dudley Avenue, Prospect, S.A.

- 50P—Brown, L. A., 16 Park Terrace, Eastwood.
 5PB—Burford, W. P., Foster Street, Naracoorte.
 5PN—Pearn, W. L., 20 Oxford Terrace, Sturt Park.
 5PR—Kilsby, K. W., Birdwood.
 5PS—Parsons, W. W., "Haigh Mansions, Esplanade, Henley Beach.
 5QP—Theel, K. M., Caulfield Avenue, Clarence Park.
 5QR—Galle, R. V., 56 Clive Street, Prospect.
 5RB—Bedford, R., Cottage Hospital, Kyanacutta.
 5RC—Cameron, A. R., 330 Kensington Road, Leabrook.
 5RD—Elliott, R. D., Farr Terrace, DaCosta Park.
 5RE—Hobcroft, H., Ral Ral Avenue, Renmark.
 5RG—Gurner, R. C., 11 Strathspey Avenue, Linden Park Gardens.
 5RH—Haskard, R. G., 9 Austral Terrace, Malvern.
 5RI—South Australian Railways Institute, North Terrace Railway Station, Adelaide.
 5RJ—Hancock, D. M., 86 Taylor Street, Kadina, S.A.
 5RK—Deane, R. K., 121 Wattle Street, Fullarton, S.A.
 5RL—Paech, R. L., 14 Fernleigh Street, Underdale, S.A.
 5RN—Robertson, D. S., "Maroonika," Milan Terrace, Mount Lofty, S.A.
 5RO—Easter, E. R., Ryan Street, Moonta.
 5RP—Parasiens, R., 138 Anzac Highway, Glandore.
 5RT—Manuel, R. T., 59 Gordon Road, Prospect.
 5RX—Luson, G. W., 8 Brook Street, West Mitcham.
 5RY—Yates, R. C., C/o B.H.P. Co. Ltd., Whyalla.
 5RZ—Nestrom, O. L., 11 Ninth Avenue, St. Peters.
 5SL—Fielder, L. V., Blyth Terrace, Moonta.
 5SM—S.A. School of Mines & Industries, North Terrace, Adelaide.
 5SP—Finn, L. W., Simpson Street, Seaton Park, S.A.
 5SU—Gray, F. M., 52 Ormond Grove, Toorak Gardens.
 5TR—Turner, R. R., 122 Seaview Road, Henley Beach.
 5TT—Thebarton Junior Technical School Club, Ashley Street, Thebarton.
 5TW—Welling, T., 106 Hill Street, South Adelaide.
 5TX—Foster, J., 11 York Street, North Kensington.
 5UK—Coakley, T. J., 10 Thomas Street, Unley.
 5UX—Wallbridge, L. W., 38 Railway Terrace, Peterborough.
 5WA—Adamson, W. K., 46 Woodfield Avenue, Fullarton.
 5WB—Wilson, H. B., 313 Young Street, Wayville.
 5WD—Wilkinson, D. A., 23 Main Avenue, Frowville.
 5WG—Govan, W. N., 39 Esmond Road, Port Pirie.
 5WH—Barber, W. H., 46 Cottell Street, Port Pirie.
 5WI—Wireless Institute of Aust. (South Aust. Division), 176 Rundle Street, Adelaide.
 5WJ—Wiseman, W. J. C., Port Lincoln.
 5WK—Prince, A. E., 23 Warwick Street, Walkerville.
 5WR—Richards, W. M., 32 Charlbury Road, Medindie Gardens.
 5WS—West Suburban Radio Club, 44 King Street, Mile End.
 5WW—Walker, W. S., 20 King Street, Alberton.
 5XA—Stacey, H. K., 10 Howard Terrace, Knightsbridge, S.A.
 5XB—Sutherland, G., Gower Street, Dunleath, Glenelg.
 5XJ—Pryzibilla, C. A., 19 Leicester Street, Parkside.
 5XK—Hewitt, A. J., 233 Henley Beach Road, Torrensville.
 5XR—Patterson, C., Peake Street, Naracoorte.
 5YK—Eastern District Radio Club, 56 Statenborough St., Burnside, S.A.
 5YL—Geisel, B. A., Charles St., Murray Bridge, S.A.
 5YQ—Charles, E. A., 193 Young Street, North Unley.
 5ZL—Weddell, J. A., 26 Kandahar Crescent, Reade Park.
 5ZU—Phillips, A. M., 68 Kintore Avenue, Prospect, S.A.
 5ZX—Heath, A. H., 7 Clifford Street, Prospect Park.
 5ZY—Mutton, A. K., 4 Burke Street, Tusmore.
- 6FJ—Kemble, F. J., Richardson Street, Katanning.
 6FL—Lambert, F. C., 9 Gregory St., Wembley, W.A.
 6FO—Ollivier, N. F., 26 Merriwa Street, Hollywood.
 6FR—Wright, F. H., 18 Palmerston St., Buckland Hill, W.A.
 6FT—Tredrea, F., 88 Arlington Avenue, South Perth.
 6GB—Gabbertas, J., 254 Guildford Road, Maylands, W.A.
 6GM—Moss, G. A., 68 Forrest Street, Mt. Lawley.
 6GR—Rippen, A. H. C., 27 Clarke Street, Fremantle, W.A.
 6GS—Horrocks, G. S. B., Uduc Road, Harvey.
 6GW—Butterfield, G. W., 12 Swan Street, South Perth.
 6HD—Davies, H. T., 19 Harley Street, Highgate Hill.
 6HF—Fogg, H. L., 27 Dumbarton Crescent, Mt. Lawley.
 6HT—Tarbottom, H. A., Middleton Road, Albany.
 6HW—Willis, H. O., 42 Jenkin Street, South Fremantle.
 6JC—Chinery, Miss J. C., John Street, Welshpool.
 6JE—Elsbury, C. R., 24 Addis St., Kalgoorlie, W.A.
 6JG—Goddard, J. E., 31 Ruby Street, North Perth.
 6JH—Horn, I. J., Observatory, Perth.
 6JJ—Jewell, T. J., 52 Lichfield Street, Victoria Park.
 6JK—Dewan, J. O., 580 Beaufort Street, Perth.
 6JR—Richards, V. J., 55 View Way, Nedlands.
 6JS—Squires, J., Cannington Terrace, Cannington.
 6JT—Treloar, J., Nannine Avenue, Beaconsfield.
 6JW—Wilmott, J. H., 6 Gardner Street, Como.
 6KB—Dook, V. L., 33 Egina Street, Mt. Hawthorn.
 6KD—McHugh, W. C., 29 Johnson Street, Guildford.
 6KM—Saar, A., 193 Sixth Avenue, Maylands, W.A.
 6KN—Morrison, G. C., 156 Augustus Street, Geraldton.
 6KO—Rann, G. W., 17 Cook Street, Nedlands.
 6KP—Parker, K. H., Darlot Street, Meekatharra.
 6KR—Bell, V. F., 5 Mercantile Chambers, Egan Street, Kalgoorlie.
 6KS—Anderson, K. S., c/o Bank of New South Wales, Mt. Magnet.
 6KX—Simmons, H. T., 7 Bedford Street, Nedlands.
 6KZ—Vernon, C. H., C/o R.A.A. Barracks, Fremantle, W.A.
 6LJ—Mead, J., 111 Gerard Street, East Victoria Park.
 6LK—Read, A. W., c/o Northam Broadcasters Ltd., Northam.
 6LL—Bishop, C. E., Carew St., Katanning, W.A.
 6LW—Petersson, W. M., 108 Hill St., East Perth, W.A.
 6LX—Richardson, J. B., 6 Merriwa St., Hollywood, W.A.
 6LY—Collis, R., 19 Murray Street, Bayswater.
 6MN—Madden, S. J., 51 Dundas Road, Maylands.
 6MO—Magnetic Observatory, Watheroo.
 6MS—Sander, J. H., 79 Eleanor Street, Geraldton.
 6MU—Urquhart, M. S., 271 Marmion Street, Cottesloe.
 6MW—Weston, W., 5 Portland Street, Nedlands.
 6MY—Murray, M., 36 Strickland St., South Perth, W.A.
 6MZ—Tonkin, A. M., Clive St., Katanning, W.A.
 6NJ—Johnston, N. B., 101 Rosalie Street, Subiaco.
 6NL—Harris, V. H., 25 Harvey Road, Shenton Park West.
 6NO—Turnbull, N., 21 Harvey Road, Shenton Park.
 6OR—Hoar, J. C., 65 Dalgety St., East Fremantle, W.A.
 6PD—Australian Aerial Medical Services (W.A. Section), Port Hedland, W.A.
 6PK—Kernick, P. E., 12 Fremantle Road, South Perth.
 6RA—Agnew, R. G., 37 Myers Street, Nedlands.
 6RH—Hull, R. A., 48 Essex Street, Wembley, W.A.
 6RJ—Tapper, J. R., 24 Davies Road, Claremont.
 6RK—Choat R. S., 37 Hanbury Street, Kalgoorlie.
 6RL—Henwood, R. F., 3 Dean Street, Claremont.
 6RS—Trew, R. S., King Street, Harvey.
 6RT—Trunfull, R. L., Government School, Roebourne.
 6RW—Muir, R. W., Johnston Street, Wagin.
 6SA—Austin, S. C., 82 Forrest Street, South Perth.
 6SG—Hogg, S., Sir James Avenue, Harvey.
 6SP—Sperring, W. J., 43 Temple Street, Victoria Park.
 6SR—Subiaco Radio Society, 75 Gloster Street, Subiaco.
 6TP—Pearce, E. R., 3 Woodville St., North Perth, W.A.
 6SW—Worth, S. E., 47 Mountjoy Road, Nedlands, W.A.
 6VK—Vincent, I., 124 Varden Street, Kalgoorlie.
 6WG—Green, W. W., Prior Street, Wiluna.
 6WH—Doddy, E. A., 9 Queen Street, Claremont.
 6WI—Wireless Institute of Australia (W.A. Division), Melbourne Chambers, Gnr. Hay and Milligan Sts., Perth, W.A.
 6WK—Ruse, T. W., Scarborough Beach Road, Osborne Park.
 6WL—McGeoch, W. L. S., Richardson Street, Brookton.
 6WM—Morris, W. B., 5 Leura Street, Hollywood.
 6WO—Pelling, J. C. F. L., Trimmer Road, Moolebing.
 6WP—Phipps, W. R., 56 Goode Street, South Perth.
 6WR—Rodda, W. D., 19 Bay Road, Claremont.
 6WS—Schofield, W., 40 Irvine Street, Peppermint Grove.
 6WW—Watson, S. W., 27 Clive Street, West Perth.
 6WZ—Atkinson, R. H., 27 Rathay St., Victoria Park, W.A.
 6XL—Miles, H. R., 34 Learoyd Street, Mt. Lawley, W.A.
 6YL—Longley, Miss R. V., 7 Cuthbert Street, Shenton Park, W.A.
 6YZ—Samphier, R. L., 53 Gloucester Street, Victoria Park, W.A.
 6ZZ—Stephens, H., 82 Fremantle Road, South Perth.

Western Australia.

- 6AA—Grey, A. E., 40 Archdeacon Street, Nedlands.
 6AB—Buckie, A. C., 14 Kinninmont Avenue, Nedlands.
 6AE—Curedale, A., 74 Palmerston Street, Perth.
 6AF—Foxcroft, A., 108 Carnarvon St., Victoria Park, W.A.
 6AG—Coxon, W. E., 38 Fifth Avenue, Mt. Pawley.
 6AK—University of West Australia, Perth.
 6AL—Lathwell, A. G., 60 Spencer Street, Bunbury.
 6AR—Russell, A. C., Perth Road, Albany.
 6AW—Watkins, A. P., 131 Davis St., Boulder, W.A.
 6BA—Arnold, W. H. R., Alexander Street, Wembley.
 6BB—Park, J. C. W., 29 Suburban Road, Mill Point, South Perth.
 6BC—Congdon, B., 75 Gloster Street, Subiaco.
 6BF—Burrows, F. H., Queen Street, Beverley.
 6BL—A.W.A. Limited, 47 York Street, Sydney. (Station at Radio Station, Applecross.)
 6BN—Stevens, A. E., 27 Strickland Street, South Perth.
 6BW—Wyle, A. J. H., 23 James St., Shenton Park, W.A.
 6CA—Bold, C. A., 13 Solomon Street, Beaconsfield, W.A.
 6CB—Brown, C. W., 11 May Avenue, Subiaco.
 6CN—Canavan, J., 196 Bulwer St., Perth, W.A.
 6CP—Cooke, C. R., 35 Beechboro Road, Bayswater.
 6CR—Reeves, C. H., 3 McMillan Street, Victoria Park.
 6CX—Quin, C., 67 Holland Street, Wembley Park.
 6CY—Young, C., 73 Marine Terrace, Fremantle.
 6DA—Saw, F. W., 31 Haynes Street, North Perth.
 6DC—D'Evelyns, C., Uduc Road, Harvey.
 6DF—Du Feu, M. A. J., 110 Heytesbury Road, Subiaco.
 6DH—Hardisty, D. C., 2 Duncan Street, Victoria Park.
 6DR—Devitt, R. L., 38 Portland Street, Nedlands, W.A.
 6EC—Cornelius, E. E., Emu Point, Albany.
 6EI—Grogan, A. W., 29 Clifton Crescent, Mount Lawley, W.A.
 6FG—Goldsmith, F. H., 27 Cooper Street, Nedlands Park.
 6FH—Hull, F. A., 37 Essex Street, Wembley.
- 7AB—Fisher, D. H., 6 York St., Launceston, Tas.
 7AG—Milne, J. C., "Askrigg," Gretna.
 7AH—Medhurst, F. W., "Cranleigh," Beach Rd., Lower Sandy Bay.
 7AL—Allen, T. A., 36 Seymour Street, New Town.
 7AM—Arnold, L. G., 42 Herbert Street, Launceston.
 7AR—Johnson, C. F., 3 Ryder Street, West Hobart.
 7BC—Forsyth, R., 7 Galvin Street, Launceston.
 7BJ—Brown, J., 22 Cromwell Street, Battery Point.
 7BM—Sheldrick, E. C., 15 Richards Avenue, Launceston.

Tasmania.

- 7BQ—Crooks, J. A. L., 64 Frederick Street, Launceston.
- 7CD—Smyth, C. W., 9 George Street, Devonport.
- 7CJ—Finch, A. E., 35 Button Street, Mowbray Heights, Tas.
- 7CK—Clark, L. F., "Woodstock," Natone.
- 7CL—Conway, M. L. D., 33 Welman St., Launceston, Tas.
- 7CM—Miller, C. H., "Carnac," Douglas Street, Bellerive.
- 7CS—Scott, A. C., 92 Grosvenor Street, Sandy Bay.
- 7CT—Connor, T., Rokeby.
- 7CW—Walch, C. A., 10 Osborne Avenue, Sandy Bay, Tas.
- 7DH—Hildyard, A. D., 325A Davey Street, Hobart.
- 7DJ—Dodds, J. S., 14 Augusta Road, Hobart.
- 7DW—Watson, D. M., 30 Main Road, New Town.
- 7GD—Dineen, G. J., 2 Brougham Street, Launceston.
- 7GH—Hall, G. L., 54 Clare Street, Newtown.
- 7HB—Banks, H. E. W., 11 Union St., Hobart, Tas.
- 7HQ—12th Battalion, A.M.F., 6th Military Districts, Barracks, Launceston.
- 7HY—Yeates, H. M., 39 George Street, Launceston.
- 7JA—Waters, J. A., 13 Russell Crescent, Sandy Bay.
- 7JB—Batchler, J. C., 21 Quarry Street, North Hobart.
- 7JH—Hooker, W. T., 47 Bay Road, New Town.
- 7KQ—Miles, G. T., "Wight Cottage," York Street, Bellerive.
- 7KR—Robinson, C. J., 8 Howick Street, Launceston, Tas.
- 7KV—Valentine, L. K., Cr. Derwent & Park Streets, Bellerive.
- 7LC—Chappell, L. A., Church St., Ross, Tas.
- 7LJ—Jenson, L. R., 319 Park Street, New Town.
- 7LP—Hyland, L. P., 83C Argyle Street, Hobart.
- 7LR—Manning, A. J., 88 Wenvoe Street, Devonport.
- 7LZ—Wright, C. P., 21 York Street, Launceston.
- 7MM—Masters, W. E., "Riverside," Victoria Esplanade, Bellerive.
- 7NC—Campbell, N. D., 25 Joynton Avenue, Hobart, Tas.

- 7NG—Jonasson, R. P., 252 Main Road, Derwent Park, Tas.
- 7PA—Allen, A. E., 8 Hopkins Street West, Moonah.
- 7PC—Hobart Technical College, 26 Bathurst Street, Hobart.
- 7PR—Launceston Technical College, Wellington Street, Launceston.
- 7QZ—Brown, B. K., 256 Charles Street, Launceston.
- 7RC—Cannon, R. F. H., Goldie Street, Wynyard.
- 7RK—Kilby, R. H., 40 Cimitiere Street, Launceston.
- 7RY—Nicholls, F. E., 15 Alexander Street, Burnie.
- 7RZ—Kemp, J. E., 16 Oldaker Street, Devonport.
- 7SR—Army Signals Radio Club, Anglesea Barracks, Hobart.
- 7WI—Wireless Institute of Australia (Tas. Division), 95 Arthur Street, North Hobart, Tas.
- 7WJ—Lithgow, J. C., 174 George Street, Launceston.
- 7WR—Nicholas, W. R., 18 Elphinstone Road, North Hobart.
- 7WT—Milledge, R. A., 86 Montpellier Road, Hobart.
- 7WX—Nicholls, W. J., 34 George Street, Launceston.
- 7XA—Oldham, C. E., 49 Bay Road, New Town.
- 7YL—Crowder, Miss J. I., 86 Main Road, Lower Sandy Bay.

Papua and New Guinea.

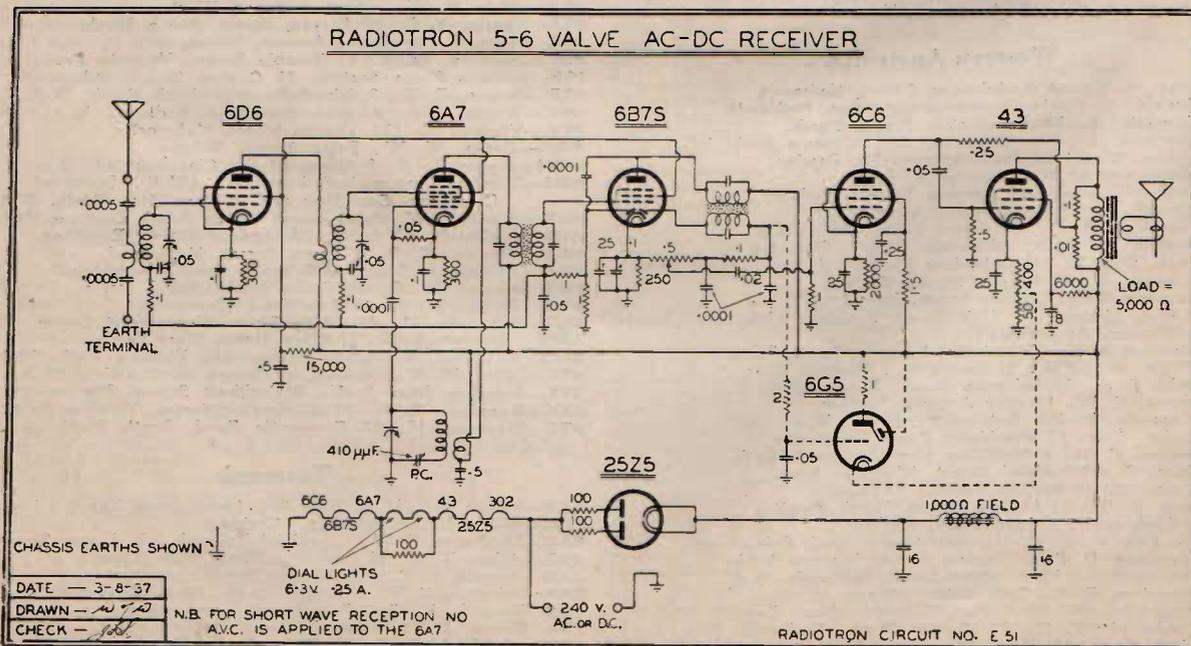
- 4HN—Nicholson, H. G., Paga Hill, Port Moresby, Papua.
- 4JT—Boileau, J. G., Port Moresby, Papua.
- 4KC—Bock, W. A., Pandora Crescent, Port Moresby, Papua.
- 9AW—Twycross, J. K., Rabaul.
- 9DK—Davis, C. E., Kavieng.
- 9GM—Hill, G. M., Rabaul.
- 9KO—Blue, H. W., Rabaul, New Guinea.
- 9LW—White, N. L., Rabaul, New Guinea.
- 9MC—MacGregor, W. A., Kavieng.

A.C. D.C. Receiver Uses New Radiotron Barretter

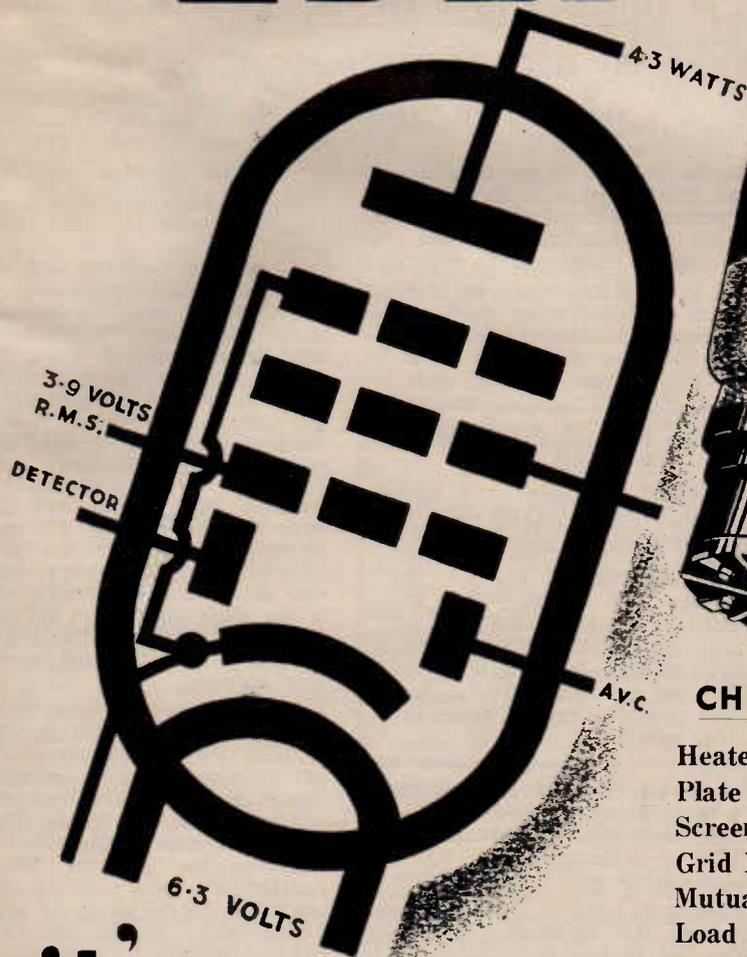
BELOW is shown the circuit of an a.c./d.c. receiver developed by the A.W. Valve Co., and using the new Radiotron 302 barretter, details of which were given last month. Due to the high power output of the 43 pentode, it is possible to obtain with this circuit an output almost identical with that given by a 42 in a standard a.c. circuit (states "Radiotronics" No. 79). In order to reduce harmonic distortion, series inverse feedback has been included, and the performance of the receiver is therefore of a very high standard.

The input to the audio amplifier is 0.24 volts r.m.s. for an output of 2.5 watts, with a total harmonic distortion of 3.5 per cent. at full output. The 302 barretter is capable of accommodating all line voltages between 200 and 260 volts (nominal), while allowing considerable fluctuations to occur above and below these nominal voltages. It is therefore not necessary to use any tapplings for different mains voltages within this range. Radiotron 25Z5, under its new ratings with 100 ohms in series with

each plate, is capable of delivering a very high current with a voltage of 250 volts R.M.S. applied to the circuit. The function of the resistance in series with each plate is, firstly, to bring about a correct distribution of current evenly between the two halves of the rectifier, and secondly, to limit the peak currents charging the first filter condenser to a value within the capabilities of the valve. Without such resistances, the rectifier would discharge for portion of the cycle into a load of very nearly zero impedance, and the peak current would therefore be excessive. It is recommended that the first filter condenser should not exceed 16 mfd. When used as described, the (continued on page 50)



-and now the EBL1



CHIEF CHARACTERISTICS

Heater	6.3V., 1.4A.
Plate Voltage	250 volts.
Screen Voltage	250 volts.
Grid Bias	6.0 volts.
Mutual Conductance	9.5 m A/V.
Load Impedance	7,000 ohms.
Power Output (D = 10%)	4.3 watts.

it's a

Mullard

MASTER VALVE

Breaking Into The Amateur Game . . 9

TO continue with our unfinished discussion of last month on various systems of modulation, we can proceed now to some of the associated details of modulators and modulated amplifiers.

As we said in the first part of this chapter, all the points that make for efficiency in a continuous wave transmitter apply equally and even more necessarily to a transmitter to be modulated. Speaking generally of the radio frequency section of the transmitter, the main element of importance is ample drive to the stage to be modulated (called the modulated amplifier) in the case of plate modulation, and good stability with absence of valve overloading particularly, in the case of grid or suppressor grid modulation.

For an example, suppose we wish to produce a 'phone signal on 14 m.c. It is quite likely that the crystal oscillator will have to operate at 3.5 m.c., due to the simple fact that 3.5 m.c. crystals are cheaper and more common in a "ham's" equipment.

The Principle Of Doubling

We could commence doubling, as it is called, in the crystal valve itself, and produce a small power from the first unit of our transmitter on 7 m.c. The popular 53 type of valve easily and efficiently accomplishes this. The 53 is really two high impedance triodes in the one glass envelope, with a common cathode. Electrically the connections are the same as a separate crystal oscillator stage, capacity-coupled to a first doubler stage.

Touching on "doublers" for a moment. As we know, a straight amplifier at radio frequency needs to be carefully separated from the preceding stage and equally as carefully neutralised. This would be a difficult problem when the two valves are so inseparable, as in the type 53. However, when we wish to double the frequency from the preceding stage, as in any "doubler," neutralisation is quite unnecessary. On the contrary, a certain amount of regeneration is permissible in the doubler itself, and it materially improves the output.

So far so good. For simplicity we use ordinary capacity coupling instead of link coupling, and we are furnished with a medium amount of radio frequency energy at the output of the first doubler, on the second harmonic of the crystal's fundamental (in this case, 7 m.c.).

The anode circuit of the first section of the type 53 will be tuned to a frequency in the 3.5 m.c. band, and coupled via a condenser and r.f.

Modulators and modulated amplifiers are discussed in this instalment—the ninth of a series of articles written for the "Radio World" . .

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

choke to the grid of the second half of the 53. Then the anode circuit of this section is tuned to a frequency in the 7 m.c. band, corresponding to the second harmonic of the crystal.

The question now crops up of what kind and power of valve shall we use to follow? Again, simply as an example, we may suggest a type '10 valve, not because it is the best for

Choice Of Final Amplifier

We now have, or should have, quite a healthy amount of radio frequency power on 14 m.c. in the plate tank of the type '10 doubler, and we next have to consider the final amplifier, which in this case will be our modulated amplifier. There are many valve types to choose from here, but as it would take up too much space to go fully into the possibilities, we will keep to the simple low-powered triodes suitable for powers permitted in amateur transmitters.

Again, the type '10 or 801 is quite large enough to handle the regulation 25 watts input power and give high efficiency output power. For those who prefer a large margin of safety in the plate dissipation rating of the modulated amplifier, push-pull '10's or 801's could be used here in the final stage.

Just by the way, there is a lot to be said in favour of this scheme of utilising the same types of valves in as many positions as possible in a "ham" transmitter. If supposing we use push-pull '10's in the final stage and a 53 type oscillator or exciter, followed by a type '10 second doubler, it is only necessary to carry one 53 and one '10 to be completely armed with "spares" for the entire radio frequency portion of the transmitter.

So now to continue, let us suppose the final stage is a push-pull '10 set-up. Since we already have 14 m.c. output power from the second doubler, our final will be a straight 14 m.c. amplifier; that is to say, neutralised and with the grid circuit and plate tank both resonant at this frequency in the 14 m.c. band. Link coupling will be used between the type '10 second doubler and the final grid circuit. Neutralising condensers will be connected from each '10 grid to the opposite plates respectively, and neutralising carried out in the same manner as previously discussed, except that the two neutralising condensers are adjusted step by step together, each one being moved the

QSL Forms, Notepaper, And Stickers

Headed notepaper and QSL forms printed for the use of members of the All Wave All World DX Club are available from the "Radio World," 214 George St., Sydney, N.S.W., price 1/6 for 50 sheets, post free. Enlarged two-colour replicas of the Club badge, in the form of gummed stickers, are also available, price 5 dozen for 1/6, post free.

the job, but because it happens to be a very common type. Any more modern equivalent would do equally as well, or perhaps better.

The job of this stage will be to operate from our 7 m.c. drive as coming from the 53 stage, and again double the frequency to 14 m.c. In dealing with the best operating conditions for a doubler, it is important to remember that we purposely wish to distort the carrier waveform at the output compared to the input in order to obtain maximum harmonic output power. Over-biasing of the doubler accomplishes this very effectively, and we may raise the bias value on our type '10 stage to fairly high limits if the drive is good (good power output from the 53 on 7 m.c.). Relatively, this bias value may be somewhat higher than that usually arranged for a class "C" radio frequency amplifier.

The 53 output and the '10 input may be capacity or link-coupled, depending on choice and amount of gear available.

same amount as the neutralising procedure is followed.

**Separate Antenna Coupling Coil
Preferable**

In order to transfer the output radio frequency energy to the antenna, it is a distinct advantage to instal a separate antenna coupling coil, which is link-coupled to the transmitter final tank coil. By doing this we remove the tuning effect of the antenna from the final amplifier tank. In the ordinary way, if the aerial develops a fault or becomes disconnected during operation, the change of inductive and capacitive load on the amplifier tank immediately upsets the tuning of it, and since resonance is no longer obtained, serious damage may result when the final draws abnormal plate current, as it would under these circumstances.

When we couple two or three turns to the current anti-node of the final amplifier, which will be about the mechanical centre of the coil in this case, the de-tuning effect is very slight and the danger mentioned above is removed. This link coil will be joined via a twisted pair to a similar coil tightly coupled to another tank coil, identical in dimensions with the final amplifier tank. Any of several antenna systems may be fed from this aerial coupling tank, but this phase of the subject will be dealt with separately.

Power Supply Requirements

Power supplies for the foregoing gear are more or less standard. A 5Z3 with a 450-volts each side power transformer, plus input choke and two 2 mfd. condensers either side of a 30-henry choke, take care of the oscillator, first and second doublers, and a similar arrangement with slightly higher current and voltage ratings will serve the modulated amplifier.

In this transmitter example, we propose to use a class "AB" modulator, and since the current drain will be continuously variable, it is best furnished with a separate power supply—on similar lines to the oscillator buffer unit. A fourth supply of lower rating and using a type 80 rectifier will be needed for the speech amplifier and sub-modulator.

The class "AB" modulator is very simple—a pair of type 42 valves with dry battery bias is the simplest and most convenient, and as well provides adequate power for the job. The requirements are an output push-pull class "AB" audio frequency transformer to carry 50 m.a. in the secondary and work into an impedance of about 10,000 ohms from the 42's in class "AB" (fixed bias), which, of course, work into the centre-tapped primary.

The sub-modulator or driver will be a single 42 wired as a triode with automatic bias supplied by a resistor of 610 ohms in the cathode circuit. An input class "AB" transformer will be needed, of a design suitable to work from the 42 driver to push-pull class "AB" 42's (fixed bias). Such a transformer will have a primary capable of carrying 20 m.a. in the primary for the driver, and a centre-tapped or two-section secondary designed to stand a small grid current for the 42's.

Some makes of this kind of transformer are built with each half of the secondary as a separate winding. Thus, individual bias can be applied to each 42 in the class "AB" stage, where it is desired accurately to balance the resting plate currents of the push-pull combination, where the valves are of slightly different resistance, or in other words, pass slightly different plate currents.

If it is desired to make the entire transmitter system batteryless, a bias supply may be substituted for the battery bias on our 42 type modulators. However, since a desirable "C" bias source must be of a low internal resistance, the battery idea will appeal to the amateur who wants highest efficiency at lowest cost.

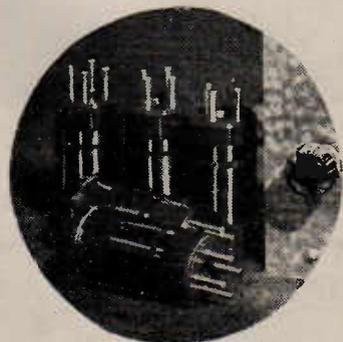
In order to make the internal resistance of a bias supply low, it is necessary to shunt across the filter output a comparatively low load resistance, since the modulator itself offers practically no load. In this example under discussion, where we need something in the neighbourhood of 40 volts to keep the resistance internally down to say 800 ohms, the shunt resistor would be asked to pass 50 m.a., likewise the filter, rectifier and transformer—in all, constituting a fair power supply, the consumption of which contributes nothing towards the output of the modulator.

Designing A Pre-Amplifier

So much for the modulator and sub-modulator. Now, of course, it will be necessary to arrange for some kind of speech amplifier to raise the voltage output of the microphone to approximately 20 volts to feed the grid of the sub-modulator to peak, in order that it may in turn drive the modulator to a power output sufficient to modulate our 25 watts of D.C. input to the radio frequency portion of the transmitter. This audio frequency power will be about 12.5 watts.

To start with the Reiss type of microphone as an example, we find that the average output voltage across 200 ohms for close speaking is somewhere around .05 volt. In conjunction with the usual microphone-to-grid step-up transformer of about 10:1 turns ratio, we should have about .5 volt across 100,000

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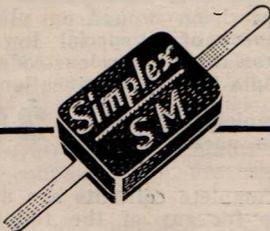
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ohms at the grid of the first amplifier valve of the speech amplifier.

To obtain a voltage amplification factor of about 10 for the first stage, we can use a 6C6 connected as a triode, and fed with 250 volts to the plate via a 100,000 ohm plate load resistor in a resistance-capacity-coupled circuit.

From the foregoing we find that at the grid of the second stage we have something like 5 volts; allowing for losses in the coupling medium, etc., this will be found to be fairly right. Actually, the triode connection of a 6C6 type valve has a theoretical voltage amplification factor of 13-14, and by taking a conservative rating of 10, the errors in this very rough calculation will be on the right side.

Overall Gain Of 50

Now, if the second stage also uses a triode-connected type 6C6, the multiplication by 10 again results in about 50 volts being available across the output load resistor of 100,000 ohms (output of second stage). Since the 6C6 type manufacturers tell us that 65 volts is the maximum peak voltage output, our 50-volt amplification condition is still well within the capabilities of the valves in use.

This is where we compare our two voltage levels. We know that the sub-modulator does not require any more than 20 volts peak to drive it up to full power output to operate the modulator, and we have just found that the microphone output under ideal conditions could take the speech amplifier output up to 50 volts, so the two compare very favourably, inasmuch as we have about twice as much voltage gain as necessary.

This may sound unnecessarily high, but actually, in practice a gain control is placed between the first and second stages of the speech amplifier. Hence the conditions will be just about right, with a reasonable amount of margin either way provided by the gain control.

Incidentally, this control would take the form of a 500,000 ohm potentiometer, the whole resistance portion of which becomes the second stage grid leak, the moving arm being joined to the second 6C6 grid. The only other portion of the audio frequency system of importance is the value of coupling condensers in the resistance-capacity set-up. These should be .05 mfd. capacity or larger—preferably .1 mfd.

The discussion on an amplifier from this angle is preferable for the sake of clarity, but the systematic way of going about the designing of a suitable speech amplifier to make any particular kind of microphone func-

tion with some particular modulator or sub-modulator is really a reversal of the way in which we have just gone through the details.

In the foregoing example we would take the 20 volts grid drive figure, which when divided by the amplification factor of the suggested last speech amplifier stage makes 2 volts. This figure is in turn divided by any preceding stage amplification factor considered—in this case 10—the result being .2 volt. This value is the input necessary to the two stages of amplification suggested.

Now, the transformer has a step-up ratio of about 10:1, therefore the necessary voltage across the 200-ohm primary would be only .02 volt, and since we know that the microphone under good conditions can furnish about .05 volt, all is correct and a substantial margin is available.

Higher Gain For Crystal "Mike"

Now if, for example, it is desired to use one of the popular diaphragm type crystal microphones, the output of which is about .02 volt across the recommended load resistance of 1 to 5 megohms, we must provide greater gain in the amplifier itself, since a 10:1 step-up ratio transformer may no longer be used.

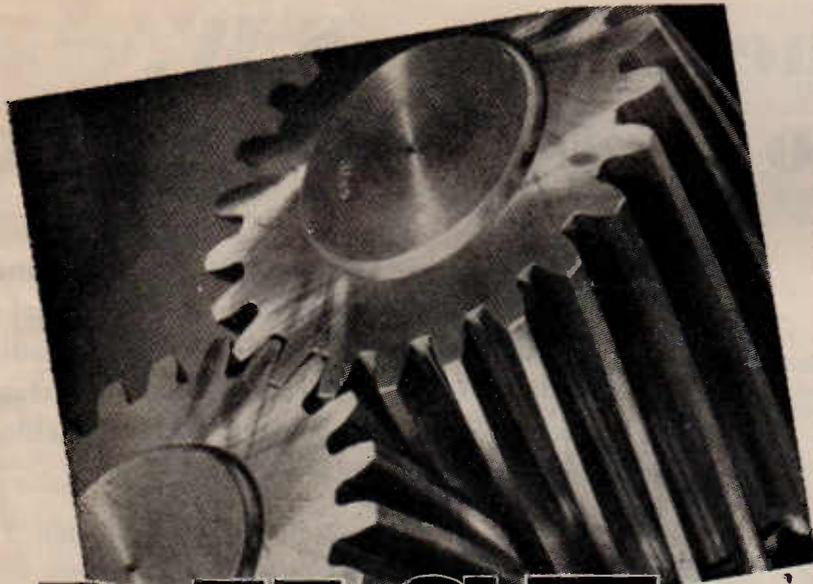
Again using a type 6C6 valve, but wired this time as a pentode audio frequency amplifier, we have a gain for the first stage of about 100.

Working backwards again from the grid of the sub-modulator (voltage 20 volts), one-tenth of 20 volts equals 2 volts, which is the input necessary at the grid of the stage before the sub-modulator. The preceding stage has a voltage amplification factor of 100, therefore one-hundredth of 2v. equals .02 volt, which is the necessary grid voltage to make the first stage operate the second stage, which in turn operates the sub-modulator and so on to the modulator. The gain control would again be installed between the first and second stages, as the second grid leak.

The foregoing cannot pretend to cover the multitude of combinations that come under the category of "speech amplifiers," but it serves to illustrate just two methods of achieving the required audio frequency range and the necessary power for the purpose of modulating an amateur transmitter.

An Appreciation From Marlee

I might say that the "Australasian Radio World" is, in my opinion, an excellent magazine, and I would not miss my monthly "treat" for any money—I only wish it was published every week. Wishing your fine publication every success.—Ken Wallis (AW276DX), Marlee, N.S.W.



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In the new Triplet factory, dust is sealed out, the entire manufacturing space is air-conditioned, and the air is filtered. The temperature—another important factor in building precision instruments—is permanently controlled, both winter and summer. A truly modern plant, completely equipped for producing to-day's most modern instruments.

The instruments illustrated opposite are, from top to bottom:—

Model 1503 Multi-Purpose Tester. Checks any type valve for merit (including separate diode test). Tests paper condensers for opens and shorts, and electrolytics for leakages. D.C. voltmeter and milliammeter, ohm-meter, decibel meter. Price: £19/5/-.

Model 000 Universal Pocket Volt-Ohm-Milliammeter for measuring A.C. or D.C. volts, ohms and mills. Price: £5/15/-.

Model 1250 Self-calibrating Vacuum Tube Voltmeter, Price £13/15/-.

Model 1260 Compact Portable Audio Frequency Oscillator. Ten frequency ranges from 100 to 10,000 cycles enable testing of audio amplifiers, speakers, P.A. systems, etc. Operates from A.C. Price: £10/15/-.

Model 1295 Modulation Monitor with tilting type twin instrument. Two movements, factory calibrated. Price: £9/15/-.

New illustrated catalogue of Triplet and Readrite equipment sent post free on request.



Exclusive Factory Representatives for Australia and New Zealand:

W. G. Watson & Co. Pty. Ltd.

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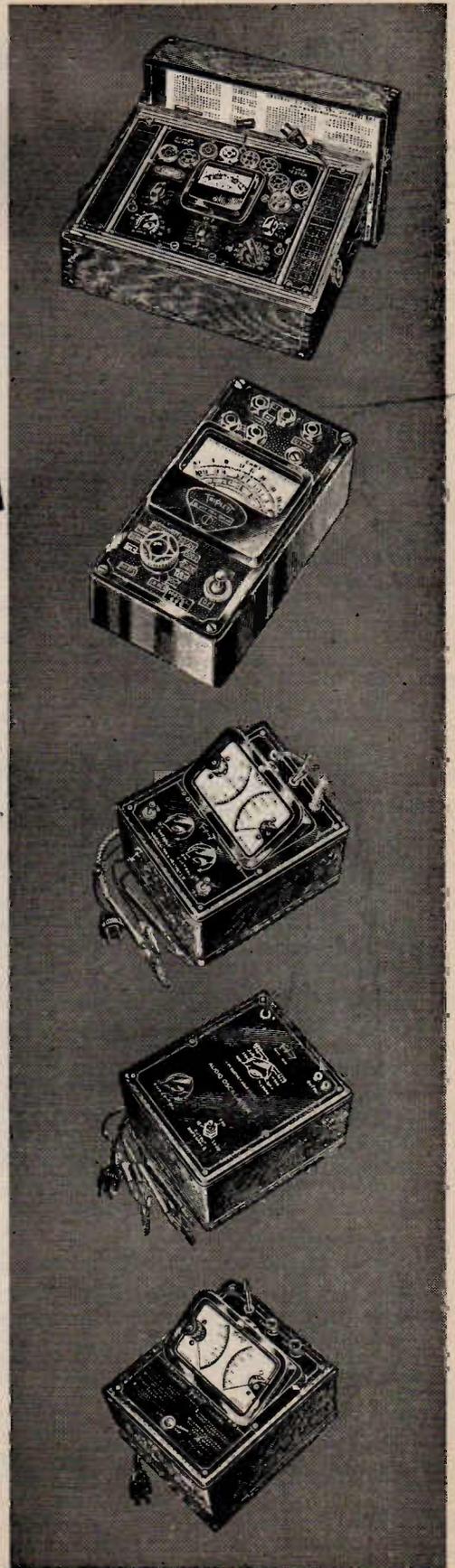
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Nine-Channel Ultra S.W. Radio Telephone Link

THE inauguration by Sir Walter J. Womersley, M.P., Assistant Postmaster-General, of the Belfast-Stranraer nine-channel ultra short-wave radio telephone link on August 31, 1937, marks one of the most outstanding achievements of to-day in the world of communications.

Although the use of ultra short waves for commercial telephony is by no means new—an experimental service having been operated by the Post Office as long ago as 1932—this is the first application in Great Britain, or in fact in the world, of a system wherein as many as nine telephone channels are passed simultaneously over a single radio link.

Micro-Ray Link Installed In 1933

This system is the outcome of many years of research by Standard Telephones and Cables radio engineers into the technique of ultra short-wave communication, coupled with long and arduous field trials.

It is interesting to note, too, that the ultra shortwave is by no means the limit of wavelength for communication purposes, and that the researches of Standard radio engineers into micro-rays resulted in the design and installation as long ago as 1933 of the Lympne-St. Inglevert micro-ray link used by the Air Ministry, which operates on a wavelength of 17.4 cms. over an optical distance of 21.7 miles.

Wide Band Transmissions Possible

Foremost among the virtues of the ultra short waves is the possibility of transmitting wide band-widths. The width of the band that can be transmitted increases as the wavelength is shortened, and it is for this reason mainly that high definition television stations all operate in this region, as they require a total band-width of as much as 6 megacycles.

The equipment is designed for unattended operation, and is capable of complete remote control from the nearest telephone exchange. In addition, it is provided with spare equipment, part of which is brought automatically into operation on the occurrence of any abnormal condition.

Both transmitting and receiving equipments derive their whole power supply from the public supply mains, the only battery used in the equipment being that for the operation of the relay system. A Diesel electric power plant is arranged so that in the event of failure of the public

A notable advance in the field of radio communications has been realised with the inauguration of a nine-channel service operating over a single radio link between Belfast and Stranraer. This new system was perfected by Standard Telephones and Cables engineers after years of research.

electricity supply, it will take over the load automatically approximately one minute after such failure, and thus avoid serious interruption of the service.

Principle Of Operation—Transmitter

Let it be assumed that the input of Channel No. 1 is supplied with sinusoidal tone of frequency f_1 k.c. per second. This input modulates a channel-frequency oscillator having a frequency in the range 150 to 300 k.c. per second, say 155 k.c. per second, resulting in a carrier frequency of 155 k.c. per second, together with upper and lower sidebands of $(155 + f_1)$ and $(155 - f_1)$ k.c. per second.

If Channel No. 2 be supplied with a tone input of frequency f_2 , this will modulate an oscillator having a frequency of, say, 165 k.c. per second, resulting in a carrier frequency of 165 k.c. per second and upper and lower sidebands of $(165 + f_2)$ and $(165 - f_2)$ k.c. per second. Similarly, Channel 3 may have a carried frequency of 180 k.c. per second, and so on to the ninth channel, of which the carrier frequency might be 280 k.c. per second.

Frequency Bands Added

The bands of frequencies derived from the nine channels are now added together, producing in total a single frequency band extending from $(155 - f_1)$ k.c. to $(280 + f_9)$ k.c. per second.

This total frequency band is now used to modulate the output of the ultra shortwave transmitter having a carrier frequency in the neighbourhood of 76,000 k.c. and to produce by this means a lower side-band extending from $76,000 - (280 + f_9)$ k.c. to $76,000 - (155 - f_1)$ k.c., the carrier wave of 76,000 k.c. and an upper sideband extending from $76,000 + (155 - f_1)$ k.c. to $76,000 + (280 + f_9)$ k.c. per second. This is the band of frequencies which is radiated by the aerial system.

How Reception Is Accomplished

It is easy to mix together nine channels, but to separate them out again without noticeable crosstalk is a problem on its own. It is on the special design of the channel-selecting circuits, by means of which this end is achieved, that the successful operation of the whole system primarily depends.

The band of frequencies radiated by the transmitting system, as described above, is delivered by the distant receiving aerial system to a superheterodyne type of receiver.

The second detector of this receiver produces from the above input the original side-band, extending from $(155 - f_1)$ k.c. to $(280 + f_9)$ k.c. This band of frequencies is then applied to a band of nine selecting circuits, which operate as bandpass filters. The currents of frequency $(155 - f_1)$, 155 and $(155 + f_1)$ k.c., will be passed by the first filter to a detector circuit, which delivers the original frequency of f_1 k.c. to the first channel.

Similarly, the frequencies $(165 - f_2)$, 165 and $(165 + f_2)$ k.c. will be passed by the second filter to a detecting circuit, which delivers the original frequency f_2 to the second channel. In this manner the whole of the band of frequencies delivered by the second detector of the superheterodyne receiver will be split up, detected and delivered to the appropriate channel.

The carrier frequency of the ultra shortwave transmitter is held constant within very close limits by a crystal-controlled master oscillator, while the beating oscillator of the superheterodyne receiver is similarly crystal-controlled. By this means a high degree of selectivity may be attained in the receiver without any necessity of frequent re-tuning.

The foregoing explanation covers the transmission of nine channels in one direction on a carrier wave of 76 megacycles approximately. For the reverse direction, the circuits of the

same nine channels are transmitted on a carrier wave of approximately 83 megacycles.

Transmitting And Receiving Aerials

In order to minimize interference between the transmitting and receiving waves, the plane of polarization of the waves emitted by the transmitting aerial is at right angles to that of the waves received by the receiving aerial.

At one terminal, therefore, the transmitter is equipped with an aerial system designed for vertical polarization, whereas the receiver is fitted with an aerial designed for horizontal polarization. At the other terminal the receiving aerial is vertically, and the transmitting aerial horizontally, polarized.

Equipment Is In Duplicate

It is quite evident that a fault in any part of the equipment common to all channels would be a catastrophe; a fault in one channel is serious, but the failure for any appreciable time of nine channels is disastrous. The ultra shortwave transmitter unit, being common to all nine channels, is therefore provided in duplicate.

The reserve unit is normally not under tension, but if a fault such as the failure of a valve occurs, the power supplies and the aerial are automatically switched from the service to the reserve unit, and a fault signal is given to the distant remote control point.

That portion of the receiving equipment which is common to all nine channels is similarly duplicated. In addition, the power supply is duplicated by an emergency plant, which is switched in on failure of the public supply.

Appreciations From Readers

Just a short note to show my appreciation of your fine magazine, "Radio World." I happened to get hold of your March issue a few days ago, and was surprised at the wonderful variety of subjects dealt with. Until a few days ago I had not heard of it, and now see what I have been missing.—S. Burgess, Armidale, N.S.W.

"Best Mag. In Australia"

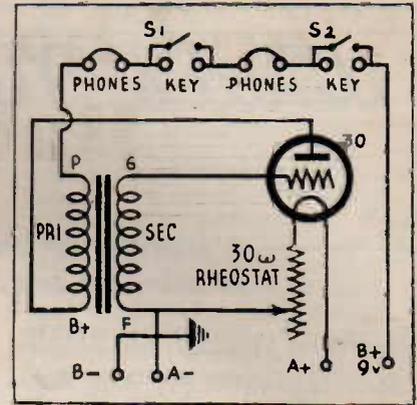
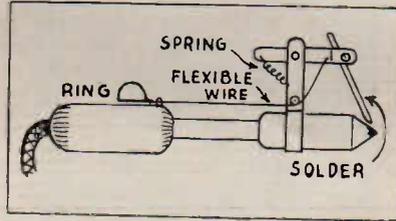
I am in receipt of my Club Badge and Membership Certificate, and both have arrived in good condition. I must say that the badge has far exceeded my expectations, and I shall be very proud to wear it.

The samples of the Club seals and forms arrived also. I think they are both very good, especially the forms, which should save a great deal of time and trouble in writing out reports.

While I am on the job, I may as well say that I think the "Radio World" is the best radio magazine in Australia; I have been reading it since the first copy, and would not miss an issue for anything. I greatly appreciate the articles on "ham" radio, and hope that you will continue with them.—D. W. McNeill (AW292DX), Bellerive, Tasmania.

Two Useful Tips

A handy little kink that enables one to use a soldering iron and apply solder to it with one hand, while the



other is used to hold the work steady, is shown in the first sketch, which is self-explanatory.

The second sketch shows an improvement on the ordinary code practice oscillator, in that it enables two persons practising the morse code to either send or receive at will.—Geo. Brown, Hamilton, N.Z.



THE SYMBOL OF
QUALITY
TEST EQUIPMENT!
The Model P.V. Valve
Tester.



The "Patec" range of Valve Testers provides the serviceman with an instrument which will prove a boon in service work, as well as an essential aid in valve sales. Three models are available, as follows:—

Model M.V.—a counter type of fine appearance ... £13/10/-.

Model P.V.—a portable compact unit, as illustrated, A.C. operated, complete with lid ... £11/10/-.

Model O.V.—portable, battery operated, requiring only to be connected to an external accumulator to test all Battery, Auto and A.C. type valves, £11/10/-.

Short test provided in all models. Remember that locally manufactured high-grade "Patec" Valve Testers are backed with a service that includes a supply of calibration figures from time to time as new American or Octode valves appear. Note: All prices are plus tax. Easy terms available on all instruments.

Available from leading distributors.

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90 Victoria Street, Ashfield
Manufacturers of Cathode Ray Equipment, Meters, and full range of Test Equipment.

What's New In Radio

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

Radiokes Competition Results

Messrs. Radiokes Pty. Ltd. advise that the Radiokes Competition has now been finalised, the prize winners being as follows:—

First, Mr. B. J. Sorley, Hollywood, W.A.; second, Mr. F. J. Kemble, Katanning, W.A.; third, Mr. L. S. Lane, Weethalle, N.S.W., and a special prize to Mr. A. Yates, Inverell, N.S.W., the prizes being respectively Radiokes goods to the value of 10, 3, 2 and 2 guineas. A set of Radiokes transposition blocks is also being sent to each unsuccessful entrant.

★

Latest Eddystone Components

For many years now the Eddystone factory at Birmingham, England, has specialised in manufacturing shortwave radio components, and their products are well known by set-builders the world over as being among the best available.

A copy of the latest Eddystone catalogue for the 1937 season is to hand from the Australian representative, Mr. R. H. Cunningham (VK3ML), of Melbourne. Comprising 20 pages, a wide variety of components is listed and illustrated—coil formers and bases, ultra shortwave coils, R.F. chokes, midget variable condensers, insulators, a wide selection of dials, etc.

The range of midget variable condensers is particularly comprehensive. All are designed for shortwave work, are of brass construction throughout, and are provided with special low-loss insulation. The "Scientific" 196 mmfd. is particularly suitable for use in the "Amateur Communications Eight," described in the June and July issues of the "Radio World." The Eddystone full-vision two-speed dial and precision slow-motion dial are also certain to be widely popular.

"Radio World" readers can obtain free copies of this latest Eddystone catalogue by writing to Mr. R. H. Cunningham, 397 High Street, Glen Iris, Melbourne, S.E.6, Victoria.

★

Radiotron Publicity Release

"The Way to Good Radio" is the title of an interesting booklet just

issued by Amalgamated Wireless Valve Co. Pty. Ltd., of Sydney. It illustrates the machines used in making Radiotron valves, and describes the testing and inspecting procedure which is so important a part in their production. The information given is of particular interest to set-owners using receivers more than a year or so old, and who are consequently interested in valve types to use for replacement purposes.

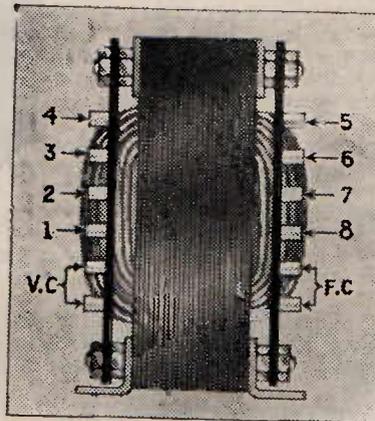
Accompanying the booklet is a set of six attractive blotters, illustrating some of the slogans used in broadcast advertisements for Radiotron valves.

Together with an attractively-prepared price list, copies of "The Way to Good Radio" can be obtained free on application to all radio retailers, or by forwarding a request to Messrs. Amalgamated Wireless Valve Co. Ltd., Box 2516 BB, G.P.O., Sydney.

★

Amplion Multi-Impedance Transformer

Set-builders who are constantly building and rebuilding their receivers will appreciate the value of the multi-impedance speaker input transformer lately released by Amplion (A'sia) Pty. Ltd., of Sydney.



The Amplion multi-impedance speaker transformer, with cover removed.

Two types are available, the TS 3874B and the TS 3875B, designed for use with speakers with

voice coil impedances of 7.8 and 13 ohms respectively.

To ensure non-saturation of the core under all specified conditions of use, a generous amount of silicon steel iron has been used, the complete transformer weighing 2 lbs. The transformer is wound with heavy gauge wire and will safely carry up to 80 mills. Double impregnation is used to prevent any moisture getting into the windings.

There are 12 lugs in all, those numbered 1 to 8 giving various impedances as below.

Impedance At 400 C/S.

Terminals

1—5—8:	—12,000 ohms centre tap.
2—5—7:	— 7,000 ohms centre tap.
3—5—6:	— 5,000 ohms centre tap.
1—8	—12,000 ohms single output.
2—7	— 7,000 ohms single output.
3—6	— 5,000 ohms single output.
1—4	— 2,500 ohms single output.

The remaining four lugs are employed, two for the voice coil leads and two for the field.

Further details of this transformer and of the latest complete Amplion range of speakers can be obtained on request from Amplion (A'sia) Pty. Ltd., 66 Clarence St., Sydney.

★

A.V.C. Measurements With Zero-Current Voltmeter

Circuits now used in modern receivers necessitate the employment of test equipment of advanced design in order to ensure maximum efficiency in service work.

Such innovations as automatic volume control and automatic tuning present a special difficulty, necessitating the measurement of voltages across high resistance networks, in which at times currents of only a few microamps flow.

The use of the conventional voltmeter is out of the question, as even special ultra-sensitive voltmeters introduce a considerable error, for the simple reason that the power required to operate the meter—no matter how small—is taken from the load resistor. Consequently, normal conditions are disturbed to a considerable extent, and serious error introduced.

To meet the requirements of present-day radio, a novel method of measuring voltages was announced by a well-known overseas manufacturer of test equipment.

Zero-Current Voltmeter The Solution

The method employed is called the zero or nil current potentiometer voltmeter, and has the advantage of measuring without drawing any current from the circuit. In other words, the impedance of the instrument is theoretically equivalent to a volt-

meter of infinite ohms per volt, a very desirable feature.

The principle is not new, having been used in laboratory practice for many years, yet its adaptation to radio is both novel and extremely effective.

The Paton Electrical Instrument Co., of Sydney, were quick to appreciate the important advantages to servicemen of the zero-current volt-meter, and it now forms one of the most important of the many valuable tests provided by their well-known Model CM Multi-tester.

Has Many Important Applications

The instrument is equipped with a large five-inch type meter, with a long scale designed for quick and accurate readings. A feature of the latter is that a single linear scale now caters for both a.c. and d.c. measurements. Another important feature is the addition of an extra range of battery-operated ohms covering 0-1 meg. in four ranges, while the power pack inside supplies the necessary high voltage for reading megohms (0-10 megs.).

Measurements of capacity, inductance, impedance and the testing of electrolytics for both leakage and capacity are valuable features that have been obtained, while ranges of decibels have been provided for the sound engineer.

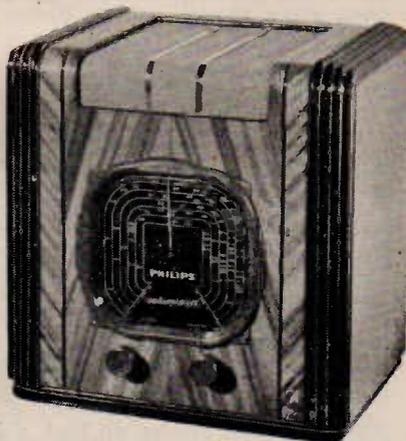
An attractive finish to a fine in-

strument is provided by a heavy 16-gauge solid brass panel which has raised chromium-plated figures on a two-colour lacquered background.

Full details of this and other Palec test equipment will be forwarded free on request by the Paton Electrical Instrument Co., 90 Victoria St., Ashfield, Sydney.

★
**Philips Radioplayer
Model 6505**

One of the latest Philips Model 6505 Radioplayers was submitted for



The Model 6505 Philips Radioplayer.

test recently to the "Radio World." A five-valve mantel receiver, the 6505 is designed for broadcast band operation from 220-260 volts a.c. mains, and retails at sixteen guineas.

Compact, and of unique and very attractive design, this latest Radioplayer should prove one of the most popular receivers in its class. As shown in the accompanying illustration, the speaker grille is on top of the cabinet, the speaker being mounted horizontally, facing upwards. This type of mounting makes possible two important features that otherwise could not be provided in so compact a receiver—the use of a full-sized 8" speaker and of a large calibrated "Twilight" dial.

The latest Philips 4-volt metal-clad valves are used throughout—an AK2 Octode as mixer oscillator, an AF3 i.f. amplifier, ABC1 duo-diode triode, AL2 power pentode, and AZ3 indirectly heated rectifier. Technical features include the use of full delayed automatic volume control and iron-cored coils. There are two controls only—volume and tuning.

For all-round performance, the model 6505 gives excellent results, comparing favourably with many console type receivers using an equal number of valves. Due largely to the use of iron-cored coils, selectivity is excellent, while sensitivity is such that with an indoor aerial dozens of

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Tune in DJE Berlin on your Ferranti All-Wave Receiver and join in the Spree . . . Beer Garden ballads, lively dance tunes, music of the old Masters, national festival songs . . . Or perhaps you want to get behind the news and hear Germany's voice on national and international affairs—then Ferranti will introduce you to Fuehrer Hitler himself.

The exclusive Magnascopic Dial that is making radio history is incorporated in all new Ferranti All-Wave Superhets. Its revolutionary tuning scale, 6 feet long in effect, is one of the reasons why Ferranti is such a fine linguist. It sets you right in the heart of the fun or whatever's on the menu.

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ARCADIA
Superhet. All-Wave A.C. variable selectivity, high fidelity console.

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WORLD RANGE RADIO

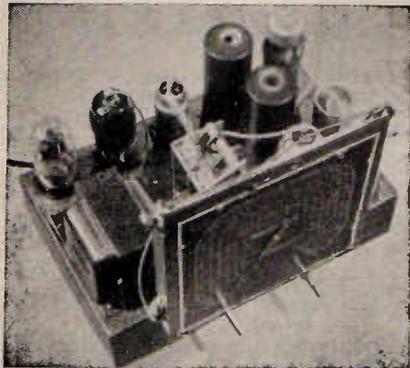
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stations can be brought in at good speaker volume.

The well-known "audioscopic" output system that is a feature of this



The chassis of the Model 6505 Radioplayer.

year's Philips releases, is incorporated in this receiver, and in combination with the full-sized speaker used ensures quality reproduction that is unusually good for a mantel model of such compact dimensions.

Latest Calstan Catalogue

A comprehensive range of meters and test equipment to cover every service need is featured in the latest Calstan catalogue, lately released by

Slade's Radio Pty. Ltd., Lang Street, Croydon, N.S.W.

The first two pages are devoted to a particularly wide selection of meters and multi-meters. Calstan all-wave oscillators and tube checkers (counter, portable and emporium models) are dealt with next, followed by details of set analysers, a cathode ray oscillograph, and thermo-coupled meters. Printed in two colours throughout, there are illustrations, with full technical details, of all equipment listed.

Copies of this catalogue can be obtained free on request from the address given above.



Ingenious Pocket Trouble-Shooters

Advance samples of two ingenious servicing aids have just been received from the Radio & Technical Publishing Company, of New York. Devised by the well-known radio author, A. A. Ghirardi, the Home Radio and Auto Radio Pocket Trouble-Shooters, as they are called, provide for servicemen and set-builders a tabulated summary of all common types of faults encountered in home and car radios.

Each trouble-shooter consists of a series of cards printed on both sides and eyeletted together through one corner. Along the top are tabulated various "Trouble Symptoms" (dead

receiver, intermittent reception, etc.), while down the right-hand side "Possible Trouble Sources" are listed. In use, the card bearing the trouble symptoms applying to the receiver being serviced is swung 90 degrees to the right, when the various sources for this particular fault are revealed. Tests and remedies are suggested for every fault.

With symptoms and possible sources of trouble tabulated in this way, a systematic method of servicing can be followed, enabling the receiver to be checked from aerial terminal to speaker in the shortest possible time.



Plans Finalised For New Radiokes Factory

Mr. R. K. Stokes, managing director of Radiokes Pty. Ltd., advises that plans have been finalised for removal to a new factory to be located in Vine Street, Redfern, Sydney. It is expected that the building will be completed early in 1938, and will be for the exclusive use of Radiokes Pty. Ltd.

The factory will comprise the ground floor of 10,000 square feet, and a mezzanine floor for the office overlooking the factory floor. Windows opening to three streets as well as a saw-tooth roof will ensure plenty of natural daylight.

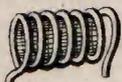


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Will carry 250 m./a. Maximum Efficiency around 14,000 k.c.

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5 METRE TYPE 1/9



"RADIOMAC" Tank Coils

Supplied to suit all hook-ups. Plain copper or plated. PRICES ON APPLICATION.

UTILITY Micro Dials



The ideal control for short-wave receivers

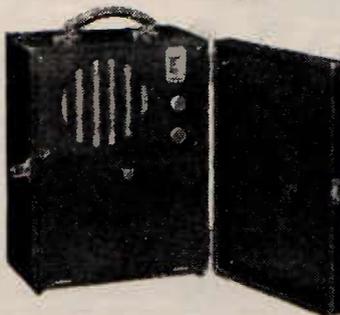
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STEATITE Ceramic Sockets
4, 5, 6 and 7 Pins

8 Pin 4/-

THE PORTABLE THAT IS A PLEASURE TO OWN



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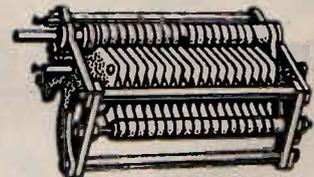
OUTDOOR PORTABLE FOUR

Powerful Selective Perfect Tone.

Can be operated anywhere.

WRITE FOR OUR DETAILED LIST.

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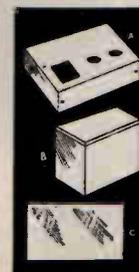


TRANSMITTING CONDENSERS

England's best. Will stand voltages up to 1,500.

100 mmf. 27/6
250 mmf. 35/-

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We cut and bend aluminium chassis, panels, shields, boxes, etc., to your own specification, or any standard design.

Aluminium Shield Partitions:
5in. high, 6in. wide, 9d.; 7in. high, 8in. wide, 1/4; 7in. high, 10in. wide, 1/8.

Aluminium Shield Boxes, with removable lid.
5in. x 6in. x 6in. . . 4/-
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7in. x 8in. x 10in. 7/6

PRICE'S RADIO SERVICE

5 & 6 ANGEL PLACE

(D. G. McINTYRE)

SYDNEY.

The latest machines and equipment will be installed in the new factory, the layout being planned to take advantage of every latest development in modern factory methods.

During the fifteen years Radiokes have been manufacturing parts for home-builders and receiver manufacturers, steady progress has been made, and managing director Keith Stokes is confident that this latest development will ensure still greater popularity for Radiokes products.

A.T.R.S. Institute— Queensland Branch

Now 72 Financial Members

By W. J. HUDSON

THE past month has been a very busy one for the various Committees of the newly-established Australian Trained Radio Servicemen's Institute (Queensland Division). There are now 72 financial members. New headquarters and library have been opened at Room 54, Albert House, Albert Square, Brisbane, and visiting radio men are invited to call at this address.

The Examination Board has granted service certificates to certain foundation members whose qualifications have been examined, and an examination will be held shortly for servicemen's certificates. Women service mechanics are eligible; in fact, we have a well-known woman service member in Miss Ella Wilcox, of Maryborough. Lectures are to be held and copies of lectures supplied to country members. Technical sheets have been supplied by manufacturers and service data is available on all problems.

An employment bureau is now functioning, and positions may be obtained by qualified mechanics, as the Institute is fully recognised by the trade in Queensland. The following are the office-bearers:—President, Eric H. Cantelin, C/- Edgar V. Hudson Ltd. Vice-Presidents, A. G. Brayne, C/- Trackson's, and R. Tittner, C/- J. B. Chandler & Co. Treasurer, "Doc" Hadley (VK4AH), Hadley Radio Services. Secretary, Keith Elliot, C/- Harrolds & Co. Committee of Management, P. Golden, Golden Radio Co.; J. Forrester, C/- Hudson's Ltd.; A. Murphy, C/- Radio & Television Ltd. Examination Committee, Eric H. Cantelin, A. G. Bayne, J. Forrester, J. Heine, J. Laws. Country Branches, Maryborough, C/- Wilcox Radio; Rockhampton, C/- A. Minchin, A.M.I.R.E.; Townsville, C/- Hillman's Radio.

Radio In The Wilds Isolation Banished

BECAUSE of radio, life in inaccessible parts of the world is becoming less precarious. Within the

past two or three years no fewer than 65 miniature radio stations have been established in remote places in New Guinea, Papua, Fiji and other Pacific Islands, and in out-of-the-way parts of Australia.

These stations, known as teleradios, first made their appearance in the form of pedal-driven appliances. A native mounted on a bicycle-like structure provided the power to operate the radio transmitter and receiver. Sets of this nature were carried far into the interior, affording means of communication with civilization for distances of 200, 300, even 400 miles.

The native-driven instruments have proved useful on plantations and outstations, but to handle traffic where a considerable number of messages are being exchanged, Amalgamated Wireless (A'sia) Ltd. (which Company introduced the teleradio) has developed a set which derives its power from a small petrol engine.

Two models of teleradio are in general use. One is essentially portable, the maximum weight being 50 lbs. This is extensively used for expeditionary and patrol work. Another type of appliance is a 10-watt wireless telephone-telegraph transmitter and receiver, which is used particularly in isolated areas, on plantations where transport is only important insofar as reaching the spot is concerned. This unit is carried in five sections, the whole weighing up to 200 lbs.

Among those who use the A.W.A. teleradio outfits are the Lutheran Mission at Finschafen, New Guinea, and at Lae, the Methodist Mission at Salamaua, Papua; the Drysdale Mission, West Australia; the Leper Station at Mokagai, Fiji; Guinea Airways, the Yodda Goldfields, Cape Barren Island, Bass Straits. The teleradio is found also at various plantations, with timber, rubber, and copra enterprises, and Government stations, patrols and expeditions, including the Archbold Expedition in New Guinea and the patrol led by Mr. Claude Champion in the western division of Papua.

Recently the teleradio was introduced into Java by the Dutch Government and the Royal Dutch Shell Company. The former has this week ordered two additional outfits from A.W.A.

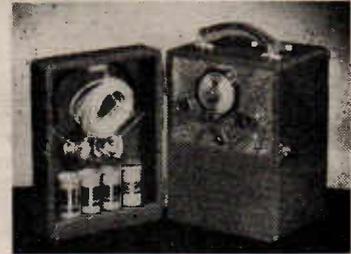
QSL's For Exchange

The following members of the All Wave All World DX Club have QSL cards that they would like to exchange with other members:—

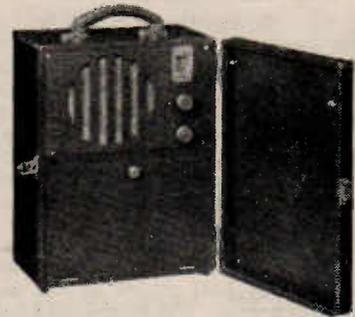
J. E. Sorbell (AW277DX), Silkwood Post Office, Nth. Q'land.
V. D. Kemmis (AW301DX), "Brampton Hall," 49 Kurraba Rd., Neutral Bay, Sydney.

Western Custom Built CABINETS

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1937 Outdoor Portable Four

Built of light, durable timber with dove-tailed joints, covered with smart mottled leatherette, and fitted with plated hinges and catch, a Western-built cabinet adds that professional finish to any home-built portable. Colours available are red, green, blue, brown, black and crocodile.

Don't spoil an outstanding set by housing it in a shoddy cabinet—

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★

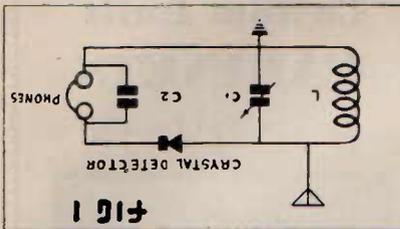
WESTERN
MANUFACTURING CO.,
18 THIRD AVENUE,
FIVE DOCK, SYDNEY.

'Phone - - U 3444

Radio Step By Step II

How Signals Are Detected

The principle of detection and how various types of detectors operate are explained in this article—the eleventh of a series for beginners.



ONE of the earliest forms of detector, widely popular many years ago, is the crystal detector. This consists of a device using a fine wire, known as a cats-whisker, held lightly in contact with a crystal of a particular mineral such as galena.

These crystals have the peculiar property that while they will allow current to flow readily in one direction, in the other it scarcely flows at all.

How The Crystal Works

Fig. 1 shows the circuit of a simple crystal set. "L" and "C1" comprise a simple tuned circuit, with a crystal and pair of headphones connected in series across it. When a modulated radio frequency signal as represented in Fig. 2 (a) is applied to the tuned circuit, it is tuned to resonance by the variable condenser "C1".

The action of the crystal on the signal now becomes apparent. During one set of half cycles of the alternating current, the resistance of the crystal is very low, so that current is able to flow through it eas-

ily, but with the half cycles flowing in the opposite direction, the crystal resistance is high, and very little current is allowed through. The result is depicted in fig. 2 (b), which shows the rectified pulsating current.

These pulses or fluctuations of current are far too rapid to actuate a 'phone diaphragm. With a station broadcasting on a wavelength of 500 metres, they are occurring at the rate of 600,000 times per second, and no diaphragm could be made that would respond to this speed.

The effect, however, is that each successive wave-train actuates the diaphragm, and its motion follows more or less faithfully the shape of the envelope of the rectified carrier current, as illustrated by fig. 2 (c). Since this envelope is the same shape as the waveform of the sound impressed on the microphone at the broadcasting studio, it follows that the movement of the headphone diaphragm sets up similar sound waves that are heard by the person listening in.

Condenser Across 'Phones An Improvement

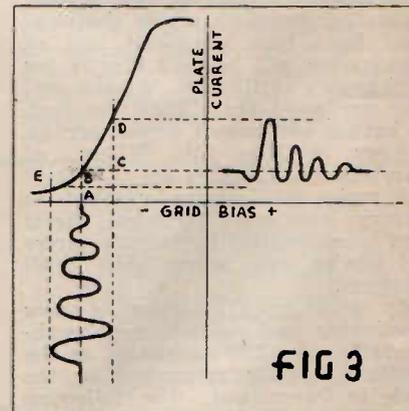
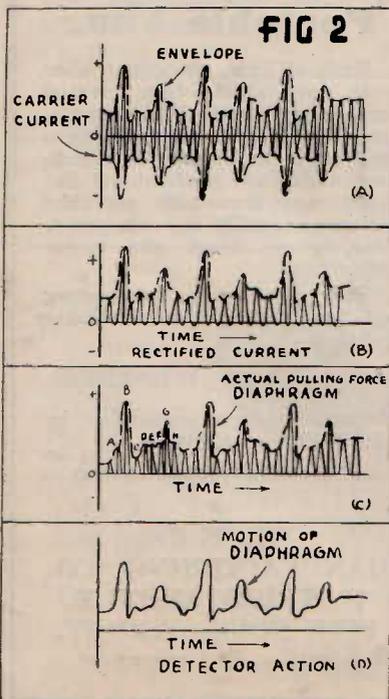
The volume and quality of the received signal is often improved by connecting a fixed condenser "C2" across the headphones. When a signal impulse flows through the headphones, "C2" becomes charged. During the next half cycle no current flows through the detector, but "C2" commences to discharge through the headphones, the discharge current flowing in the same direction as that of the impulse which charged the condenser. This action assists considerably in keeping the diaphragm in position until the next impulse comes along. There is, then, during each wave-train a more continuous attraction on the headphone diaphragm, with improved reproduction, since the diaphragm then follows more closely the envelope of the rectified signal current.

However, often it will be found that there is sufficient capacity existing in the headphone windings and cord to provide this effect without the necessity for adding further capacity.

Once widely popular, crystal detectors are little used nowadays, having been supplemented almost entirely by the valve detector.

The Diode Detector

The closest valve equivalent to the crystal is the diode, consisting essentially of two elements, a filament (or heater) and plate. With a signal applied to the plate, the filament-to-plate electron flow will be stimulated on the positive half-cycles and re-



pressed on the negative, as illustrated in fig. 2.

Triode Power Detector

Another type of detector that found wide favour in the days of the early a.c. receivers is the power, or "C" bias, detector. More sensitive than the diode, it is appreciably less so than the leaky grid detector, though it has the important advantage over the latter of being able to handle a far more powerful signal.

The action of a triode power detector is similar to that of the triode when used as an audio amplifier (explained in a previous instalment), with the important exception that instead of working on the straight portion of the plate current grid volts characteristic curve, the valve is biased back so that the operating point falls on the bottom bend.

This is illustrated in fig. 3, the valve being biased so that the operating point is set at "B." When



The All-Wave All-World

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

DX News



Third DX Contest Closes On December 1

The closing date for the third "Radio World" Shortwave DX Contest is December 1. Entries can be forwarded at any time up to this date. The rules are as follows:—

1. For each Contest a trophy (a Replage World Globe with time converter, value 59/6) will be awarded to the reader who submits the best individual verification.
2. Verifications from any short-wave station between 5 and 100 metres may be submitted. Thus cards from broadcast, commercial, radio-phone and amateur transmitters are all eligible.

3. All verification 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. Only verifications of reception between January 1 and October 31, 1937, 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 to 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 third competition will be announced in the January issue of "A.R.W."

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

—The Shortwave Editor.

Radio Step By Step

(Continued from opposite page)

a signal is applied as shown, the maximum swing to the right takes the point to "D." The grid bias is decreased, and hence the plate current increased by an amount represented by "CD."

The next swing, to the left this time, takes the operating point to "E." The bias is increased, so the plate current decreases — by an amount represented by "AB." The distance "CD" is appreciably greater than "AB," and so rectification is obtained (not complete, because the negative swing is not completely cut out). This rectification is due to the curvature of the characteristic.

The power detector has the disadvantage that it is not very efficient, and also it distorts when the input is small. Hence it is necessary to have one or more stages of radio frequency amplification ahead of the detector to present as large a signal as possible to it.

Another widely popular method of detection is the leaky grid detector. Its main advantage is that it is highly sensitive, though its power handling capacity is limited. Power grid detection is a compromise between the power and leaky grid detector, in that it is an adaptation of leaky grid detection to allow of bigger inputs without distortion. These two methods of detection will be outlined in detail next month.

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.]



Short-wave Review

CONDUCTED BY
ALAN H. GRAHAM

More Police Stations logged ★ When to listen for those elusive Africans ★ New South Americans ★ 20 Metre Amateurs good.

AS predicted last month, reception on the police bands has improved very appreciably during recent weeks. On both the 30.1 and 33.1 meg. bands, quite a number of these low-powered transmitters have been logged at reasonable speaker strength. At times the stations heard are difficult to identify, as the rapid-fire announcements of the police "despatchers" are sometimes almost unintelligible. However, despite this difficulty, the following police stations have been positively identified since September 1:—

30.1 meg. (9.9 m.): **W2XEM**, Newark, N.J.; and **W6XBH**, Los Angeles (?).

33.1 meg. (9.0 m.): **W3XBG**, Norfolk, Virginia; **W4XK**, Durham, N.C.; **W6XMW** (?), Arcadia, Calif.; **W5XB**, Fort Worth, Texas; and **W8XBE**, McKeesport, Pa. (In addition, **W6XJJ**, **W9XKC** and **W9XQ**, the locations of which are unknown, have been heard).

W5XB is by far the loudest and most consistent of these stations. They have been logged almost daily for several weeks past; and, at times, their signals are a steady R8-9. Incidentally, a verification of a report forwarded earlier in the year has just come to hand from Mr. James E. Palmer, Radio Technician at **W5XB**.

Mr. Palmer mentions that **W5XB** has recently increased its power from 50 to 350 watts, which probably explains why signals from this station are so much louder than any others heard on the band. Mr. Palmer would very much appreciate reports from Australia or New Zealand dxers, since the writer's is the only one received as yet from Australasia.

Quite apart from the extreme pleasure which any dyed-in-the-wool dxer will derive from the reception

of these high-frequency signals, some of the messages broadcast are quite entertaining. Patrol cars have been ordered to apprehend "a coloured man, throwing bricks"; "a boy on bicycle disorganising traffic and annoying neighbours"; and "boys in car park annoying people in church"!

Official S.W. Observers

Two additional shortwave observers have been appointed—Mr. R. Russell, of Taumarunui, New Zealand, and Mr. J. K. Sorensen, of Gympie, Queensland.

The positions of shortwave observer for New South Wales, South Australia and Tasmania have yet to be filled, and any readers in these States who are interested in this matter are invited to communicate with the Shortwave Editor as soon as possible, setting out the experience they have had in DX work, and also giving brief details of their receiving equipment.

—The Shortwave Editor.

As would be expected, the 31.6 and 25.9 meg. broadcast channels have also been on the improve. On 31.6 meg. (9.9 m.) a very powerful heterodyne whistle, which is audible almost every morning, denotes the presence of a number of American commercial stations. Latest information available suggests that the following stations are at present using this channel:—

W3XEY, Baltimore; relays **WFBR**; daily 7 a.m.-3 p.m.

W2XDV, New York City; daily 8 a.m.-1 p.m.

W4XCA, Memphis; relays **WMC**; irregular.

W8XAL, Rochester; relays **WHAM**; daily 10.30 p.m.-3 p.m.

W8XWJ, Detroit; relays **WWJ**; daily 9 p.m.-3 p.m.

W9XPD, St. Louis; relays **KSD**; irregular.

As all these stations appear to operate on over-lapping schedules, the **QRM** is so bad that identification is almost out of the question. Occasionally, however, **W9XPD**'s call has been distinguished amid a welter of noise.

On 11.56 m., **W6XKG** are again very consistent—a steady R6-7 in the late morning and every afternoon.

(Quite apart from improved conditions on the high-frequency bands, recent alterations to the receiver described on page 16 of the last issue of "Radio World" have resulted in better results being obtained below 13 m. A 6L7 is now being used as first detector in place of a 6C6, and as a consequence the regeneration, which was never really satisfactory with the 6C6, is now most effective—boosting R3 signals to R5-6).

Generally speaking, conditions above 13 metres have remained much the same as during August. This being the case, the suggestion of a correspondent that these notes should indicate the best times at which to listen for the various countries of the world has been adopted.

Africa—North

The "best bets" as far as North Africa is concerned are the Italian colonial 'phone stations located in Mogadiscio, Asmara or Addis Ababa. These stations, among whom **ITK** (18.32 m.), **IUG** (19.41 m.), Asmara (20.69 m.), **IDU** (22.42 m.), and **IUC** (25.09 m.) are outstanding, are usually heard best after 5.30 p.m. However, they operate on more or less irregular schedules, and can be heard on one of the above frequencies at almost any hour of the night.

Africa—South

South Africans are undoubtedly the most elusive stations on the air;

and in addition to the difficulty experienced in logging them, their hours of transmission are far from convenient, bringing them on the air when all but the most enthusiastic dxers are comfortably abed.

VQ7LO is probably the best-known transmitter in Africa. Located in Nairobi, Kenya Colony, it operates on 49.31 m. It broadcasts at intervals from 8.45 p.m. till 6.30 a.m.—the hours of transmission varying from day to day. However, its signals are seldom heard before midnight—and the best times to listen are: Mondays to Fridays, 2.30-5.30 a.m.; and Sundays, 2.30-6.30 a.m.

Another South African widely reported at present is CR7BH, Laurence Marques, Portuguese East Africa, on 25.6 m. As all announcements are in both Portuguese and English, the station is not difficult to identify. No set signature-tune is used, but the opening selection is invariably a march. The latest schedule of CR7BH is: Daily, 12.30-2 a.m.; 3.30-6.30 a.m.; 7.30-9.30 p.m. Also Sundays 9-11 p.m. The session which commences half an hour after midnight is the most suitable for reception here.

Of the shortwave transmitters located in the Cape area, very little can be heard. News is frequently received that tests are being carried out, but only exceptionally good conditions permit these transmissions to be received. (At present Capetown is reported to be testing on 33.71 m. with a power of 5 k.w.). Last year several of the Rhodesian stations—notably ZEA, Salisbury, on 50 m.—were reported around 5 a.m., but with conditions so poor on this wavelength, it is not likely that they will be audible at present.

Asiatic Review

Any number of Asiatic countries are "loggable" at present.

Firstly, Siam can be heard through phone stations on 15.7 and 16.91 m. (calls are HSE2 and HSP). HSE2 is used whenever possible for communication with JVE, Tokyo, and DFB, Berlin. Listen between 6 and 10 p.m. It has been rumoured that reports to Bangkok would no longer be verified, but this is not entirely correct, as the station staff will QSL whenever possible.

The Burmese government experimental station at Rangoon is still being heard on 49.9 m. in the late evenings. Official Observer La Roche (West Australia) reports that its signals are consistent and strong.

VPB, Ceylon, is another Asiatic being heard on the higher wavelengths (48.77 m.). Listen for these around midnight.

Philco Radio station in Saigon, Indo-China, is still believed to be

SHORTWAVE STATION OF THE MONTH 2.

COGF, MATANZAS, CUBA.

METRES: 25.45.

KILOCYCLES: 11,790.

STANDARD TIME: 15 hours behind Aust. E.S.T.

ANNOUNCER: Man.

DISTANCE FROM SYDNEY: 9,000 miles.

LANGUAGES: Spanish and English.

TIMES OF TRANSMISSION: Irregular. Station believed to be testing.

REPORTS TO: P.O. Box 51, Matanzas, Cuba.

IDENTIFICATION: Announces in English—station CMGF, and short-wave station COGF.

REMARKS: Heard regularly between 1 and 3.30 p.m.

testing on 25.57 and 49.75 m., operating simultaneously with a power of 250 watts. Power is to be increased in the near future. The station schedule is from 2-4 p.m. and 8.30 p.m.-12.30 a.m. daily, and signals are best after 10 p.m.

Of the Indian stations, VUC, Calcutta, is the most likely to be logged. Listen on 49.1 m. around 2 a.m.

Frequent reference has been made in these notes to Chinese commercial stations, which have been heard very well recently. For the convenience of readers, the calls of the "regulars" are repeated below:—

XTB, Shanghai, 26.2 m.; XTV, Canton, 31.61 m.; XGW, Shanghai, 28.79 m.; XTS, Swatow, 26.1 m.; XTK, Hangkow, 33 m.; XTR, Swatow, 32.03 m.; XOJ, Shanghai, 18.9 m. Remember to address reports to Mr. T. C. Loo, Chinese Govt. Radio Administration, Sassoon House, Jinkee Rd., Shanghai.

From Erlanger and Golinger Inc., P.O. Box 283, Manila, comes a communication regarding the recent tests of KZRM, "Radio Manila." KZRM broadcasts simultaneously on 485 and 31 m. from 7.30-9 a.m., and from 7 p.m.-midnight. The shortwave transmitter uses a power of 1 kilowatt, and was intended primarily for Phillipine listeners only. However reports from the United States, South Africa and South America have resulted in a decision to continue experiments on the short waves, and KZRM may be heard on other frequencies in the fairly near future.

European Jottings

From the "Poste emetteur a ondes courtes de Belgrade," station YUA, comes further details of their monthly Transatlantic broadcasts. These can be heard through YUA (49.18 m.), DJO (25.43 m.), and DZC (29.14 m.) from 10-11.15 a.m. The period of transmission is not very suitable for reception in the eastern

States, but fair signals should be audible through DJO.

Radio Centre, Moscow, forwards the latest information regarding their English transmissions. These may be heard through RAN (31.25 m.), RNE (25 m.) and RKI (19.9 m.) at the following times:—

Sundays: 10 a.m.-12.15 p.m., RAN and RKI; 9-10 p.m., RNE.

Mondays: 1-2 a.m., RNE; 7-8 a.m., RNE; 10 a.m.-12.15 p.m., RAN and RKI.

Tuesdays: 7-8 a.m., RNE; 10 a.m.-12.15 p.m., RAN and RKI.

Wednesdays: 10 a.m.-12.15 p.m., RAN and RKI.

Thursdays: 9-10 p.m., RNE; 7-8 a.m. (Special Concert), RNE; 10 a.m.-12.15 p.m., RAN and RKI.

Fridays: 10 a.m.-12.15 p.m., RAN and RKI.

Saturdays: 7-8 a.m., RNE; 10 a.m.-12.15 p.m., RAN and RKI.

The new Swedish station SBG has replaced SM5SX. It operates on 25.63 and 49.22 m. on the following schedule:—

25.63 m.: 2-4.30 a.m., 10 p.m.-midnight—week days. 6 p.m.-4.30 a.m.—Sundays.

49.22 m.: 4.30-8 a.m.—daily.

North America

The outstanding United States station of the month is W9XAA, on 25.36 m. They have been heard between 9 and 10 p.m. (closing at the last-mentioned hour). The station has no regular schedule.

The 25 m. stations W1XAL and W2XE have been especially good this month. Both signals peak shortly after 8 a.m.

Reception on 49 m. continues to be most unsatisfactory in comparison with other years. The improved conditions below 13 m. have been compensated by a falling off on the higher wavelengths, it would seem.

Of the Mexicans, XEWW, Mexico City, on 31.58 m., continues most consistent. This station forwards a

magnificent QSL card—the most attractive the writer has yet received. XEBR (25.38 m.) and XEWI (25.21 m.) are fairly consistent, though not so loud. These stations are best in the early afternoons.

South America

Several new South Americans have been reported as audible during the past month. The best times to listen for such stations (which, incidentally, are being heard better this year than ever before) are 1-3.30 p.m. (till 6.30 p.m. on Sundays) and 9.30-11.30 p.m.

Two of the new stations are located in Venezuela. The first of these is reported by Official Observer La Roche: it is YV3RA, Barquisimeto, operating on 50.8 m., from 3 p.m.-4 a.m. The other is YV1RB, Maracaibo (Apartado 214), heard on 51.28 m. around 10 p.m.

Listen for the following:—

Peruvians: OAX4J (32.1 m.), OAX5C (31 m.), OAX4G (48.1 m.).

Colombians: HJ1ABP (31.19 m.); HJ1ABE (31.57 m.), HJ2ABC (51.08 m.).

Brazil: PRF5 (31.58 m.).

Central America

In the early afternoons listen for HP5I, Aguadulce, and HP5A, Panama City, both on 25 m. The former station may be identified by three notes on a gong sounded three times on the hour and half-hour.

Opening at 10.30 p.m., HP5K, Colon, can be heard at good strength almost every night.

West Indies—Cuba

Cubans continue to come in exceptionally well. COCX (26 m.), COCQ (30.78 m.), COCH (31.8 m.), COGF

(25.45 m.), COBC (not COBP as previously stated) (32.03 m.), COBZ (32.6 m.) and COCD (48.94 m.) have all been heard at good strength. The majority of these stations are heard best around 10 p.m.

West Australian Conditions

A very interesting report is to hand from Mr. G. O. La Roche, Official S.W. Observer for West Australia. It is apparent that conditions in the West are slightly more satisfactory than in the Eastern States, especially on 49 m. On this band Rangoon, Colombo, COCD, VUC, ZTJ (Johannesburg, 49.2 m.), VQ7LO and COCO are audible.

In the near vicinity of the 49 m. band, Mr. La Roche reports the following: YV3RA, HJ2ABC, CO9GC, TG2.

Of the Americans, not many stations are heard at reasonable strength. The best is W2XAF, with W3XAL (16 m.), W8XK (25 m.) and W3XAU only fair.

Reception of D.E.I. stations is very satisfactory in the West—especially above 49 m., where, despite increasing QRN, the following are audible: YDU5 (62.1), YDE2 (62.37), YDL3 (86.96), YDO2 (87.46), YDL4 (87.98), YDO4 (94.38), YDG3 (95.2) and YDA (98.68).

Several of the Europeans mentioned by Mr. La Roche are of considerable interest. ORK (29.04 m.), CSW (30.1 m.), OER3 (25.45 m.), SBG (25.6 m.), EA8AB, Canary Is., (28.98 m.), and EA9AH (42.67 m.).

The Amateurs

The 20 m. amateur band is still of considerable interest. Europeans (7-9 a.m.; 3-6 p.m.) and Africans (around

1 a.m.) add spice to the solid fare of Americans (North and South), West Indians and Asiatics (the latter best after 6 p.m.).

Calls heard on 20 m.: PK1MX, PK1VM, PK1RI, PK2VD, PK3AA; KA1ME, KA1DT, KA1MG; G6AG, G6AT, G6JF, G6XR, G5PW, G5JO, G5TP, G5RV, GM5NW, GW5KJ, LA1G; F3JD; PAOUN; PAONQ; EI2L, EI3J; CN8AM; EA9AH; K7FBE; XE1GK, XE2FC, XE2PJ; CO2OK, CO2WW, CO7AS, CO7CX; YV5AK; CE1AH; HC1JB, HC1JW; VU2BG and XU8MC.

Verifications Received

Broadcast Stations: WCCO (W9-XHW 9.49 m.), Minneapolis; HJ4ABH, Armenia, Colombia; KZRM, Manila, P.I.; LRX, Buenos Aires; PRF5, Rio de Janeiro; YDC, PLP and PMN; XEWW, Mexico City.

'Phone Stations: DFZ, Nauen.

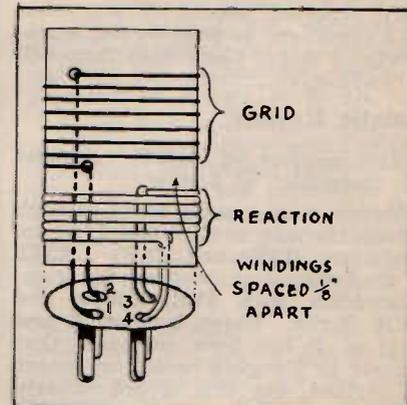
Police Radio: W5XB, Fort Worth.

Amateurs: W6GCX, W6KEI; VE-1CR, VE2KO; HP1A; K4SA; J2KJ, J2NF; XE1HA, XE2JK; LU8AB and CE3DW.

"Tom Thumb Two"

(Continued from page 8)

The set is now placed downwards in front of the cabinet, and the two 1½-volt dry cells placed in the latter. These are followed by the two 9-volt batteries, placed side by side. As well, a "V" notch is cut at the back of the baseboard to permit the battery cable to pass down to the batteries. If the aerial and earth leads from the sockets on top of the



Pin connections for the five plug-in coils are shown in this sketch.

cabinet have been connected up as outlined in last month's article, the set can be slid into position. It is then ready for operation.

Gives Excellent Results

The "Tom Thumb Two" will be found to give excellent results on all wavebands. When in use, the aerial carried in the case should be erected as high as possible, and also an earth should be used for best results.

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Readers who want to take the "Radio World" on a subscription basis and have their copies posted to them direct each month are invited to complete the coupon below (annual sub. 10/6). New readers are advised that all back numbers in Volume 1 (May 1936-April 1937) are still available, price 9d each, post free.

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THE AUSTRALASIAN RADIO WORLD,
 214 George Street, Sydney,
 N.S.W., Australia.

DX News and Views

A page for
letters from
DX readers

Latest Loggings And Verifications

Lately I have logged and reported to:—G6DT, VK6WS (20m. 'phone), JZJ and JZK on 25.42 m. and 19.79 m. respectively. I have veri's from:—ON4VK, G2XV, GSB, DJQ, XEIG, NY2AE, W2XAF, W6BKY, and VK's 2, 3, 4, 5, 6 and 7; mostly heard on a four-valve T.R.F.—G. B. Lance (AW133DX), Hamilton, Vic.

Outstanding Five-Way QSO

I am writing re a five-way QSO that took place on August 3 at 12.30 a.m., and which I thought was worthy of a few notes in your valuable paper. The stations in contact on date mentioned were VK2ABD, W6BKY, ZU6AF, VK2HS and ZT6Y. I might add I followed the QSO's from beginning to end, and they were all word perfect for 1½ hours. It was one of the best amateur QSO's I've heard for many a day.

ABD was R8 to 9 in Africa, HS, R8 in Africa, ZT6Y was R6 to 7 here, ZU6AF R7 to 8 here, W6BKY R8 to 9 here. W6BKY was receiving the African R5 to 6, mostly R5 as they hadn't a directional antenna, but were word perfect to W6BKY. The two VK's to BKY were R8, with ABD having the edge on HS. The interesting part re the two African stations was that one station was 112 yards away from the other! ZT6Y could look at the other station's shack from his back door. And again, VK2ABD and VK2HS are about half a mile away from each other.—W. M. Chapman (AW112DX), Moore Park, Waterloo, Sydney.

DX On The 20-Metre Band

The following DX stations were heard recently on the 20-metre band:—G6DT, G5TZ, G6GF, G2AK, OA4N, OA4AI, OA4AL, HI7G, K4SA, CO7CX, HK1Z, PK2WL, PK1VM, VS1AI, XE2AH, XE2FC, KA1ME, KA1HS, KA1YL, CE1AH, HC1FG, PAOUN, TI2RC, XU8MC and EA9AH.

EA9AH is located in Spanish Morocco, and can be heard during the afternoon from 2.30 to 5.00 p.m. He operates on the low frequency end of the band (about 14,015 k.c.).

The Americans are coming in in great style, the most consistent being W6BKY, W6JKR, W5ZS and W2AZ. Has anyone noticed how the VK5's fade out during the afternoon? On several occasions I have been listening to them when, after two or

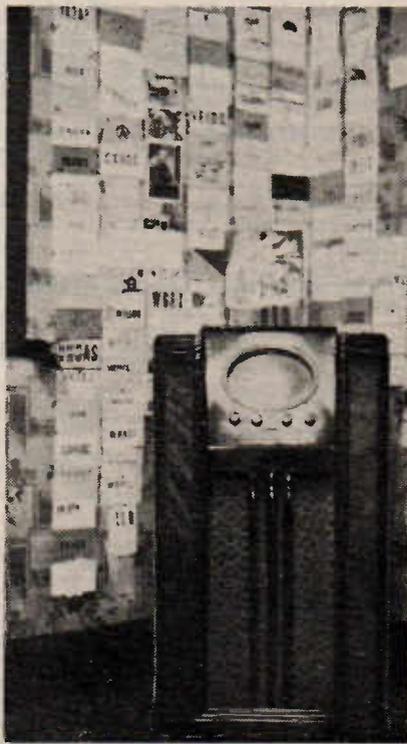
three quick fades, they disappear altogether.—S. Stanworth (AW291-DX), Nth. Bondi, Sydney.

VE4TQ Wants VK Reports

In the second last American mail I received a verification card from VE4TQ, of Dauphin, Manitoba, Canada. This chap has been on the air since about the middle of 1935. During that time he has only contacted one VK station. My card and report were the first he had received from Australia. He will appreciate reports and cards from SWL's, and will QSL 100%.

He operates generally on 40 m. C.W., so if any of you chaps hear him and are desirous of getting a QSL, send him a report.

I would appreciate hearing from any club members and SWL's, and will exchange cards and shack photos. Wishing the "Radio World" every success.—N. Churchward (AW-221DX), 392 Alice St., Maryborough, Q'land.



This receiver and fine collection of QSL's belong to Bob Russell (AW-201DX), of Taumarunui, N.Z.

Eastern Amateurs Coming In On "20"

Reception continues to be good on 20 metres, with the band starting to "open up" once more with the amateurs in the East, who previously had faded out. Some of the latest loggings have been F's 8KI, 3NF; G's 6GF, 6RH, 6PC, 6RF, 6OS, 8NX, 8NJ, 2SG, 6GL, 6OF; PAOUN, PAOEA, PAOEO, PAODE, PAOAZ, PAOAJ; HC1JB, CN8AJ, H8N, SV2RE, VS2AB, W7GTY (160 m.); also VKP on approx. 2,200 k.c. QSL's received have been G2AK, W's 4EP, 3EO, 8FHE; VS2AO, VE4KZ, LU5CZ. I would also like to tender my congratulations to Allan Graham on his very fine shortwave notes.

Best 73's to fellow readers.—Bob Russell (AW201DX), Taumarunui, N.Z.

QSL'S For Exchange

To date I have logged and verified 50 stations, including 3 Americans. I also have a few "AW" from readers who wanted to swop, but as I've only recently had my own cards printed, I could not oblige till now, so those who send me cards will be sent one of mine immediately. Also, any other member who wishes to swop cards or any other information I will be only too pleased to correspond.—R. Cook (AW122DX), Norris St., Bowen, Nth. Q'land.

Joseph Biscoop (AW5DX), "Coolgardie," Allison Rd., Cronulla, Sydney, has an attractively-designed three-colour QSL card he would like to exchange with other members.

Radio Equipment For W.A. Steamer

The "Koolama," a new passenger motor ship for the Western Australian State Shipping Service, now being constructed on the Clyde, will be fitted with a comprehensive Australian-made radio installation. Last month Amalgamated Wireless despatched the "Koolama's" equipment from Australia, comprising a standard 750-watt radio telegraphic transmitter and emergency equipment, an auto alarm receiver, a direction finder, and a music amplifying equipment, also a number of receivers covering the wave bands from 15 to 20,000 metres. This equipment will be fitted in the United Kingdom before the "Koolama" makes her trial trips.

Zero Beat Radio Club Notes

By "Ragle"

During the past month the Zero Beat Radio Club changed its address to the old location at Gregson's Studios, 38 Sydney Arcade, Sydney. The meeting nights are Tuesday and Friday, when lectures and morse code classes are held for A.O.P.C. candidates.

The club transmissions are now radiated on 40 metres as well as 80 metres, and arrangements have been made to intersperse the morse code transmissions with summaries of lectures. A schedule of transmissions to be held at week-ends is at present under review, and a comprehensive syllabus will be transmitted for country members and others. Reports on these experimental transmissions, sent to the secretary, will be greatly appreciated.

A successful field day was held at Carramar on September 19.

Chess-By-Radio Suggestion

Would anyone interested in playing chess by amateur radio get in touch with Vic Joyce, VK2AEN, or the secretary of the Zero Beat Radio Club, 38 Sydney Arcade, Sydney, who will be pleased to give any further information regarding the activities of the club?

A.C./D.C. Receiver

(Continued from page 32)

25Z5 is capable of giving good service even with a higher current output than is used in this receiver. It is rated at a maximum current of 170 m.a. D.C., whereas in this receiver the total current drain is only 60 m.a. on a 250-volt supply.

The heaters of the various valves are arranged so that those more critical to hum are at the lower end, and the barretter is at the higher end. The heater-cathode voltages in the various valves are kept quite low, and no trouble should be experienced in this regard. A 6G5 magic eye tuning indicator is shown as an optional addition, but if this is desired to be omitted, the lines shown dotted should be neglected.

A sample of this receiver has been operating continuously for a number of weeks and has stood up to repeated surges under onerous conditions of operation, and with valves withdrawn and then plugged in again without any detriment whatever to the valves or to the receiver. It appears to be sufficiently rugged to withstand even the severe conditions imposed by badly fluctuating supply voltages on either a.c. or d.c. mains, and its use should eliminate the all too frequent complaints regarding a.c./d.c. receivers in the past.

S.W. Stations 2ME, 3ME, And 6ME—Transmission Schedules

According to advice just to hand from Amalgamated Wireless (A'sia.) Ltd., the following transmission schedules will be observed by short-

"Radio World" Covers Available

Readers are advised that special covers for volumes 1 and 2 of the "Radio World" are available. Using a strong, durable leather board covered in dark blue book-cloth, they are attractively printed in gold with the title of the magazine, volume number and dates of issue.

Twelve strings are attached along the inside back portion of the cover, so that each issue of the magazine as it is bought can be slipped into place in a few moments. This method of binding is cheap, effective and very convenient, as any issue can be instantly removed if desired.

These covers are now available from the "Radio World," 214 George Street, Sydney, price 3/6 each (or for two covers for volumes 1 and 2, 6/-, post free).

wave stations VK2ME, VK3ME and VK6ME during October:—

VK2ME (31.28 m., 9590 k.c.)
Sydney Time G.M.T.
Sundays: 3.30-5.30 p.m. 0530-0730
7.30-11.30 p.m. 0930-1330
Mondays: 12.30-2.30 a.m. 1430-1630

VK3ME (31.5 m., 9510 k.c.)
Melbourne Time G.M.T.
Nightly
Monday to 7 p.m.-10 p.m. 0900-1200
Saturday
(inclusive)

VK6ME, Perth (31.28 m., 9590 k.c.)
Nightly
Perth Time. G.M.T.
Monday to 7 p.m.-9 p.m. 1100-1300
Saturday
(inclusive)

Marchesa Marconi Coming to Australia

Accepts Radio Engineers' Invitation

Advice has been received by Sir Ernest Fisk, President of the Institution of Radio Engineers (Australia) that the Marchesa Marconi has accepted the Institution's invitation to visit Australia during April of next year, when the World Radio Convention will be held in Sydney. This Convention, to be held from April 4 to 14, will take place during

the Celebrations period of Australia's 150th Anniversary.

Several prominent overseas radio engineers will be attending, and in view of the late Marchese Marconi having accepted the invitation before he died recently, it was decided to invite his widow.

The Marchesa was married to Marconi in June, 1927, and before her marriage she was the Countess Maria Cristina Bezzi Scali, daughter of Count Francisco Scali, Brigadier-General of the Papal Noble Guard. She is now thirty-three years of age and will be accompanied on her trip to Australia by her seven-year-old daughter, Elettra.

S.W. Station HAS3

THE latest European mail brought a letter to the "Radio World" from the manager of shortwave station HAS3, "Radiolabor," Budapest, Hungary. The following details regarding the station were given.

The transmitter is located about 40 miles south-west of Budapest, capital of Hungary, and a power of 5 k.w. is used. The station is on the air on Sundays from 14.00 to 15.00 G.M.T., the programmes usually consisting of Hungarian and gipsy music, folk songs, and news, partly in English. Programmes are relayed by land-line from Budapest.

According to the manager, HAS3 is heard quite regularly in India and China, though it is evidently difficult to pick up in New Zealand or in the eastern portion of Australia. West Australia evidently receives the station best from October to December.

Two verification cards used by HAS and HAT were enclosed, together with the accompanying view of the station. Both cards are attractively printed in red and green, with a small photograph showing a view of Budapest mounted in the centre of each.

And It Comes In Handy, Too!

Any serviceman can service any receiver. All he needs is a
set analyzer or a
set tester or a
diagnometer
(They're all our friends)
an oscillator
a C.R. oscillograph
an output meter
pliers (many)
cutters (more)
screw drivers (left and right hand)
dummy valves
other valves
box spanners
ad infinitum
Oh, yes, also a knowledge of radio.

Round The Shacks 3

- VK3AP -

The third of a series of articles on amateur stations, written for the "Radio World" . . .

By "REPORTER"



A view of VK3AP's transmitting shack.

BRAVING Victoria's unseen hordes of infantile paralysis germs, and tolerating a freezing trip of forty-five minutes in a street car, brought me to one of the cosiest shacks it has been my pleasure to visit. Built on real "ham" lines, away from the house and domestic QRM, and complete with the operat-

or's bed and personal belongings, it made my work of interviewing a genuine pleasure.

Greeted on arrival by VK3AP and his second op., VK3IR, we were soon shaking off the chill that only Victoria can instil into the bones of a visitor. Unfortunately, conditions were such that I was unable to hear the rig at its best, but a perusal of the QSL's around the walls of the shack satisfied me that here was a little rig which brought highly satisfactory results, when consideration is given to the low power used. Locations contacted are:—All VK's. ZL. W, G, PK1, PK3, K6, KA1 and XE1.

VK3AP "hit the ether" for the first time on July 30, 1935, and since that date has worked approximately 650 QSO's on 40 and 80 metres. The 20-metre band has been tried at times, and relegated to the discard in favour of domestic rag-chewing on 40 and 80 metres.

The transmitting antenna at present in use is a 40-metre half-wave Zepp with 30-foot feeders, series tuned on "40," while a 20-foot antenna is used for the receiver. The former runs north and south and is about 34 feet high.

All Equipment Home-Made

The whole of the equipment used at VK3AP has been designed and made on the spot by the owner. All circuits have been experimentally

developed before being incorporated in the rig. An excellent set of microphones, all home-made, differing in size from lapel type to ribbon, were shown and tested, all giving results as satisfactory as the commercial product. VK3AP will be glad to give any "ham" a few money-saving wrinkles in regard to carbon granules if they care to get in touch with him.

The rig is a three-stage crystal-controlled job, comprising a 42 as tritet oscillator, link-coupled to a 46 as buffer, capacity-coupled to a 10 as final amplifier. Double choke heising modulation is used, a 24A being resistance-capacity coupled to a 57 (triode), resistance-capacity coupled to a 2A3 class "A" modulator. The microphone most generally used is a Reiss, which is supplied with 45 volts D.C. from the receiver power supply. For test purposes, a B.T.H. pick-up is used. Receiver is a three-valve "Super-Gainer" superhet which drives a cone speaker.

Asked for information on his particular "fad," VK3AP suggested that the most successful modulation system is undoubtedly double choke Heising, and, provided extra filter condensers are inserted, a Reiss microphone may be operated from a well-filtered receiver power supply. In his rig, a 4 mfd. filter condenser was used as a coupling condenser. His motto seems to be—"Crystal control for accuracy and Heising for quality."



Owner-operator A. Bowley.

Radio Telephone In Mid-Pacific

AN important link in the wireless communications of the Pacific Ocean has been strengthened by the British Phosphate Commission providing improved radio telephone facilities at Ocean Island and at Nauru.

These places are visited by the Commission's vessels, "Triaster" and "Triona," which carry to Australia large quantities of phosphate. Several years ago the B.P.C. had A.W.A. radio telephones installed on both islands, and on the Commission's

ships. The older equipment at Nauru and at Ocean Island has now been replaced with medium wave telephone transmitters and receivers. In the case of Ocean Island, also, an additional unit has been installed for operation on short waves.

The new equipment, which was designed and manufactured by Amalgamated Wireless, is proving of high value for communication purposes between the shipping of the B.P.C. and the two islands. On the medium wavelength, vocal communication of good quality has been held for dis-

tances of over 1,000 miles, and with the use of the shortwave telephone, this range has been considerably increased.

The wireless equipment includes special types of voice-operated relays, by means of which the transmitter is brought into action immediately one commences to speak into the telephone. The wavelength change at Ocean Island is effected by press-button control, the aerial system being 800 yards from the transmitter. Highly sensitive superheterodyne receivers are used.

Shortwave Station Addresses

By ALAN H. GRAHAM

EUROPE

AUSTRIA

OER2—Oesterr. Radioverkehrs. A.G.,
Johannesgasse 4b, Vienna.

BELGIUM

ORG, ORK, etc.—Direction des Radio-
communications, Brussels.

BULGARIA

LZA—Radio Sofia, 19 Moskovska Str.,
Sofia.

CZECHO-SLOVAKIA

OLR—Ministere des Postes et des
Telegraphes, Prague.

DENMARK

OXY—Stratsradiofonien, Heibergs-
gade 7, Copenhagen.

FRANCE

TPA—Radio Coloniale, Boulevard
Haussmann 98-bis, Paris 8.

French 'Phones—Administration Fran-
cais des P.T.T., 5 rue Froi-
devaux, Paris 14.

FNSK, s.s. Normandie—French Lines,
Pier 88, foot of W. 48th Str.,
New York.

Other French Ships—French Lines,
Pier 57, Hudson River, New
York.

GERMANY

DJA, etc.—Haus des Rundfunks,
Berlin-Charlottenburg 9.

German 'Phones and Ships—Reich-
spostzentralant, Berlin -
Templehof.

HUNGARY

HAS, HAT—Gyali-ut 22, Budapest.

ICELAND

TFJ, TFK, etc.—Icelandic State
Broadcasting, Box 547, Reyk-
javik.

ITALY

I2RO—Radio Roma, 5 Via Montello,
Rome.

IAC—Radio Maritime Coltano, Pisa.

IRM, IRW, etc.—Societe Italo Radio,
Servici Radio Elettrici, via
Calabua 46-48, Rome.

Italian Ships—Italian Lines, 1 State
Str., New York.

NETHERLANDS

PHI, PCJ, etc.—Philips Radio, Hil-
versum.

PIIJ—Middlebare Technische School,
Oranjestaan 12, Dordrecht.

NORWAY

LKJ1, etc.—Dept of Commerce, Di-
vision of Radiø Telegraphy,
Oslo.

POLAND

SPW—Radio Polskie, Mazowiecka 5,
Warsaw.

PORTUGAL

CSL, CSW, etc.—Rua do Quelhas 2,
Lisbon.

CT1AA—Av. Antonio Augusto de
Aguiar 144, Lisbon.

CT1CT—Rua Carvalho Araujo 97-3
D, Lisbon.

CT1GO—Parede.

SPAIN

EAQ—Transradio Espanol, Apartado
951, Madrid.

SWEDEN

SM5SX—Royal Technical University,
Stockholm.

SWITZERLAND

HBL, HBO, etc.—Radionations, In-
formation Section, League of
Nations, Geneva.

MB9B—Radio Club Basel, Postfach 1,
Basel.

UNITED KINGDOM

GSA, GSB, etc.—B.B.C., Broadcast-
ing House, London, W.1.

English 'Phones—Engineer-in-Chief,
Armour House, St. Marins
le Grand, London, E.C.1.

U.S.S.R.

RNE, etc.—Radio Centre, Solianka
12, Moscow.

(To be continued)

ALL WAVE ALL WORLD DX CLUB . . . New Members

- AW208DX—John E. C. Heaver, Box 17 G.P.O., Portland, Victoria.
AW209DX—C. R. Fanshawe, 217 Ellena St., Maryborough, Q'land.
AW210DX—E. Geoff Corser, 53 Pallas St., Maryborough, Q'land.
AW211DX—Herbert E. Varley, Waitoa, New Zealand.
AW212DX—Edward J. Bayley, 709 Macarthur St., Ballarat Nth., Victoria.
AW213DX—Sydney Edward Molen, C/- Box 72, Sarina, Queensland.
AW214DX—Noel Mills, 155 Ernest St., Crows Nest, North Sydney.
AW215DX—W. A. McCall, 5 Coromandel St., Wellington, S.1., New Zealand.
AW216DX—Alan G. Brown, Box 31, Kaniva, Victoria.
AW217DX—L. F. Dalton, 7 Walker St., West Brunswick, N.12, Melbourne, Vic.
AW218DX—H. C. Tidbury, C/o. National Bank A'sia Ltd., Atherton, Nth.
Q'land.
AW219DX—G. W. Gowen, 827 Kiwi St., Wanganui, New Zealand.
AW220DX—Ken Deering, Jamestown, South Australia.
AW221DX—Neville W. J. Churchward, 392 Alice St., Maryborough, Q'land.
AW222DX—Douglas Gordon Donald Mackie, P.O. Box 9, Mt. Isa, Qld.
AW223DX—Les Oxenham, 6 Glendavar St., Berhampore, Wellington, S.1., N.Z.
AW224DX—James Stewart, 34 Salisbury Avenue, Ivanhoe, N.21, Victoria.
AW225DX—D. B. Pring, C/- Dalby Vulcanising Works, Dalby, Q'land.
AW226DX—John Stanley Brown, Chittaway Road, Ourimbah, N.S.W.
AW227DX—Denis Hollins, 99 Bridge St., Ballarat, Victoria.
AW228DX—Mrs. Annie Connor, 8 Cameron St., Devonport, N.1. Auckland, N.Z.
AW229DX—F. Raymond Swan, 18 Divett Place, Alberton, Sth. Australia.
AW230DX—Ron Daniels, 95 Targo St., Bundaberg, Q'land.
AW231DX—J. F. Spain, Clifton Street, Charlton, Victoria.
AW232DX—Ronald Paul, 5 Fitzroy St., Kerang, Victoria.
AW233DX—William A. Howe, 47 Angas Rd., Lower Mitcham, South Australia.
AW234DX—Gordon Hough, "Runnymede," 17 Pacific St., Manly, Sydney.
AW235DX—K. R. Lehmann, Kelly Town, Nhill, Victoria.
AW237DX—James H. Clark, 76 Alpha St., Willoughby, N.S.W.
AW236DX—William Jennings, 33A George St., Burwood, Sydney, N.S.W.
AW238DX—David Rowe, C/- Post Office, Home Hill, Nth. Q'land.
AW239DX—Ken Brown, 732 High St., Lower Hutt, Wellington, N.Z.
AW240DX—John D. H. Arnott, "Kurraba," Edgecliffe Rd., Woollahra, N.S.W.
AW241DX—R. L. Le Moine, 71 Lawrence St., Harboard, N.S.W.
AW242DX—Vernon Wyatt, Queen St., Cobram, Victoria.
AW243DX—Elwyn H. Fallowfield, 128 Manning St., Taree, N.S.W.
AW244DX—Roy Ferrow, 268 Old South Head Rd., Vaucluse, Sydney, N.S.W.
AW245DX—Gordon Young, Paterson St., Teneriffe, N.1., Brisbane, Q'land.
AW246DX—R. Coundon, Watchupqa, Victoria.
AW247DX—Walter Haynes, 12 Brady St., Croydon, N.S.W.
AW248DX—Jack Wallace, 355 Barnard Street, Bendigo, Victoria.
AW249DX—Robert Hamilton Mackintosh, 8 Halcyon Ave., Wahroonga.
AW250DX—G. M. Anselme, 16 Hartley St., Rozelle, Sydney, N.S.W.
AW251DX—W. N. Black, 4 Swanpool Ave., Chelsea, S.15, Victoria.
AW252DX—Eric Wiseman, Clarke St., Clifton, Q'land.
AW253DX—Charles Walker, East St., Clifton, Q'land.
AW254DX—N. Thornton, 88 Main Road, Redcliffs, Christchurch, N.Z.
AW255DX—D. J. Medley, Cuthbertson House, Geelong Grammar School,
Corio, Vic.
AW256DX—E. B. Strong, 1 Evelyn Street, St. Kilda, S.2., Melbourne, Vic.
AW257DX—Orlando Garnard Washfold, 59 Radnor St., Camberwell, Vic.
AW258DX—A. E. Read, 11 Elizabeth Street, Masterton, New Zealand.
AW259DX—Max Bott, 25 Pearson St., Sale, Victoria.
AW260DX—B. Robert Mitchell, 25 Electra St., Bundaberg, Q'land.

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|------------|-------------|
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| .0002 mfd. | .00015 mfd. |
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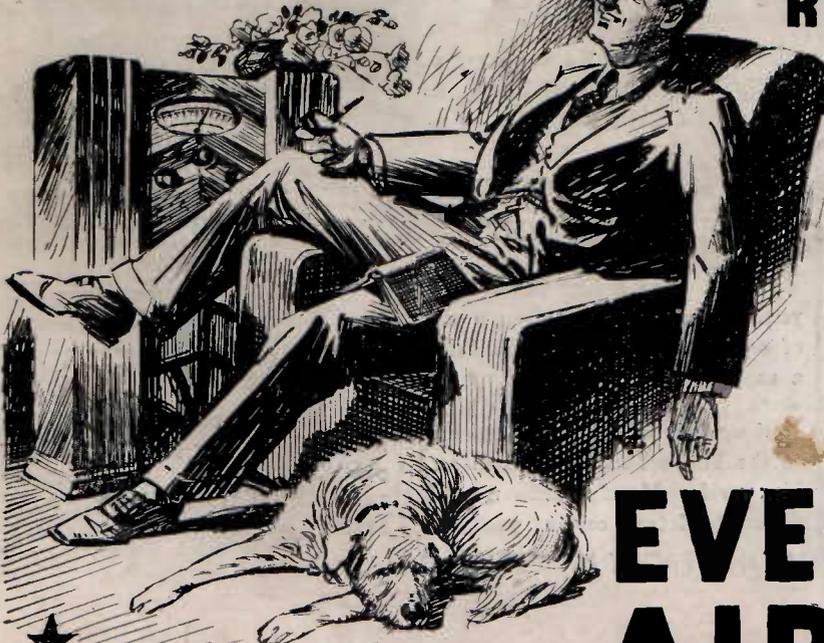
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