

THE  
AUSTRALASIAN

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# Radio World

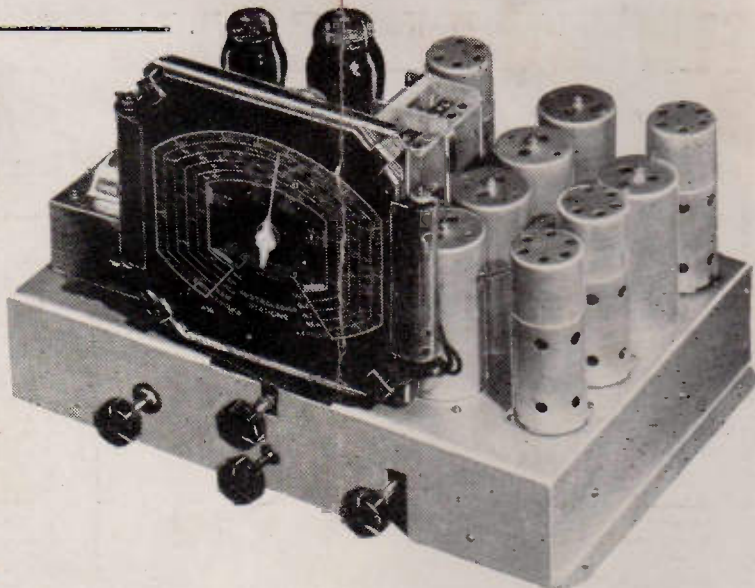
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—See Page 8

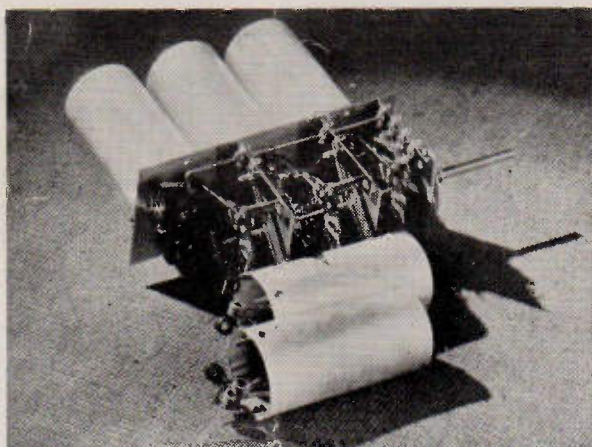
- TWO-BAND PORTABLE TRANSMITTER-RECEIVER: TRIPLE-RANGE VACUUM
- TUBE VOLTMETER: TWO-VALVE A.C. SUPERHET: MORE ABOUT THE
- "1938 FIDELITY D.W. SIX": LATEST WORLD SHORTWAVE NEWS.

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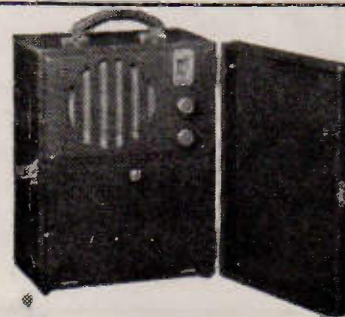
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(See full details in this issue.)

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1 aluminium chassis (see sketch)	£0 7 0
1 0-25 m.a. meter (Hickok)	3 5 0
1 40-metre crystal and holder, approx.	2 5 0
3 23-plate midget condensers—4/6 each	0 13 6
1 5-plate midget condenser	0 2 3
5 .002 mfd. fixed condensers (Solar)—8d. each	0 3 4
2 .0001 mfd. fixed condensers (Solar)—1/- each	0 2 0
1 15,000-ohm resistor, 1-watt (E.T.C.)	0 0 9
2 10,000-ohm resistors, 1-watt (E.T.C.)—9d. each	0 1 6
1 8-ohm filament resistor	0 1 0
4 R.F.C.'s, transmitting type—5/- each	1 0 0
1 S.P.D.T. toggle switch	0 2 8
1 D.P.D.T. toggle switch (send-receive switch, see sketch)	0 3 6
1 single toggle switch, S1	0 2 8
2 6-pin valve sockets for 19's—6d. each	0 1 0
3 4-pin sockets for coils—6d. each	0 1 6
4 4-pin coil formers—1/6 each	0 6 0
1 stand-off insulator	0 2 0
2 small plugs and sockets for battery connections—1/3 ea.	0 2 6

#### VALVES:

2 type 19 valves (Radiotron, Ken-Rad, Philips)—16/- ea.	1 12 0
---	--------

#### MISCELLANEOUS:

Knobs, dial plates, nuts and bolts, solder lugs, washers, hook-up wire, rubber grommets	0 10 6
---	--------

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Complete vibrator supply, including filters, chokes, condensers, etc., or parts as follows:—

1 vibrator unit and transformer	£5 0 0
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3 .5 mfd. fixed tubular condensers (Solar)—1/6 each	0 4 6
2 8 x 8 mfd. condenser blocks, 500v. working (Ducon type 24)—7/6 each	0 15 0
1 .1 mfd. fixed condenser, 500v. (Solar)	0 0 10
1 500 mfd. condenser, 6-volt working	0 6 6
1 piece of aluminium, rubber grommets, etc., for mounting	0 1 6
1 6-volt accumulator to suit	1 9 6

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# THE AUSTRALASIAN RADIO WORLD

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

Vol 2.

MARCH 1, 1938.

No. 11.

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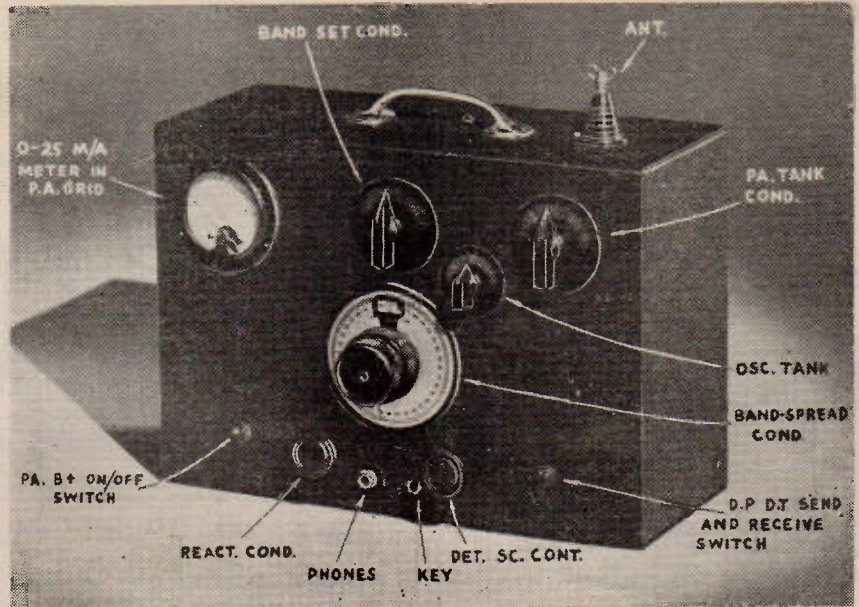
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★  
The two photographs on this page show front and rear views of the completed transmitter-receiver.  
★

# Two-band Portable



# Transmitter-Receiver

Complete details of a highly efficient two-band portable transmitter-receiver, housed in a metal case measuring only 15"x10"x6", are given in the article below.

By L. S. MEYERS (VK2KS)

**M**OST amateurs have, at some time or other, desired to operate a portable station, but have been deterred from doing so by the thought of having to transport heavy and bulky equipment, while others who have experimented in

this field have been discouraged through poor results and unsatisfactory operation.

The portable transmitter described below is one which has been tried and proved as far as efficiency and results are concerned, and what is

more, it is not expensive to build. The only external source of supply is a six-volt accumulator.

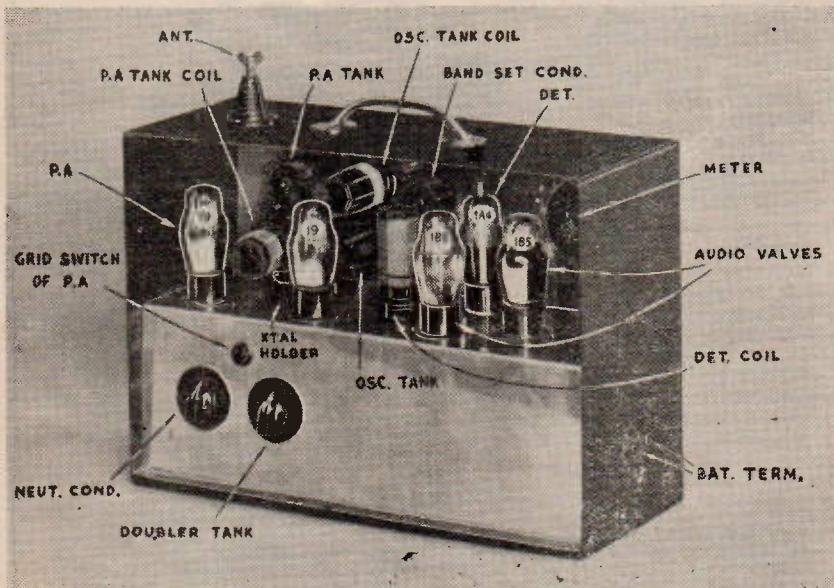
### The Circuit

The transmitter section consists of two stages, crystal-controlled, with a 19 as oscillator-doubler, and another 19 as power amplifier, the latter valve having its plates and grids connected in parallel.

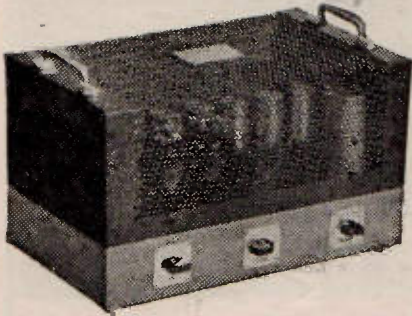
With a 40-metre crystal, operation may be had on 7 and 14 m.c., the two most popular bands. However, if it is desired to operate on 3.5 and 7 m.c., an 80-metre crystal may be used. Shunt feed is used to the oscillator section of the 19, and also to the P.A., thus permitting the tank condensers to be grounded, thereby simplifying construction.

The P.A. is keyed in the grid circuit in preference to the plate, because this method minimises key clicks and consequently improves quality of the signal, while the 19, being a zero bias valve, lends itself admirably to this method. It is not advisable to key in the oscillator circuit, as this would cause the load on the vibrator power supply to be thrown on and off rapidly, resulting in considerable "splashing" at the contacts, which would in time damage them so much as to cause objectionable "hash" in the receiver. An 0-25 m.a. meter is used in the P.A. grid to simplify tuning of the transmitter—in particular for neutralizing.

It is not intended to discuss the receiver section to any great extent,



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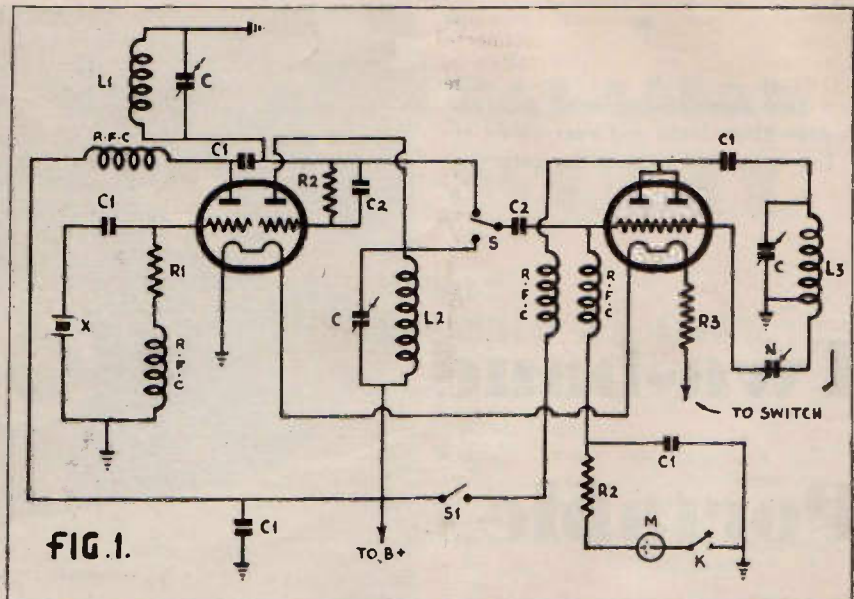


FIG. 1.—The circuit of the two-stage crystal controlled transmitter, which uses a type 19 valve as oscillator-doubler, and a second 19 with the triode sections in parallel as power amplifier.

as this part will be left to individual tastes, depending on the type of receiver preferred by the builder. The

one illustrated at the right, (see photograph showing a rear view), consists of three valves—1A4 detec-

## TWO-BAND PORTABLE TRANSMITTER-RECEIVER

### TRANSMITTER SECTION—List of Parts

- |   |  |
|---|--|
| 1 metal case, 15in. x 10in. x 6in.                | 1—S.P.D.T. toggle switch (band switch).  |
| 1—aluminium chassis (see sketch).                 | 1—D.P.D.T. toggle switch (send-receive switch, see sketch).                              |
| 1—0-25 m.a. meter (Triplett, Calstan, Palec)      | 1—single toggle switch S1.   |
| 1—40-metre crystal and holder.                    | 2—6-pin valve sockets for 19's.  |
| 3—23-plate midget condensers (Raymart, Radiokes). | 3—4-pin sockets for colls.   |
| 1—5-plate midget condenser (Raymart, Radiokes).   | 4—4-pin coll formers.  |
| 1—5—002 mfd. fixed condensers (Solar, Simplex).   | 1—stand-off insulator.   |
| 2—0001 mfd. fixed condensers (Solar, Simplex).    | 2—small plugs and sockets for battery connections.                                       |
| 1—15,000-ohm. resistor, 1-watt (E.T.C.)           | <b>VALVES:</b>   |
| 2—10,000-ohm. resistors, 1-watt (E.T.C.)          | 2—type 19 valves (Radiotron, Ken-Rad, Raytheon, Philips).                                |
| 1—8-ohm. filament resistor.                       | <b>MISCELLANEOUS:</b>  |
| 4—R.F.C.'s, transmitting type.                    | Knobs, dial plates, nuts and bolts, solder lugs, washers, hook-up wire, rubber grommets. |

### RECEIVER SECTION—List of Parts.

- |  |   |
|--|---|
| 1—23-plate midget condenser (Radiokes, Raymart). | <b>FIXED CONDENSERS:</b>  |
| 1—5-plate midget condenser (Radiokes, Raymart).  | 2—.0001 mfd.  |
| 4—4-pin valve sockets.                           | 2—.01 mfd.  |
| 1—100,000 ohm. potentiometer (E.T.C.)            | 2—1 mfd.  |
| 1—s.w. r.f. choke (Radiokes).                    | <b>FIXED RESISTORS:</b>   |
| 1—audio choke (Radiokes).                        | 1—50,000 ohm.   |
| 1—vernier dial.                                  | 2—500,000 ohm.  |
| 1—pair headphones.                               | 1—2 megohm.   |
| 1—jack and plug.                                 | <b>VALVES:</b> —1—1A4. 2—1B5 (Radiotron, Raytheon, Philips, Ken-Rad).             |
| 2—7-pin plug-in colls to suit.                   | <b>MISCELLANEOUS:</b> —Knobs, nuts and bolts, grid clip, terminals, hook-up wire. |

### POWER SUPPLY—List of Parts

- |  |   |
|--|---|
| Complete vibrator supply, including filters, chokes, condensers, etc., or parts as follows:— | 3—.5 mfd. fixed tubular condensers (C1) (Solar).                  |
| 1—vibrator unit and transformer (T).   | 2—8 x 8 mfd. condenser blocks 500v. working (C2) (Ducon type 34). |
| 1—L.T. choke (CH1).  | 1—.1 mfd. fixed condenser 500v. (C3) (Solar).                     |
| 1—30 henry 50 m.a. filter choke (CH).  | 1—500 mfd. condenser 6-volt working (C4) (Aerovox type 97).       |
| 1—L.T. R.F. choke (R.F.C.1).   | 1—piece of aluminium, rubber grommets, etc., for mounting.        |
| 1—H.T. R.F. choke (R.F.C.2).   | 1—6-volt accumulator to suit (Clyde).                             |
| 2—.01 mfd. fixed tubular condensers (C) (Solar).   |   |

tor and two IB5's as audio amplifiers. The filaments are connected in series, bias for the IB5 valves being obtained by tapping the grid returns on to the filament line. 30's could be used in place of the IB5's, although they have not as high an amplification factor as the latter. Both screen and plate control of regeneration are used, to ensure smooth operation on the higher frequencies.

**The Power Supply**

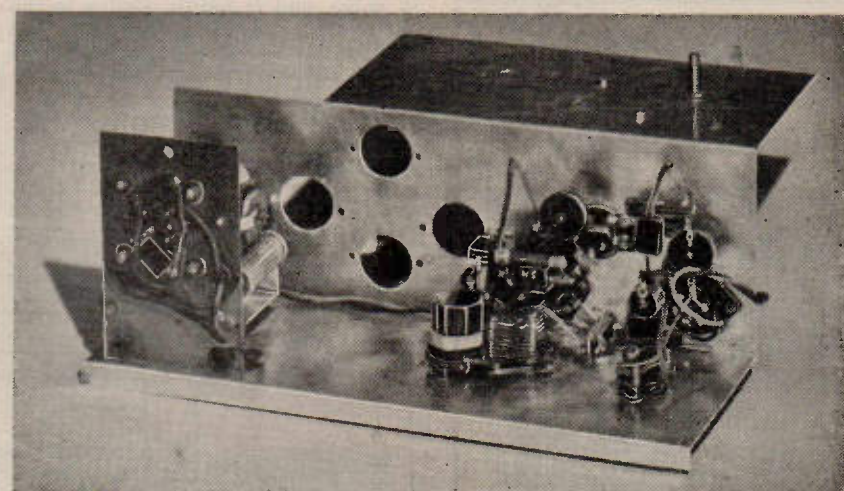
The power supply is a standard vibrator power pack, and delivers 145 volts at 40 m.a. on full load. It is mounted on a small panel 6" x 3", which is in turn floated on sponge rubber washers, so as to prevent vibration affecting reception.

The supply in the original portable was assembled from parts as specified elsewhere, but it is quite possible that the complete supply may be procurable as a single unit. In this case, care should be taken that it can be fitted into the metal case; if not, it will have to be used as a separate unit externally.

**Assembly And Layout**

The transmitter and receiver are built on a chassis as shown in Fig. 5. This allows for removal of the units for alteration, and facilitates construction.

Referring to the front view of the portable, the controls are as fol-

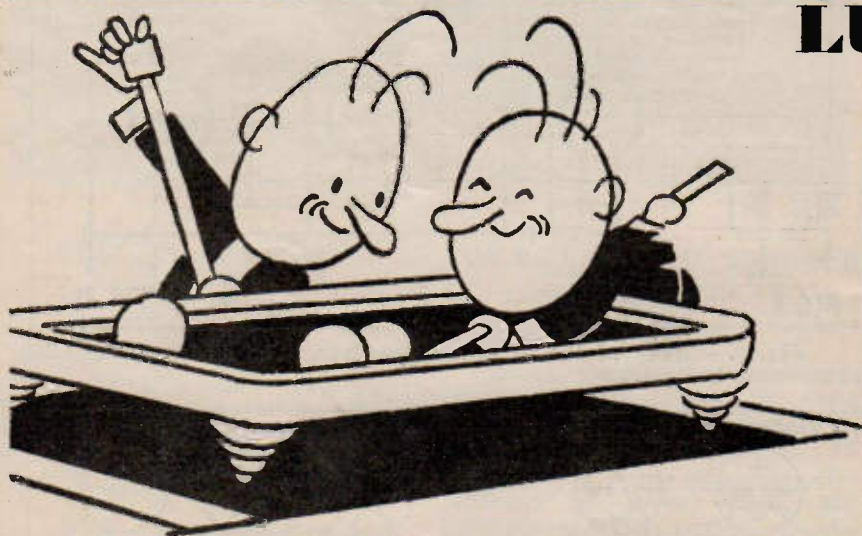


An under-chassis view of the transmitter assembly. The vibrator unit, comprising all components shown in fig. 2 within the dotted line, is on the extreme left, in the approximate position in which it is mounted on the base of the metal cabinet.

low:—Top half, left to right: 0-25 m.a. meter in P.A. grid circuit, band-set receiver condenser, oscillator tank condenser, P.A. tank condenser. Centre vernier control is the receiver band tuning condenser. Bottom half, left to right: P.A. high tension switch, reaction control for receiver, 'phone jack, key jack, potentiometer

in detector screen, D.P.D.T. send-receive switch (switches antenna and filament supply).

In the photograph showing a rear view, the layout is as follows:—Top half, left to right: 19 P.A., P.A. tank coil with P.A. tuning condenser directly above. The crystal holder is mounted directly behind the second



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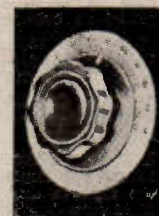
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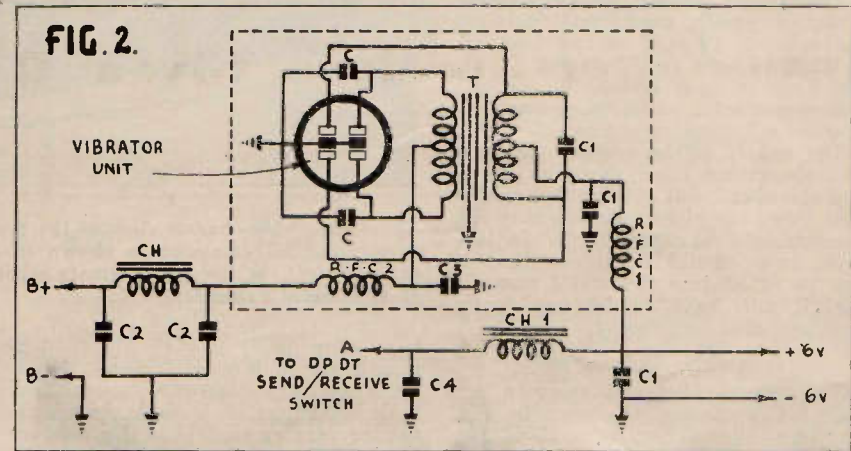
19 valve, and is hardly visible in the photograph. The oscillator tank coil is directly above, with its associated tuning condenser below the coil.

The large coil in the centre is a broadcast coil (which was wound for the receiver when it was operated at a holiday camp on one occasion), while above this coil is the band-set condenser. The three receiver valves are at the extreme right.

The lower controls are the neutralizing condenser, grid switch of

P.A., and doubler tank tuning, while the battery terminals are at the side, one being insulated. The aerial coupling stand-off insulator is at the top.

The panel containing the vibrator unit is mounted directly below the meter, while the two filter chokes and condenser block are also mounted on the floor of the case alongside the pack. The neutralizing condenser and doubler tank condenser are brought out at the back, and both are insulated as shown in Fig. 6.



The circuit of the vibrator unit showing the smoothing system adopted to ensure a completely noise-free "B" supply.

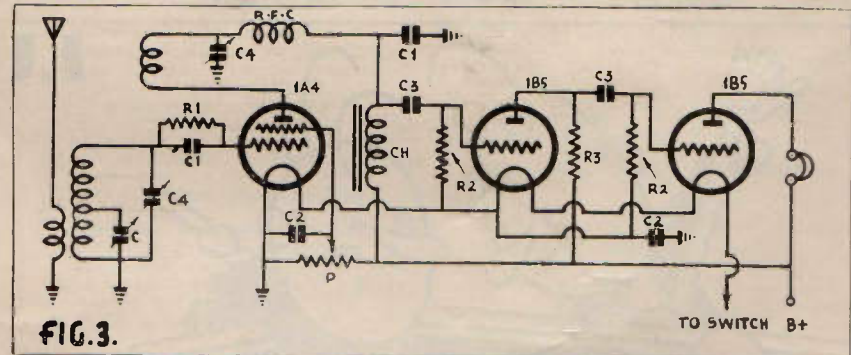


Fig. 3.—Circuit of the three-valve receiver. The diodes of the 1B5's are not used, hence are not shown.

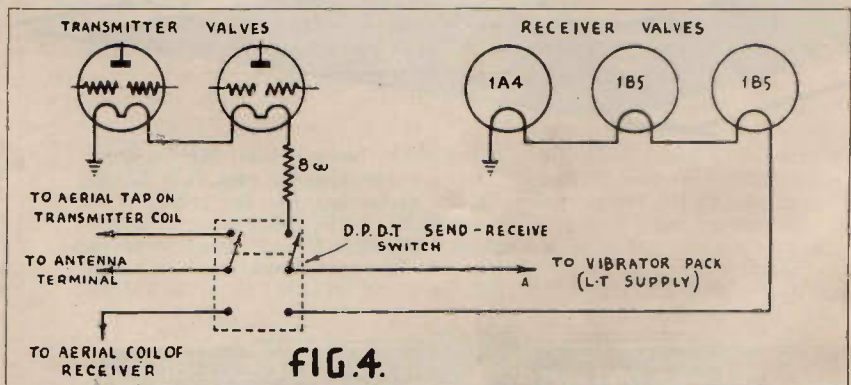


Fig. 4.—The diagram shows the wiring of the filament and aerial circuits to the double-pole and double-throw send-receive switch.



THE  
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PIONEERS

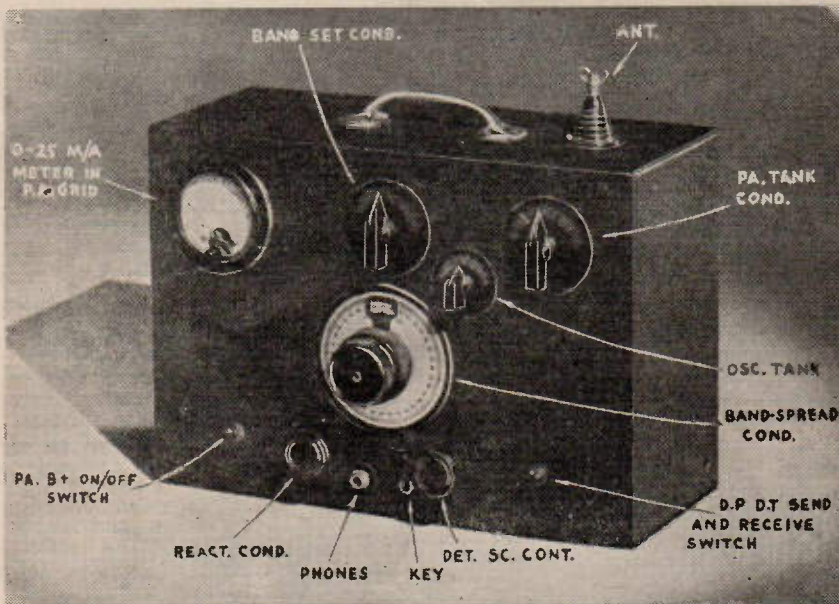
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### Two - Band Operation: Highly Efficient: Vibrator Power Supply.

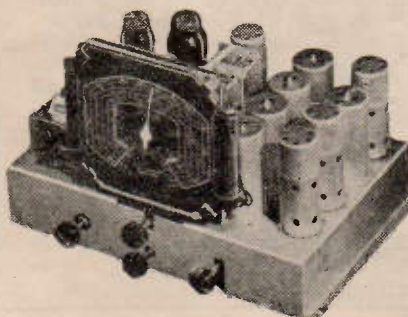
This inexpensive, highly efficient transmitter-receiver is the ideal portable rig for amateurs. Crystal controlled, the transmitter section uses two 19's, one as oscillator-doubler and the other as power amplifier (triode sections in parallel). The receiver uses a 1A4 as detector and two 1B5's in the audio stages. Vibrator power supply. Two R4 reports from Europe and RST 569 from a W2.

Write for our detailed quote. Every part guaranteed as specified.

### FIDELITY SIX GIVES 3 WATTS FIDELITY OUTPUT.

A 3-watt high fidelity amplifier is used in the "1938 Fidelity Dual-Wave Six," described this month. Sensitivity and selectivity are excellent, and tone is unbeatable, making this the ideal receiver for the discriminating set-builder.

Write for our detailed quote.



### "DE LUXE METAL MIRACLE TEN."

Uses 6L6 beam power valves with inverse feedback, giving 25 watts output. Frequency-compensated tone control—all-wave coverage from 15 to 550 metres—large oval accurately-calibrated dial—metal valves. 100 per cent. results are assured with the Micromatic factory-adjusted and guaranteed coil unit.

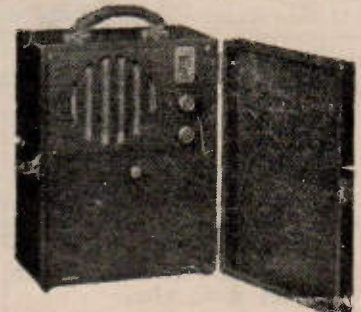
Complete kit, with valves and power supply ..... £33/15/-

With valves, power supply and Magnavox Model 305 speaker ..... £40/-/-

WRITE FOR FURTHER DETAILS  
—SENT FREE BY RETURN POST.

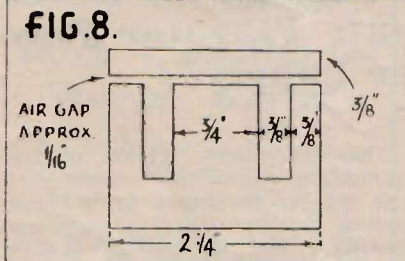
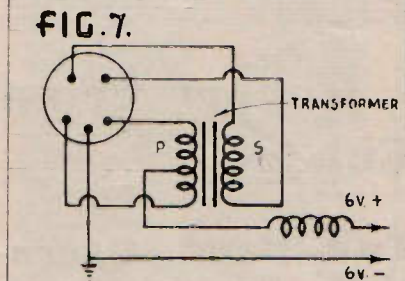
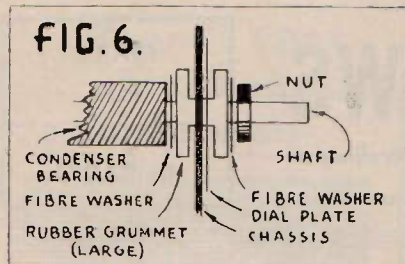
### GOING AWAY THIS EASTER ?

Yes! Then why not take a "1937 Outdoor Portable Four" (described in the "Radio World" for October and November 1937) along with you?



Guaranteed to have more pulling power than many sixes under similar operating conditions, it is the ideal companion for all occasions.

Get YOUR kit now! Every part guaranteed as specified by the Editor.



As will be observed, the P.A. tank, oscillator tank, and band-set condensers are mounted directly to the chassis, while the reaction, band-spread and screen potentiometer are mounted directly on the case. The send-receive switch is a D.P.D.T. toggle switch for switching the filaments and antenna. This is the only change-over control required when it is desired to transmit or receive. An 8-ohm dropping resistor is inserted in the transmitter filament line in order to reduce the voltage to four volts.

#### Short, Direct Wiring Best

The wiring will not be discussed in detail, as it is anticipated that builders of this transmitter will have had some previous experience in transmitter construction.

#### Coil Data

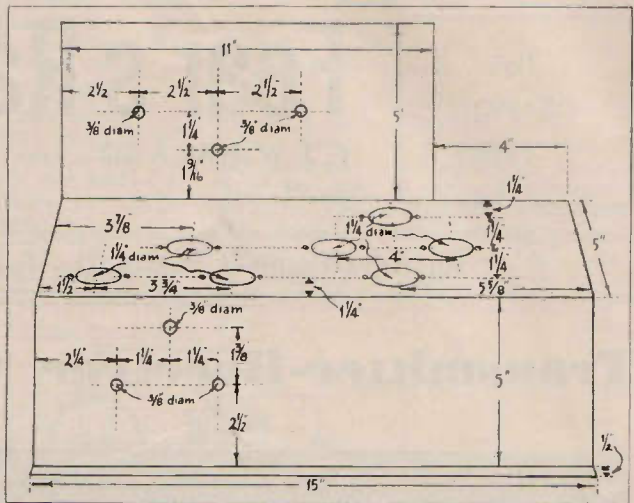
	40 metres.	20 metres.
L1	14	14
L2		6
L3	16 (tapped 6 turns)	7 (tapped 3 turns)

Wound on  $1\frac{1}{4}$ " former with 18 gauge d.c.c. wire.

The LT r.f. choke may be made by filling up a bobbin  $1\frac{1}{4}$ "  $\times$   $\frac{3}{8}$ "  $\times$   $\frac{1}{8}$ " with 22 gauge s.w.g. enamel wire, jumble wound.

Fig. 5 (right) shows full chassis dimensions.

Fig. 6 (left) shows how to insulate the neutralising and doubler tank condensers. Fig. 7 shows the wiring of the vibrator socket. The unit is a Ferrocart type 18978. Details of the core required for the "LT" choke are given in fig. 8. 120 turns of 20-gauge s.w.g. enam. wire are layer wound on a  $\frac{3}{4}$ -in. square core of 26-gauge laminations.



The components have been placed so that the wiring will be as short as possible, as will be observed in the photograph illustrating the underneath of the chassis. **IN THIS PHOTO THE RECEIVER PORTION HAS BEEN ELIMINATED, IN ORDER TO ILLUSTRATE MORE CLEARLY THE LAYOUT OF THE TRANSMITTER SIDE.** The vibrator unit is located at the extreme left. A number of the parts, such as condensers, chokes and resistors, are soldered right on to the valve and coil sockets.

The completed portable is fitted in a metal case measuring only 15"  $\times$  10"  $\times$  6", fitted with a carving handle, the only external requirements, apart from 'phones, key and aerial, being a six-volt accumulator.

#### Tuning And Adjustments

To tune the transmitter, set the P.A. grid switch to the doubler section of the 19 oscillator, close the key, and tune the oscillator tank for maximum reading in the grid meter. If the crystal is not oscillating, there will be no reading or grid current. Next tune the doubler tank for maximum grid current and re-set oscillator tank.

Using the 20-metre coil in the P.A. tune the P.A. tank condenser. As it passes through resonance, the grid meter will flicker, showing that the P.A. is not neutralised. In order to neutralize the P.A., continue to tune through the resonance point, and at the same time adjust neutralizing condenser and the doubler tank until there is no variation of grid current.

For 40-metre operation, change the P.A. tank coil and set the grid switch to the oscillator section of the first 19, and repeat the tuning and adjustments. A switch is inserted in "B+" to the P.A. to allow for neutralizing with the key closed; otherwise the P.A. would oscillate while neutralizing is being carried out.

With the "B+" switch closed, tune

the P.A. tank condenser for maximum grid current. The antenna tap on the tank coil will have to be found by experiment, as this position will

(Continued on page 46.)

#### This Month's Front Cover.

This month's front cover photograph shows the new Ever Ready factory at Rosebery, which was recently opened by the Prime Minister, the Right Hon. J. A. Lyons, in the presence of a gathering of prominent public figures and notable citizens.

This airy, spacious and modern building houses the most up-to-date plant of its kind in the world; contains over 80,000 square feet of floor space, and is ideally situated from the health and manufacturing points of view.

Planned for both purposes of labor-saving efficiency and the care and general comfort of employees, the factory contains its own staff hospital, staff cafeteria and dressing rooms fitted with hot and cold showers and individual steel lockers for each member of the staff.

Throughout the building the lavish use of glass has provided an absolute maximum of natural lighting on every floor. As well, this has been supplemented by exceptionally powerful and complete artificial lighting arrangements, so that all employees work under ideal conditions.

Products produced by the Ever Ready Co., (Aust.) Pty. Ltd., number over 200, and embrace every conceivable type of dry cell known to the battery industry.

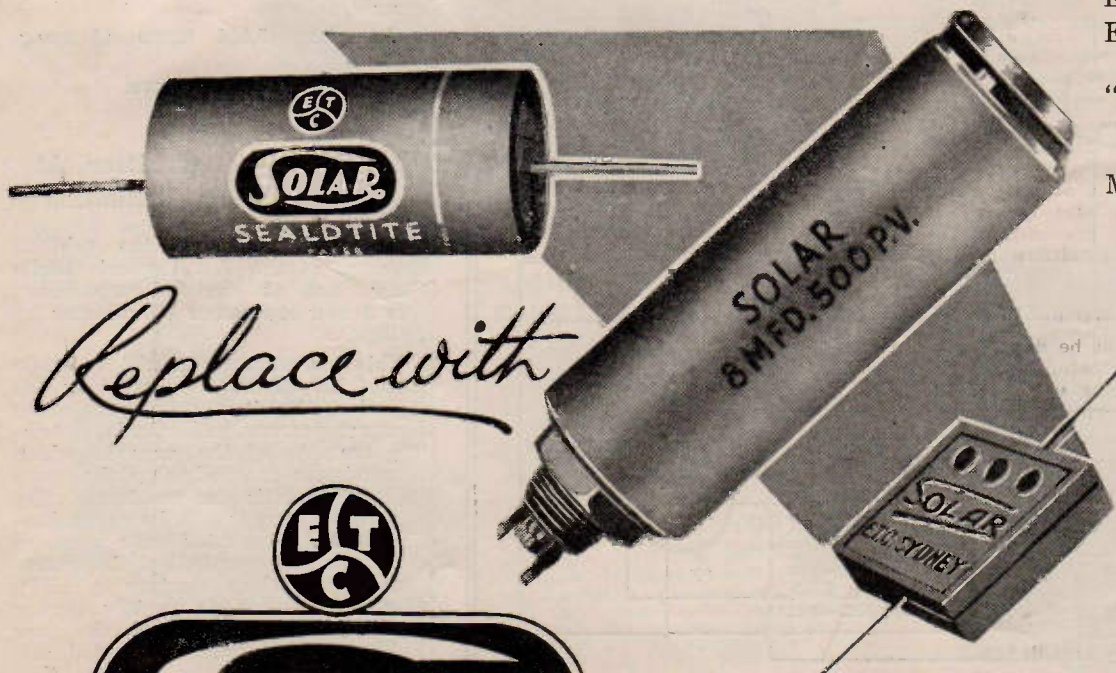
*Actually improved*

**MORE DEPENDABLE THAN EVER!**

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"Reliable in  
every  
Climate"



*Replace with*



Manufactured in Australia by:

**E. T. C. INDUSTRIES LTD.**  
SYDNEY & MELBOURNE.

# Battery-Operated Portable Transmitter

A simple form of portable transmitter suitable for either 'phone or c.w. operation has been requested by several readers (states "Radiotronics" No. 83). The design finally adopted incorporates three type 19 valves and one 1K6. The first 19 is used in two sections as a crystal oscillator and doubler, while the second 19, with both units in parallel, is the final stage of the transmitter. This is plate-modulated by the third 19 operating as a class B audio amplifier, which in turn is driven by the 1K6.

A high output carbon microphone is used in conjunction with a step-up transformer, having a ratio of 1:15, and by this means there is no difficulty in obtaining sufficient gain to give full modulation. When operation on c.w. is required, the modulator may be switched out of circuit, and only two valves will then be employed in the transmitter.

The transmitter is capable of radiating either at the fundamental

frequency of the crystal or at its second harmonic, depending on the coils which are used for L2 and L3. A "B" battery of 135 volts, an "A" battery consisting of a two-volt accumulator and a "C" battery of 4.5 volts are required. The whole instrument may be placed into a fairly compact case with a battery either internally arranged or in a separate case for ease in transport.

Quite interesting work may be carried out with this small, but ef-

ficient transmitter, and no difficulties should be experienced by anyone who might care to make up such an outfit.

Full details are given on the circuit diagram, but the layout is left to the individual designer.

Input to Final Stage (19):—

15 m.a. at 135 v. = 2 w.

Equivalent load on final stage = 9,000 ohms.

Plate-to-plate load on modulator = 20,000 ohms.

Modulation transformer ratio = 1.5:1 P. to S.

Typical Modulation Transformers:—

Cross section of core— $\frac{3}{4}$  sq. in.

Window area— $\frac{3}{4}$  sq. in.

Primary—7,500 turns 40 s.w.g. enamel.

Secondary—5,000 turns 40 s.w.g. enamel.

Use "butt-joint" in core.

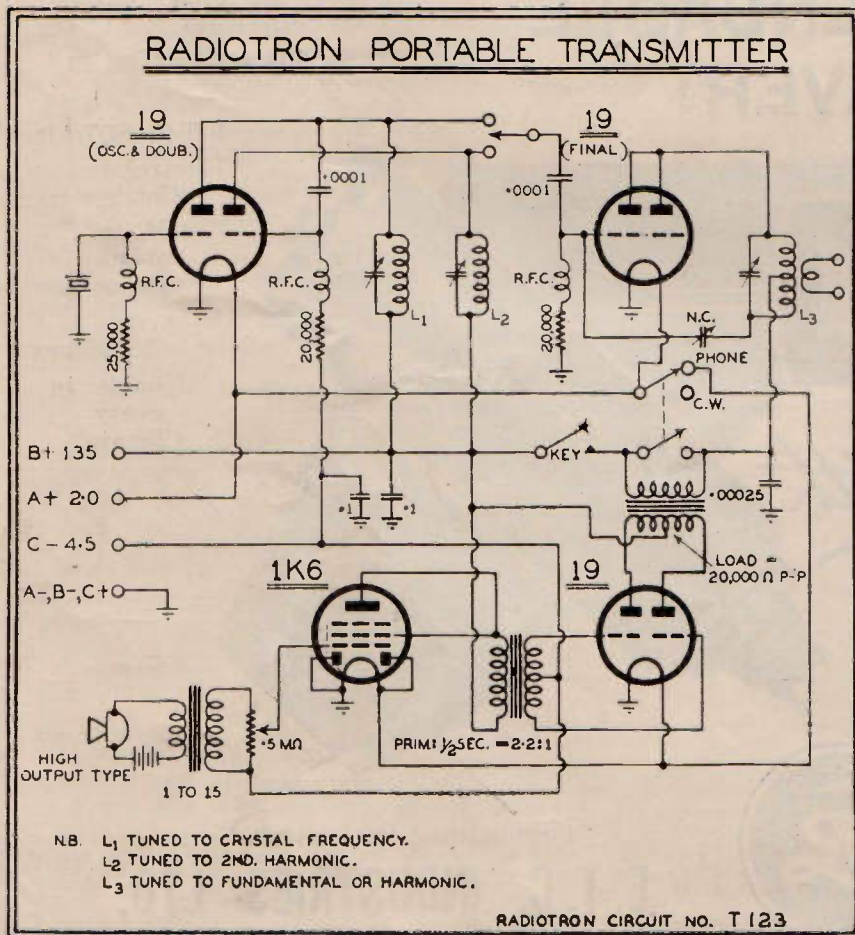
## Interesting Transmitter At Brussels Radio Exhibition

Noteworthy among the exhibits featured at the last Brussels Radio Show, and at the Antwerp Show, was a new low-power transmitter by Philips.

This 50-watt transmitter (type KSFH 050/6) has been specially designed so that it may be operated by inexpert persons, and affords a striking example of the way in which transmitters are following the same path of evolution as receivers. The early receivers, it will be remembered, could be operated only by more or less expert people, but the operation of a modern receiver is child's play. The same is rapidly coming true of transmitters, and the new Philips model, here illustrated, affords evidence of the advance that has been made in this direction.

The telephony transmitter in question can be modulated in three different ways, viz., via a telephone line, a microphone amplifier, or a

(Continued on page 48.)



**Fits your pocket BOTH ways  
..in Size and Price!**

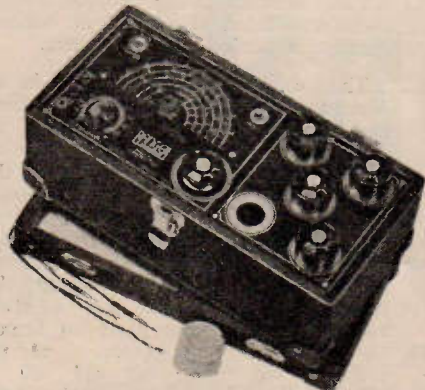
**RANGER  
EXAMINER**

**VOLT — OHM — MILLIAMMETER**



Has Triplet precision instrument, selector switch, moulded case and individual zero adjustment for resistance measurements. Can be carried easily in the coat pocket. For home and shop servicing, and a handy instrument for engineers or in the laboratory. Ranges: 15-150-750 D.C. volts; 1.5-15-150 D.C. milliamperes;  $\frac{1}{2}$  to 1000 low ohms; 0-100,000 high ohms at 1.5 volts. External batteries may be used for higher resistance measurements. Accuracy of tester, 2%. Black moulded case, 3 $\frac{1}{8}$ " x 5 $\frac{7}{8}$ " x 2 $\frac{1}{4}$ ". Silver and black etched panel. Battery and test leads with alligator clips are included. Price ..... £4/10/-

Write for 1938 catalogue on Readrite and Triplet equipment.



**MODEL 840  
OSCILLOSCOPE (at right)**

A foundation oscilloscope with built-in 60-cycle sweep. For essential visual measurements of the amateur broadcast station. Also a practical foundation unit for those who wish to add external sweep and amplifiers for specific test purposes. Vertical and horizontal deflector plates. Controls for intensity, focus and sweep amplitude. A.C. operated. Price (less tubes) ... £5

**SIGNAL GENERATOR  
MODEL 557 (at left)**

Trimmer calibrated plug-in coils, assuring laboratory accuracy, are used with this Direct Reading D.C. Signal Generator. Has five frequency bands from 110 to 20,000 Kc., all fundamentals. Accuracy 1% from 110 to 3000 Kc.; 2% for higher frequencies. Price .. £7/17/6



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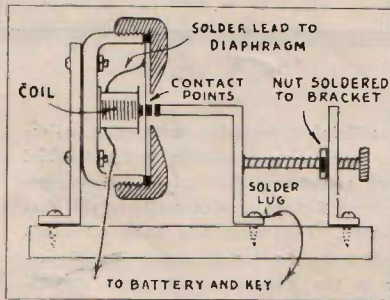
# Radio Ramblings

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

## Home-Made High Frequency Buzzer

I am now re-building my receiver—it will use a 58 r.f., 56 detector, 56 first audio and 2A5 output. I am still jogging along with my study for the A.O.P.C., and through your wonderful mag. have made many friends who have the same object in view.

The sketch below illustrates the



construction of a home-made high-frequency buzzer made out of a single ear-piece from a pair of 'phones.

The 'phone is mounted in a vertical position using a very heavy bracket, and a contact point is soldered on to the diaphragm. The other contact point is mounted on another bracket in front of the headphone, while directly behind this bracket is a third, in which there is a bolt to adjust the pitch of the buzzer. To ensure best results, the buzzer must be made very substantially and the diaphragm kept as large as possible.—C. R. Nelson (AW98DX), Ararat, Vic.

## Heart Beats Over The Air

In the January issue of your paper you published an item as above wherein you state that heart-beats were "broadcast for the first time."

I wish to correct this, for as far back as Sept. or Oct. of last year I heard a broadcast from London of heart-beats of Jack Lovelock, the athlete, both normal and after jumping on and off a chair 30 times. Also heart-beats of a dog were broadcast, demonstrating the different pulsations between normal and when he was offered a biscuit.

The broadcast came through about 4. to 5 p.m. on a Wednesday after-

noon, and was easily QSA7, R4, on speaker. The beats just "bumped" in, especially after the exertion above.

I have mislaid the notes I made at the time, but I believe it was in a session "Put To The Test" that was being transmitted about that time. It was so extraordinarily clear, and the whole session was excellent. I feel sure that this could be verified by looking up a programme of Empire broadcasts about Sept., 1937.—A. R. Payten (AW352DX), Coff's Harbour, N.S.W.

## When Drilling Coil Formers

When drilling small holes in coil formers, the drill sometimes goes through the former too forcefully, sometimes cracking it. To prevent this, drill a hole in a piece of 1/2" dowel just large enough for the drill to go through. The drill should protrude about 1/4" to 1/2".—J. White, Arncliffe, N.S.W.

## Rejuvenating Old Valves

The following "Rambling" is for rejuvenating valves that have lost their emission. For A.C. types, leave the filaments on and disconnect the high tension and bias, then leave for 24 to 48 hours. For battery types, connect "B+" to "B—" and vice-versa, and leave for 24 hours. In numerous cases I have brought valves from 30 per cent. to 70 per cent. with this method.—J. T. Waterhouse (AW362DX), Killara, Sydney.

## Magic Eye Tuning With Sets Not Using A.V.C.

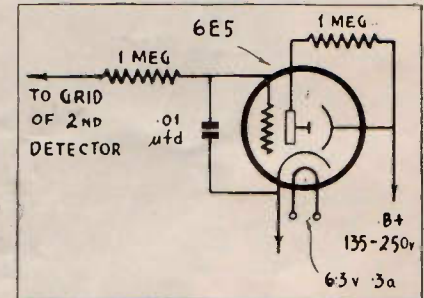
At last I have found the police band on 30.1 m. This is by far the most interesting band I have ever listened on. I have only identified four stations yet, as I have only been at it for two days: W6XKW, W6XPA, W2XEM, W2XEW.

This is the type of thing that I have heard: "Calling car 89. Proceed immediately to 1172 4th Avenue, disturbance on first floor." "Calling car 205. Arrest driver of car 178649 now travelling along High St. towards the bridge." The American police patrol must have a busy time.

The four stations which I identified were heard at R6-R8 between 10.30 a.m. to 1.30 p.m. It would be very helpful if "R.W." could publish the QRA's of as many police stations as possible.

I think the U.H.F. competition should be extended to about May 1, as it is closing much too soon. VK-2NO's receiver for the u.h.f. band should be described in detail, together with plenty of photos.

I am enclosing a "Rambling" of how to connect a Magic Eye to a receiver without a.v.c. This is very



handy for showing carrier variations, and could also be used as an "R" meter for measuring signal strength.—Jamie Ferrier (AW129DX), Coleraine, Vic.

## Tom Thumb Portable Two Operates Well In Car

The accompanying photo shows about one-third of my cards, collected over a period of four years.

The dual-wave set shown is an Airzone a.c. five-valve and rectifier, and although fitted for 'phones, all reception is now brought in on speaker. The small two-valver on the left was built from a "Radio World" circuit, using 49's as space-charge detector and audio amplifier. It uses two torch cells for "A" and approximately 12 volts for "B" supply. Although excellent on the amateur bands, it is not too good on broadcast, probably on account of the coils I am using—an old set of "Dresner" coils. Re-arranging the windings on the broadcast coil I am sure will overcome my trouble.

On the right of the Airzone is the monitor, which I use as a beat oscillator when listening to c.w. on the

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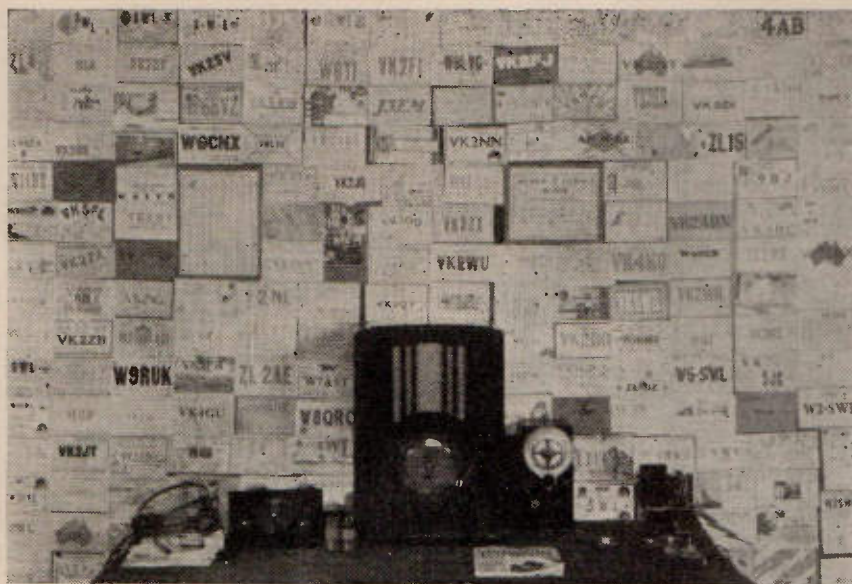
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 New Zealand



Dxer J. Reedy operates the dual-wave Airzone shown above, and as well for portable work has built the "Tom Thumb Two."

big set. The circuit was also taken from "Radio World." It uses a 30 valve, having "A" and "B" supply all enclosed in an aluminium case. On the extreme right is an audio oscillator with 'phones and key for morse practice. Batteries for the two-valver and oscillator are under the table.

The antenna mostly used is an "L" type, approximately 70-foot flat top and 30-foot lead in, 3/20 wire, and on 32ft. poles. The earth is 4ft. 6in. of 2in. galvanised piping driven into moist ground. Another antenna often used for DX is 130 feet long on 30ft. poles, which in my locality has proved "the goods." I also find the small set—the two-valver—when used in the car and using car antenna, gives every satisfaction on 40 and 80 m. bands. Although the car antenna is small, good 'phone reception is assured.

I have a carrying case for the set, two torch cells and two 9½v. "C" batteries in course of construction, and when completed hope to be able to send photo and further reports.

In conclusion, I wish to congratulate you on an excellent publication, and hope to hear further of Don Knock's series on amateur radio in the early days.—J. Reedy (AW-50DX), Coff's Harbour, N.S.W.

★

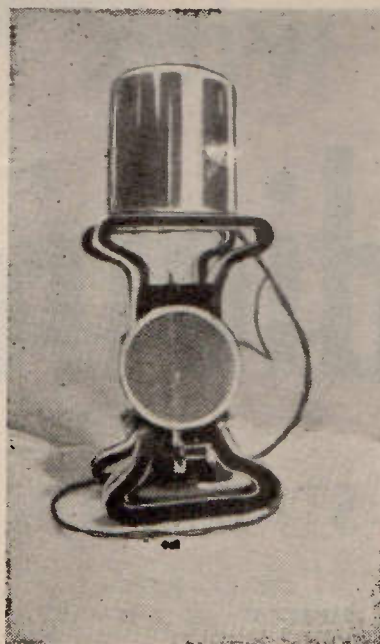
### Home-Made Ribbon Microphone: Ingenious Design By VK6LW

ILLUSTRATED below is a unique application of a prehistoric telephone frame, an aluminium quart can and the perforated disc from a coffee percolator.

The first provides the essential part of the "mike," the can is the

perforated disc is something entirely new in diaphragms. The gap between the poles is ¼", and the ribbon comprises 5" of aluminium foil. The transformer is an old job which had the primary burnt out and was re-wound with 14 turns of 24 DCC. Total cost—nil!

Efficiency may be judged by the list of "hams" who have been contacted with this "mike" and who have all given very favourable reports on it. Incidentally, they will



6LW's "mike" cost him nothing to make, and general performance is excellent.

transformer shield, while the pernow have an opportunity of viewing it! in the past, 6LW has found difficulty in describing it.

In spite of its ungainly appearance, it can deliver the goods. At 6LW's shack a crystal "mike" was tested with the home-made article for purposes of comparison, and the results showed that the frequency response was practically the same. The crystal job gave slightly better quality.

Stations contacted with the "mike" include those listed below. They comprise all States with the exception of VK7. 6LW mentions that all patent rights are waived if anybody wants to copy and improve on his idea!

VK2: VA, DQ, OQ, AGJ, XS, BZ, ACL, CP, XH, VB, OJ.

VKS: GQ, XJ, YS, NP, TW, LA, NG, TD, ZZ, SE, MR, CU, WD.

VK4: VD, LW, GG, RJ.

VK5: FL, AK, BH.

VK6: WZ, YZ, AF, RH, FL, BW, HD.

### VK2ME, 3ME And 6ME — Transmission Schedules For March

The following transmission schedules will be observed by shortwave stations VK2ME, VK3ME and VK6ME during March:—

VK2ME (31.28 m., 9590 k.c.)  
Sydney Time G.M.T.

Sundays: 4-6 p.m. 0600-0800  
8 p.m.-Mtd. 1000-1400  
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.)

Perth Time G.M.T.

Nightly  
Monday to 7 p.m.-9 p.m. 1100-1300  
Saturday  
(inclusive)

### Twelve Qualify For W. T. S. Crawford Trophy

The preliminary heats for the W. T. S. Crawford Trophy (morse operating) were conducted on Tuesday evening, Feb. 15.

The following qualified for the final, which will be held on April 11, during the W.I.A. Convention:—  
VK2ABH, 2ABS, 2AEN, 2AHB, 2AHJ, 2AS, 2CE, 2NP, 2PN, 2RA, 2YY, 2ZK.

The general standard of operating was good, and close competition is expected for the final.—R. A. Priddle, Publicity Officer, W.I.A. (N.S.W. Division).



# Japanese B.C. Stations 150 K.W. For JOAK-1 And 2

Contributed by Akifusa Saito, "R.W." Japanese Correspondent.

There are some new Japanese stations already on the air which will be found in the following list:—

**MTCY-2.**—Now on the air on long waveband, using 100 kilowatts (formerly on 560 k.c.).

**MTCY-1.**—New transmitter is being used.

**X Q H A.**—Japanese station in Shanghai, formerly owned by a Japanese merchant and now controlled by the Government. Power will be increased soon.

**JOAK-1.**—New 150 k.w. transmitter is nearly completed, and will be on the air soon.

**JOMG.**—Opened before this summer, together with JOJG, JOLG, JOOG, JBBK-1 and 2, and JBCK.

**XZG.**—New station to take the place of XGOA, which was bombed. Kinryo (Japanese pronunciation) is a town near Nanking.

**JODK-1.**—Now on 710 k.c. JODK-2's power has been increased to 50 k.w. and is now on 970 k.c.

**JQAK-1.**—Uses new transmitter. JQAK-2 was recently opened.

**JOKG.**—Was opened in December, together with JOPG, JORG and JOSG.

**JQBK.**—Was recently opened, together with MTGY and MTHY in Manchukuo.

**JOAK-2.**—Was completed this summer, and is now on the air after 10.30 p.m., J.S.T., until 11 p.m., sending the news in foreign languages.

**JOQG.**—Will be opened next spring.

**JBAK.**—Power has been increased to 250 watts.

### Eastern Broadcast Stations

Call.	Location.	K.C.	K.W.
MTCY-2	Shinkyo (Man.)	180	100
MTCY-1	Shinkyo (Man.)	560	10
JFCK	Taichu (For.)	580	1
XQHA	Shanghai	580	.25
JOAK-1	Tokyo	590	10
JOMG	Miyazaki	600	.5
JOJK	Kanazawa	610	3
KZRM	Manila	618.5	50
JOKK	Okayama	630	.5
JODG	Hamamatsu	640	.5
JOUK	Akita	650	.3
XZG	Kinryo, China	660	?
JOTK	Matsuye	670	.5
MTFY	Harubin (Man.)	674	3
JOVK	Hakodate	680	.5
JOBK-1	Osaka	690	10

Call.	Location.	K.C.	K.W.
JOCG	Asahikawa	700	.3
JODK-1	Keijo (Kor.)	710	10
JORK	Kochi	720	.5
JFBK	Tainan (For.)	720	1
JOCK-1	Nagoya	730	10
JOSK	Kokura	740	1
JFAK	Taihoku (For.)	750	10
JQAK-1	Dairen (Manu)	760	1
JOHK	Sendai	770	10
JOPK	Shizuoka	780	.5
JOGK	Kumamoto	790	10
JOKG	Kofu	800	.5
JQBK	Anto (Man.)	805	.05
JOIK	Sapporo	810	10
JBBK-1	Heijo (Kor.)	820	.5
JOFK	Hiroshima	830	10
JORG	Hirosaki	840	.3
JBCK	Seishin (Kor.)	850	10
JOAK-2	Tokyo	870	10
JOQG	Morioka	880	.5
JOLG	Tottori	890	.5
JOLK	Fukuoka	910	.5
MTHY	Shotoku (Man.)	915	.05
JOQK	Niigata	920	.5
JOAG	Nagasaki	930	.5
JOBK-2	Osaka	940	10
JOOG	Obihiro	950	.5
JOSG	Matsumoto	960	.5
JODK-2	Keijo (Kor.)	970	50
JOXK	Tokushima	980	.5
JOCK-2	Nagoya	990	10
JOBG	Mayebashi	1,000	.5
JOPG	Kushiro	1,010	.1
MTGY	Botanko (Man.)	1,015	.1
JOFG	Fukui	1,020	.3
JBAK	Fusan (Kor.)	1,030	.25
JONK	Nagano	1,040	.5
JOHG	Kagoshima	1,050	.5
JOIG	Toiyama	1,060	.5
JQAK-2	Dairen (Man.)	1,065	1
JOOK	Kyoto	1,070	.3
JOJG	Yamagata	1,080	.5
JBBK-2	Heijo (Kor.)	1,090	.5

The following are the new s.w. stations in Formosa and Manchukuo:—

**JFO**, 9,630 k.c., Taihoku—relays JFAK at night.

**JDY**, 9,925 k.c., 10 k.w., Dairen—overseas B.C. 9-10 p.m. J.S.T.

JOAK-1 and JOAK-2 will be increased to 150 k.w. very soon. JOKG, JORG, JOQG, JOSG and JOPG will be opened very soon, except JOQG. JORG and OPG will be temporarily on the air with 50 w. JOQG will be opened this year. JQBK, MTHY, MTGY and JQAK-2 were opened recently.—Akifusa Saito, Kumamoto, Japan.

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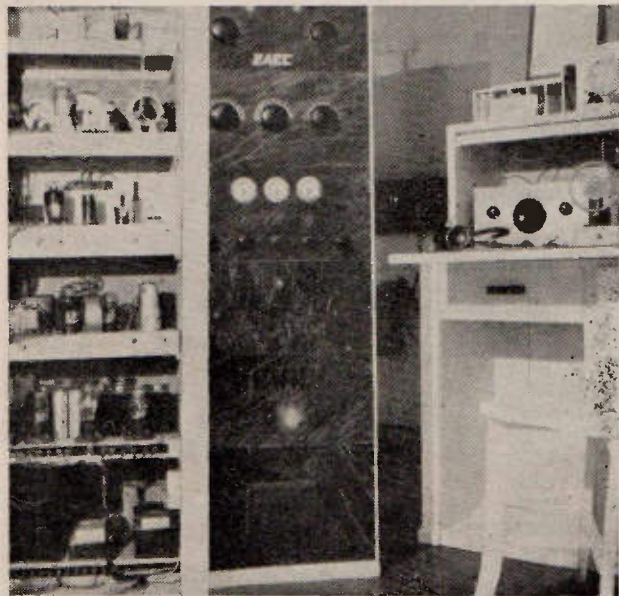
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# Sydney DXer Logs Europe On B.C. Band



Has Verifications To Prove Outstanding Feat : The Infinite Baffle : VK2AEC an "Old Timer" : Lakemba Radio Club Notes and News . . .

By W.J.P.

VK2AEC's present rig—a three-stage crystal-controlled transmitter—and his four-valve t.r.f. receiver can be seen in the photo on the right. On the left is a rear view of the transmitter.

OUTSTANDING results obtainable with receivers operating on the broadcast band were revealed by Mr. G. W. F. Rouse on the occasion of his visit to Lakemba Club last month. As a visitor, Mr. Rouse received a cordial welcome, and on the invitation of the president outlined his experiments, extending over a period of three years, with receivers designed primarily for DX purposes on this band.

Verifications of reception were exhibited by him from broadcast stations in Paris, Hamburg, Hungary, Italy and Breslau, from which station he heard a description of the meeting between Herr Hitler and Signor Mussolini. Others were from Delhi, Calcutta, Siam, Suva, Manila, Honolulu, Manchuria, Mexico, China, Japan and the United States, while a particularly interesting exhibit was a framed photo of the "China Clipper" presented by Pan-American Airways.

Mr. Rouse stated that he also had reports out to Leipzig, Belgrade, Bucharest, Nice, Siberia, and to approximately 20 additional American stations, and that he had logged 104 Australian "A" and "B" class stations.

Such a performance would be highly creditable to the owner of an all-wave set, but even more credit is due for such extraordinary results on the ordinary broadcast frequencies, especially in view of the fact that the receiving location at Potts Point, Sydney, is a rather difficult city locality, with electric signs, electric motors, trams, and numerous

other interference sources in the immediate vicinity.

★

## The Infinite Baffle

A practical demonstration and lecture was recently delivered at the club rooms by 2OD and 2DL on the principles and application of "The Infinite Baffle."

Briefly summarised, those on demonstration consisted of speaker baffles constructed so as to permit about nine cubic feet of air space totally enclosed behind the speaker. The entire inside is lined with a special padding material, and if correctly constructed, is stated to give far superior results to the average speaker baffle.

For the benefit of those interested in high fidelity work, a more detailed description will be given in a later issue of "Radio World."

★

## VK2AEC An "Old Timer"

VK2AEC is owned and operated by Reg. Anthony, of Burwood. The owner first became actively interested in amateur transmission and reception back in 1923, when the "ham" band was anywhere from 300 to 100 metres and inter-state contacts were regarded as real DX.

Reception of American signals and then English signals marked an epoch in the annals of amateur radio, these contacts being made on 80-100 metres.

Activity ceased for some years,

and then a licence was taken out under the call-sign of 2HR. Transmissions were once again commenced on 3.5 and 7 m.c., mainly using c.w. for transmission. In 1936, 2HR was transferred to a country B.C.L. station, and since then the station has operated under the call-sign of VK-2AEC, being fairly active on 7 and 14 m.c. W.A.C. on c.w. was achieved some time ago, and altogether 38 countries have been worked on c.w. and 14 on telephony.

The present rig, as shown in the photograph, is a three stage using 2A5 E.C. osc. and 6L6G buffer on 40 (doubler on 20), linked to a pair of 801's P.P. in the P.A., with a power input of 40 watts on c.w. and 20 watts on telephony. Modulation system is Heizing double choke using 6L6G's.

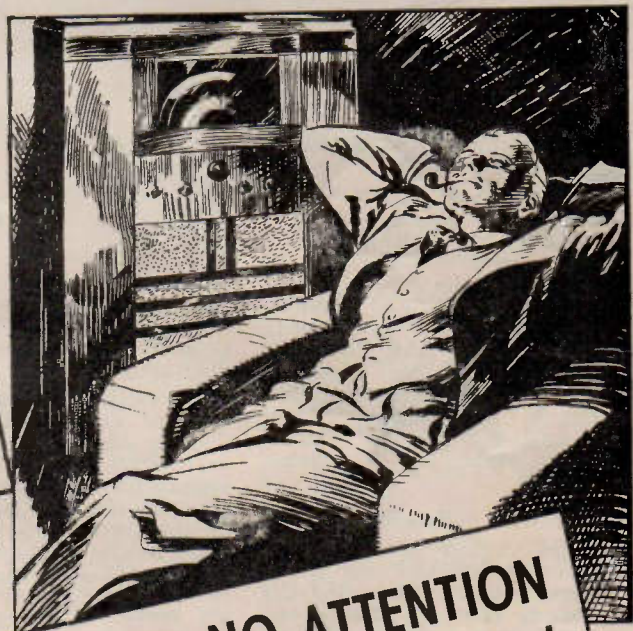
The left-hand photograph shows a back view of the transmitter, which is built on rack and panel lines and stands 5 feet high and 19 inches wide. The power transformers are housed on the bottom shelf with the filament transformers, while the rectifiers and filters are directly above. The modulator stage is next, with a 57 and 56 preceding the 6L6's. The next shelf holds the oscillator and buffer, above which is the power amplifier. The top shelf houses the antenna tuning unit, which is linked to the 801's in the P.A.

The antenna is a full-wave Hertz with Zepp feeders. Finally, the receiver is a four-valve T.R.F., 35, 57, 56 and 2A5, most of the receiving being done on a five-inch dynamic speaker.

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| Aristocrat (E.S.M.) | Howard    | Symfona           |
| Bandmaster          | Kreisler  | Tasma             |
| Breville            | Lekmek    | Velco             |
| Briton              | Paramount | Weldon            |
| Calstan             | S.T.C.    | Westinghouse      |
| Croyden             | Sterling  | Zenith            |

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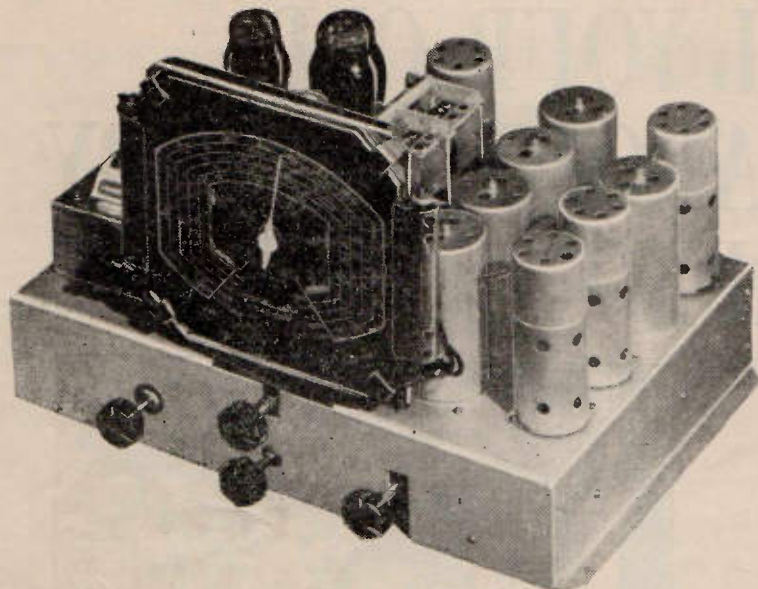
**AIR CELL  
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# Assembling And Wiring The . . . . .

## Fidelity Dual-Wave Six



Final instructions covering the assembly, wiring and alignment of the "1938 Fidelity Dual-Wave Six", described last month, are given in the article below.

**T**HE chassis for the "1938 Fidelity Dual-Wave Six" can be purchased from several firms ready stamped and drilled, but for those who have facilities for preparing their own, a sketch showing full dimensions is published elsewhere. This also applies to the steel bracket used for supporting the .5 megohm volume control.

### Heater Wiring Put In First

The eight sockets used—six for valves, one speaker and one power socket—are mounted first, and the heater wiring put in. Next, the power transformer can be mounted, the heater wiring completed, and the rectifier and power sockets wired. The four wet electrolytics are then mounted and the wiring of the 2A3 output valve, speaker socket and power pack put in. The last is completed after mounting the 30-henry smoothing choke.

The i.f. transformers are mounted next, together with the aerial and earth terminals, pick-up switch and terminals, and r.f. gain control. Before mounting the condenser gang, solder on each fixed plates lug a 4" length of 16-gauge tinned copper wire. These leads pass through the chassis and form rigid connections to the dual-wave coil unit, which is put in later.

### Earth Leads Short And Direct

Next, commencing at the aerial terminal, put in as much wiring as possible without mounting the dual-wave coil unit. All earth leads should

This under-chassis sketch gives full dimensions for preparing the steel chassis,

be made as short and direct as possible to an earth line of 16-gauge tinned copper wire run around the chassis, as indicated on the wiring diagram.

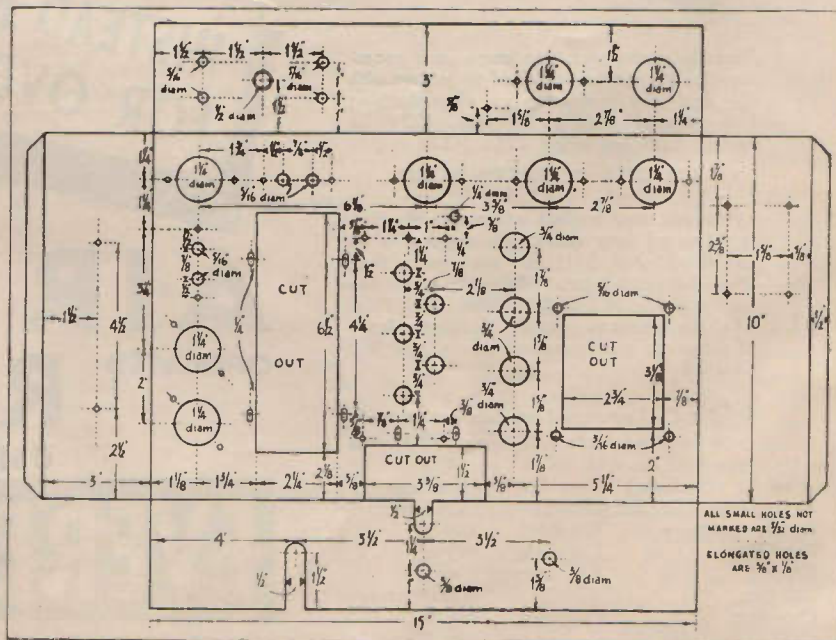
The voltage divider can now be mounted and wired, and following this the dual-wave coil unit is bolted in position. The wiring of this is indicated in a separate sketch drawn from the front of the chassis, each of the three sections of the wave-change switch being shown as if folded forward parallel to the chassis. All leads from the dual-wave coil unit are numbered, the points to which

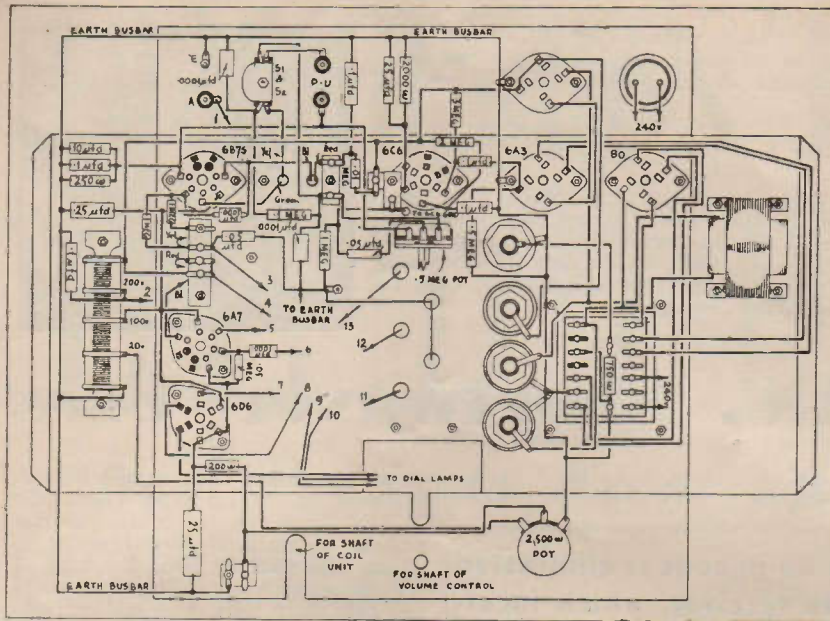
they run being numbered correspondingly on the under-chassis wiring diagram.

Lastly, the dial is mounted and the pilot lamps wired as indicated on the sketches.

### Magic Eye An Optional Fitting

A 6U5 magic eye tuning indicator is an optional fitting, though it is a decided advantage to include it to ensure accurate tuning. For it, a five-wire cable is required, together with a six-pin wafer socket, a 1-megohm  $\frac{1}{2}$  or  $\frac{1}{4}$ -watt resistor, and the special bakelite mount designed for the 6U5.

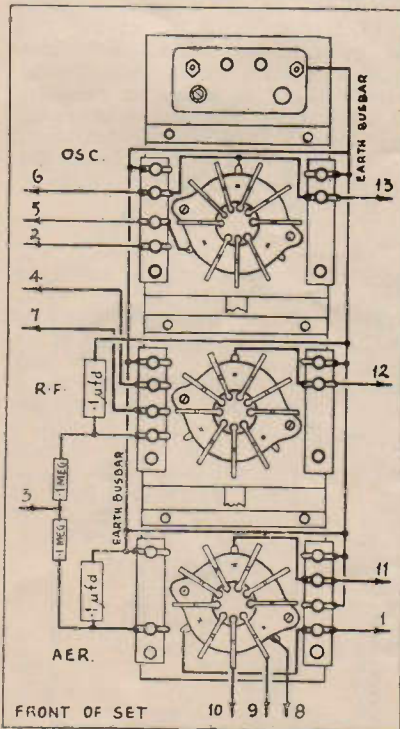




The under-chassis wiring of the "1938 Fidelity Six" is shown above, complete except for connections to the dual-wave coil unit. Leads to the latter are numbered in accordance with the sketch below.

Provision is made for mounting this separately on the front of the cabinet, thus eliminating the need for a mounting bracket on the condenser gang.

A sketch showing the method of



This sketch of the wave-change switch has been drawn as if each of the three sections of the switch had been bent forward to lie flat against the chassis.

wiring in the Magic Eye cable is published on page 28 of the December "Radio World," in the article describing the assembly of the "De Luxe Fidelity Eight."

**The First Test**

When the wiring has been completed and checked, the control knobs and grid clips can be fitted, the valves and speaker plugged in, and the aerial and earth connected up.

With the set operating correctly, the alignment can be completed.

**Aligning The "Fidelity Six"**

For best results, the "Fidelity Six" should be aligned using a calibrated service oscillator. With the latter adjusted to 1,400 k.c., set the broadcast oscillator trimmer a turn or so out, and then adjust the r.f. and aerial broadcast trimmers for best results.

Next, swing over to the other end of the band, to a frequency approximating 580 k.c. Now adjust the padding and tuning dial simultaneously until a setting is found for the former which gives greatest output. A weak signal should be used, so that the a.v.c. will not spoil the adjustments.

If the shortwave trimmers are aligned in a similar manner on about 25 metres, tracking should hold consistently right across the band.

**An Outstanding Performer**

Like the "Fidelity Eight," described in the November and December issues of last year, the "Fidelity

(Continued on page 34)



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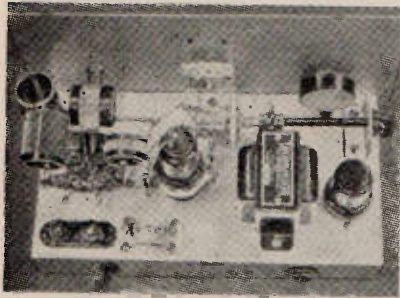
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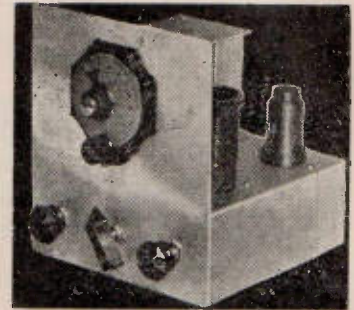
AGENTS IN ALL STATES.



Left: This photograph illustrates the method of mounting the four coils around the wave-change switch. The circuit is shown below.



Right: The "Eaglet All-Wave Two," described in the "Radio World" for June and July of last year, uses a circuit that is almost identical with that of the receiver described below, except that plug-in coils are used to give all-wave coverage.



# Two-Valve A.C. Shortwaver Uses Coil-Switching

The necessity for using plug-in coils is eliminated in this two-valve shortwave receiver, which incorporates coil-switching to cover the 20, 40, 80 and 160-metre amateur bands.

An interesting method of accomplishing band changing without the use of plug-in coils is illustrated in the photograph above of a two-valve shortwave receiver, described in the "1938 Radio Amateur's Handbook,"\* from which the following article is taken.

## Two-Valve Coil-Switching Receiver

The pentode detector and audio amplifier circuit shown below is the same as that of many regenerative receivers, with the exception of the coverage of four bands, 1.7 m.c. to 14 m.c., by means of the band-switching arrangement instead of by plug-in coils.

The panel, measuring 9 3/4" by 1/2", is cut from a sheet of 1/16" aluminium, as is also the base and one of the brackets. The base is started from a piece of stock 9" by 6". A line, parallel and 1 1/2" in from one of the 9" sides, is scratched with a sharp-pointed tool. With the 1 1/2" section bent down until it is at right angles with the 4 1/2" piece, we have a chassis 9" x 1/2" x 1 1/2". A 9" length of 1/2" aluminium angle serves to fasten the base and panel together.

Next come the two brackets, one to support the band-setting condenser shaft and the other for the coil switch. These also may be made from 1/16" aluminium; however, in the original job 1/8" stock was used for the switch mount to assure extreme rigidity. If the condenser is mounted on one of the small pillars provid-

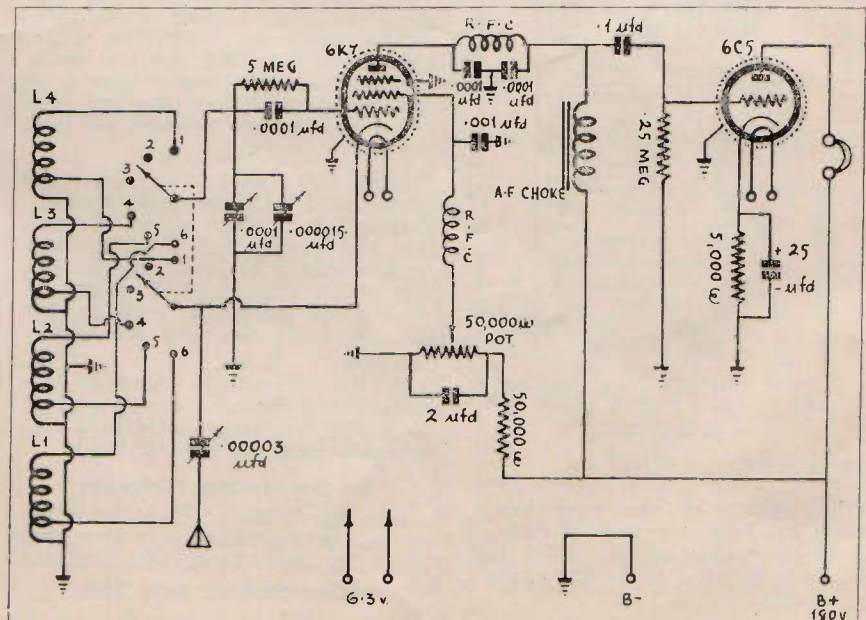
ed, its bracket will measure 1 1/2" x 1 3/4" in the upright position, with an added 1/2" lip for fastening to the base. A 1/4" hole is then drilled in line with the condenser shaft to allow the passing through of the extension rod. The switch bracket measures 2" x 2", with a 3/4" lip which allows the use of four mounting screws to make a firm attachment to the base.

### Stray Capacities At Minimum

With the band-setting condenser mounted as shown, a considerable decrease in stray capacities results

from the use of short leads. Elevating the 6K7 valve base above the chassis provides a much shorter cathode connection—something of no small importance. The switch is of the six-position type, and since there are only four coils, two sets of contacts are left unoccupied.

To allow spacing of the 14 and 7 m.c. coils, the two with which coupling effects are most likely to cause trouble, one or even two of the spare contacts may well be left between their points. We then have the 14-m.c. coil at the left end of the switch, next to the valve, the extra contacts, and then the 7, 3.5 and 1.7 m.c. coils mounted on the remaining three sets of points. A word of warning: Don't attempt to mount the coils at anything other than right angles with each other. Also try to separate them as much as possible, still keeping in mind the necessity of short leads. If these precautions are taken, little or no trouble should arise to impair the proper functioning of the circuit.

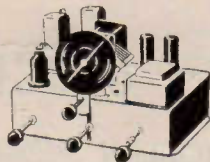


\* Available from McGill's Agency, 183-185 Elizabeth St., Melbourne, price 7/6, postage 10d.

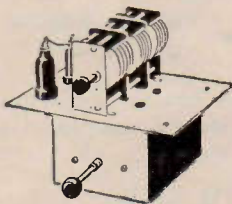
# 1938 Radio's Finest, by RADIOKES

## New Products From a New Factory!

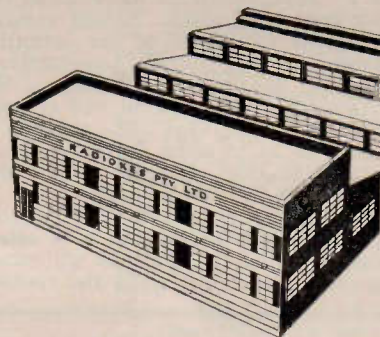
**F**OLLOWING closely the completion of the magnificent new Radiokes Factory comes news of 1938 components now being developed in the Radiokes laboratories. The advance information published in this announcement will indicate both to the Radio Industry and to the Home Constructor the many radically new developments for which Radiokes this year—as in previous years—will be responsible.



A 1938 4/5 valve dual-wave "Money Saver" Kit-Set will soon be here! It has many new features, but its greatest asset is its remarkably compact size, making it suitable for a table model cabinet or a console cabinet. Performance is something right out of the box. If you are thinking of building or buying a new radio, we suggest you wait for details of this fine Kit-Set before you spend any money.



There will be a big demand for the new Dual-Wave Coil Assembly, because it is something entirely new to Australia. Besides the coils and gang condenser, it includes the R.F. and First Detector stages already wired



in. You just drop the coil assembly in the chassis and save yourself space and extra wiring.



Something that has long been wanted is the new Radiokes Type MA-60 Power Transformer, flat, midget, unshielded type. It retails for only 15/- and is also available shielded for 1/6 extra. Its small dimensions (3 3/8 in. long, 2 1/8 in. wide, 2 3/4 in. deep) assure it prompt popularity amongst makers of small-size receivers.



Keenly anticipated also is the special low-loss midget air dielectric trimmer with the Trolutol base. Non-microphonic and with frequency drift almost non-existent, this new trimmer is ideal for use in pre-set tuning systems. Its capacity ranges from 3-35 mmfd.

Note that in the last few weeks the following NEW testing instruments have been added to the already complete equipment in the Radiokes laboratory:—The G.R. Signal Generator, type 6A5A—the very last word in Signal Generators; a Coil Matching Oscillator, covering frequencies from 100 kilocycles to 30 megacycles; an extremely accurate Power Transformer Tester; while on the way from overseas is a latest type 1938 model "Q" Meter.



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**Coil Table**

COIL.	BAND. (M.C.)	WINDING LENGTH (INCHES)	NO. TURNS.	CATHODE TAP TURNS.	WIRE	TUNING RANGE (K.C.)
L1	1.7	1½	90	15	No. 28 d.s.c.	1,160 to 2,930
L2	3.5	1½	35	8	No. 24 d.c.c.	2,900 to 7,050
L3	7	½	15	3	No. 24 d.c.c.	7,000 to 12,000
L4	14	¾	7	2	No. 24 d.c.c.	10,000 to 15,400

All coils are close-wound on 1-inch diameter forms. Cathode tap turns are counted from the ground end of each coil.

**Metal Valves Used**

The circuit is of the pentode detector and one-stage audio amplifier type, employing two valves, the 6K7 and the 6C5, both of which operate at a low current drain, making feasible battery operation.

Coupling of the antenna to the cathode of the detector through the small variable condenser, C8, proved to be the most satisfactory method. Although operation on any band with maximum capacity is permitted, adjustment of the condenser to match

various antennas allows the circuit to be brought up to its most sensitive operating point. Screen voltage is varied by means of the potentiometer R5 to control regeneration, which is obtained by tapping of the cathode near the ground end of each detector coil. This tap should be placed so as to allow the valve to go into oscillation with about 30 volts applied to the screen grid.

A second way to determine the correct placement of the tap is to select a position for the tap that will cause oscillation to occur when the control,

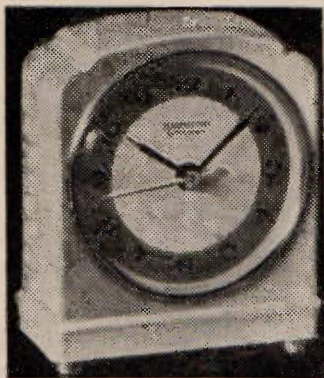
R5, is half turned on. These hints are given in case the coils are wound with wire different from that specified.

The r.f. choke in the plate output lead protects the amplifier from radio frequency currents flowing in the detector circuit. A second r.f. choke, in series with the screen, strengthens oscillation by discouraging attempts of r.f. currents to flow from the screen back into the regeneration circuit. L2, R6 and C5 act as the audio coupling unit.

Filaments of both valves are connected in parallel and heated with a 6.3-volt filament transformer, the centre tap of which is grounded to reduce hum. For portable work, the heaters will, of course, be supplied from a six-volt storage battery, the alternative connection of which is indicated in the circuit. Voltages ranging from 135 to 250 volts may be used on the plates, the best values being 180 volts for battery work and 250 volts when used with rectified a.c. power supply.

**The Coil Assembly**

Three of the four coils are wound with No. 24 d.c.c. wire, while the fourth, the 1.7 m.c. coil, is wound with No. 28 d.s.c. The forms in each case are made from 1" bakelite tubing. The coil table specifies the length of the windings, the number



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of turns, and placement of the cathode tap.

Two holes that will pass No. 14 tinned wire are drilled at each end of the form. When the tinned wire is threaded through these holes and bent over to form a clasp, we not only have points at which to start and end the windings, but also means of mounting the coils on the switch. The cathode taps are most easily made by making a loop in the wire at the right place, scraping the insulation from the loop, and then twisting and soldering to add firmness, after which the winding is continued in the same direction.

To the front section of the switch goes the common grid lead, and to the other section goes the cathode lead. The coils are mounted with the cathode and grid leads going to their respective switch contacts. No. 14 wire is used to bring a lead from the grounded rotor plates of the condensers to the ground ends of the coils.

**Heavy Wire An Essential**

Heavy wire should really be installed whenever advised and shown in the pictures, otherwise a frail coil assembly will result. Unless the construction of this unit is as rigid as possible, operation and handling of the receiver will cause shimmying or shifting of the coils, upsetting any hope of stability.

General coverage of the combined four coils is made from 1,160 to 15,400 k.c. Bandspread is so arranged that the 1.7 m.c. band covers just exactly the entire scale of the dial. The c.w. portion of the 3.5 m.c. band is also spread over the entire scale, with the 'phone section of the same band requiring a small resetting of the band-set condenser. Both the 7 and 14 m.c. channels are allotted approximately fifty divisions of the dial.

A suitable amount of output is delivered from the 6C5 triode amplifier used, as explained before, to permit battery operation. If a.c. power supply operation is contemplated, output may be further boosted by replacing the triode with a pentode. This has been tried, the 6F6 being the particular valve used.

However, for a dual purpose receiver—that is, battery and also a.c. operation—the 6C5 triode is the better valve. Its current drain is well below that of any pentode, and it does work satisfactorily when used in conjunction with a 250-volt power pack.

The detector should be first tested for oscillation. While the regeneration control is advanced from minimum to maximum with one hand, the grid side of the tuned circuit (stator terminal of the band-set or tuning condenser) should be touched with one finger of the other hand. As the regeneration control

(Continued on page 33)



**Can you detect the difference?**

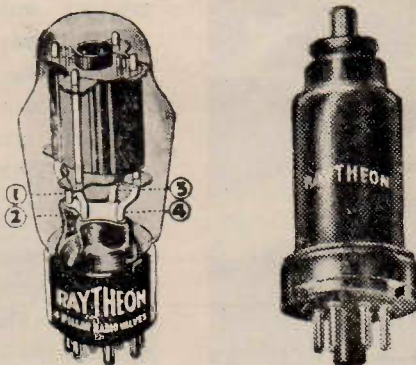
● They look alike to you and me. But to the finger-print expert there's a difference that is just the distinction between innocence and guilt!

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# Radio Valves In The Making . . . 3



This final instalment of a series of articles describing the process of valve manufacture, as followed in the factory recently established in Sydney by Philips Lamps (A'sia) Pty. Ltd., outlines the final series of exhaustive tests to which each valve is submitted before it is passed on for branding and packing.

IN the two preceding instalments of this series of articles, the growth of a Philips valve has been traced through the various stages of its manufacture until it has passed the ageing rack—and a series of tests such as for noise, emission, insulation, etc. Any faulty valve is immediately rejected.

## Second Testing Process Follows

Prior to packing, the valves are submitted to a second testing process, similar in comprehensiveness to the first. This second series of tests ensures that any valves which are faulty in any respect, and which might in some inconceivable manner have escaped detection in the first testing, will be rejected before packing. Thus each valve undergoes two complete series of tests—and the chances of a faulty one finding its way to the packing section are indeed remote.

As mentioned previously, in order to test a valve thoroughly a certain amount of pre-heating is necessary, so as to obtain the same temperature as under operating conditions. Here the valves are submitted to the same wide variety of tests as before—for noise, emission, saturation, short-circuit, actual receiver performance, insulation, etc. A noteworthy feature of all the testing equipment used is the size of the meters, the

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These views show some of the elaborate and up-to-the-minute testing equipment used in the laboratories of the Philips valve works.

The main laboratory test-board, which provides a comprehensive test on all types of valves.

easy legibility of which proves an effective safeguard against eyestrain on the part of the operatives.

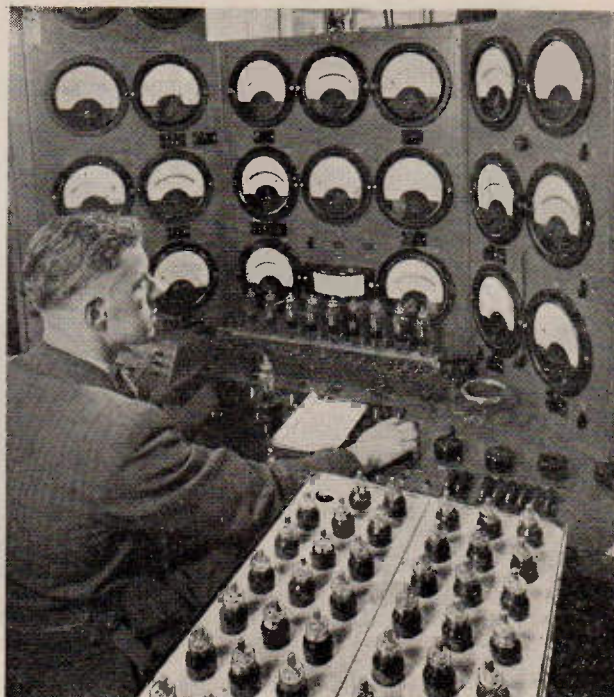
### Branding And Packing

Before being packed, the valves are branded on the base. They are then wrapped in corrugated board and paper and inserted into their attractive Philips cartons.

The final step in packing is the effective sealing of the cartons as a means of protection for the purchaser. The valves are then ready to yield a long period of useful service in radio receivers in all parts of the Commonwealth.

The interesting story of the manufacture of Philips valves does not end, however, in the packing department. There yet remains to be described the comprehensive series of laboratory tests to which representative batches of valves are continually being submitted.

In the well-equipped laboratory, a group of expert technicians devotes all its time to checking performance, analysing imperfections, and recording useful data on characteristics. Here, valves are "tortured" under rigorous conditions, to which few, if any, of them would be subjected in actual use. Effects are noted, comparisons made, and graphs charted. Measurements of all kinds are carried out—anode currents, grid currents, filament currents, etc.—in short, every factor which has any bearing at all on the ulti-



mate performance of a valve is charted and kept for future reference.

In order to carry out efficient testing, it is essential that the testing equipment itself should be perfect in every respect. A constant check is therefore kept on the meters, and a large store of spare meters and parts is always maintained.

### 1,000-Hour Life Test

An important phase of laboratory activity concerns the testing of valve life. Sample batches of both rectifying and ordinary receiving valves are burnt for a period of not less than 1,000 hours—equivalent to many months of actual receiver use in an average home—and are also tested periodically during the process. The effects of the burning are recorded and studied, and from this data useful standards may be fixed.

### Ideal Conditions For Employees

Staff welfare is an important consideration at the Philips Australian valve works, and every care is taken to ensure pleasant working conditions for the employees. Throughout the fac-

(Continued overleaf)



After the final testing, the valves are branded and then passed along for packing to this bench.



The well-lighted, airy cafeteria maintained for employees at the Philips valve works.

tory special attention has been paid to lighting and ventilation, and everywhere the factors of comfort and convenience have been carefully studied. In this connection, the spacious airy cafeteria plays an important part, as does the dispensary,

where a trained nurse, who is always on the premises, or a medical practitioner, who regularly visits the factory, treats sick employees.

Cheerful music is amplified on every floor of the factory during low production hours—11.30 in the morn-

ing and 3.30 in the afternoon. Employees are unanimous in their approval of this musical stimulant—it makes work go with a "swing," they say.

It is particularly fitting to note that as Australia passes its 150th Anniversary, its people rise to the occasion and prove that they, too, are worthy of its dignity by showing themselves, in this most exacting of fields—the radio industry—worthy rivals of their co-workers in both the New and Old Worlds.

### John Logie Baird For World Radio Convention

As part of Australia's 150th Anniversary Celebrations, the Institution of Radio Engineers (Australia) has organised a World Radio Convention to be held in Sydney from April 4 to 14. Quite a number of prominent overseas radio people will be attending, with many others from New Zealand and all over Australia.

The Institution has extended an official invitation to Mr. J. L. Baird, one of the best-known television experts throughout the world. Mr. Baird has accepted the invitation, and will arrive in Sydney on March 30 on the "Strathaird."

While at the Convention, Mr. Baird will contribute a scientific paper on British television.

## SHORT WAVE!!

We are Sydney's leading shortwave specialists, and can supply you with a specially-designed receiver to suit your purse and purpose. A few of the types available are listed below, but we will be pleased to quote you for any type receiver, and will design one to suit you.

### JONES SUPER-GAINER 2

Described in July and August issues of "Radio World." A highly efficient two-valve super. using the multi-purpose 6F7 and 79 valves. Incorporates regeneration on the detector and B.F.O. Gives the results of four valves.

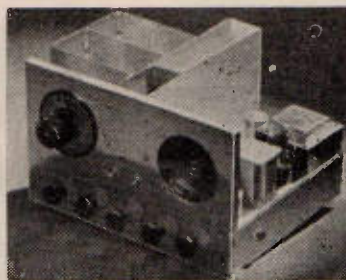
Complete Kit of Parts, £6/11/6.

### JONES SUPER-GAINER 4

The most popular "ham" receiver that we have handled. Uses a regenerative detector, H.F. oscillator. Iron-cored transformers. A 79 as combined second detector and B.F.O. This machine is more than equal to the average 6-valve receiver.

Complete Kit of Parts, £9/5/-.

### RADIOTRON BATTERY COMMUNICATIONS 7



The battery version of the famous A.C. Eight. Separate H.F. oscillator and B.F.O. Regenerative input. Fully described in "Radio World," Dec. and January.

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and Tested ..... £21/-/-

### ULTRA GAINER 5

Five metal valves are used in this modern receiver. A regenerative R.F. stage, together with an efficient I.F. stage, results in the utmost selectivity. On crowded 'ham' bands it is a pleasure to use. It is also an ideal machine for the shortwave listener.

Complete Kit of Parts, £13/10/-.

### THE RADIOTRON EIGHT

(As illustrated on left)

Fully described in June and July issues of "Radio World." The ideal "ham" receiver. Fully shielded. R.F. stage. H.F. oscillator. B.F. oscillator. Built-in speaker. Full band-spread. Wound plug-in coils. Complete Kit of Parts £18/-/-  
Completely Assembled

and Tested ..... £25/10/-

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# A Triple-Range Valve Voltmeter

THE valve voltmeter is a very important measuring instrument for many applications connected with radio receivers and associated equipment. The voltmeter described here-with embodies a 0.2 milliammeter as an indicator, and is capable of providing sufficient precision for most practical purposes. To be effective, the voltmeter must meet with the following specifications:—

(a) Provide convenient measuring ranges (e.g., 0-5v., 0-15v., 0-50v.).

(b) Avoid damping the circuit on which measurement is made. Therefore, grid current in the voltmeter valve is not permissible.

(c) The maximum milliammeter current for the maximum measured voltage in each range is to be approximately 2 m.a.

(d) The minimum current for zero measured voltage in each range should be practically zero. The milliammeter current should not cut off before the voltage across the input terminals reaches zero.

The circuit diagram for the instrument, which is entirely a.c. operated, shows the r.f. pentode AF7 connected as a triode, operating as an anode bend detector. The grid is biased negatively by the cathode tap on the resistor R5. The voltage divider has a comparatively low resistance, so that the bias remains substantially constant when the plate current of the valve increases. For this particular circuit a negative bias of 13 volts is just sufficient to cut-off the plate current, and for the 0-5 volt range the valve is thus adjusted to the most favourable part of its characteristic curve (see Fig. 1). An input

of 5 volts will produce a milliammeter reading of 2 m.a.

For the measurement of higher potentials, however, the range of the milliammeter would be exceeded, and grid current would flow. Thus, to permit the measurement of 50 volts and still limit the milliammeter current to 2 m.a., the bias must be increased to at least  $50 \times \sqrt{2} = 70$  volts.

If this were accomplished by fixed bias methods, we would obtain a result similar to Fig. 2, which indicates that only the higher input voltages would produce plate current.

### Automatic Bias Overcomes Difficulty

In order to avoid this difficulty, automatic bias is used as an alternative to fixed bias. Therefore a switching arrangement has been used to incorporate bias resistors in the cathode circuit for the two higher voltage ranges. Resistance R2 is used for the 0-50 volt position and resistance R3 for the 0-15 volt range.

For a no-signal condition, the fixed bias of 13 volts across R5 reduces the plate current to practically zero, and no potential drop occurs across the cathode resistor in circuit.

As the measured voltage increases, however, the grid is driven less negative, and plate current flows. The increasing plate current produces an increasing voltage across the cathode resistor, and a measure of compensation is effected. Thus, for the 0-15 and 0-50 volt ranges, sufficient additional bias is produced to limit the milliammeter current to 2 m.a. for maximum deflection in both ranges. To obtain a suitable operating characteristic, the potential on the plate and screen is in excess of the normal ratings. Since the plate current is limited to 2 m.a., the use of a higher plate voltage is permissible.

### The Filter Circuit

The high tension supply for the AF7 is smoothed by means of two 16 mfd. electrolytics and a resistance R7 of 10,000 ohms. This resistance renders a choke coil unnecessary, and also serves to protect the meter by limiting the current. For example, when the grid circuit switch is in position 1, the grid of the valve will be isolated from the bias voltage if the circuit under test is disconnected. Under these circumstances, the resistance R7 will tend to limit the current passing through the milliammeter. Another advantage of the resistance R7 is that it permits the use of any 0.2 milliammeter, since the internal resistance of the meter will be small compared with 10,000 ohms.

A capacity of 1.0 mfd. is connected from plate to cathode, so that when measuring high frequencies the impedance of the meter will not cause a voltage drop. This condenser should be a non-inductive type.

In the 0-15 and 0-50 volt ranges, the valve voltmeter is practically independent of mains voltage fluctuations. If the mains voltage increases, the plate voltage will rise accordingly, and the plate current will also tend to increase. The higher plate current will produce a greater drop across the cathode bias resistor, and the plate current will readjust itself to approximately the original value.

In the 0-5 volt range, however, the position is different, since this range does not include a cathode resistor. A variation of 10 per cent. in the mains voltage corresponds to an

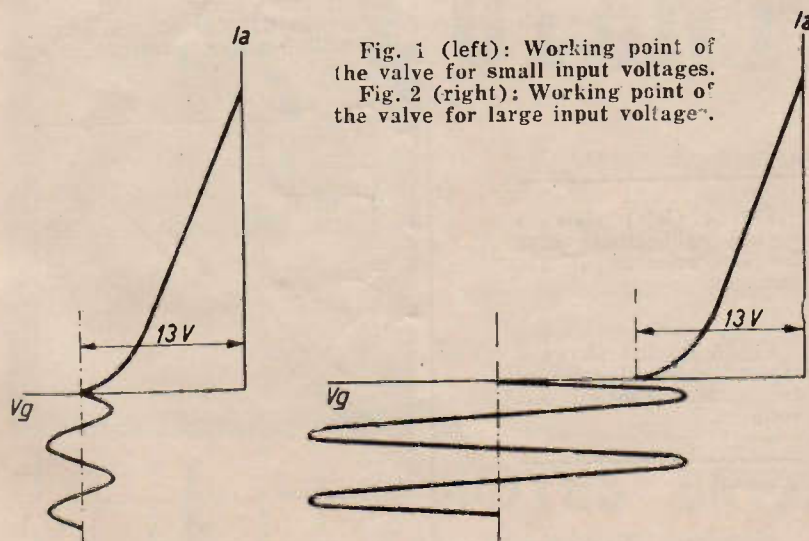


Fig. 1 (left): Working point of the valve for small input voltages.  
 Fig. 2 (right): Working point of the valve for large input voltages.

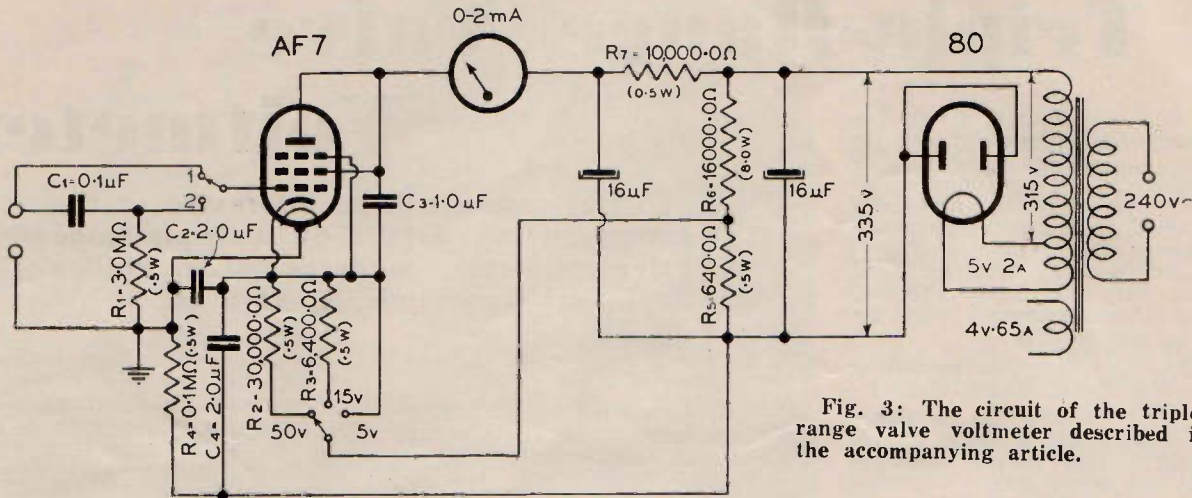


Fig. 3: The circuit of the triple-range valve voltmeter described in the accompanying article.

error of approximately 8 per cent. in the reading of the milliammeter. It will therefore be necessary to adhere to the mains voltage applied for calibration on the 0.5 range if accurate results are expected.

When using this voltmeter with the grid switch in position 1, care should be taken to ensure a conductive connection across the input terminals, as otherwise the grid will not receive negative bias. For this reason, the grid switch should be changed to position 2 when disconnecting input leads, so that the bias is applied to the grid by means of the 3.0 megohm resistance, which is included to provide a grid return when measuring a voltage via a condenser.

**Calibration Pointers**

Although this voltmeter is not an instrument of great precision, it has considerable practical value, particularly as the majority of measurements made are for comparative readings. This voltmeter can be used for measuring a.c. or d.c. poten-

tials, and separate calibrations are necessary for each service.

Calibrations for a.c. voltages can readily be made by connecting an a.c. voltmeter in parallel with the input terminals to indicate the applied voltage. The a.c. applied to the valve voltmeter should be variable to enable a series of readings to be recorded for each range. Typical calibration curves for an experimental instrument are shown in Figs. 4 and 5. Generally, 50-cycle mains will be used for calibration purposes, and the supply should be reasonably free from harmonics. If this is not the case, the voltage for calibrating may be applied through a 50-cycle filter circuit.

A filter system comprising the condenser C1 and resistance R1 has been provided to isolate d.c. potentials when the instrument is used to measure a.c. voltages in circuits also carrying direct current, e.g., when measuring the a.c. voltage on the plate of a valve. The insulation of the condenser C1 is important, and should be of a high order.

**D.C. Measurements**

The calibration for d.c. applications is accomplished by applying a source of variable d.c. voltage to the input of the valve voltmeter and checking the applied voltage on a moving coil voltmeter. Typical calibration curves are shown in Fig. 5. The positive side of the voltage to be measured is connected to the grid side of the input terminals.

**Grid Current Not Permissible**

It has already been established that grid current is not permissible. If a voltage exceeding the maximum input voltage for any measuring range is applied to the voltmeter, grid current will flow.

As the resistance R1 is not in circuit for d.c. measurements, any voltage in excess of the bias will increase the plate current and may damage the milliammeter. In the case of a.c. measurements with the resistance R1 in the grid circuit the plate current will be restricted in the event of overloading by the voltage drop across R1, due to grid current, which will increase the negative grid

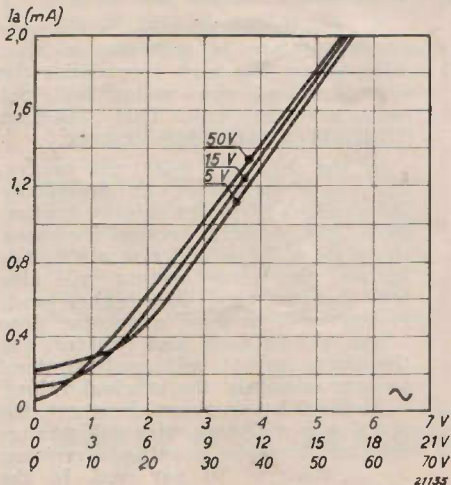
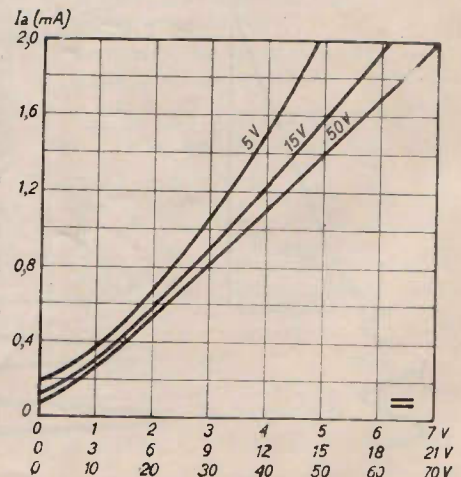


Fig. 4 (left) shows a typical calibration curve for measurement of a.c. voltages.

Fig. 5 (right) shows a typical calibration curve for measurement of d.c. voltages.



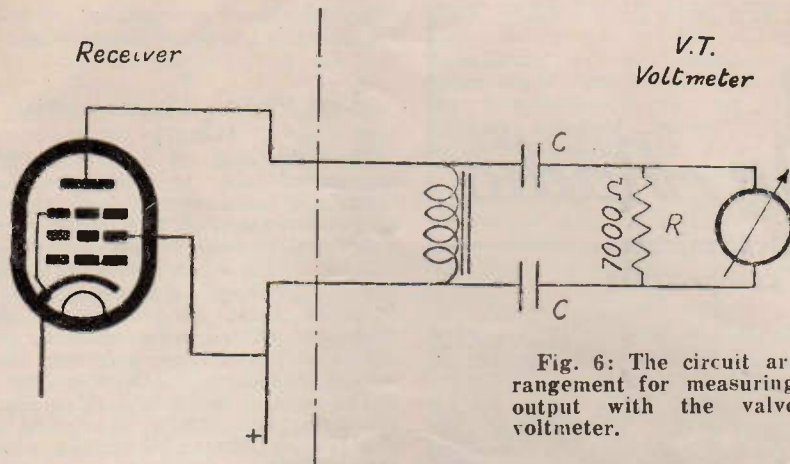


Fig. 6: The circuit arrangement for measuring output with the valve voltmeter.

bias. A large input voltage could result in damage to the milliammeter, as it may be seriously overloaded. The plate current produced by excessive voltages is indicated in the table.

**Measuring Receiver Output**

The valve voltmeter is also useful as an output meter when checking receivers. A special coupling circuit is necessary and a practical arrangement is shown in Fig. 6. The resistance R should have a value corresponding to the recommended load resistance of the power valve. For the majority of pentode valves a resistance of 7,000 ohms will be satisfactory.

The condensers C should have a capacity of at least 4 mfd. each, thus ensuring a low impedance to audio frequencies compared with 7,000 ohms. The inductance of the audio choke should be as high as practicable, since the a.c. output of the valve is divided between the choke and resistor. An output of 50 m.w. corresponds to 18.7 volts measured across the 7,000 ohm resistor.

**Table**

Ranges (Volts)	Voltage at 2 m.a.	Overload applied to input terminals of valve voltmeter.	Current through instrument.	Input Voltage.
0-5	5.5	100 v.	.5 m.a.	A.C.
0-15	17	100 v.	4.5 m.a.	A.C.
0-50	55	150 v.	2.3 m.a.	A.C.
0-5	5	60 v.	12 m.a.	D.C.
0-15	18	200 v.	11 m.a.	D.C.
0-50	70	240 v.	6 m.a.	D.C.



# POTENTIOMETERS

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Positive in Action. Robust in Construction.

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# What's New In Radio

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

## New High-Fidelity Amplifier For Public Address Work

A high-quality public address sound system amplifier which is capable of delivering an undistorted output of 20 watts, with frequency response substantially flat from 50 to 9,500 cycles, has just been released by Martin de Launay Pty. Ltd.

It is a particularly compact and easily-handled unit, because it follows standard American "turret-top" design. The base is finished in crystalline battleship grey, while the turret-top is crystalline navy blue. The unit weighs 45 lb. and measures 10" high, 10" wide, and 17" long. Nickel-plated carrying handles make the amplifier easy to transport.

The valve line-up in the Mardel amplifier is as follows:—1 6C6 triode as microphone amplifier, resistance-coupled to a 6N7 double triode, which in turn is resistance-coupled to a second 6N7 as a further resistance-coupled amplifier phase inverter. The output valves are two 6L6G's in push-pull, and the rectifier is a 5Z3. The maximum output of 20 watts has less than 4 per cent. harmonic distortion. The amplifier operates on 240 volts a.c.

Inlet plugs are provided for microphone and pick-up, and provision is

made for mixing both. The output impedance is 500 ohms tapped at 250, 166 and 125 ohms.

In conjunction with the Mardel amplifier, Martin de Launay Pty. Ltd. are making available, at extra cost, the following series of accessories:—(a) Gramophone pick-up unit, comprising an a.c. induction motor with turntable and piezo type crystal pick-up; (b) piezo-crystal microphone; (c) nickel-plated tubular steel microphone stand; (d) Rola heavy-duty G12 permanent magnet high-fidelity reproducers. In this way, those who are interested in public address work may secure a complete sound system of matched units.

A folder describing the Mardel amplifier in detail is available free on request from Martin de Launay Pty. Ltd., cr. Clarence and Druitt Sts., Sydney.

## Two New Radiokes Lines

A new unshielded midget flat type 60m.a. power transformer (type MA-60) is announced by Radiokes Pty. Ltd., of Sydney. A further new line also to be released shortly is a new air-dielectric trimmer using the latest Trolutol base, and having a capacity ranging from 2.5 to 32 mmfd. Special facilities are provided either

for sub-chassis mounting or for trimming from above the chassis.

## New Philips Characteristic Chart

Characteristics of well over 200 valves of all types—Continental, American, metal, glass, and metal/glass—are listed in the latest valve characteristics chart just released by Messrs. Philips Lamps (A'sia.) Pty. Ltd., of Sydney. Measuring 43" X 34", the chart is clearly and attractively printed in two colours, and forms an invaluable reference for service workshop or laboratory use.

Thoroughly up-to-date, the chart gives complete details of over 50 of the new octal-based "G" series, while other types on which complete data are given are the Metal Clad series (comprising 4-volt a.c., 6.3 volt a.c., 200 m.a. a.c./d.c., and 2-volt battery types). Other types included on the chart are barreters and cathode ray tuning indicators. Under-socket connections of all valves listed are also given.

Copies of this chart are available free on request to Radio Division, Messrs. Philips Lamps (A'sia.) Pty. Ltd., G.P.O. Box 2703C, Sydney.

## Four New Radiotron Releases

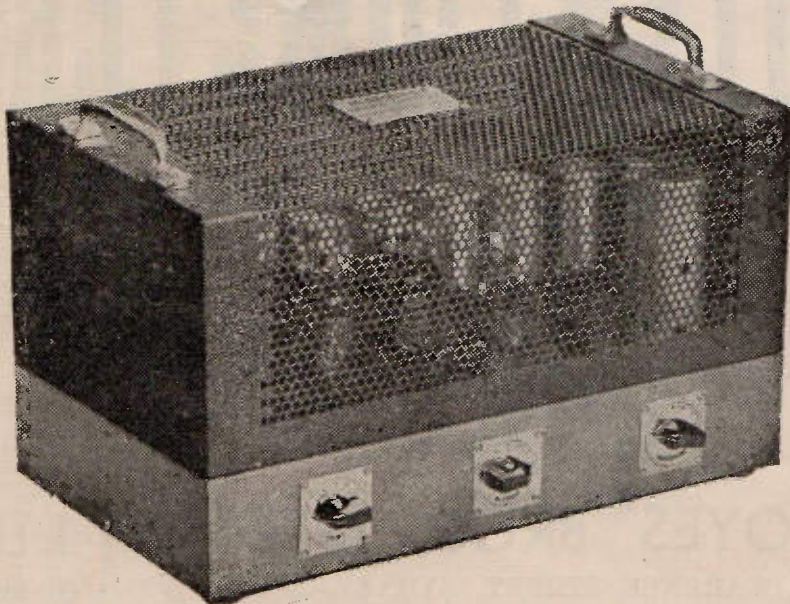
The following details of four new Radiotron releases by Amalgamated Wireless Valve Co. Pty. Ltd., of Sydney.

**Radiotron 6K8** is an all-metal triode-hexode frequency changer which has certain advantages over existing types of frequency changers. It incorporates a separate triode-oscillator and a hexode (four-grid) mixer valve in the one envelope. Due to this form of construction, the oscillator is capable of giving stronger oscillation, particularly on the short-wave bands, than valves of the pentagrid converter type.

The oscillator grid of the 6K8 is internally connected to the third grid in the mixer, so that no additional coupling is required in the circuit. The number of component parts in the circuit will therefore be identical with that used for valves of the 6A7-6A8G variety.

The conversion conductance of the 6K8 is 400 microhms and the plate resistance 0.6 megohm. It will be seen that the conversion conductance is rather lower than that of the 6A8G, but the plate resistance is effectively higher. It is uncertain whether the 6K8 will prove effective in avoiding certain disadvantages encountered with other forms of frequency changers, and considerable experiment may be required before the most useful field of application

The Mardel 20-watt p.a. amplifier just released by Martin De Launay Pty. Ltd., of Sydney.





of this new type can be determined. A small quantity of these valves is expected to be available towards the end of March.

Radiotron 6J8G is in many respects similar to the 6K8, but it has a glass bulb on an octal shell base, and the mixer section incorporates an additional grid, making it a triode-heptode. Notes regarding its application and availability are similar to those on the 6K8.

Radiotron 6C8G is a twin triode with a 6.3 v. 0.3 a. heater. Each cathode is brought out to a separate base pin. This type is only intended to be used where low heater current is essential; in other cases type 79 or 6A6 is to be preferred. It may also be used in cases where it is essential for the two cathodes to be separate, such as when cathode loading is used.

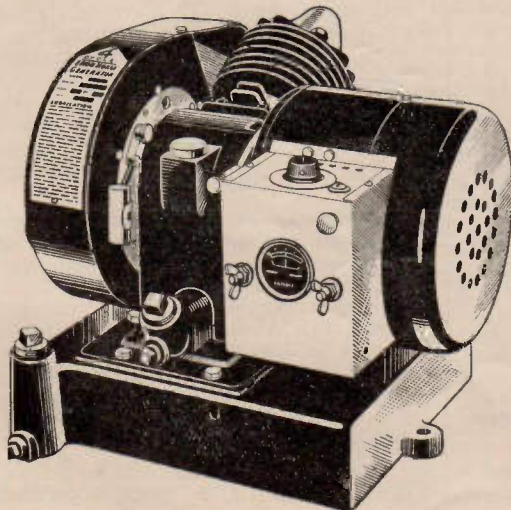
Radiotron 6G6G is a 6.3 v. 0.15 a. indirectly heated power pentode intended for use with battery and particularly with vibrator powered receivers. It is not recommended for automobile use, and the heater voltage should be maintained correct within 10 per cent. With a plate and screen voltage of 135 volts and a grid bias of -6 volts, plate current 11.5 m.a., and screen current 2 m.a., the power output is 0.6 watt on a load of 12,000 ohms.

With this valve it is probable that the ability to operate with self-bias will prove a valuable feature. A self-bias resistor of 440 ohms is recommended. The maximum plate and screen voltage is 180 volts, and under these conditions a power output of 1.1 watts is available with a plate current of 15 m.a. and screen current of 2.5 m.a.



**Breville Appointed Distributors  
Iron Horse Home Lighting  
Plant**

Messrs. Breville Radio Pty. Ltd.,  
of 67-73 Missenden Road, Camper-



down, N.S.W., lately announced their appointment as N.S.W. wholesale distributors of the Johnson Iron Horse home lighting plant, made by the manufacturers of the famous Johnson outboard motors at Waukegan, Illinois, U.S.A.

A petrol-driven generator, the Iron Horse is an inexpensive and economical source of electricity for light, power and radio. Besides being ideal for lighting the country home, camps, caravans and boats, it will charge batteries, operate radios, and is provided with a belt pulley for driving light machinery.

The maximum output is 300 watts at 12 volts. Push-button electric starting, in which the generator is used as a motor to start the small petrol engine incorporated in the generator, is a particularly attractive feature. The magneto ignition cable and spark plug are all thoroughly shielded to prevent interference with radio receivers, which can be operated while the generator is running.

Complete information on the iron horse generator is available free on request from Breville Radio at the address given above. Inquiries are also invited from dealers interested in this new line.



**New Triplett Test  
Equipment**

Latest Triplett test equipment landed recently by the sole Australasian representatives, Messrs. W. G. Watson & Co. Pty. Ltd., includes the Model 1670 vibrator tester, Model 1630 de luxe oscillator, and Models 1402, 1403 and 1404 laboratory test-bench panels.

**Model 1607 Vibrator Tester**

The Model 1607 vibrator tester checks vibrators used in auto and home radios under actual performance conditions.

(Continued on page 34)

The Johnson Iron Horse home lighting plant, for which Breville Radio Pty. Ltd. has recently been appointed N.S.W. distributor.

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Here's the secret of its wonderful performance: The "ANTENNEX" Aerial Energiser. The "NOISEMASTER" Aerial Outfit is the ONLY NOISE-REDUCING, SIGNAL-BOOSTING OUTFIT AUTHORISED TO USE "ANTENNEX" . . . the amazing American invention that cuts out noise and peps up sensitivity. You get in the "Noisemaster" Kit, as well, 200 feet of special aerial wire, 12 specially designed transmission blocks, earth clamp, lead-in strip, screws, lightning arrestors, etc. Easy to follow instructions and drawings with each Kit enable you to set up your aerial in a very short time. No testing. No doubt. No delay. Once "Noisemaster" is fitted, your noise-troubles end! Send this special form for your "Noisemaster" Aerial Kit NOW, and get marvellous DX on broadcast and shortwave bands. If you want yours NOW, send this Coupon!

Antennex (A'sia) Agencies,  
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48-60 Margaret Street,  
SYDNEY.

Send me right away your "Noisemaster" Kit. I enclose 52/6 in postal notes, money order, cheque. (Add exchange to country and interstate cheques.)

Name.....

Address.....

# Radio Step By Step . . . . 15

## From Detector To Speaker

The need for audio amplification between detector and speaker is explained in this article, which also outlines the theory and construction of the audio transformer.

AT the conclusion of last month's instalment describing the operation of a typical three-valve battery receiver, we left the signal in its audio frequency form after it had passed through the detector and had been stripped of remaining r.f. by means of an r.f. choke and bypass condenser.

The signal is now in exactly the same form as it was after leaving the microphone at the transmitting station, and before it was impressed on the radio frequency carrier wave. By the process of detection the signal has been transformed from a radio frequency signal oscillating at the rate of say a million times a second, to an audio frequency signal varying from perhaps 50 to 15,000 times per second.

### Audio Valves Needed For Speaker Operation

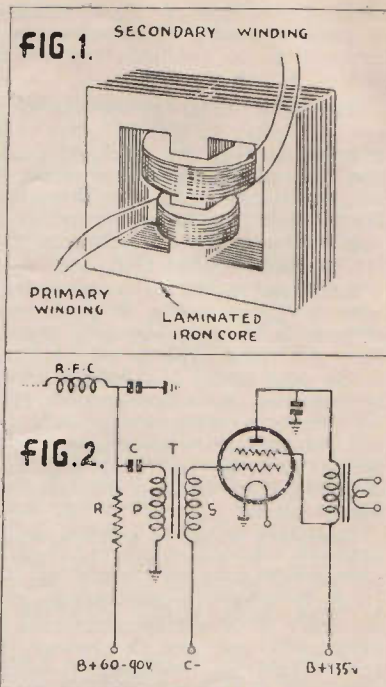
This signal is still comparatively weak, though it could operate a pair of headphones connected in the plate circuit of the detector valve, thus transforming the electrical impulses into the sounds that originally impinged on the microphone diaphragm. However, to provide sufficient power

for loud-speaker operation, further amplification is necessary, and this is provided by adding an additional valve or valves. Just as the amplifying stage ahead of the detector was called the r.f. amplifier, because amplification there takes place at radio frequencies, so the amplifying valve or valves following the detector comprise the audio frequency amplifier.

One common way of effecting amplification is by using an audio frequency transformer immediately following the detector, and coupled to the succeeding valve in the chain. This can be the last valve in the set, as in the circuit under discussion, or it can be followed by still another valve to give still greater amplification. Thus, in the circuit shown, the transformer "T" couples the detector valve "V2" to the output valve "V3."

### How An Audio Transformer Is Made

An audio frequency transformer consists of two windings of wire on an iron core, special iron alloys being generally used in order to intensify the magnetic effect. If a solid



iron core were used, losses due largely to eddy currents would be extremely high, and so laminations are employed to build up the core. As well, the core must be of sufficient size to avoid saturation at the maximum value of primary current passed.

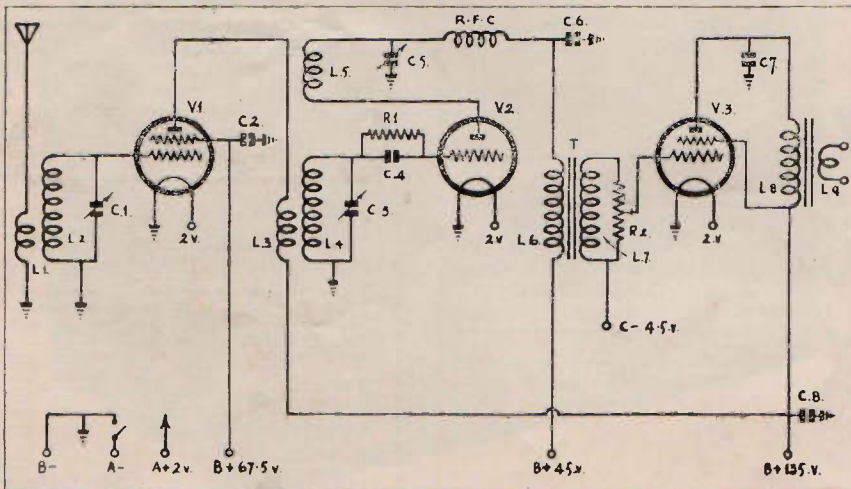
The two windings are called the primary and secondary. The primary winding, which generally consists of something like 3,000 turns, is wound over the laminated iron core. Next, a layer of insulation is put on, and the secondary winding is wound alongside (or over the top of) the primary, as illustrated in fig. 2.

The ratio of the number of secondary turns to the number of primary turns varies from 3½:1 to 10:1, the former ratio being very commonly used. This means, for example, that if the primary consists of 3,000 turns, the secondary has 9,000 turns, and neglecting losses, the signal applied across the primary would be amplified three times.

### No Power Increase

It should be noted that voltage only, and not power, is increased by this process. Coincident with the step-up in voltage there will be a corresponding step-down in current (amperes). Assuming that the transformer is 100 per cent. efficient, the power generated in the secondary, measured in watts (volts by amperes), will remain the same as that developed in the primary.

However, the normal audio amplifying valve is a voltage-operated



device—current is of no importance. Hence the object is to produce the largest possible voltage variations between the grid and filament of the valve. Though an audio transformer cannot amplify by itself, it greatly increases the output of the valve following it by virtue of the voltage step-up it gives the signal developed across the primary.

**Limit To Transformer Step-Up**

From the above it might be assumed that the ratio of an audio transformer could be increased indefinitely, resulting in an enormous increase in amplification. Unfortunately, however, there are two practical restrictions.

The ratio of a transformer is determined by the number of turns of wire on the two windings, and to increase this ratio there are two alternatives, the first of which is to decrease the number of primary turns. However, this is impracticable, as for efficient operation the inductance of the primary must be kept above a certain value. One practical result of decreasing this inductance unduly is that bass response suffers seriously.

The other alternative—to increase the secondary turns indefinitely—is equally impracticable, as the result is an increase in the self-capacity of this winding. Appreciable capacity here is very undesirable, as it bypasses the higher frequencies.

It was mentioned earlier that the laminated core of an audio transformer must be of sufficient size to avoid saturation at the currents normally passed. Saturation is reached when further current increases fail to increase the flux density.

**Parallel Feed Avoids Saturation**

One way to avoid this saturation effect is illustrated in fig. 2, which indicates how parallel feed can be employed to divert the steady d.c. component of the plate current around the primary of the transformer. The resistance "R" has a value of the order of 30,000 ohms, depending on the plate resistance of the detector valve. The coupling condenser "C" should have an impedance sufficiently low so that the entire range of audio frequencies required in the output can be passed through it without difficulty. The value of .5 mfd. is suitable for most purposes.

**Two-Valve A.C. Shortwaver**

(Continued from page 23)

approaches maximum, there should be a point at which a distinct "plunking" sound is heard in the 'phones when the grid circuit is touched. Further advance of the regeneration control may cause a squealing or howling sound with the antenna disconnected. If there is no evidence of oscillation, a check should be made to make sure the tickler is properly connected.

After the oscillation test shows the detector to be operating, the antenna should be connected and the controls manipulated to tune in signals. The antenna coupling condenser should be set slightly below maximum (adjustment screw backed off one or two turns to the left). Some adjustment of the antenna coupling condenser C8 may be necessary to give smooth regeneration over a given band. This depends on the particular receiving antenna used, and must be determined by trial. In general, a receiving antenna of 50 foot or so length is satisfactory.

**Australian Trained Radio Servicemen's Institute—Queensland Division.**

By W. J. HUDSON.

The usual monthly meeting of the A.T.R.S.I. was held at the Chamber of Commerce Rooms, Adelaide St., Brisbane, on February 16, at 7.30 p.m.

There were 35 members present, and business was conducted as follows:—Minutes of the previous meeting were read and confirmed. 100 copies of lectures printed for country members. Syllabus of lectures to be published monthly by the Queensland "Electrical World," and copies to be supplied also to "Radio World" if required. Mr. Hadley, the treasurer, resigned from executive committee, but not from Institute; received votes of thanks for services rendered.

List of Lectures: Mr. Fuller—"S.A.A. Rules," on February 23. Mr. Heine—"Modern Service Methods," and Mr. W. J. Hudson—"A.C. Theory," about March 23.

Examination for metropolitan members will be held on March 16, the country exam. on April 16. Every country centre will hold the exam. before postmaster or other official. "A" grade certificates certified by Queensland Electrical & Radio Federation, with preference of employment, will come into force next May. Several inquiries for mechanics were received during the month. Discussion was held about extending the Institute to other States, and members of I.R.E. present stated that body does not affiliate with other bodies, so Queensland A.T.R.S.I. must extend its activities to other States for service mechanics.

A very fine lecture was presented by Mr. D. Laws, of Crammond Radio, on "Design of Modern Superhets and How to Analyse Them." He showed by simple circuit diagrams how to analyse commercial circuits and how to discover any departures from standard design. It was a very fine lecture indeed, and the speaker received a hearty vote of thanks at the conclusion.

**For That  
EXTRA PUNCH**

that pulls in 10-watters from the other side of the world, insist on . . .

**RAYWAY  
LOW-LOSS HIGH-GAIN  
COILS**

Precision wound on threaded plug-in formers of a special low-loss moulded material, these coils will give your set that extra "punch" you must have for DX work.



Rayway Coils are used and specified EXCLUSIVELY in all "Radio World" shortwave receivers. Illustrated above is the special kit wound for the sensational "Empire All-Wave Three," described in the "Radio World" (battery and A.C. models available). Other "Radio World" receivers for which Rayway Coil Kits are available include:—

- "All-Wave All-World Two"
- "Eaglet Shortwave Two"
- "Empire All-Wave Three" (A.C. and battery models)
- "All-Wave Bandsread Two"
- "Amateur Communications Eight"
- "Battery Communications Seven"
- "Jones' Super-Gainer"

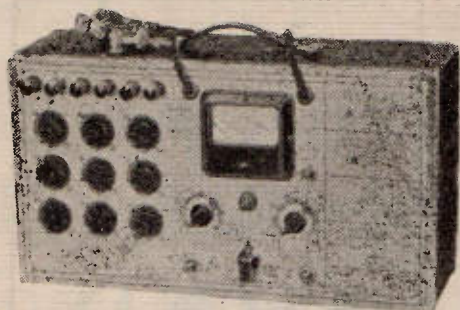
If unobtainable from your local dealer, write direct to:—

**Standardised Products**

Note new address:—

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LEICHHARDT, SYDNEY,  
N.S.W.

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★  
This latest Triplet vibrator tester checks all types of vibrators under actual working conditions. Fundamental vibrator circuits are shown on the silver and black etched panel.

★

the vibrator, a good/bad scale for output, and a scale marked 0-100 per cent. showing per cent. of output voltage as reflected by the change in input voltage. The low damped meter permits the pointer to follow voltage fluctuations caused by faulty vibrator contacts, while a switching arrangement makes it possible to place buffer condensers in the vibrator circuit (for test purposes) when they are not regularly incorporated in the vibrator.

Fundamental vibrator circuits are shown on the silver and black etched panel, while full instructions are included for testing every type of vibrator.

#### Model 1630 De Luxe Oscillator

It is claimed that triple shielding ensures absolute zero leakage in this new Triplet signal generator. Designed for extreme accuracy, it covers from 100 k.c. to 30 m.c. in six ranges.

The direct reading vernier type dial with widely-spaced divisions has a total scale length of 52½ inches. Each coil is individually calibrated and tracked for linearity over the entire range, while a continuously variable attenuator of the pad type offers steps from zero output to full output. Accuracy is from ½ to 1 per cent.

#### Laboratory Test Bench Panels

The Models 1402, 1403 and 1404 laboratory test bench panels are attractively matched units designed to simplify shop and laboratory test panel requirements. Any Triplet Master or De Luxe Tester can be included, while a continuous panel setup may be obtained by bolting any two or more cabinets together. The Model 1402 accommodates any two De Luxe models, Model 1403 one De Luxe and two Master units, and Model 1404, four Master units.

Each unit is held firmly in place by means of suction fitting red rubber retaining strips. The important advantage with this type of mounting is that it permits instant removal of any unit for portable use.

Full details of these latest Trip-

let releases, together with complete information on the entire range of Triplet and Ranger-Examiner test equipment, are available free and post free from Messrs. W. G. Watson & Co. Pty. Ltd., 279 Clarence St., Sydney.

★

### — Latest Test Equipment Featured In 1938 Palec Catalogue

A particularly comprehensive range of measuring instruments and test equipment, as manufactured in Australia by the Paton Electrical Co., of Sydney, is covered in the 1938 Palec Catalogue, which has just been released.

Well-illustrated, and printed on heavy art paper, complete information is given on all lines, including the Palec multi-tester (two models), volt-ohm-milliammeter (two models—one with a meter sensitivity of 20,000 ohms per volt), analyser selector units, battery and a.c. all-wave test oscillators, battery and a.c. valve and circuit testers (both portable and counter types), cathode ray oscillographs, battery and a.c. beat frequency oscillators, and direct reading vacuum tube voltmeter.

Complete information is also included, together with prices, on all types of Palec meters manufactured, while a page is also devoted to the meter repair service, covering all makes of meters, that is maintained by this company.

Copies of this catalogue are obtainable free and post free from the Paton Electrical Co., 90 Victoria St., Ashfield, Sydney, N.S.W.

★

#### Model 1252 Philips Radioplayer

Released recently by Messrs. Philips Lamps (A'sia.) Pty. Ltd., the Model 1252 Radioplayer is rapidly proving a best seller among sets of its class. A 5-valve a.c. dual-wave superhet, mounted in a console cabinet of particularly attractive design, it is soundly engineered through-

out, and is a first class all-round performer.

The five valves used comprise an EK2 octode, 6D6 i.f. amplifier, 75 second detector, a.v.c. voltage generator and first audio amplifier, EL3 output pentode, and 80 rectifier. Waveband coverage is from 540 to 1,520 k.c. on broadcast, and from 7 to 22 megacycles (43 to 13.5 metres) on shortwave. Band-pass tuning is incorporated, resulting in excellent selectivity that is particularly useful when inter-state reception is required. A wide vision State-zoned tuning dial and audioscopic reproduction—two features common to all latest Philips releases—are both incorporated in this model.

Tested on a 25ft. indoor aerial in an indifferent location, the model supplied to the "Radio World" for test gave results that fully justified this receiver's popularity. Both selectivity and sensitivity were surprisingly good, while tone was well-balanced and free from objectionable cabinet resonances.

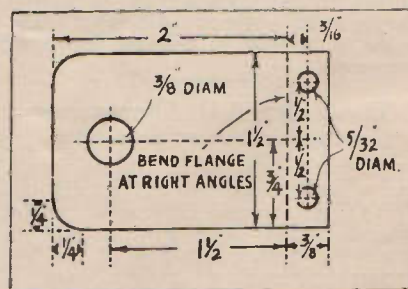
On the short waves the set proved a pleasure to handle, due largely to the particularly smooth dial movement employed. With the international shortwave bands accurately located on the dial, station finding is a simple matter. On the short waves, an outstanding feature is the high uniform sensitivity obtained right across the band.

#### Assembling And Wiring The "Fidelity Dual Wave Six"

(Continued from page 19.)

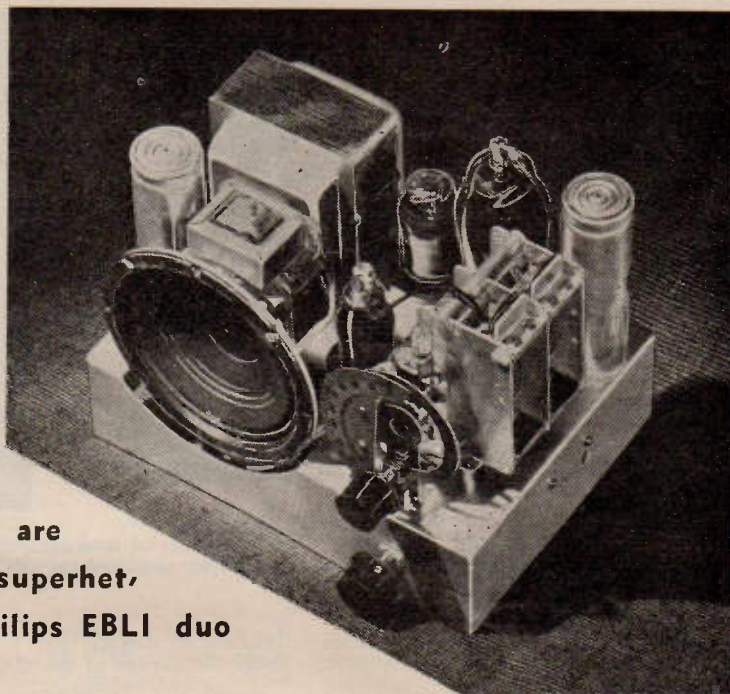
"Six" will be found very simple to handle, despite the enormous reserve of sensitivity. For local work the r.f. gain control should be turned back slightly—not too much, but just sufficient to eliminate excessive inter-station noise.

After the correct setting has been obtained, volume should then be controlled by the main volume control.



This sketch gives dimensions for preparing the sprayed steel bracket on which the volume control is mounted.

# Two-Valve Local Station Superhet



Excluding rectifier, only two valves are used in this experimental midget superhet, which is designed around the new Philips EBL1 duo diode output pentode.

THE midget superhet shown in the accompanying photographs was designed around the EBL1, a new type valve released by Philips towards the end of last year. A duo-diode high-mu power pentode, this valve makes possible small superhets with reasonably high sensitivity, incorporating delayed a.v.c. and providing high quality output.

### 4.3 Watts Output Obtainable

With this valve, a grid swing of only 3.9 volts will provide approximately 4.3 watts output, with the fairly low distortion figure of 10%. With no driver stage between the detection diode and the pentode, the overall sensitivity is necessarily reduced, but quality of reproduction is

The completed receiver. The EBL1 is at the rear of the chassis, to the left of the wet electrolytic filter condenser.

undoubtedly improved by the elimination of the first audio stage, together with its associated input and output circuits. Characteristics are given below.

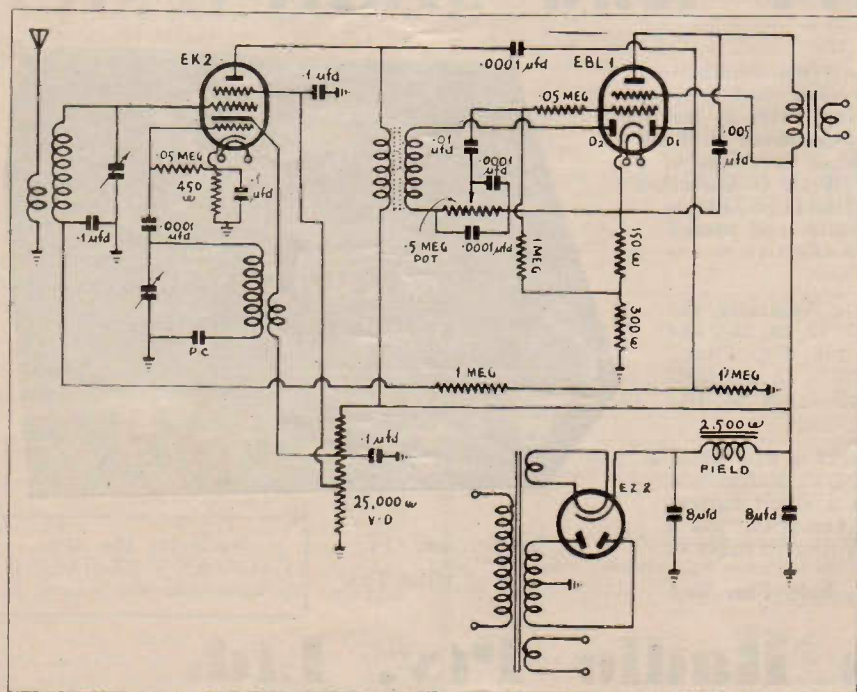
Heater voltage	... 6.3 v.
Heater current	... 1.4 a.
Plate voltage	... 250 v.
Screen voltage	... 250 v.
Plate current	... 36 m.a.
Negative grid bias	... 6.0 v.
Screen current	... 5.0 m.a.
Mutual conductance	... 9.5 m.a.-v.
Plate impedance	... 50,000 ohms
Optimum load	... 7,000 ohms
Power output (for 10% distortion)	... 4.3 watts

BASE: Philips type P universal side-contact.

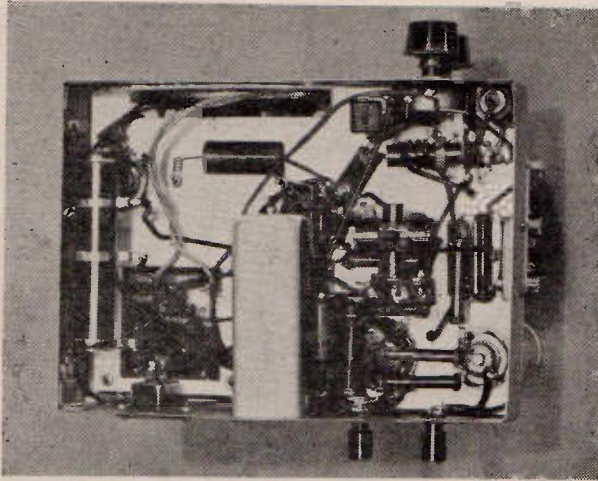
A 150-ohm resistor is required in the cathode to provide bias, a 25 mfd. by-pass condenser being required across it. Incidentally, self-bias is recommended for all applications of the EBL1, because of the steep slope characteristic and the possibility of grid current on large signals.

### EK2 Followed By EBL1

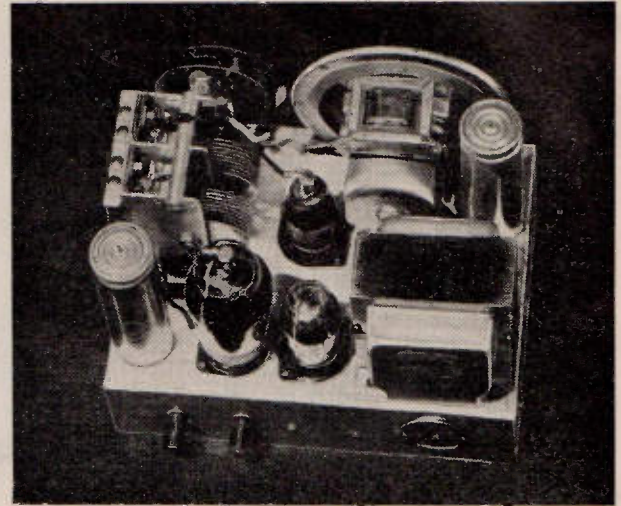
The circuit shown uses an EK2 octode as mixer-oscillator, the plate circuit of this valve being coupled by an iron core i.f. trans-



The circuit of the receiver, which uses iron-cored aerial and oscillator coils and i.f. transformer,



The under-chassis view shown above illustrates the method of mounting the unshielded iron-cored aerial and oscillator coils at right angles to each other, to prevent coupling between them. The i.f. transformer is mounted on the rear wall of the chassis. On the right is a rear view of the completed receiver.



former directly to the detection diode of the EBL1. For local work, extreme selectivity is not required, while in a small set of this type, gain is all-important. In order to ensure this, the coupling between the windings on the iron-cored i.f. transformer used was substantially in-

creased by taking out a  $\frac{1}{2}$ " section from the centre of the dowel supporting the two windings.

Results given by this receiver were surprisingly good, especially in view of the fact that no i.f. amplification is employed. In fact, using a 40-foot outside aerial, several inter-

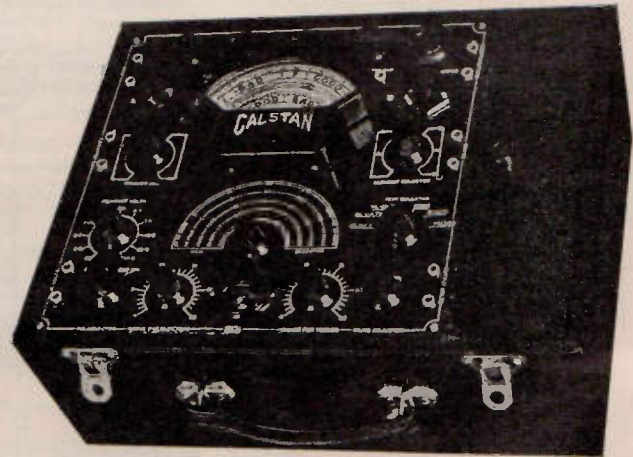
state stations were received at fair speaker strength. However, the performance does not compare with that of the "Companionette Three," a t.r.f. receiver described in the "Radio World" for April and May of last year, and so a detailed description of (Continued on opposite page)

## FOR EFFICIENT RADIO SERVICE FOR ALL TIMES—*the New 1983 Model Combined Valve Tester And Multi-tester*

★ Released by SLADE'S RADIO PTY. for the discriminating Radio Dealer and Serviceman who appreciate and practise the finer points of efficient Radio Servicing. Here at last is an outstanding instrument in the Test Equipment field for all-round perfection, combining the multiple functions of a Valve Tester and Multitester. The CALSTAN (CALibrated to STANdard) 223 VALVE-TESTER-MULTITESTER is a boon to the Radio Serviceman and Dealer, and needed by ALL who rely on Radio Service as an effective means of building up a modern radio business.

★ Model 223 will test every valve used in Australia, the Multitester range is A.C. and D.C. volts, 5, 10, 50, 250, and 12,500. Milliampères, 5 ranges, 1, 5, 25, 100, 250. Ohms, 5 ranges from 1 ohm to 5 megohms. Also is an excellent instrument for lining up sets. Tests all types of Dry Condensers and Electrolytic Condensers.

★ The D.C. VALVE TESTER MODEL D223 is also available as a Combination Tube Checker and D.C. Multimeter. As a D.C. Valve Tester it operates from a 6-volt battery and tests every type of valve used in Australia. As a D.C. Multimeter it has 5 ranges of D.C. Volts, 5 ranges of Milliampères, and 4 ranges of Ohms. Price £18/6/-, Portable Model £18/16/-, both Plus Tax.



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# All-Wave All-World

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

# DX News



### QSL Exchange Bureau

The following members would like to exchange QSL cards with other dxers:—Clifford Watts (AW28DX), Box 91, Bowen, Q'land; S. Wright (AW345DX), 10 Milton St., Mackay Q'land; George G. Anthony, 303 South Seventh, Panca City, Oklahoma, U.S.A.; A. D. Wilbur, C/Post Office, Orlando, Florida, U.S.A.

### 20 And 50 K.W. S.W. Broadcasters

The Federal Communications Commission has granted permission for the new General Electric transmitter at Belmont, California, to have a power of 20 k.w. It will work on 9.53 and 15.33 megacycles from 9 p.m. to 3 a.m. P.S.T., and this ought to give good reception in Australasia. It will be completed towards the end of this year. The call will be W6XBE.

The National Coffee Dept. is considering erecting a new 50 k.w. transmitter at Rio de Janeiro to advertise their coffee.

ZRK, a new South African on 9,610 k.c., broadcasts between 7 and 9 p.m., and 11.30 and 2.40 a.m. (A.E.S.T.).—W. T. Choppen, Timaru, N.Z.

### Two-Valve A.C. Superhet

(Continued from opposite page)

this latest midget receiver will not be given. However, in certain locations—where selectivity and ease of handling are all-important—this superhet will give superior results.

### Delay On A.V.C. Diode

The circuit shown is perfectly standard, except that several details regarding the EBL1 perhaps need a little explaining. Because the pentode has to be fully loaded from the detection diode, the delay on the a.v.c. has been increased by adding an additional 300-ohm resistor in series with the bias resistor, the total voltage drop, which is equivalent to the amount of delay, being approximately 18 volts.

A second point is that the 50,000 ohm resistor included in series with the grid is designed to prevent high-frequency oscillation, which is liable

to result because of the high mutual inductance of the EBL1.

The EZ3 used as rectifier is an indirectly-heated valve, its 6.3 volt heater taking 4 ampere. The EK2 and the EBL1 require .2 and 1.4 amps. heater current respectively.

The power transformer used has a 6.3 volt 3 amp. winding and a 6.3 volt 1 amp. winding, the latter being used for the rectifier and the former for the remaining two valves and dial lights. The total "B" drain amounts to 55 mills., and so a high tension secondary winding rated to deliver 60 mills. at 350 volts is ample. Using a 2,500-ohm speaker field as smoothing choke, the smoothed output is a trifle over 250 volts.

### Four-Valve Model Being Built

The performance given by this receiver is such that the addition of an i.f. amplifier valve, used in conjunction with two iron cored i.f. transformers, should result in an outstanding performance. Actually, it is expected that results from this 3/4 superhet, which is now in the course of construction, will be as good as that given by many 4/5 commercial receivers.

Whether this will actually prove to be true or not remains to be seen, but a further article on the results obtained, together with full constructional details of this new receiver, will be featured in the April issue of the "Radio World."

## 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**

## Authentic List of Spanish War Transmitters ★ Reader Logs Police Stations ★ Reports from Official Observers ★ 20-Metre Amateur Frequencies ★ Amendments to Station List ★ Hourly Tuning Guide.

In last month's issue of the "Radio World" some space was devoted to the war broadcasts from Spain. Since then much additional information of great interest has been received from overseas. From an authentic source the following details regarding the Nationalist transmitters are available.

The list of stations given below has been officially confirmed, and may be taken as being absolutely correct.

In addition to the stations listed below, reference is also made to the Madrid front station, whose transmission intrigued European listeners for some time. This station, "Radio Espana en el Frente de Madrid" (or "Radio AZ" as it is sometimes announced) operates on two frequencies simultaneously on the 40-metre band. No information is available as to its

exact location for very obvious reasons; but there is no doubt that it is located in the Nationalist lines near Madrid.

Without exception, all Spanish National stations relay Salamanca from 9.15 till 9.45 a.m., broadcasting a special military news bulletin in a variety of languages, including English. In addition, special English sessions are given from San Sebastian at 7.20 and 11.20 a.m.

The abbreviations R.R., and F.E. are explained as follows. They stand for Radio Requete, and Falange Espanola respectively: the Requetes being the Carlists, and the Falange the Spanish Fascists. Both have amalgamated in the organisation now styled F.E.T., or "Falange Espanola Tradicionalista y de las Jons."

## Ultra-High-Frequency Jottings.

Further verifications are to hand from several American police transmitters—from W6XUL, National City, Calif.; from W9XAC, Paducah, Kentucky; and from W9XKC, St. Joseph, Mo.

Mr. H. O. Steward, Chief Electrician at W9XKC, furnishes some interesting "dope" on U-H-F work. He mentions that practically all the American Police Departments are installing U-H-F equipment. However they are experiencing some difficulty on account of excessive interference. Naturally they are concerned chiefly with the ground wave for their transmissions, but it has been found that the sky wave has a tendency to dip, causing considerable QRM among different stations on the same frequency.

Mr. Steward points out that although St. Joseph is located in the central section of the United States, the West Coast police transmissions are received by the St. Joseph mobile units at the same strength as W9XKC's signals. At times the West Coast car transmitters (which use only 5 watts) are heard by the St. Joseph cars, although their re-

## Spanish War Transmitters

Call.	Location.	K.C.	M.	W.	Call.	Location.	K.C.	M.	W.
Radio Espana (EAJ28)	Bilbao	7246	41.4	200	EA1BL	Pontevedra	7212	41.6	145
F.E.T.5	Burgos	14200	21.1	300	EA1BL	Pontevedra	7200	41.66	75
EA7BA	Cadiz	14284	21.0	40	EA1BH	Pontevedra	7500	40.0	60
EA7BA	Cadiz	7142	42.0	40	Radio Espana (EAJ8)	San Sebastian	7203	41.65	1½ kw.
F.E.T.5	Burgos	7100	42.2	300	Radio Pizarrales	Salamanca	10630	28.2	1 "
F.E.T.21	Ceuta	7134	42.0	100	EA1BO	Salamanca	7070	42.4	74
EA2BL	Ejea de Los Caballeros	7000	42.8	50	EA1AV	Salas	15000	20.0	60
EA2BA	Jaca	14031	21.38	200	EA1AV	Salas	7000	42.8	60
EA2BA	Jaca	7177	41.8	200	Radio Tenerife (EAJ43)	Teneriffe	10373	28.9	23 "
F.E.T.8	Melilla	7202	41.65	85	F.E.T.7	Teneriffe	7474	40.1	100
EAME	Melilla	7200	41.66	20	EA9AH	Tetuan	6996	43.5	500
EA8AE	Las Palmas	14080	21.3	100	EA9AH	Tetuan	3992	75.1	500
EA8AE	Las Palmas	7200	41.6	100	EA9AH	Tetuan	14030	21.4	500
F.E.T.	Las Palmas	7003	42.3	40	F.E.T.1	Valladolid	7006	42.8	400
F.E.T	Las Palmas	7147	41.9	40	F.E.T.10	Vittoria	7027	42.7	160
F.E.T.6	Palma de Mallorca	7125	42.1	145	R.R.6	Vittoria	7265	41.2	
F.E.T.6	Palma de Mallorca	7168	41.8	145	EA2AA	Zaragoza	7002	42.8	150



ceiving antennas are merely attached to the car tops, and are consequently less than 10ft. above the ground. Obviously the antenna and the wattage do not make very much difference with the sky wave of U-H-F transmissions.

Reception of the police transmitters is definitely on the improve. A new logging on 9.06m. is W6XEH, Long Beach, Calif. Fort Worth and Arcadia on the same band, and Newark on 9.9m. are received regularly.

After many months a report has been received from a "Radio World" reader regarding these 9-metre stations. Mr. J. Ferrier (AW129DX) of Colerain, Vic., reports reception of W6XPA, Los Angeles on 9.9m; and also heard signals which he believes were transmitted by car 223 in that city.

★

### New 9-Metre Station On B.C. Band.

The 9.494m. broadcast band is again "coming good." During February a new transmitter was heard on this wavelength. This was W9XUY, located in Omaha, Nebraska, which relays station KOIL (?). Although the frequency of this transmitter was announced as 31,600 kc., it appears to be a fraction higher, as W9XUY is logged a trifle below the other 31,600kc. stations.

★

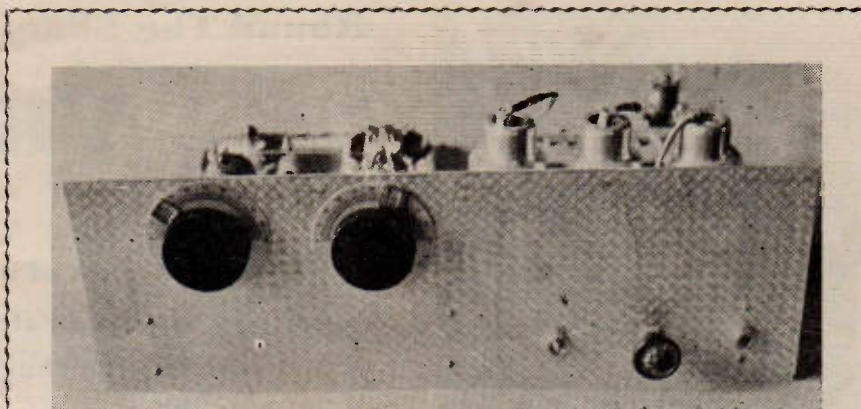
### Latest News From Overseas Stations.

The long awaited expansion and reorganisation of Radio Coloniale, Paris, has at length taken place. For several years now frequent announcements have been made concerning a new high-powered transmitter ready to go on the air. At long last this station has made an appearance on the 31m. band (9550kc: 31.41m; same frequency as OLR3A). At the present time this new transmitter is testing around 10 a.m.

#### Expeditionary Stations.

Two widely separated scientific expeditions have recently undertaken interesting transmissions on the 20-metre amateur band. The first of these was the Holden expedition to the headwaters of the Amazon river. Through station VP3THE (not 3PHE as previously reported) the expedition kept in touch with the N.B.C. in New York. It is understood that the expedition has returned to America; but listeners may still forward reports of reception to the N.B.C.

OX2QY are the call-letters assigned to the station attached to the MacGregor Arctic Expedition, now



## Experimental U.H.F. Superhet Uses Special 2,000 K.C. I.F. Amplifier Unit

This experimental seven-valve ultra-high frequency superhet uses a pair of 955's as first detector and h.f. oscillator, 2-6D6 i.f. amplifiers, 6B7S second detector, 6C6 b.f. oscillator, and 41 audio. It incorporates a special Eddystone three-section 2,000 k.c. i.f. amplifier unit, the three pairs of coils and condensers being built into a die-cast aluminium container, which is sub-divided by screening partitions into three sections.

Copies of the 1938 Eddystone catalogue containing details of latest s.w. and u.s.w. receiving and transmitting components are available free on request from R. H. Cunningham (VK3ML), 1449 High Street, Glen Iris, Vic.

located at Reindeer Point, Greenland. It is requested that reports be sent to amateur station W2QY; if this is done all reports will be verified when the expedition returns to New York. (QRA of W2QY is—Mr. A. G. Sayre, Storm King School, Cornwall-on-Hudson, N.Y., U.S.A.). Incidentally OX2QY operates on approx. 14360kc.

#### PCJ Desires Observers

Since the inauguration of their new 60kw. transmitter, Philips Radio have been very anxious to receive comprehensive reports from all quarters of the globe. They desire that listeners who are willing to act as observers for an extended period should get in touch with them.

#### South Africa.

A certain amount of confusion relating to recent changes in South Africa have been cleared up. The new Klippeval station has been put into operation to provide an alternative program service for South African listeners. Accordingly most of the announcements will be made in Afrikaans.

During the daytime hours in South Africa, this station operates on 31.22m; whilst during the evening it shifts to 49.2m, on exactly the same frequency as ZTJ, Johannesburg. Under the new conditions the Johannesburg station only operates

during the day, and the Klippeval transmitter takes its place at night.

#### Portugal.

The call letters of CT1AA, Lisbon Radio Coloniale, have been changed to CS2WA (erroneously printed last month as CS2AA.)

A new station in Portugal is CS2WD, 50.15m, also in Lisbon. The address is Rua Capelo 5.

★

### New Stations Logged.

An interesting letter received recently from Mr. R. Simpson (winner of the 3rd DX Contest), gives details of several unusual loggings.

Bombay has been heard on 6085 kc: 49.3m., around 3 a.m. They announce as "Bombay calling, transmitting on 244m., and also experimentally on 49.3m., 6085kc."

A new Canadian is also to be found on the 49-metre band. This is CFRX, 49.42m., opening at 9.30 p.m.

The Vatican City station is believed to be testing on a new 25-metre frequency—not far from GSD. It is understood that they are usually on the air after 2 a.m.

An "old-timer" in the Philippines, KZGF, has been on the air again in the late evenings. KZGF operates on 51.72m.

(Continued on page 41.)

## Round The Shacks . . . . . 7

# - VK5FL -

The seventh of a series of articles on Australian amateur stations, specially written for the "Radio World"

By "REPORTER"



Mr. R. C. Harris, of Glenelg, S.A.,—owner-operator of VK5FL.

**H**EARING VK5FL putting out an excellent signal from a portable about two months ago reminded us that he owed the "Radio World" a "write-up." At that time he was on vacation in the Mount Lofty Ranges, and, on his return, we contacted him at Adelaide.

We had previously sent him a report on his transmission, which, without flattery, was comparable, as far as quality and modulation were concerned, with some of the over-rated commercial shortwave transmitters. The rig used on that occasion was a two-stage, using a 59 and E406, D104 Astatic "mike," 57 and 56 resistance coupled to two 2A5's par. modulators (output approximately 10 watts). Receiver was a seven-valve superhet. Antenna was 66 feet, and stretched over the top of adjacent trees. The complete rig fitted into a kerosene case. With this outfit, VK5FL worked, in less than three weeks, four countries, five W's, and a total of 109 QSO's. The most distant S.W.L. report came from BERS195, at Darwin, 2,000 miles from the transmitting location. Great going for portable work!

An inspection of the shack showed what can be done to the OM's workshop when a determined "ham" gets to work. Starting with a small bench in the corner, the rig and associated apparatus has gradually spread to the extent that 5FL is now principal space-owner—the workshop that was is no longer! What happens when the OM has a job of work to do is not mentioned.

The shack, measuring approximately 12' × 10' × 8' high, is situated about 40 feet from the house. The interior is completely lined with soundproof insulation board, which, incidentally, has been liberally wall-papered with the familiar "hrs mne, wrs urs?" The transmitter is housed in a six by two feet rack, and

comprises a three-stage crystal-controlled job using a 59 tritet crystal oscillator, link-coupled to a 6L6G, link-coupled to an 830B as power amplifier.

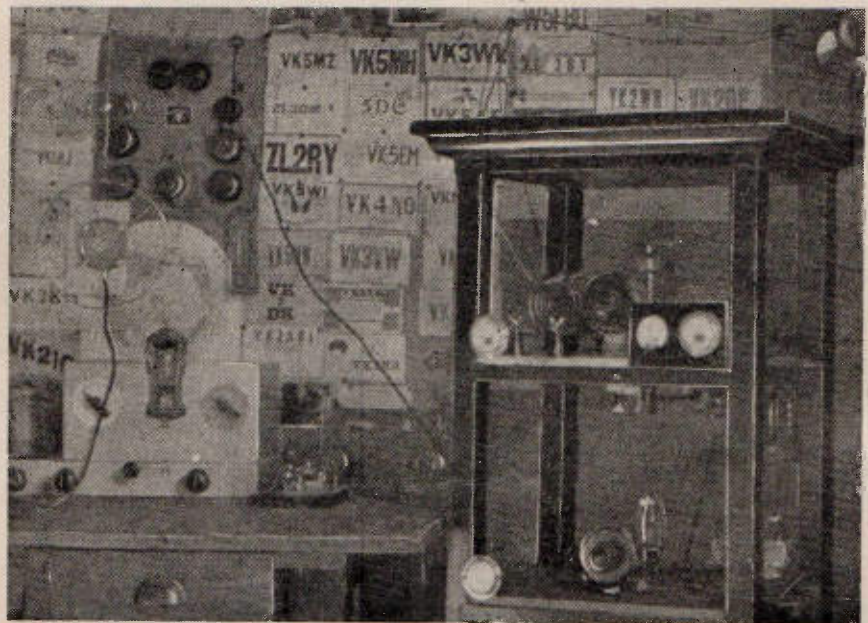
The modulation system is single choke Heising using a pair of 2A5's in parallel as Class A modulators. The speech amplifier is a two-stage, incorporating a 57 resistance coupled to a 56. Microphone is a D104 piezo astatic crystal type. Maximum power input is 25 watts to the final stage. The receiver is a seven-valve superhet, and can be seen in the photograph. Antenna in use at present is two half-waves, directional on U.S.A. and South Africa.

VK5FL has WAC and WBE on both 'phone and CW, while 50 coun-

tries have been contacted up to the present.

### Shortwave DX With The "Empire"

I recently built the "Empire All-Wave Three" and logged the following stations on 12 to 40 metres the first two nights after its completion:—VK's 4IL, 4OG, 4RJ, 4AB, 4BJ, 4JU, 2GU, 5SL, 4SA, 2UG, 4GG, 6ME, 3ME, VU2CQ Bombay, KA1BH Manila, K6BHL Honolulu, and YV5AC Venezuela. Also there were eight or nine foreign broadcasters, besides many amateurs, but unfortunately I missed the call-signs. —George Pitkin (AW354DX), Port Lincoln, S.A.



A general view of 5FL's shack. Piezo "mike" and seven-valve superhet are on the left, with three-stage c.c. transmitter on right.

**Miscellaneous Notes.**

Watch for KZIL, Philippine Govt. station at Iloilo, Panay Island, calling KAIYL, the yacht "Latitude" on 20m. band.

The Colombians are moving to 60 metres, as was mentioned in these columns some months ago. Already HJ3ABH, Bogota, 61.19m; HJ3ABD, Bogota, 62.0m; HJ2ABC, Cucuta, 62.34m; and HJ1ABB, Barranquilla, 62.39m are there. Note also that some of the other Colombians have changed their call-signs—HJ4ABH to HJ6ABH; HJ4ABB to HJ6ABB etc.

The correct call of the new Kliepheuval, South Africa, station on 31m. is ZRK.

CR6AA, Lobito, Port. West Africa, in addition to its regular transmissions on 41.8m, also tests occasionally on 31.04m.

**Reports From Observers.**

**Mr. G. O. La Roche (West Australia).**

"Generally speaking, conditions are good, rather better than is usual at this time of the year.

"The highlight of recent weeks was the logging of XEWW (31.58m.)" (South Americans are seldom heard in the West, and their reception is very fb dx there—S.W.Ed.).

From Mr. La Roche's list of stations logged it is clear that conditions are good in his state as far as the higher wavelengths are concerned. In the early morning he hears the following at good strengths:—COHB (47.7); CR7AA (48.82); COCD (48.92); YUA (49.18); ZTJ (49.2); VQ7LO (49.3); OLR (49.75 and 49.92); COCO (49.9). VPB (48.7), Rangoon (49.9), and the N.I.R.O.M transmitters are best in the evenings.

The Americans are still good: with W8XK (19), W2XE, W1XAL (25), W2XAF (31) and W3XAL (49) best on their respective bands.

Africans logged in addition to CR7AA, include CR7BH, ZTJ, and VQ7LO.

Most of the Latin-American stations heard at present are Cubans—the only others being HJ6ABH and XEWW (referred to above).

The Europeans are very steady in the mornings: TPA3, ORK, SBG, DZC, CSW (30.21), CS2WA, 2RO4, EA9AH (43.5), YUA, and OLR on two 49m. frequencies.

The 20-metre amateur band is still only fair—just at the moment being dominated by KA stations. The W's are quite scarce. Two further Africans were heard on the 40-metre band between 3 and 4 a.m. (Perth time)—ZU5-AC and ZU5-AK.

**Mr. V. D. Kemmis (New South Wales).**

"DX conditions for the first portion

of the month were rather patchy, but for the last week or so things have improved considerably. As far as the broadcast stations are concerned, I have not done very much listening, but those I have logged came in at good strength. Most of the heavy QRN which marred reception lately seems to have cleared up.

"Our old friend EA9AH on 14030kc. broadcasts "News from the Front" both in English and Spanish every morning around 7 a.m. Strong signals reach a peak of R8 here at a quarter past the hour. Of late EA9AH has been very badly QRM'd by a C.W. station.

"On the amateur band the Europeans are again coming in strongly after 6 p.m., when a good number of G's and F's can be logged. At 3 a.m. conditions are exceptionally good: it being quite a simple matter to log all continents.

"Best loggings for the month are LAIF (Norway) and TG1RB (Guatemala)."

**Mr. J. C. Linehan (South Australia).**

"Conditions this last month have not been so hot. The early mornings have been a slight improvement, with W2XE (25.4) best. VQ7LO are

also fairly strong on the 49m. band.

"Around 10.30 p.m. the new South African on 31m., ZRK, is fair. KZRM (31.35) and COBC are other good evening stations.

"The usual German and B.B.C. transmitters are fairly good in the early part of the evening: and after 11p.m. (Central time) are very strong. GSH is steady at R8-9 on 13m.

"An interesting talk by Hon. Mr. Kent Hughes on the recent Empiad in Sydney was heard exceptionally well through VLK (28.51). Signals were R max., with no fading.

"No further trace has been found of the American W2XGB, logged recently on 34m. I think they must have simultaneously changed to another wave-length. (Possibly using W2XGH on 17.33m.—S.W. Ed.)

"I have had great difficulty in getting my receiver to function efficiently on 10m. However, the other night (Tuesday, Feb. 15th.) at approximately 9.30 p.m., I heard U8RS on the amateur band, contacting a VK2. This chap is apparently an American, and when heard was transmitting on 5 frequencies."

**New Palec Test Oscillators!**

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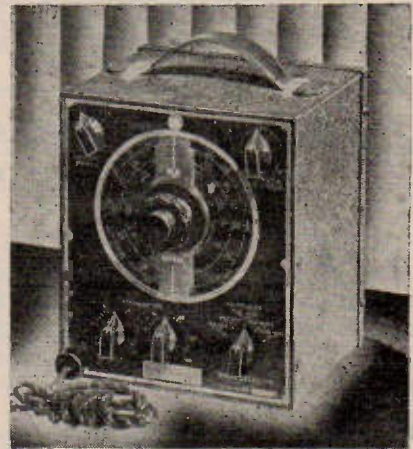
**ATTENUATION:** The most outstanding feature of the Model "DR" and "DE" is their attenuation capabilities on all bands. Cast aluminium coil and attenuator cases, together with correct Signal Generator design, has reduced the minimum leakage ACTUALLY to below 1 microvolt. It enables the operator to align the most sensitive set without disturbing the A.V.C., for in no other way can perfect alignment be achieved.

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Mr. A. E. Bruce (South Australia).

"General conditions have been fair to medium, and at times very good. Most noticeable was the absence of any loud signals during the week ending January 29, when even London was down to just a carrier on two evenings—this was apparently due to sunspot activity. Early in February conditions on the other hand were the best experienced for some months, most of the 13, 16 and 19 metre stations reaching R 9.

"The 31-metre band is quite good in the evenings, but is rather marred by a lot of background noise. 49 metres has definitely improved.

"Morning stations are not very consistent; the best being YDC (19.8). W3XAL is just audible after 8 a.m. (Central time).

"The amateur band is providing good DX. Afternoon reception of American hams is improving a good deal; while from 9 p.m. on conditions are very good."

Mr. H. A. Callander (Tasmania).

"Reception this month has brightened up slightly, and some good DX has been available on most bands. QNR has been much less troublesome.

"Best for the month was the reception of IQA, Rome, on approximately 20m., calling Tokyo.

"The All-Continent hook-ups on the 20-metre amateur band were heard well earlier in the year; and gave me two new countries in SU and HK. The QRA of the new Philippine Is. station, KA1ZL, is P.O. Box 3232, Manila.

"A good number of verifications have come to hand during recent weeks. They include G5OV, J2MI,

W2IXY, W2AZ, W9TIV, W9GIC, ZL4FW, ZL3DC, and JYLP (the "Canberra Maru").

Mr. J. K. Sorensen (Queensland).

"Conditions have been about the same as last month, possibly a little worse. There are quite a number of stations on the 49m. band, but QRN is so heavy that it is extremely difficult to identify them. A station closing in the early morning with "God Save the King" would probably be VQ7LO (49.3). Several of the Americans are also audible on occasions.

"On 19m. the London transmitters have been best, GSO and GSF. The German stations are strong early in the evenings, but later become very weak.

"The midnight news session over DJN is heard amazingly well. At this same time London is at good entertainment value on all bands.

"I have heard the Archerfield aerodrome on 45m. on several occasions, contacting planes in the vicinity. This station can be heard throughout the day, but has been logged well here in the early mornings."

Mr. E. Neill (Queensland).

Mr Neill forwards some interesting information concerning the Saigon, Indo-China station. He has logged their new transmitter on 48.2m. around 7 p.m. (E.S.T.). Mr. Neill mentions that transmissions commence and close with the "Marseillaise". He gives the call-sign of the station as FIXI, but as yet no confirmation of this can be obtained.

The most recent verification cards received by Mr. Neill include the following:—ZL3AY, ZL1IL, PK1ZZ, OA4AL, D3DCK, W8IQE, G5SA,

VE3AEX, VP3BG.

Mr. R. Russell (New Zealand).

Mr. Russell reports slightly improved conditions, especially on the 20 metre amateur band, where he has logged some fine DX of late; especially from South America. Europeans are again coming in well.

His best for the month are:—ZP2AC (Paraguay): PY2LM, PY2BF, PY4BL (Brazil); CX3BI (Uruguay); VS8AA (Bahrain Is.); and XU8XJ (China).

## Amateur Review.

### Calls Heard.

...EUROPE: France—F3HI, F3HL, F3HM, F3JD, F3KH, F8DC, F8KI, F8PK (Kemmis). England: G5ML, G5TZ, G5RV, G5NA, G5OV, G6DT, G6XR, G6LK, G6WX, G6VP, G6NL, G6FS, G6BC, G2VG, G2XV, G2PU, G8IC (Kemmis, La Roche, Russell, Sorensen, Linehan). Holland—PAOMQ, PAOUN, PAOUT (Kemmis). Portugal—CT1QE, CT1PN (Russell); Norway—LA1F (Kemmis). Northern Ireland—GI2CC (Kemmis).

AFRICA: French Morocco—CN8AJ, CN8AM, CN8AV (Kemmis); Spanish Morocco—EA9AH; Egypt—SU1KG, SU1CH (Kemmis. Russell); Southern Rhodesia—ZE1JR (Russell) South Africa—ZU5AC, ZU5AK (La Roche). Madagascar—FB8AA (Kemmis); Reunion Is.—FR8VX.

ASIA: Japan—J2MI, J2NF, J2NG, J2JJ, J8CP (Russell, Linehan, Kemmis, La Roche); Philippine Is.—KA1AF, KA1GL, KA1ZL, KA1CS, KA1AX, KA1YL, KA1MH, KA1ME, KA1ER, KA1HS, KA1EO, KA1JR, KA1AP, KA1BH, KA1VI, KA1CH, KA1MG, KA2OV, KA7EF (Russell, Bruce, Linehan, Sorensen, Callander, La Roche, Kemmis); China—XU8MC, XU8RB, XU8XJ, XU8JM (Kemmis, Russell, Linehan); Burma—XZ2EZ, XZ2DY, XZ2DZ (Kemmis, Russell, Linehan, La Roche); India—VU2CQ, VU2SE, VU2EM, VU2JK, VU2FV, VU2BG (Kemmis, Russell, La Roche, Bruce, Linehan); Dutch East Indies—PK1GL, PK1MJ, PK1MX, PK1VY, PK2WL, PK3GL, PK3WI, PK4WS (Bruce, Kemmis, Russell); French Indo-China—FI8AC (Russell, Linehan, Kemmis); Bahrain Is.—VS8AA (Russell); Ceylon—VS7RA, VS7RF, VS7GJ, VS7LA; VS7MB, VS7JB (La Roche, Bruce, Russell, Kemmis); Malaya—VS2AK, VS2AI, VS2AE, VS2AR, (Linehan, La Roche, Kemmis, Russell); Hong Kong—VS6AB, VS6AG (Kemmis, La Roche); Guam—K6OJG (Kemmis); Hawaiian Is.—K6BHL, K6BJJ, K6BNR, K6CGK, K6CMC, K6FKN, K6GQF, K6JPD, K6KBM, K6KRR, K6LKM, K6MXM, K6NTV, K6NZQ, K6OFW, K6OQE, K6PCF, K6PHT, K6NBQ, K6DTI, K6MXF (Callander, Sorensen, Kemmis).

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CENTRAL AMERICA: Mexico—XE1GK, XE8AA (La Roche, Kemmis); Guatemala—TG1RB (Kemmis); Panama Canal Zone—NY2AE (Kemmis).

WEST INDIES: Cuba—CO2HR, CO2LY, CO2HY, CO7CX, CO8EG, CO8JK (Kemmis, La Roche); Porto Rico—K4FAY; Dominican Republic—HI5X, HI7G, HI7S (Kemmis, Linehan); Haiti—HH5PA (Linehan).

## LIST OF 20-METRE FREQUENCIES.

Dxers who devote most of their attention to the amateurs will find the following list of amateur frequencies of great assistance. Much of the information below was supplied by Mr. V. D. Kemmis, Official Observer for N.S.W.

14000	CP1AA		CT1AY		KA1JR
14010	EA8AE	14120	CE3DW		OA4N
	HC1FG		YV5AP	14260	F18AC
	ZS2N		CE1AH		PK1GL
14018	PK1RI		ZS6AJ		J2KJ
14020	PK3GD		HA8N		OA4AK
	OA4AL	14120	G2PU		VS2AK
14030	ZS6AJ		KA1BH		ZE1JR
	VS6AB	14130	OA4AF	14265	ZT2G
	EA9AH		F3JD	14270	PK6HI
	PK3WI		CN8AJ		K6OJG
14040	XZ2EH		VS7GJ		KA1ER
	VS1AF	14140	HA4A		LU4BL
	ZS2X		LA1G	14280	ZS1AV
14042	VS1AI		G2XV		VP9G
14050	ZS6T		ZU5L		FB8AB
	ZT6Y		ZT6J		J2MI
	ZT6AL		ZS6S		ZT6AM
	XU8HW	14145	ZE1JN	14300	FA3HC
	ON4VK	14146	VS2AK	14310	PK1MF
	OA4AB	14148	KA1ME		PK3ST
14060	CE1AO	14150	VU2DR		ZS3F
	KA1AP	14152	XZ2JB	14314	ZS5M
	J2NG	14170	NY2AE	14320	PKIMX
	ZU6P	14180	VS2AO		VS7RF
14065	ZE1JR	14185	K4SA	14325	ZU6T
14070	HS1BJ	14200	ZL2BI	14330	XZ2BZ
14080	PK6WF		KA1MD	14340	XZ2DY
	LU6KE	14206	CE3DG	14350	VS7JW
	LU5CZ	14210	KA1DT		YI2BA
14090	KA1MM	14220	PK2WL	14360	CT2AB
	LU7AG	14225	XU8MC	14370	ZS5J
	SU8MA	14245	VS1AD	14375	SU1SG
14100	CN8AM		KA1HS		PK4VR
	VS6AG	14250	VS1AB	14378	VU2CQ
	PAOMQ		FB8AH	14380	ZU6AF
14110	TI1AF		J3FK		XU8RB
	PK1MX		KA1KY	14390	ZT6AL
	ZU6N	14252	GM6RC	14398	KA1AN
14115	G6LK	14255	VS7RP		

EARLY awaited by amateurs and set-builders throughout Australia, supplies of the 1938 "Radio Handbook" have just arrived from the States.

Compiled by Frank C. Jones and the technical staff of "Radio," this fourth edition of the Handbook comes in an enlarged and thoroughly revised form. It is obvious that no effort has been spared to provide readers with everything that is latest and best in transmitting technique.

The first two chapters, entitled "Fundamental Electrical Principles and Radio Theory," and "Vacuum Tube Theory and Practice," have been completely re-written, the fundamentals of radio theory being presented clearly and concisely. Next follows a chapter on "Decibels and Logarithms," some useful practical applications of logarithms to decibels being given.

Chapter 4 is entitled "Learning the

Code," suitable circuits being given for code practice sets.

Aerials of all types are dealt with in chapter 5, on "Antennas, Feed Systems, And Coupling Methods," complete data being given on all latest and proven types of arrays.

Chapters 6 and 7, entitled "Radio Receiver Theory," and "Radio Receiver Construction," are of particular interest not only to amateurs, but to set-builders as well. Full constructional details are given of five shortwave receivers, and of an improved regenerative pre-selector.

The sets described comprise a one-valver using a type 19 dual triode, a standard regenerative two-valve a.c. "Gainer," a continuous coverage three-valve t.r.f. amateur receiver tuning from 8 to 215 metres, the 1938 version of the famous "Jones Ultra-Gainer," and a ten-valve de-luxe communications superhet.

Several of these receivers feature a special aerial noise balancer that has excellent possibilities. Briefly, a second "noise" aerial is used, arranged to pick up as much of the power leak type of noise as possible. This is introduced to the aerial coil of the set, and there balances out noises picked up by the aerial proper. Complete details covering the construction of each receiver are given, the entire section being well illustrated with diagrams and photographs.

Unfortunately, space does not permit of a detailed review of each chapter, but a point that should be mentioned is the presentation that has been adopted for buffers and amplifiers. This enables the reader to select the oscillator, buffer and doubler or power amplifier that he prefers, regardless of the type of valve he wants to use. This scheme permits the design of a transmitter employing one of several combinations of the respective units, though for those who so desire, articles covering the construction of transmitters as complete units are also included.

Altogether, the "1938 Radio Handbook" is a first-class publication that progressive amateurs and set-builders will find invaluable.

\*The "Radio Handbook," 1938 edition, by Frank C. Jones and the technical staff of "Radio." Our copy from McGill's Authorised Newsagency, 183-185, 218 Elizabeth St., Melbourne, C.1. Price 9/6, postage 9d.

## VK AMATEUR TRANSMITTERS

**P**UBLISHED below are the additions and amendments for November and December, 1937, and January, 1938, to complete the official list of VK amateur transmitters published in the October issue of "Radio World."

Note:—All call signs given below should be prefixed by the letters "VK."

### VK ADDITIONS AND AMENDMENTS FOR NOVEMBER, 1937.

#### Additions

Call Sign.	Name.	Address.
2AHZ	Jackson, H. P.	17 Baroona Ave., Church Point, N.S.W.
3FE	Constable, H. S.	20 Louise Ave., Mont Albert, E.10, Vic.
4KF	Price, K. F.	Lockyer St., Camp Hill, Qld.
4DU	Dundas, R. L.	Boat Mountain, Murgon, Qld.
2AIA	Eagles J. A.	35 Cotswold Rd., Strathfield, N.S.W.
3ZU	O'Donnell, F. A.	315 Wattletree Rd., East Malvern, S.E.5, Vic.
3GN	Turner, G. A.	26 Cambridge St., Maryborough, Vic.
3VQ	Evans, A. B. D.	12 Dudley St., Brighton, S.5, Vic.
3ZV	Tinkler, A. E.	31 Bridge St., Hampton S.7, Vic.
4OR	O'Rourke, J. S.	Wendel St., Brisbane, S.E.1, Qld.
2AIB	Wells, A. A.	Freemasons' Hotel, Wagga Wagga, N.S.W.

#### Changes Of Address

4VD	Bell, V. S.	Jones St., Wandall, Rockhampton, Qld.
2BM	Martin, B.	37A Wycombe Rd., Neutral Bay, N.S.W.
6KN	Morrison, G. C.	275 Stirling St., Perth, W.A.
5WB	Wilson, H. B.	Mayfair Flats, Thornber St., Unley Park, S.A.
2EQ	McNamara, J. S.	79 Burdett St., Hornsby, N.S.W.
2AHH	Carter, A. R.	2 Flat, "Kentworth," Alexander St. Coogee, N.S.W.
3NC	Bennett, P. C.	196 Auburn Rd., Auburn, E.3, Vic.
2AGT	Cresswell, H. L.	15 Lackey Ave., Coorparoo, Qld. (See also Alterations to Call Signs).
3NZ	Murfett, N. C.	Grey St., Terang, Vic.
4HT	Todd, A. H.	Lind St., Newmarket, Qld.
2UX	Goyen F. M.	25 Glen St., Eastwood, N.S.W.
2AHN	Rogers, J. E.	172 Midson Rd., Epping, N.S.W.
2SN	Nelson, S. S.	3 Modern Ave., Canterbury, N.S.W.
3XA	Groves, G. W.	64 Sutherland Rd., Armadale, S.E.3, Vic.
3JD	Davies, J. C.	24 York St., St. Kilda, S.2, Vic.
4GE	Ginn, E. G.	8 Lamington Rd., West End, Townsville, Qld.
3FX	McCarthy, J. K.	31 Bloomfield Rd., Ascot Vale, W.2, Vic.
2AFB	Dickson, F. P.	C/- K. Blair, Carp St., Bega, N.S.W.
2RV	Huband, R. W.	164 Dewhurst St., Werris Creek, N.S.W.
4ER	Reilly, E. H.	C/- Laidley Motors, Laidley, Qld.
5RZ	Nestrom, O. L.	24 Second Ave., Joslin, S.A.
2UU	Waddle, E. M.	C/- District Hospital, Cairns, Qld. (See also Alterations to Call Signs).
3LD	Richardson, L. R. N.	122 Kooyong Rd., Armadale, S.E.3, Vic.
3YW	Waring, C. C.	Cromie St., Rupanyup, Vic.
2IN	Ayres, J. A.	"Handsworth," Sackville St., Hurstville, N.S.W.
2XH	Manley, M. W.	28 Manning Rd., Gladesville, N.S.W.
2QK	Preston-Smith, C.	"Winchcombe," Morrice St., Lane Cove, N.S.W.
3YO	Woodward, C.	15 Selbourne St., Moreland, N.13,

Call Sign.	Name.	Address.
3NI	Nicholls, A. H.	59 Alma Rd., East St. Kilda, S.2, Vic.
2QD	Dixon, R. H.	171 Beardy St., Armidale, N.S.W.
2AHQ	Quilty, H. E.	11 Middleton Ave., North Bondi, N.S.W.

#### Cancellations

3BS	Splatt, A. B.	Mountain View Rd., Montmorency, Vic.
3KP	Ayre, D. R.	6 Sidwell Ave., East St. Kilda, S.2, Vic.
2NF	Musgrave, J.	28 Brighton St., Petersham, N.S.W.
2AEL	Bailue, I.	19 Church St., Randwick, N.S.W. (Portable).
2AGS	Swaby, M. J.	C/- R.A.A.F. Station, Richmond, N.S.W.

#### Alterations To Call Signs

2AGT	Cresswell, H. L.	Blenheim St., Enfield, N.S.W. Now VK4DL. (See also Changes of Address).
2UU	Waddle, E. M.	Nimbin, N.S.W. Now VK4GZ. (See also Changes of Address).

#### Amendment

3YT	Costello, A. D.	10 Grant St., Ballarat, Vic. Should be 16 Grant St., Ballarat, Vic.
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### VK ADDITIONS AND AMENDMENTS FOR DECEMBER, 1937.

#### Additions

3UG	Sallmann, N. H.	1 Arlington St., Camberwell, E.6, Vic.
5BG	Grundy, R. H.	Edward St., Murray Bridge, S.A.
3IN	Simpson, C. W. A.	39 Tope St., South Melbourne, S.C.5, Vic.
5LW	Kelly, R. D.	9 Harcourt Rd., Payneham, S.A.
3FV	Chick, K. F.	576 Main St., Mordialloc, Vic.
2AIC	Benson, J.	38 Addison Ave., Concord, N.S.W.
2AID	Mitchell, R. S.	50 Brookang Ave., Wagga Wagga, N.S.W.
3ZD	Williams, R. A.	45 Banool Rd., Balwyn, E.8, Vic.
3ZE	Cumpston, L. W.	34 Longmore St., St. Kilda, S.2, Vic.
2AGO	Wilson, H. G.	65 Greenwich Rd., Greenwich, N.S.W.
2AIE	Hocking, E. J.	27 Albert St., Hornsby, N.S.W.
3UU	Lauder-Cridge, W. E.	105 Bulla Rd., Essendon, W.5, Vic.
3TF	Dennis, G. W.	14 Milton St., Footscray, W.12, Vic.
3RY	Smith, R. S.	38 Barrington Ave., Kew, E.4, Vic.
3QS	Wall, J. W.	86 Herbert St., Northcote, N.16, Vic.
2AIT	Tierney, V. E.	5 Transvaal Ave., Double Bay, N.S.W.
5DW	Wreford, A. F.	34 Myall Ave., Kensington Gardens, S.A.
2AIG	Parsons, R. A. B.	19 Frenchman's Rd., Randwick, N.S.W.
2AIH	Parris, K. C.	Dowling St., Bungog, N.S.W.
2AIK	Horne, C. T.	59 Australia Ave., Matraville, N.S.W.
2AIL	Ellis, J. A.	106 Zadoc St., Lismore, N.S.W.
2AIN	Pursell, J. R.	46 Alice St., Lakemba, N.S.W.
3UM	Mitchell, W. T. S.	329 Wattletree Rd., East Malvern, S.E.5, Vic.
4HC	Core, H. J.	Ripon St., Coorparoo, Brisbane, Qld.
4GC	Campbell, G. A.	22 Brook St., South Brisbane, Qld.
3QW	Brown, A.	231 Wood St., Preston, N.18, Vic.
2AIO	Brand, A. O.	Fairview Ave., The Entrance, Tuggerah Lakes, N.S.W.

Call Sign.	Name.	Address.
3IG	Ireland, G. W.,	5 Gillies St., Mitcham, Vic.
4DN	Horn, D.,	Thargomindah, Qld.
9WF	Forman, W. A. D.,	on patrol vessel "Eros," stationed at Rabaul, New Guinea.
3WO	Humphreys, R. E.,	53 Llaneast St., Malvern, S.E.4, Vic.
2DI	Cole, G. F.,	20 Ewos Parade, Cronulla, N.S.W.
2AIP	Thorburn, R. G.,	21 Fernbank St., Marrickville, N.S.W.
2AIQ	Cant, Alan,	14 Harriett St., Marrickville, N.S.W.
3PV	Veall, R. P.,	38 Eildon Rd., St. Kilda, S.2, Vic.
3ES	Callander, A. R.,	34 Halstead St., Caulfield, S.E.7, Vic.
2AII	Cleburne, E. W.,	34 McIntosh St., Gordon, N.S.W.
3IS	Worsley, H. A.,	12 Glencoe St., Caulfield, S.E.7, Vic.
5NA	Ancher, N. L.,	27 Henley Beach Rd., Mile End, S.A.
5UL	Allan, A. J.,	12 Torrens Rd., Ovingham, S.A.
9DM	Mitchell, D. McR.,	Mining Lease D.S.L. 280, Watut River, Terr. New Guinea.
3EI	Watson, L. G.,	23 Redan St., Caulfield, S.E.7, Vic.
2AIR	Griffin, T. N.,	18 Baroona Rd., Northbridge, N.S.W.
4HD	Lindsay, H. M.,	Riley Rd., Nambour, Qld.

**Changes Of Address**

2QX	Warren, J. C.,	C/- W. Goodall, 148 Wileys Ave., Lakemba, N.S.W.
3DG	Giddings, A. W. J.,	Tyers St., Stratford, Vic.
2ZE	Woodman, J. H.,	Bombala St., Delegate, N.S.W.
3EW	Wheller, E. C.,	96 Toorak Rd., Camberwell, S.E.6., Vic.
5EM	Mann, J. E.,	24 Newman St., Semaphore, S.A.
2AIB	Wells, A. A.,	69 Trail St., Wagga Wagga, N.S.W.
6RS	Trew, R. S.,	29 London St., Mt. Hawthorne, W.A.
4RV	Vickary, R. M.,	98 Grafton St., Warwick, Qld.
6WM	Morris, W. B.,	23 Chester St., Subiaco, W.A.
5WH	Barber, W. H.,	101 Boulder Rd., Kalgoorlie, W.A. (See also Alterations to Call Signs).
2AGG	Jones, H.,	Albert St., Speers Point, Boolaroo, N.S.W.
6WG	Green, W. W.,	50 Forrest St., Wiluna, W.A.
5RD	Elliott, R. D.,	Flat 1, "Burnleigh," Esplanade, Kirkcaldy, S.A.
3ML	Cunningham, R. H.,	1449 High St., Glen Iris, S.E.6, Vic.
4SU	Sherriff, E. G.,	113 Hawthorne Rd., Hawthorne, N.E.1, Qld.
2XP	Thompson, J.,	274 Woodville Rd., Guildford, N.S.W.
3LP	Paul, L. A.,	130 Victoria Parade, East Melbourne, C.2, Vic.
4FN	Nolan, F. M.,	587 New Sandgate Rd., Clayfield, N.2, Qld.
7QZ	Brown, B. K.,	50B, Frankland St., Launceston, Tas.

**Cancellations**

2II	Moore, M. J.,	70 Church St., Dubbo, N.S.W.
2ZZ	Clarke, W. R.,	Olive St., Asquith, via Hornsby, N.S.W.
2NN	Cortis-Jones, B.,	62 William St., Roseville, N.S.W.
3ES	Yorston, E. S.,	184 Hawthorn Rd., Caulfield, Vic.
5JK	Kidman, I. M.,	Robertson St., Narracoorte, S.A.
2ADF	North Suburban Radio Club,	Cnr. Brown St. and Pacific Highway, Chatswood, N.S.W.

**Alterations To Call Signs**

5WH	Barber, W. H.,	46 Cottell St., Port Pirie, S.A. Now VK6DX. (See also Changes of Address).
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**Amendments**

2EM	Sutton, A. F.,	28 Elva Ave., Gordon, N.S.W., now 26 Elva Ave., Killara, N.S.W.
2OA	Amalgamated Wireless (A/asia) Ltd.,	12 Muston St., Mudgee, N.S.W., should be 12 Muston St., Mosman, N.S.W.

**VK ADDITIONS AND AMENDMENTS FOR JANUARY, 1938**

Call Sign.	Name.	Address.
<b>Additions.</b>		
2AIS	Graydon, J. F.,	346 Pacific Highway, Lindfield, N.S.W.
3MS	Waters, M. H.,	3 Derry St., Essendon, W.5, Vic.
5WP	Pridham, L. C.,	118 North Parade, Torrensville, S.A.
4JQ	Graham, J. A.,	Connah St., Ekibin, South Brisbane, Qld.
3JI	Jepson, R. R.,	25 Marlborough St., East St. Kilda, S.2, Vic.
4CH	Hawson, T. E. C.,	Macrae St., Woodend, Ipswich, Qld.
2AIU	Smith, R. J.,	18 Washington St., Bexley, N.S.W.
5HS	Scott, W. H.,	Main Rd., Clare, S.A.
2AIV	Jackson, C. J.,	Carool, Tweed River, N.S.W.
9MC	MacGregor, W. A.,	Wewak, New Guinea.

**Changes Of Address**

2ML	McLaughlin, W. R.,	3 Fotheringham St., Taree, N.S.W.
3OA	Winch, R. M.,	Milne St., Crib Point, Vic.
7NG	Jonasson, R. P.,	Waddamana Power Station, Tas.
5JC	Cawthorn, E. J.,	59 Fisher St., Fullarton, S.A.
2ADH	Deaman, F. C.,	76 Anzac Ave., West Ryde, N.S.W.
2AEA	Shoring, T.,	C/o. Burnett Club, Quay St., Bundaberg, Qld. (See also Alterations to Call Signs).
3SC	Sargeant, W. B.,	Wall St., Camperdown, Vic.
2ET	Tormey, E. A.,	Leslie Crescent, Canberra, F.C.T.
4XL	Chapman, F. W.,	Christensen St., Yeronga, S.3, Qld.
2WJ	Peell, W. J.,	228 Boyce Rd., Maroubra, N.S.W.
4DU	Dundas, R. L.,	Crawford, Kingaroy Line, Qld.
2AFF	Roberts, P.,	56 Thorn St., Wagga, N.S.W.
2QY	Moss, A. M. L.,	18 Mundarra St., Clovelly, N.S.W.
6LJ	Mead, J.,	39 Canterbury Terrace, Victoria Park, W.A.
2WM	Piggott, W. L.,	"Beverley," 18 Kellett St., King's Cross, N.S.W.
3VM	Marks, Dr. E. H.,	70 Malvern Rd., Malvern, S.E.4, Vic.
3QS	Roseblade, R. K.,	C/o. Mr. Shelton, 18 Emu St., Enfield, N.S.W. (See also Alterations to Call Signs).
3OU	Williams, J. O.,	12 Mildura Ave., Sandringham, S.8, Vic.
4ZT	McDonald, W. N.,	No. 7, "Cora Lynn," 638 Brunswick St., New Farm, N.1, Qld.
2AGP	Leyden, F. M.,	1 Albert Parade, Ashfield, N.S.W.
4AZ	Sharpe, F. V.,	Whytecliffe Parade, Scott's Point, Redcliffe, Qld.
3RM	Easterbrook, R. W.,	23 Osborne St., South Yarra, S.E.1, Vic.
5BK	Grivell, J.,	C/o. Station 5CK, Crystal Brook, S.A.
3JN	Young, L. G.,	15 Clyde St., East Malvern, S.E.6, Vic.
3DS	Spencer, D. D.,	23rd Squadron, R.A.A.F., Pearce, W.A. (See also Alterations to Call Signs).
3OG	Sawers, T. V.,	43 Cooper St., Essendon, W.5, Vic.
2WU	Macdonald, L.,	20 Sunderland St., Mayfield, Newcastle, N.S.W.
2YA	Black, R. C.,	Derribong St., Trangie, N.S.W.
2DV	Hodder, F. A.,	411 Old South Head Rd., North Bondi, N.S.W.
2ZX	Lumbewe, E. W.,	9A Otho St., Inverell, N.S.W.
2WF	Faulks, R. W.,	7 Modern Ave., Canterbury, N.S.W.
2FI	Wells, A. J.,	No. 7, La Paloma Flats, 45 Birriga Rd., Bellevue Hill, N.S.W.

### Alterations To Call Signs

- 2AEA—Shoring, T., Railway St., Wagga, N.S.W. Now VK4SR. (See also Changes of Address).  
 3QS—Roseblade, R. K., 23 Macartney Ave., Kew, E.4, Vic. Now VK2AIJ. (See also Changes of Address).  
 3DS—Spencer, D. D., Cnr. Queen and Bayview Sts., Altona, W.18, Vic. Now VK6DS. (See also Changes of Address).

### Cancellations

- 2GG—Gue, J. R., 12 Llewellyn St., Lindfield, N.S.W.  
 2AC—Edwards, A. C., 83 Old South Head Rd., Waverley, N.S.W.

- 4JT—Boileau, J. G., Port Moresby, Papua.  
 2JS—Kitto, T. C., C/o. Airsales Broadcasting Co., P.O. Box 123, Newcastle, N.S.W.  
 2BW—Moye, A. S., 1 Roma St., Wagga, N.S.W.  
 2KI—Pickering, A. V., "Ocean View," Blair St., Bondi, N.S.W.  
 6FO—Ollivier, N. F., 26 Merriwa St., Hollywood, W.A.  
 2ZP—Yates, A. G., Prince Alfred Hospital, Camperdown, N.S.W.  
 2IB—Sproule, A. L., 143 Henry St., Werris Creek, N.S.W.  
 2ABM—Jenner, J. L., "Yallambee," Chichester St., Maroubra Junction, N.S.W.  
 3NT—Martin, J. L. A., 14 Hemming St., Dandenong, Vic.  
 3TP—Prentice, T. F., 158 Wattletree Rd., Malvern, S.E.4, Vic.

### Portable Transmitter-Receiver.

(continued from page 8)

vary with different aerial heights and lengths. The transmitter is now ready to go on the air.

The aerial used on the original set was a single-wire matched impedance feeder type, cut for the crystal frequency, which is 7,001 k.c. Particular care should be exercised with the cutting and tapping of the aerial, as this plays a very important part in the final performance, especially as regards working DX.

A slight trouble may be caused in the receiver if the vibrator unit is "hashy." The trouble will be noticeable when the detector is oscillating. To effect a cure, all the receiver "earths" should be run to one point and then run to the earth of the vibrator pack.

However, if this does not fix the trouble, have the vibrator checked, as in most cases, if the "hash" is very persistent, it is due to excessive "splash" at the contacts. In the original unit, no trouble at all was experienced, and the receiver is as quiet and stable in operation as a straight-out battery model.

The combined oscillator and doubler plate current should be about 15 m.a., while the P.A. should draw about 25 m.a. This gives an input to the final of approximately 3.5 watts, sufficient under good conditions to work DX.

Extremely long distances have been worked with the original transmitter, contacts being made with Germany, U.S.A. and New Zealand. Reliable interstate communication may be had on 40 and 20 metres, while the best DX report received so far was from a W2, being RST 569, while two R4 reports have been obtained from Europe. These transmissions were on 20 metres.

On the occasion of the W.I.A. National Field Day, operating from Sublime Point, South Coast, two reports were received from Germany, showing that the signal was getting out, although we were entirely out of luck at not being able to work DX on this week-end.

Telephony has also been tried with this transmitter, using a 1D4 as a

modulator with a single-button microphone, and single choke Heising. Good interstate reports have been received, the average being R5 to R7. However, with the 1D4 on, the vibrator load is a little too high, and will cause the points to deteriorate much more quickly.

Briefly summarised, this portable gives excellent all-round performance. It is one which is worth building, as it gives real enjoyment in operating.

### Police Radio Signals Heard 10,000 Miles.

THE following extract from a St. Joseph, Mo., U.S.A. newspaper, published under the heading "Police Radio Signals Heard 10,000 Miles," exemplifies the interest taken in that country in reports of reception of police transmissions on 9 metres:—

"The voice of the law is as long as its arm—if not longer. From far away Victoria, Australia, a radio operator writes that he has picked up signals of station W9XKG. That is the police department's short wave station. For verification, he repeats messages he heard in part. He got only snatches of the messages because of 'fading,' and it seemed reception faded somewhat dishearteningly just when the operator gave station identification. So, while he got the station call letters, he invariably heard only 'Saint ..... police department,' of the rest of it and wrote to the St. Louis police department.

### Stirs Discussion

"His letter was forwarded here, however, and has stirred animated discussion at Central Police Station on the peculiarities of the ultra high frequency short wave. C. J. Schrank, secretary to the board of police commissioners, went to the atlas and his figures and came up with the estimate that Victoria is almost 10,000 miles away.

"The operator 'down under' is Alan Graham. He was interested in receiving the police station's signals as much because he is short wave editor of the 'Australasian Radio World' as for the fact his set is a home-

built, six-tube superheterodyne set with an ordinary inverted 'L' antenna 35' high and 80' long. He has, however, heard quite a number of other American police stations, he said.

### Big Difference In Time.

"As interesting as anything else about it to the police here was the difference in time reported by Graham, sixteen hours. The first time he heard M9XKC was the morning of Sept. 11, he writes. It was 6.15 p.m. Sept. 10 here. Similarly he heard the local station on Sept. 14, 20, 21, 23 and 30, Australian time.

"The fading, he writes, was 'usually fairly bad' otherwise reception 'always has been fairly QSA5 (good) as the quality of transmission was excellent and the noise level low.'"

### Ducon Co. Now Exclusive Licensee For Aerovox.

Negotiations have just been concluded resulting in the settlement of the litigation between the Aerovox Corporation of New York and the Ducon Condenser Pty. Ltd., of Melbourne and Sydney.

Terms of settlement provide for the recognition on the part of Ducon Condenser Pty. Ltd., of the validity of the Aerovox Australian patents and the purchase by Ducon Condenser Pty. Ltd., from the Continental Carbon Co. Pty. Ltd., late attorneys of the Aerovox Corporation of New York, of the whole of the Continental Carbon Co's. condenser plant, stock and goodwill.

The Continental Carbon Co. Pty. Ltd. is retaining its trading rights in connection with vibrators and resistors.

The Aerovox Corporation has now appointed Ducon Condenser Pty. Ltd. as its attorney and exclusive licensee for Australia and New Zealand.

The Ducon Condenser Pty. Ltd. are consequently now holders of the exclusive right in Australia and New Zealand under Aerovox patents, in addition to the various other patents previously held.



# DX News and Views

A page for  
letters from  
DX readers



**Amazing DX On One-Valver**  
In the February "Radio World" I noticed that HI7G was received on a single 19 receiver. I have received the following stations on a set of



These four views of the German broadcasting system were received from Berlin recently by Mr. Alan Graham. They show (top to bottom):—Broadcasting House, concert and entrance halls, and four radio equipped cars used for outside broadcasts.

this type:—99 VK2's; 28 VK3's; 32 VK4's; 28 VK5's; 5 VK6's; 4 VK7's; VK8XT, ZL4PK, KA1ME, KA1ZL, KA1CS, KA1MH, K6OQE, KA1ER, KA1AF, KA1AP, KA1AH, KA1AE, KA1HS, K6KCC, K6JUY, K6MZK, K6IHF, K6NUJ, KA1DH. W1's AXA, JFG, AO, KKK, KRW; W2's CYX, BMY, IPQ, GO; W3's EWN, AHS, EOZ, ELK; W4's MS, NEI, DLH, DRY, ERG, DMH, DBC, DSY, TEI, HX; W5's WX, AC, FIY, AHK, EYD, DQ; W6's JPD, NR, BKY, AHT, MZD, AGH, GRV; W8's TCC, CCC, PDC, DIA, LPI; W9's GIC, KNH, RUK, KR, KPC, EEE, CQU.

I have also heard KLV, IQE, IQA, DJQ, CQN, DJB, GSG, PCJ, TPA2, VSG, VSO, VR2FF, VS7GJ, VS6AB, HI5X, HI3N, HK1V, P8LX, HH2B, G5RV, HI7G, HI5Y, CX3BL, CM8RC, OA4AI, YV5AA, VS1AF, OA4AB, XU8JM and YF7IA.—J. R. Webb (AW328DX), Belmore, Sydney.

### 207 Stations In One Month

I have spent a considerable amount of time lately in dxing, and between Jan. 4 and Feb. 4 logged 207 stations, comprising the following:—

51 VK2's, 30 VK3's, 28 VK4's and 11 VK5's. VK6's, WZ, WS, YZ, MW, JH; VK7's AB, CL and VK8XT. KA1-AF, EF, MG, BH, MH, HS, CS, ZL, ME; KA2-OV, AY, K4FAY, K6-PJI, KMB, KRG, NZQ, GAS, OJI, FAZ, KGA, BJJ, NTY, MTH, MHY, MXM. W1-JFG, KIB, GED; W2-CQL, AZ, W3BMA, W4DSH and DJQ; W5-EFG, BPD, FVI, FNH, FFR and CCU; W6-CQS, NCW, DUW, MWT, GRS, FCL, BUY, TT, NHB; W8KML and W9ODQ. Also PK1-GL, PK; PK2JN; PK3GD and 4WS. J2NF, J2MI, XU8RB, XU8MC, XE1GK, VS2AK, VS2AE, VE3MD, HI7G, VU2CQ, ZE1JR, CO2BY, F3GR, F3HL, F8XT, VQ4KT, VQ8AE, FR8VX, G6XR, G6WT, CE1AH, FI8AC, XZ2EZ, SM5YU.

All the above stations were logged on 'phone on the 20 and 40-metre amateur bands, using a seven-valve dual-wave commercial receiver. My aerial is a 66-foot doublet, 30 feet high. QSL's are just to hand from VK's 4AB, 2EP, 2AFO, 3NG, 6WZ, 2CE, 4GG, 4EC, while reports are out to J2MI, VK's 4HN, 3EA, 3ZK, 3WA, 4XN, 3ZL, 2TR, 2OQ, 2XU; KA1BH, W4BPD and KA1MH.—C. H. Thorpe (AW342DX), Nth. Rockhampton, Q'land.

### "Sky-King" Gives Good Results.

I built the "Sky-King Dual-Wave Five" last August, and it has not failed to give efficient service yet.

I used a Rola K7 10" speaker, and I have heard few receivers which eclipse it for tone... It is a particularly simple set to build. At the moment my set is not aligned—after making some adjustments recently I found my oscillator had given up the ghost. However even aligned by ear it exceeds expectations.

If any of your readers would like to hear this set they could get in touch with me and I would be only too pleased to arrange for them to come and see me. ( 'Phone JX1710).

I haven't done very much dxing lately, but a few weeks ago I got a veri. from Russia consisting of a postcard showing the Bolshoi Theatre Moscow, a copy of the radio programmes and also a very interesting magazine on the U.S.S.R. in construction. RNE is best at 9 p.m. Sunday evenings on 25m. They are always glad to receive reports. (Don't forget 3d. stamp to Russia).—John T. Waterhouse (AW362DX), Killara, Sydney.

### New Radiokes "Money-Saver" Kit-set Just Released.

Advice is just to hand from Radiokes Pty. Ltd., of Sydney, that a new dual-wave version of the ever-popular Radiokes "Moneysaver" Kit-set has just been released. A working model of the receiver is being displayed at the Sydney Electrical and Radio Exhibition.

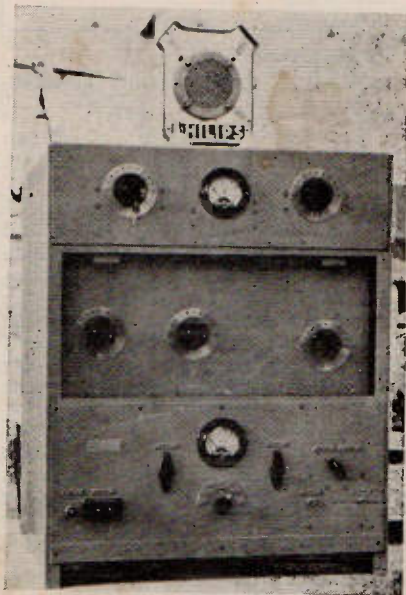
Retailing at £6-19-6, this latest "Moneysaver" provides waveband coverage from 16 to 50 metres, and from 1500 to 550 k.c. Valves used are a 6A8, 6K7, 6Q7, 6F6, and 5Z4.

Readers can obtain a two-colour folder giving full assembly information on this latest Radiokes release by writing to Radiokes Pty. Ltd., P.O. Box 58, Chippendale, N.S.W.

**Phillips Exhibition Transmitter.**

(continued from page 10)

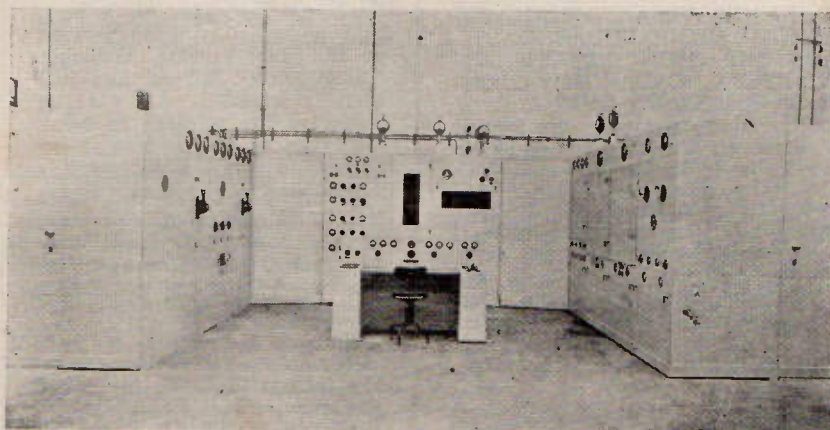
gramophone pick-up. The wave-range, of which the ratio between maximum and minimum wave-length is as two to one, is selected from a range of 17-1,500 metres, a fixed fre-



quency in this range being crystal-controlled. Besides telephony, the transmitter is also suitable for telegraphy.

**Four Philips Transmitters For Indian Government**

This photograph conveys an excellent idea of the layout of the four shortwave transmitters recently constructed by Philips for the British Indian Government. The transmitters all work on 10 kilowatts, with a wave-range from 30 to 90 metres. Each is fitted with a simple wave-length change over device, and is provided with three crystal controls.



One of the four s.w. transmitters recently built by Philips for the Indian Government.

**Shortwave Station Addresses**

Contributed by ALAN H. GRAHAM

**COLOMBIA**

- HJA3—Apartado Nacional 263, Barranquilla.  
 HJU—Ferrocarriles Nacionales, Buenaventura.  
 HJ1ABB—Apartado 715, Barranquilla.  
 HJ1ABC—Intendencia de Choco, Quibdo, Choco.  
 HJ1ABE—Apartado 31, Cartagena.  
 HJ1ABG—Apartado 445, Barranquilla.  
 HJ1ABJ—Santa Marta.  
 HJ1ABP—Apartado 37, Cartagena.  
 HJ2ABC—Cucuta.  
 HJ3ABD—Apartado 509, Bogota.  
 HJ3ABF—Apartado Postal 715, Bogota.  
 HJ3ABH—Apartado 565, Bogota.  
 HJ3ABI—Apartado de Correos 513, Bogota.  
 HJ3ABX—Apartado 26-65, Bogota.  
 HJ4ABB—Manizales.  
 HJ4ABC—Apartado 39, Ibague.  
 HJ4ABD—Medellin.  
 HJ4ABE—Medellin.  
 HJ4ABH—Armenia.  
 HJ4ABP—Medellin.  
 HJ4ABU—Pereira, Caldas.

**ECUADOR**

- HCETC—Casilla 134, Quito.  
 HCJB—Casilla 691, Quito.  
 HCVT—Ambato.  
 HC1PM—Apartado Postal 664, Quito.  
 HC2CW—Apartado Postal 1166, Guayaquil.  
 HC2ET—Apartado 249, Guayaquil.  
 HC2JSB—Guayaquil.  
 HC2RL—Apartado 759, Guayaquil.  
 PRADO—Apartado de Correos 98, Riobamba.

**PARAGUAY**

- ZP10, ZP3AC—Asuncion.

**PERU**

- OAX1B—Apartado 9, Chiclayo.  
 OAX4D—Casilla 2336, Lima.  
 OAX4G—Apartado 1242, Lima.

- OAX41—Ed. Minero 6 piso, Lima.  
 OAX4K—Ocona 158, Lima.  
 OAX4P—Cuzco 25, Huancayo.  
 OAX5A—Tacna 112, Ica.  
 OAX6A—Munoz Najar 141, Arequipa.  
 OAX7A—Montero 43, Cuzco.  
 OAX1A—Elias Aguirre 171, Chiclayo.

**VENEZUELA**

- YVQ—Maracay.  
 YV1RB—Apartado 37, Maracaibo.  
 YV1RD—Apartado 100, Maracaibo.  
 YV1RG—Valera.  
 YV1RH—Apartado 261, Maracaibo.  
 YV1RI—Coro, Falcon.  
 YV2RA—Apartado 37, San Cristobal.  
 YV3RA—Barquisimeto.  
 YV4RB—Valencia.  
 YV4RD—Maracay.  
 YV5RC—Apartado 2009, Caracas.  
 YV5RD—Interior delle Passage Ramella, Caracas.  
 YV5RF—Apartado 983, Caracas.  
 YV5RH—Apartado 1931, Los Jardines, El Valle, Caracas.  
 YV5RJ—Caracas.  
 YV5RP—Caracas.  
 YV6RB—Ciudad Bolivar.  
 YV15RV—Apartado 125, Valencia.

**WEST INDIES****CUBA**

- COCD—Apartado 2294, Habana.  
 COCH—Calle B No. 2, Vedado, Habana.  
 COCO—Apartado 98, Habana.  
 COCX—Apartado 32, Habana.  
 COHB—Apartado 85, Sancti Spiritus.  
 COKG—Apartado 137, Santiago.  
 CO9JQ—Calle del General Gomez No. 4, Camaguey.  
 CMA, CMB, etc.—Cuban Transatlantic Radio Corp., Habana.

**DOMINICAN REPUBLIC**

- HIG—Ciudad Trujillo.  
 HIH—San Pedro de Macoris.  
 HIL—Apartado 623, Ciudad Trujillo.  
 HIN—Apartado 48, Ciudad Trujillo.  
 HIT—Apartado 1105, Ciudad Trujillo.  
 HIZ—Calle Duarte 68, Ciudad Trujillo.  
 HI1A—Apartado 423, Santiago de los Caballeros.  
 HI1J—Apartado 204, San Pedro de Macoris.  
 HI1S—Santiago de los Caballeros.  
 HI2D—Ciudad Trujillo.  
 HI3C—La Romana.  
 HI3U—Apartado 123, Santiago de los Caballeros.  
 HI4D—Ciudad Trujillo.  
 HI4V—Apartado 771, Ciudad Trujillo.  
 HI5N—Apartado 195, Santiago de los Caballeros.  
 HI7P—Ciudad Trujillo.  
 HI8A—Apartado 1312, Ciudad Trujillo.  
 HI8Q—Avenida Espana 12, Ciudad Trujillo.  
 HI9B—Apartado 95, Santiago de los Caballeros.

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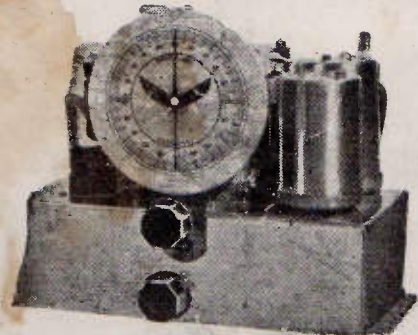
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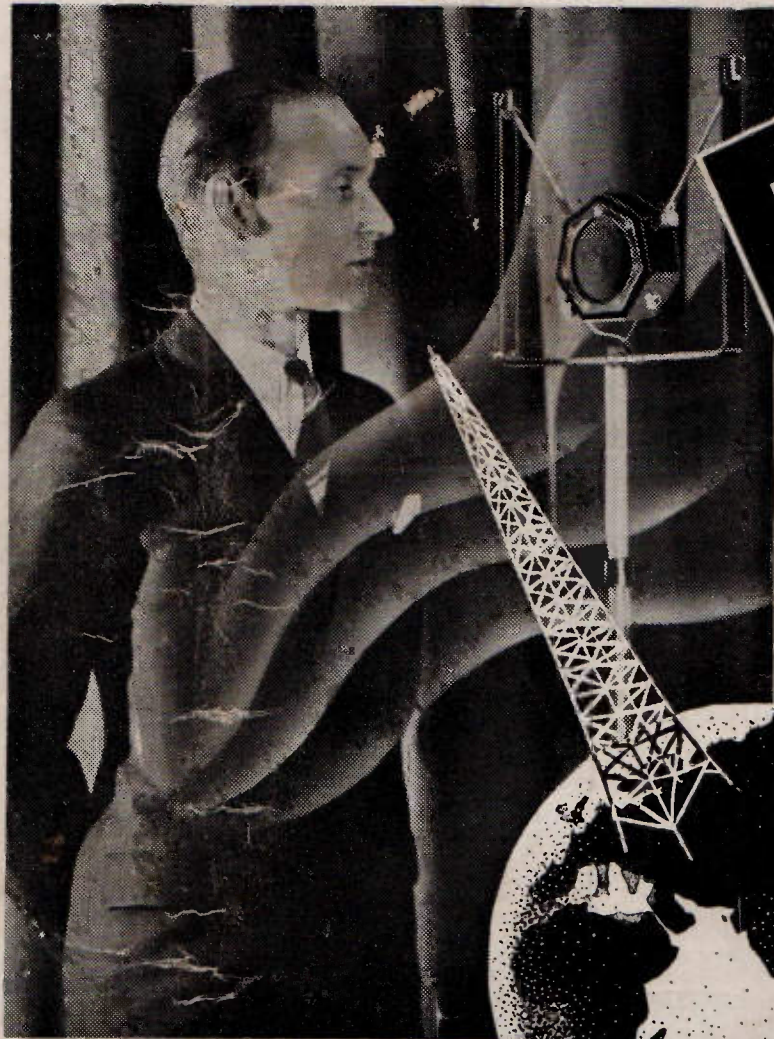
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