

THE  
AUSTRALASIAN

JUNE 1, 1938  
VOL. 3 — NO. 2  
PRICE, 1/-

# Radio World

Registered at the G.P.O.,  
Sydney, for transmission  
by post as a periodical.



—See Page 8

- PUSH-BUTTON DUAL-WAVE SUPERHET USES PERMEABILITY TUNING
- THROUGHOUT—WITH BEAM TETRODE OUTPUT: LATEST LIST OF WORLD
- SHORT-WAVE STATIONS: MORE ABOUT THE "AIR-CELL DUAL-WAVE FOUR".





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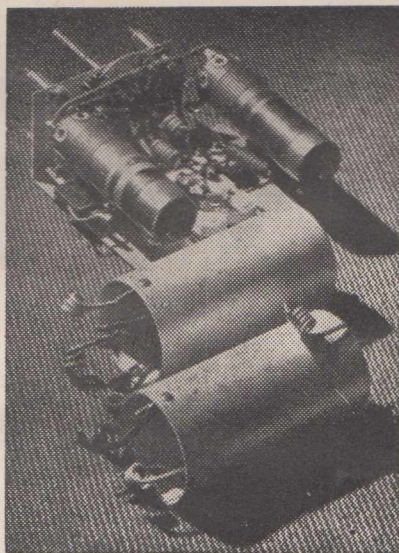
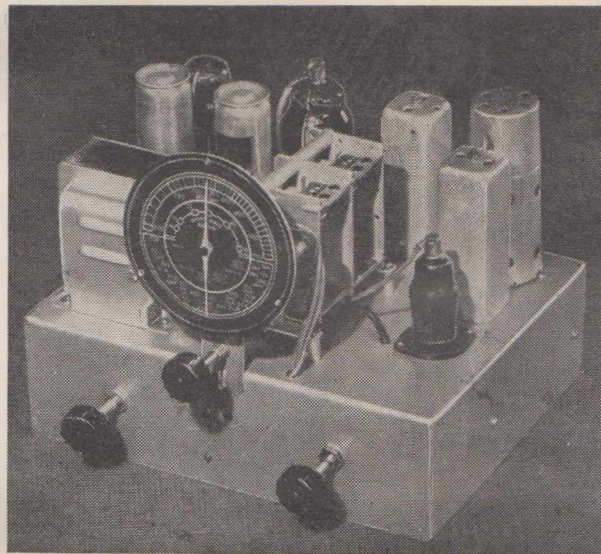


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The "Comet Dual-Wave Four," illustrated alongside and described in last month's "Radio World," is one of the most sensational receivers we have ever tested. Using only four valves, and built around the FOXRADIO Coil Kit illustrated below, the "Comet" in a side-by-side test easily out-performed a standard 4/5 superhet of modern design.

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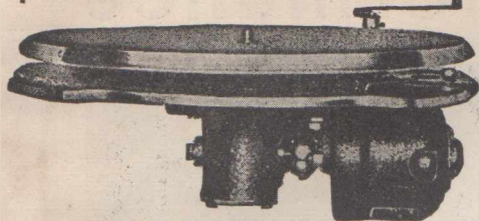
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# THE AUSTRALASIAN RADIO WORLD

Incorporating the  
**ALL-WAVE ALL-WORLD DX NEWS.**

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

Vol. 3.

JUNE, 1938.

No. 2.

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The "Australasian Radio World" is published monthly by Trade Publications Proprietary, Ltd., Editorial offices, 214 George Street, Sydney, N.S.W. Telephone BW 6577. Cable address: "Repress," Sydney. Advertisers please note that copy should reach office of publication by 14th of month preceding that specified for insertion.

Subscription rates: 1/- per copy, 10/6 per year (12 issues) post free to Australia and New Zealand. Subscribers in New Zealand can remit by Postal Note or Money Order.







# RAYWAY

releases . . . .



## 15 to 600-METRE COIL KIT FOR SHORTWAVE FANS AND AMATEURS!

Illustrated above is the new RAYWAY 15 to 600-metre Amateur All-Wave Coil Kit. Using a .00016 mfd. tuning condenser, with or without bandspread, continuous coverage from 15 to 600 metres can be obtained using the five plug-in coils shown.

Precision-wound on moulded formers of the highest-grade imported bakelite, each coil is scientifically planned to give the last ounce of gain from the lowest to the highest frequency covered.

Each kit is packed in a solidly-built box intended for use as a permanent container. Of ingenious design, the box opens to permit the removal or replacement of coils in an instant, while when not in use it can be kept closed to exclude dust.

A sheet accompanying each kit shows typical circuits, with full constants for one, two, and three-valve receivers designed to operate with the kit. Also included are under-socket connections of coils, together with their colour code.

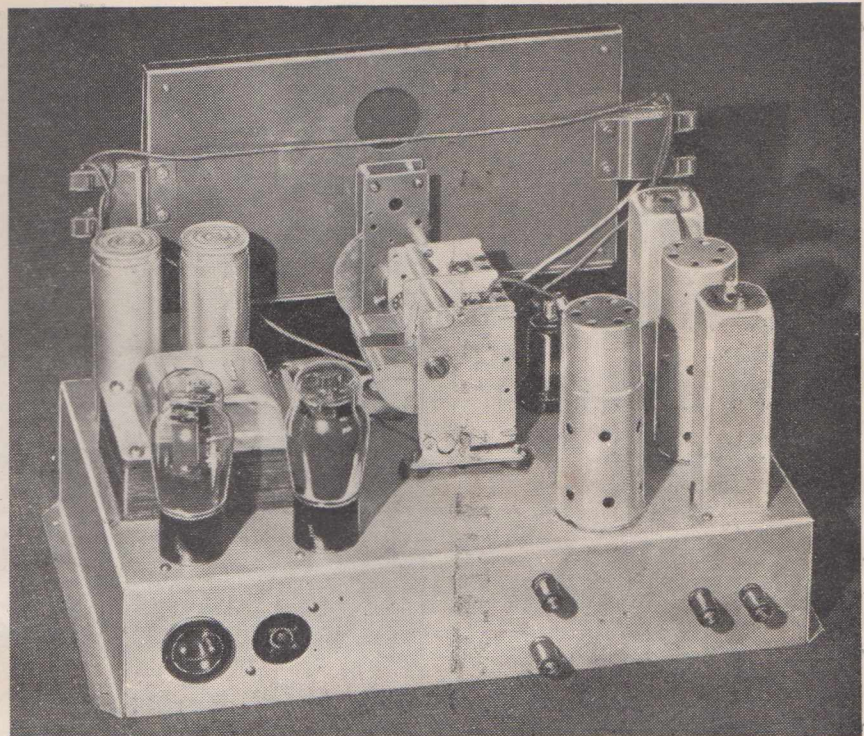
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A rear view of the "Auto-Tune Dual-Wave Five." The 6K8 metal converter is on the right of the condenser gang.

### Sixteen Permatune Coils Used.

The PB8SP push-button unit is permeability-tuned throughout. Sixteen permatuned iron-cored coils are used, eight being mounted on each side of the latest Yaxley push-button switch, which is more compact than that used in the original Crown push-button unit. To keep out dust, the entire unit is built in a sprayed metal box which mounts directly on the cabinet.

### Standard Receiver Or With Auto-Tuning.

The "Auto-Tune Dual-Wave Five" will be described as a standard superhet first of all, and then the modifications necessary to incorporate automatic tuning will be outlined in detail.

This method of description has been chosen for two reasons—firstly, it will be of great assistance to those who merely wish to convert existing receivers, and secondly, there will, no doubt, be readers who would like to build this receiver as a standard job without push-button tuning, for preliminary tests have revealed the "Auto-Tuned Dual-Wave Five" to be an exceptionally fine receiver.

### Many Attractive Features.

Apart from the automatic tuning feature, it incorporates several other new refinements that have a particularly strong appeal. In the first place, the Crown type D22 dual-wave coil kit used covers from 12 to 35 metres

on the short waves, in accordance with the latest trend in commercial receivers. For those who still prefer the ordinary 16 to 50-metre coverage, however, an alternative box is available, type D26.

The mixer-oscillator used is the new 6K8 triode hexode, giving appreciably better performance on the short waves than ordinary converters. The high plate load that is required for this valve for best operating conditions is provided by the primary of the first permeability-tuned i.f. transformer, of which two are employed.

The remainder of the valves are of the new octal-based glass types, a 6G8G being used as i.f. amplifier, diode second detector, and a.v.c. voltage generator, a 6J7G as audio driver, 6V6G beam tetrode output, and 5Y3G rectifier.

### Over Four Watts Output.

The 6V6G beam tetrode output valve is used with inverse feedback. The main characteristics of this valve are as follows.—Heater, 6.3 volts .45 amp., plate and screen currents at 250 volts, 45 and 4.5 m.a., respectively. Bias -12.5 volts, output 4.25 watts.

The increase of power output over that obtainable from ordinary pentodes such as the 42 or 6F6 enables a higher degree of inverse feedback to be applied, with consequent increased reduction of harmonic distortion, so that from a practical viewpoint, quality of reproduction very closely ap-



proaches that given by a triode such as the 2A3.

#### Full Description Next Month.

The photographs give an excellent idea of the layout adopted in the experimental model, which is giving exceptionally fine results.

To effect the conversion to automatic tuning, the volume control is shifted towards the left-hand edge of the chassis, and is balanced by a tone control on the extreme right. This then provides room for a Yaxley 6 x 2 single-bank switch required to make the change-over from ordinary to au-

tomatic tuning and vice-versa. A five-wire cable then passes up through the chassis to the push-button unit mounted above the dial.

Next month a step-by-step description of the assembly and wiring of the "Auto-Tune Dual-Wave Five" will be published, together with a variety of photographs and diagrams that will enable even those knowing little of the technicalities of radio to build the receiver successfully. In the meantime, local set builders who wish to hear the receiver in action may do so by calling at Messrs. John Martin Pty. Ltd., of 116 Clarence Street, Sydney, on or after June 24.

to 1600 k.c. (filling all broadcast band requirements), while position 3 covers from approximately 6 to 10 m.c. (for shortwave work).

#### Two 30's Used.

A type 30 valve is used as r.f. oscillator with a further 30 a.f. oscillator for use when a modulated signal is required. The attenuator is simple but very efficient in its action, providing the very low minimum of output needed for precision alignment of high-gain receivers.

Battery requirements are two 22.5-volt light duty "B" batteries, and two 1.5-volt "A" cells.

#### No Extras To Buy.

The kit of parts is supplied with ready-drilled chassis, panel and cabinet, and is complete down to the last nut and bolt. The construction of the oscillator, together with full details of a simple but satisfactory method of home calibration, are outlined in detail in a 12-page pamphlet that is lavishly illustrated throughout with photographs and diagrams. Copies of this pamphlet are available free and post free to "Radio World" readers writing Slade's Radio Pty. Ltd., Lang Street, Croydon, N.S.W.

#### Calstan Combination Valve-Tester and Multi-Tester.

A sample of the Model 223 Calstan combination valve-tester and multi-meter has just been received for test from Slade's Radio Pty Ltd., N.S.W. This instrument is particularly flex-

(Continued on page 48.)

## Calstan Test Oscillator Now Available In Kit Form

In addition to some form of multi-meter, which is always essential to any radio experimenter, a modulated test oscillator of reasonable accuracy is indispensable not only to servicemen, but to set-builders as well. The performance of any superhet using ganged tuning depends wholly on its alignment, and it is impossible to ensure accuracy in this respect by guess-work.

Of course, there are coil kits on the market that have been pre-tuned to give satisfactory operation, but to those who are constantly encountering receivers that require accurate alignment to give peak results, then doing the job satisfactorily by ear is next to impossible.

Realising this, Messrs. Slade's Radio Pty. Ltd. have released a complete kit of parts covering the con-

struction of an up-to-date and dependable all-wave test oscillator, retailing at the very reasonable figure of seven guineas, including valves and batteries.

#### Metal Cabinet Provides Ample Shielding.

As shown in the illustration below, the oscillator is housed in an attractive metal cabinet with an engraved panel and precision vernier dial. To give the all-wave coverage needed for servicing modern receivers, and to eliminate the need for laborious coil-changing every time a different wave-band is required, a compact coil assembly and switch are provided.

Position 1 of the three-position switch covers from approximately 150 to 500 k.c. (taking in all intermediate frequencies in common use in Australia). Position 2 covers from 525

Make sure of  
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## M A S T E R

### RADIOVALVES

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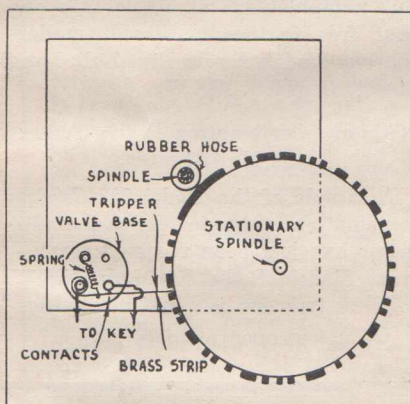
# Radio Ramblings

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

## Calling CQ Automatically

For the amateur who does most of his transmitting in morse code, it is very handy to be able to fill in the log book, or do some other little job in the shack while the station is automatically calling CQ. An old gramophone can easily be made to do this job, and still be used for playing records. This is how the idea was put to work at VK2UJ:

First take the turntable off and push a piece of tyre pump hose about half an inch long on the spindle; this is to drive the turntable by friction. If it is found that the rubber hose is not true on the spindle it will be necessary to wind up the motor and true it up lathe fashion, using a coarse file as a cutter. Now another stationary spindle should be fixed in one corner of the top of the gramophone,



phone, so the turntable is turned without slipping by the rubber covered spindle. Washers may be required on the stationary spindle to raise the turntable to the correct level.

For the make and break unit an old four-pin valve base is used. It is clamped down by a screw through a hole bored in the centre. One end of a piece of sheet brass 2in. long and 1/2in. wide is bent to form an eye and fitted to a pin on the valve base. This is held against the next pin by a little coil spring, one end of which hooks on to a pin on the opposite side and the other on to the brass strip by means of a small hole bored through it half way between the two valve pins. A small bead of solder on the brass strip where it touches the pin and also on the pin itself will make good contact points.

One end of a length of twin flex long enough to reach from the gramophone

to the regular key is soldered to contact and pivot pins inside the base and the other end goes across the key.

The morse characters are burned into the edges of the gramophone records, but they can still be played as usual as the notches are only about an 1/8in. deep. For this job two flat pieces of iron at least a foot long are needed, one for the dots 1/16in. wide and one three times as wide for the dashes. Possibly a piece can be found three times as wide as it is thick. The irons should be heated less than red hot or else they will burn too quickly. Care should be exercised with the spacing, but this is not difficult, as it can easily be guessed with a little practice. It takes only about ten or fifteen minutes to go around the record, which is much quicker than filing. The record will now present a very rough appearance, but after cleaning off the charred material with a knife, quite a neat finish will be obtained.

The tripper should be adjusted so that it makes contact as it enters the gaps and brakes it as it comes out by loosening the screw holding down the valve base and turning the unit a little either way until the right position is found and then tightening the screw. The diagram will explain everything not clear in this description.

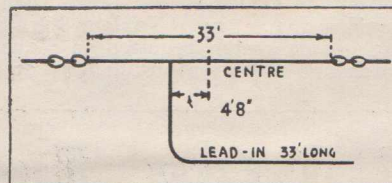
One record in use here sends out CQ three times followed by "de VK2UJ," and another the word "test" three or four times, followed by "de" and call-sign. Others could be made to send a series of "V's" for test purposes. Don't forget to send the "K" or "go ahead" signal by hand after switching off the CQ record when going "over."—H. W. Unger (VK2UJ), Alectown, via Parkes, N.S.W.

## Tuned Aerial For 20 M. Band.

I am enclosing details of a tuned antenna I am using for reception on the 20-metre amateur band. It increases the signal strength considerably, and when no stations can be received with the usual aerial at readable strength they can be received comfortably with this aerial.

The sketch shows the aerial, which is 33ft. long, the 33ft. lead-in being taken from a point 4ft. 8in. from the centre. If 33ft. is too short, use 66ft. or 99ft. If the aerial is made 66ft.

long and is tapped 9ft. 4ins. from the centre, and using a lead of 66ft. long,



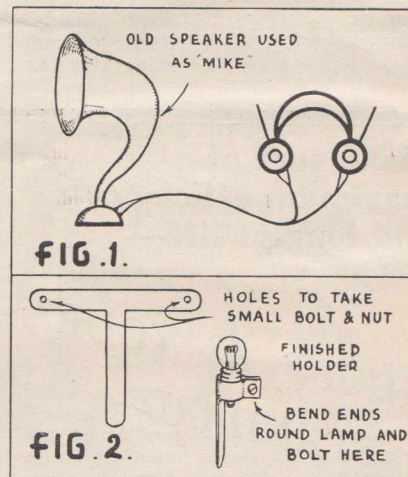
the antenna can be used on the 40-metre band. — J. K. Sorensen (AW316DX), Gympie, Queensland.

## Making Galena Crystals.

Galena crystals can be made by melting a piece of lead about the size of a pea, in a teaspoon. Then add one gram of sulphur and stir the mixture with a piece of wire. When cool you will have a crystal ready for use.— Ian L. Griffin (AW285DX), Marong, Bendigo.

## Inter-Room Communication System.

A good form of home telephone system can be constructed from old pairs of headphones and speakers. If the unit used for the microphone portion



be of the permagnetic type, no battery is required, but better results will be obtained if one is used.

Fig. 1 shows the method of connection. These instruments could be mounted in cabinets if desired.

Excellent pea-lamp holders can be made by cutting and bending a sheet



# Keen Low Prices On Complete Kits Of Parts

## The "AIRCELL" DUAL-WAVE 4

Designed especially for "Air-cell" operation, the "Air-Cell Dual Wave Four" fully described in this issue should be particularly popular with country readers. Note the special price for the complete kit of parts—order one to-day. Vealls pay freight to your nearest Victorian Railway Station.

COMPLETE KIT **£12-10-0**

## The "SCOUT" BATTERY THREE

Three-valve battery sets have always been popular, owing to their low first cost and upkeep. The sensitivity and reliability of the "Scout Battery Three" is such that it can be recommended with every confidence. Note Vealls special price for the complete kit—everything necessary to build the complete chassis, including valves and speaker.

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## The "COMET" Dual-Wave Super

Read the full constructional details in last month's issue of the "Australasian Radio World" . . . learn how easily you can build the "Comet" Dual-Wave Superheterodyne. . . . Note the special low price for the complete kit—everything necessary to build the chassis, including valves and speaker—a set you'll be proud to own . . . to demonstrate to your friends. Order a kit to-day.

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A.R.W. 6/38.

of 26 gauge aluminium to the shape shown in Fig. 2.—Ian L. Griffin (AW-285DX), Marong, Bendigo.

★

### "Fidelity Eight" A Fine Set

I have been a reader of the "Radio World" since November, 1937, and have found it a very excellent magazine. I have built the "De Luxe Fidelity Eight" from your circuit and have found it a particularly fine set which has given me the uttermost satisfaction and pleasure.—Donald A. Ashford, Bowenfels, N.S.W.

★

### Increasing Headphone Sensitivity

Phones can be considerably "pepped up" in the following manner. From an old photographic film cut a disc of the same as the original diaphragm. From the latter cut a disc three quarters of an inch in diameter and glue it to the exact centre of the celluloid disc. This results in greater sensitivity and clarity of tone.—F. A. Burke, Waverley, Sydney.

★

### Latest Shortwave Loggings.

For the past three weeks, while on vacation in the Woy Woy district, away from the din and strife of the big city, I found that 33ft. of wire attached to a tree 15ft. high gave me wonderful results, but conditions have not been too good. However, I might add that I didn't go out of my way specially to collect "new scalps!"—just to make casual observations.

First of all I found that the May Day broadcast from U.S.S.R. could be heard on almost any band from 19 to 40 metres. On May 1 at 10 p.m. a station was heard on 20.50 m., like African language, didn't get call sign (mass cheering). On May 2 a station was heard on 43 m. speaking Spanish or similar language at 6 a.m.; also 36.50 m. and 38.25 m. like loud-speakers in background. Then I find our old friend CSW, Lisbon, on 27 m. coming in R7 to 8 at 6.30 a.m. On 25.68 m. W1XAL was heard at R7 at 8.15 a.m. on May 2 asking for reports, and referred to sun spots on shortwaves. Also W8XK on 19 m. was a good R8.

On May 3 PCJ2 at 5.30 p.m. on 19 m. came in at a good R8 with a very fine programme, asking for usual reports on reception to be sent to P.O. Box 2703C, Sydney.

On May 4, OLR, Prague, was heard on 25 m., R8, at 7.30 a.m. This station was all over the place; first on 25, then 19.31, then back to 25 m.

May 5, KZRM 31 m. band, R8, 7.30 p.m. A bit of jamming here; VLR or VPD2, I think, otherwise quite good.

May 6, RNE, 25.20 m., 2 p.m., R8. English session—what a good Scotch accent this announcer has! Referred to opening of Arts Exhibition.

On May 8, Japan on 20.5 m. was good R7 at 6.45 a.m. EHQ, National Spain, 6.40 a.m., 30.7 m. good R8. 7 a.m., Russia on 36.2, good R6-7. 7.15 a.m., OXF, Denmark, 31 m. band R7-8, very clear signal. May 9: Radio Colonial, Paris, 9.15 a.m., 19 m. band, R7. Some of the amateurs heard include: LU4BC, YV1AA, XE1GK, VE3MD, VE4JJ, VE5NY, VE5PE, XE2XE, VE5KJ, VE5HU, F8LX, F8LZ, F8XT, F3KH, G6RH, G6KL, G2QT, HK1FC, HH2AK, CO8JK, J2LL, PY2IM, and KA's, K6's, K7's, XU's, and W's by the handful.

My latest QSL's are from W's 1BLO, 8CPC, 8CGU (7BCU 2nd), 9DKU, 9IAC, 9DOP, 9PTY, 9JIE, 9DQD, 9WOW, 5BKV, 4LU, 4AGB, 3ASG, 3FII, 2FHJ; K6MXM, K6BNR, CO7CX, ON4VK, HC1JB, VP5PZ, XE2FC, LU1QA, LU9BV, VU2AU, G8OT.

Mr. H. G. Mephram, of 33 Baladana Road, Derby, England, would like to

### The Front Cover.

This month's front cover shows the B.B.C.'s mobile television unit in action at the Oval, famous ground of the Surrey Cricket Club. Results were highly successful.

—Photo courtesy B.B.C.

correspond with a VK "ham." Incidentally, I have a QSL card and would like to exchange with club members or others.—W. M. Chapman (AW112-DX), 3 Dowling Street, Waterloo, Sydney.

★

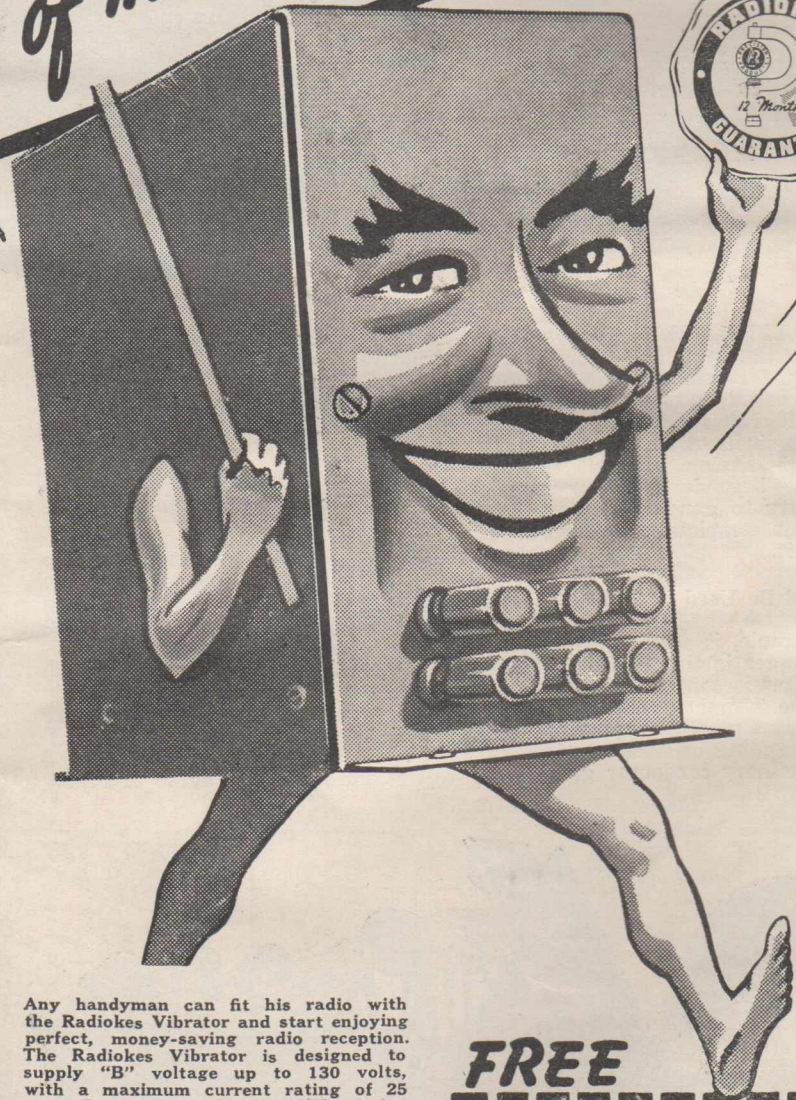
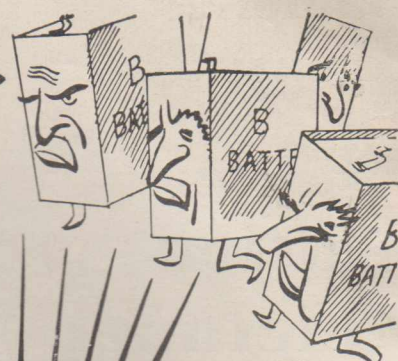
### 5UX Was Clare's First "Ham."

I notice on page 26 of your April issue an announcement stating that Mr. W. H. Scott is Clare's (S.A.) first "ham." I wish to correct this statement, as I was stationed at Clare for four years (1932-36), and during a part of that time had a small T.P.T.G. rig working on 7 m.c. The rig was self-excited, using a TBO/410 and a UX210 in parallel with an input of 12 watts to a half-wave Zepp. Although this was working for only a few months, among some of the hams QSO'ed from that location were: VK's 4PK, 5QR, 5DQ, 3MR, 3EK, 3XK, 6OW, 3LN, 3XF, ZL1CK and others.

The radio club mentioned came into being while I was at Clare, although studies prevented me taking any active part in its activities.—Leslie W. Wallbridge (VK5UX), Peterborough, S.A.



*I'm here to save every  
BATTERY-SET OWNER  
a lot of money!*



**M**AYBE you don't think of the batteries in your set as the wolf behind the door, but stop and think—how many times a year do you pay £2 or £3 for a new set of "B" batteries? It becomes expensive, this fun, even over 12 months and ever so much more over several years.

Here, then, is one reason why you should install as quickly as possible the Radiokes Vibrator in your present set. After you pay its initial low price, you have no other expenses—no more replacements, nothing to go wrong, or run down. Your accumulator looks after everything. For years to come the Radiokes Vibrator gives you perfect, unvarying service. Never again will you have the troubles you had with run-down batteries—distortion, whistles, squeaks, weak volume. You get the same reliable performance as the owner of an A.C. set in the city. And the beauty of it is that you can fit it yourself.

**You too can fit the  
RADIOKES  
VIBRATOR  
to your radio & make  
it BATTERY-LESS!**

**List Price £5/5/-**

Any handyman can fit his radio with the Radiokes Vibrator and start enjoying perfect, money-saving radio reception. The Radiokes Vibrator is designed to supply "B" voltage up to 130 volts, with a maximum current rating of 25 m.a. It can be used with ANY existing battery set, employing either 2-volt, 4-volt or 6-volt valves. Small in size and neat in appearance. Fully guaranteed for 12 months. Easy-to-follow instructions accompany each unit. You can't go wrong. So why hesitate—the list price of the new Radiokes Vibrator is only £5/5/-. Get it from your nearest high-class radio dealer. Stocks are held by all radio wholesale houses throughout Australia and New Zealand. If you have any difficulty communicate direct with Radiokes Pty. Ltd., cnr. Vine Street and Vine Lane, Redfern, Sydney.

**FREE**

Radiokes Pty. Ltd.,  
Vine Street and Vine Lane,  
REDFERN, N.S.W.

Please send me your free folder describing the Radiokes Vibrator, and giving full installation instructions.

NAME.....  
ADDRESS.....

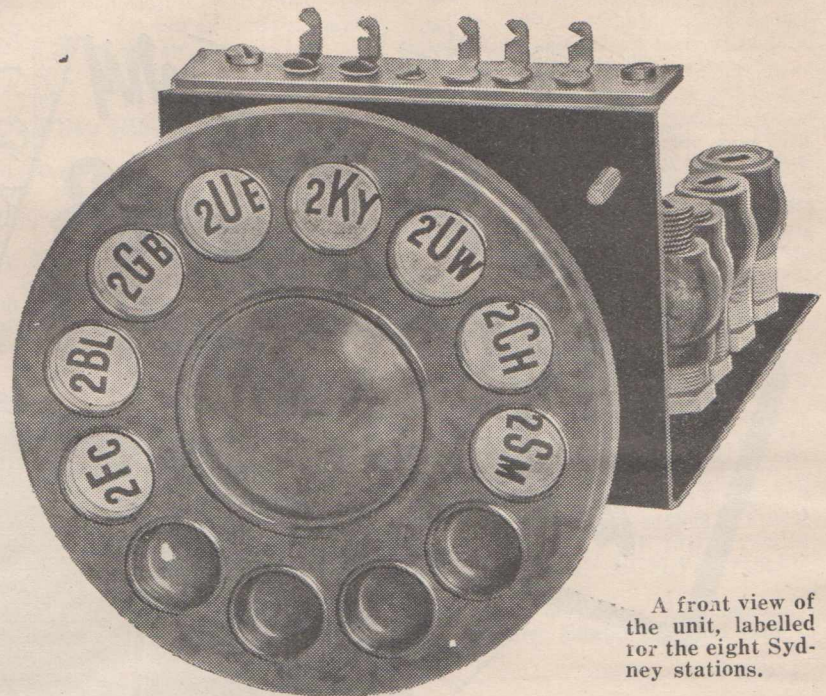
A.R.W. 6/38.



## Radiokes release . . . . .

# Eight- Station Teletuner

Details of the new Radiokes Teletuner unit, designed to give automatic tuning on up to 8 local stations, are given in the article below.



A front view of the unit, labelled for the eight Sydney stations.

**A** PARTICULARLY effective reply to the demand for pre-tuned units, for incorporation in automatically tuned receivers, is the release by Radiokes Ltd. of their new Teletuner unit illustrated on this page.

An eight-station pre-set control unit, it has been designed for use as an auxiliary to gang condenser tuning, or as a completely self-contained tuning unit.

### Could Be Used In "Comet."

For example, it could, with several minor changes in the locations of the front-of-chassis controls, be incorporated in the "Comet Dual-wave Four" described last month, to provide both automatic tuning on local stations as well as ordinary condenser gang con-

trol on broadcast and shortwave. Alternatively, the condenser gang and dual-wave unit could be omitted altogether, and the Teletuner incorporated to provide local station reception only.

To ensure freedom from drift, both aerial and oscillator circuits are permeability-tuned.

Contrary to usual practice, the switch has been incorporated in the earth potential ends of the tuning coils, and by means of a shorting system of switching, all unwanted coils and switch leads are reduced to earth potential.

This makes for extreme stability of alignment; in other words, it is unnecessary to keep moving from coil to coil and then back again to adjust

Due to the coverage of the coils, any eight stations on the broadcast band can be selected.

Sensitivity, under 15 microvolts; selectivity, average 80 k.c. at 104 microvolts; osc. grid current, average 250 microamperes.

### VK2ME, 3ME And 6ME — Schedules For June.

The following transmission schedules will be observed by shortwave stations VK2ME, VK3ME and VK6ME during June.

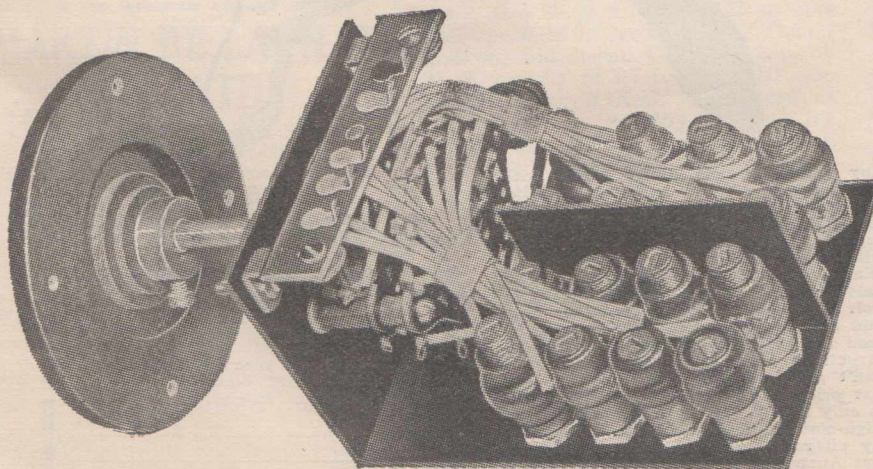
**VK2ME (31.28 m., 9590 k.c.)**  
Sydney Time G.M.T.  
Sundays: 3-5 p.m. 0500-0700  
8 p.m.-Mdt. 1000-1400  
Mondays: 2.30-4.30 a.m. 1630-1830

**VK3ME (31.5 m., 0510 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)



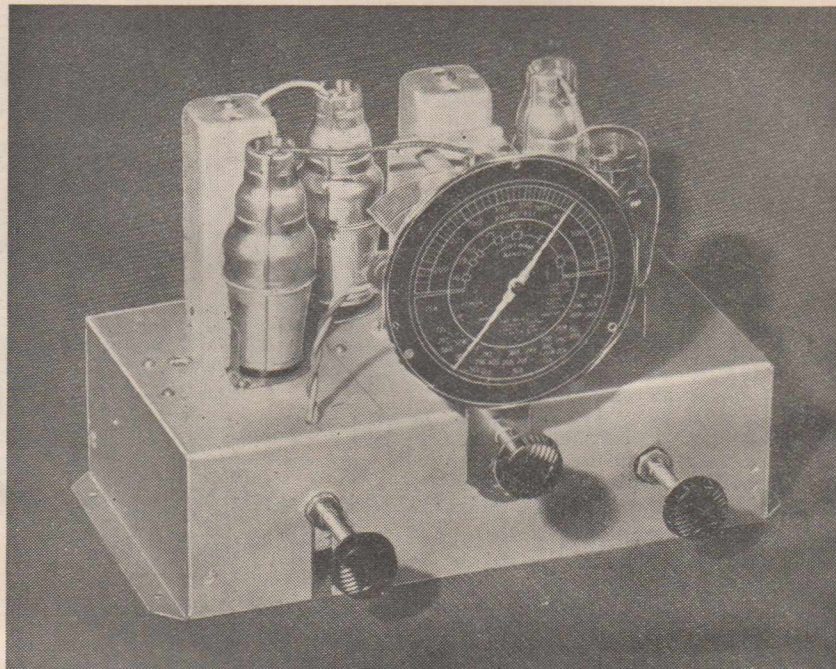
This rear view illustrates the remarkable compactness of the unit, which is permeability-tuned throughout. It could easily be fitted to many existing receivers, with little or no modification.



More About The . . .

# AIR-CELL D.W. FOUR

Further constructional and alignment pointers are given in this concluding instalment.



THOSE doubtful of their ability to wire the "Air Cell Dual-Wave Four" from the circuit will find below a sketch giving the main under-chassis wiring. To avoid confusion, the filament wiring has been omitted, though this is particularly simple to complete.

### Completing The Filament Wiring.

On the four octal valve sockets the filament lugs are indicated by open circles. The "A-" terminals are bonded together with 16-gauge tinned copper wire used as an earth line. The "A+" lead from the battery socket runs through the .720 ohm voltage dropping resistor to a lug on the

bakelite strip mounted near the 1C7G socket. The lead from this lug, marked "To Fil.", is taken to the "A+" lug on the 1C7G socket. A further lead runs from this to the corresponding lug on the 1D5G socket, and so on until all four sockets are wired.

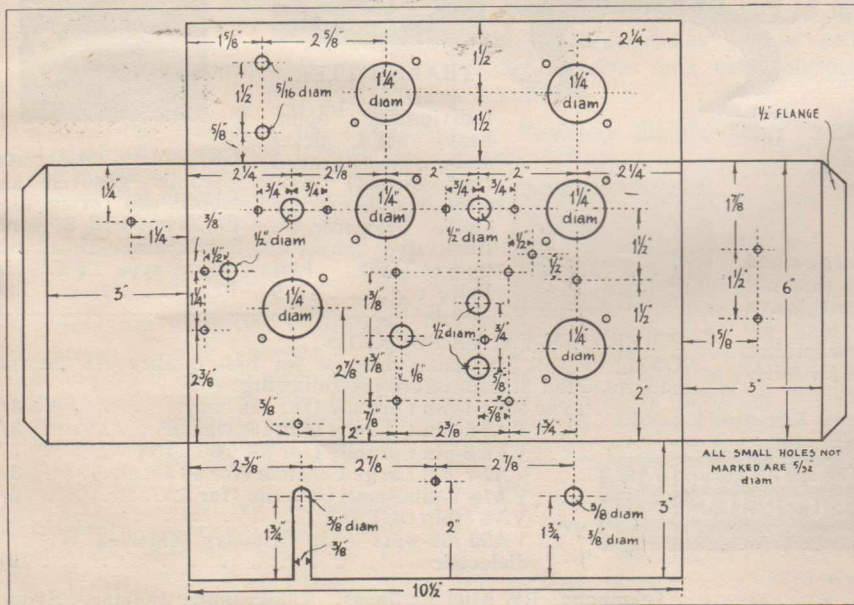
### Mounting And Wiring The Coil Unit.

Following this, the assembly can be completed as outlined in last month's issue and the wiring completed as far as possible without the dual-wave unit being mounted. Twelve leads run to this unit, as follows:—

- 1—Green lead on unit.
- 2—Red lead on unit (oscillator "B+").
- 3—Green lead on unit (a.v.c. bottom of aerial grid winding).
- 4—Blue (padder).
- 5—To lug on unit to which is attached red lead (oscillator "B+").
- 6—Green lead on unit (oscillator plate).
- 7—Yellow lead on unit (oscillator grid).
- 8—To dial light lug on wavechange switch.
- 9—To lug on unit to which is attached green lead (aer. sec.).
- 10—Earth busbar on unit.
- 11—Yellow lead on unit (aerial section).
- 12—Yellow lead on unit (oscillator section).

With the unit in place, the wiring should be thoroughly checked over, valve shields can then be fitted and the valves plugged in. Next, connect up the batteries together with the aerial and earth leads and plug to the speaker. Switch the set on, advancing the volume control, and it should be possible to tune in a station.

The alignment procedure is simple. Tune in a station towards the lower end of the broadcast band, and adjust the oscillator trimmer on the unit for maximum response. Now rotate the dial to a station near the other end of the band, and adjust the padder for greatest volume. While the padder screw is being rotated, the



Dimensions for stamping and drilling the 18-gauge steel chassis are given in this sketch.

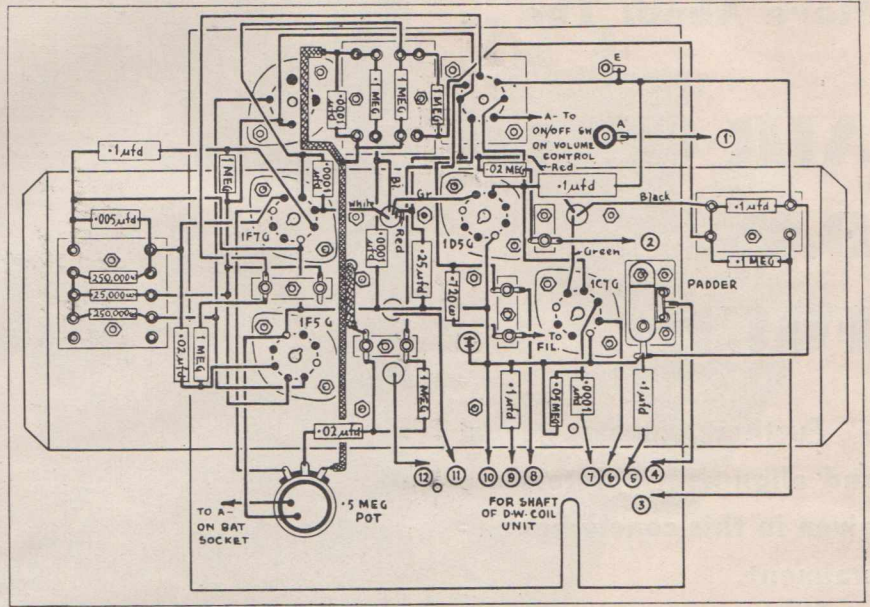


dial should be rocked backwards and forwards to keep the station tuned in.

These two operations can then be checked, and the trimmers on the i.f. transformers very carefully adjusted for maximum response. It should not be necessary to move these more than a fraction of a turn, and as well the original settings should be marked so that the trimmers can be returned to these positions as desired.

With regard to the alignment, it should not be necessary to move the trimmers more than half a turn, while the shortwave coils require no adjustment whatever.

It will be found that for a four-valve superhet, the "Air Cell Dual-Wave Four" gives excellent results, though, of course, the set should be very carefully wired and aligned. It may be found that with a long aerial there is a slight tendency towards instability with the volume control rotated full on. If this occurs, it can easily be cured by the simple expedient of shielding the lead from the first i.f. transformer to the grid of the 1D5G i.f. amplifier, and earthing the shielding.



The under-chassis wiring of the "Air-Cell Dual-Wave Four" is given in this sketch. The numbered leads shown connect to the dual-wave unit, as indicated in the accompanying article.

# STONKED?

**TRANSMITTER DIALS.**  
Individually spun, heavy solid nickel dials with engraved (not etched) divisions and handsome knob. Diameter 4". Illustrated above, type EXD. List Price . . . . . 12/9

**CERAMIC Coil Formers**  
Ceramic grooved and ribbed coil forms, 2½" diameter, with 5" winding space. Illustrated above, type TFX. List Price . . . . . 14/6

If your short wave work is giving you a large-sized "sock" . . . don't sit down and take it! Scrap that old junk and buy "Raymart" Craft A Creed Short Wave and Ultra Short Wave Gear. "The Friendly Wholesale House" stocks everything radio and electrical at the **LOWEST PRICES IN THE STATE.**



- AMERICAN VALVE SOCKETS.**  
Owing to the increasing demand for first quality HF ceramic sockets, John Martin offers the following:—
- Type VA4 4-pin Ceramic (for 210 etc.) . . . . . 3/-
  - " VA5 5-pin Ceramic (for 46, 47, etc.) . . . . . 3/-
  - " VA6 6-pin Ceramic (for 58, 6D6, etc.) . . . . . 3/-
  - " VA7 7-pin Large Ceramic (for 59 53, etc.) . . . . . 3/-
  - " VA7S 7-pin Small Ceramic (for 6A7, etc.) . . . . . 3/-
  - " VA8 8-pin OCTAL . . . . . 4/-
  - " VA50 50-watt (Air Ministry XMB262 HF dielectric) . . . . . 12/6

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THE  
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# Fear's Radio News

F. J. W. FEAR & CO. - - - - 31 Willis Street, Wellington  
New Zealand :: Telegrams: "FEAR"

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FOR  
EVERYTHING  
IN RADIO

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

## "MEISSNER MICRO 14" Is Finest Communications Receiver Yet

- FEATURES :**
- Band coverage from 5 to 550 metres.
  - Electric bandsread.
  - Band expansion.
  - Crystal filter.
  - Beat frequency oscillator.
  - Noise silencer.
  - Pushpull output (using 2-6V6G's).
  - Ultra modern in every detail.

### Better Performance And Wider Band Coverage Than Any Other Receiver

In the "Meissner Micro 14" we are proud to present a communications receiver that is second to none. Covering from 5 to 550 metres, every worthwhile modern development has been built into this sensational 14-valver, which uses the latest world-famous Meissner five-band coil assembly. This comprises the r.f., mixer, and oscillator stages, and is supplied ready-wired and aligned. Thus the most critical portion of the receiver has been completed for you, and has been air-tested to ensure peak results.

We can supply a complete kit of parts for this receiver, or for any portion of it, at a price to suit everyone's pocket.

**WRITE FOR OUR DETAILED QUOTE NOW !**

### Unequaled Range of U.T.C. Transformers Now Available

The United Transformer Company of America manufactures the most complete range of quality transformers for every purpose—for amateur requirements, set replacements, public address systems, broadcast or special purposes. For amateurs, the U.T.C. Vari-Match modulation transformers match all audio and class "C" valves, and give 100 per cent. efficient transfer of audio power.

Send For Descriptive Catalogue.

### Meissner Quality Products

Meissner coil assemblies and tuning units are unsurpassed for high gain, accuracy and dependability. A complete range of coil assemblies is available, covering from 5 to 2000 metres in 5, 4, 3 or 2-band units.

Also available are Meissner i.f. transformers, crystal filter beat oscillators, noise silencers, etc.

Write Now For Further Details

### The Alpha Centaurus Five

1938 version of the famous "Comet." the "Alpha Centaurus Five" incorporates band-pass tuning, high efficiency "Micro" coils, metal valves and semi-telephone dial.

Complete kit, including 8-inch speaker . . . . . £11/18/6

### Red-Hot or White-Hot

. . . They'll Take It !

Eimac Transmitting Tubes are the biggest step forward in design and performance in the field of radiation-cooled tubes made in over a decade. Tantalum Plates and a special non sag thoriated tungsten filament. Eimac Tubes will stand a greater overload than any other Transmitting Tube of similar rating.

Type 35T . . . £3/7/6 net  
Type 100 T.L. or  
T.H. . . . . £5/9/6 net  
Type 250 T.H., £10/15/- net

### The Reflexed Portable

The design of our 1938 model four-valve reflexed portable receiver has now been completed, and gives amazing results. Order your kit now for the summer.

Price and Full Details on Request

### Taylor Tubes.

Taylor Tubes, owing to their low price and sturdy construction, have proved in America to be one of the most popular of the wide range of transmitting tubes. They are adaptable for all frequencies up to and including 56 M.C. The T20, as well as being an excellent Class "C" amplifier, is capable of giving excellent results as a Class "B" audio tube delivering under such conditions 70 watts of audio. The T.55 meets the requirements of those amateurs increasing power and unable to go to the expense of high-priced tubes.

T.20 or T.Z.20 . . 23/- net  
T.55 . . . . . 65/- net  
H.66 . . . . . 16/- net



# Lakemba Club Holds Eighth Annual Re-union

It is with the deepest regret that we record the passing of "Joe" Buchanan (VK2ABT), who has been a member of Lakemba Radio Club for the past two years. His death occurred in very tragic circumstances last month during the preparation of the evening meal. A sudden heart seizure struck him without warning, and when found a few minutes later he was dead.

Those of us who made personal contact with 2ABT well remember the hospitality always extended by him and his mother to any visitors who called on their way through Yerrinbool. To Mrs. Buchanan the death of her only child, at the age of 25, came as a terrific blow, but the situation is even more tragic in view of the fact that since the death of his father several years ago, Joe had taken over the majority of the work in connection with their large orchard. He spent little time on pleasure, and what few minutes he did have to spare were spent in the radio shack.

In offering Mrs. Buchanan our heartfelt sympathy, we do so in all sincerity, and trust that some consolation will be found in the fact that Joe's fine character and sterling qualities have not gone unnoticed by any of us. If, upon answering the Final Call, our own Log Book of Life contains but a portion of entries like those of 2ABT, then we can safely state we have done well.

★

## The Annual Reunion.

The eighth Annual Reunion of the club was held on Tuesday, May 3, at the "Sunrise Hall," Canterbury, there being in attendance the usual large representative gathering. The speech by Mr. Burbury, of the Radio Inspectors' Department, was of special interest, as it contained some good advice to amateurs in general.

In congratulating the Lakemba Club on its remarkable progress, Mr. Burbury stated that he was pleased to see that the club had shared last year's prosperity in the history of amateur radio in Australia. The recent increase in power was an indication that the Federal Government was anxious to extend privileges to amateurs. He recommended that amateurs should not abuse any privileges extended, and should treat the bands with the respect to which they were due. The problem at the moment was the allocation of frequencies. Day by day commercial interests were constantly making applications for frequencies for various services.

With the advent of television, the pressure would be even greater, continued Mr. Burbury, and at the forth-

## Large Representative Gathering at Enjoyable Function ★ 200th General Meeting ★ Lakemba Radio Club Notes And News.

By W.J.P.

coming world convention, amateur radio would hold what they now possess only by submitting a good case for the retention of all the bands. He did not think that there existed any deliberate lack of co-operation between amateurs and the department, but in conclusion he suggested that in preference to spending money on more power, it should be spent on improving the quality of the signal.

Other speakers included representatives from the Wireless Institute of Australia and leading suburban radio clubs, also Messrs. Haworth (A. W. Valve Co.), McIntyre (Prices' Radio), Hume (Philips' Radio), etc.

The Chanex-Dulytic Cup was won this year by VK2OI, and Slades' Radio Cup was won by VK2AS. The

"Booby" Cup was won by VK2EH, and was presented amid much amusement and laughter. Three other prizes were drawn for and presented as follows:—First, an open order for £1/1/- presented by Mr. D. G. McIntyre, of Prices' Radio Service, won by ZL3KX (a visitor); second, 12 months free subscription to "Radio World," presented by "Radio World," won by VK2AEC; third, something to take home to the wife, mother or YL, won by Mr. Mulligan of Zero Beat Club. Mr. Mulligan did not like opening his prize, but it was a very nice piece of lady's handiwork in the form of a woolly poodle dog for milady's table.

The reunion, which practically coincided with the 200th general meeting of the club, was voted by all as a wonderful success.

★

## The 200th General Meeting.

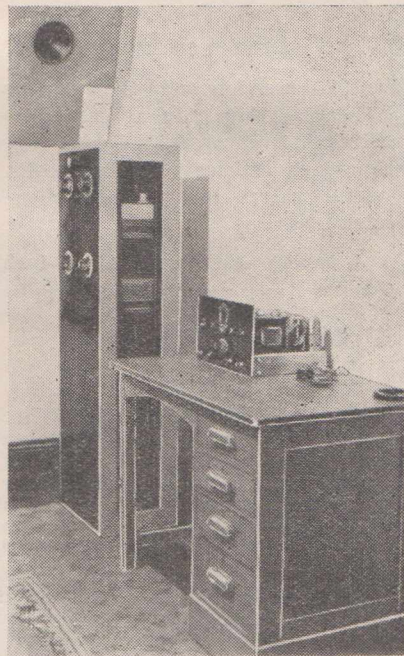
On the occasion of the 200th general meeting of the club, a special representative from the W.I.A. in the person of Mr. R. Priddle, VK2RA, was in attendance.

The following members were elected to hold office for the ensuing year:—President, Mr. E. Hodgkins, VK2EH; vice-president, Mr. J. Warren, VK2QX; honorary secretary, Mr. V. Bennett, VK2VA; honorary treasurer, Mr. H. Ackling, VK2PX; publicity manager, Mr. W. Phelps, VK2DL; QSL manager, Mr. L. Hughes, VK2QP. A committee of management, a social committee, and a technical committee were also elected.

## Waverley Radio Club Notes And News

The Club's Annual Field Day will be held on Sunday, June 5, in National Park, and an invitation is extended to all interested shortwave enthusiasts who may desire to attend

A transmitting station, operating on 40 metres, will be concealed in a suitable location, and parties equipped with portable receivers will set out on foot from a pre-determined



Owner-operator D. C. Dunn, of Sydney, designed and built this professional-looking rig, which operates under the call-sign of VK2EG.



**... the RADIOTRICIAN'S  
PORTABLE LABORATORY  
... IS CONTAINED IN THE  
CALSTAN  
(CALibrated to STANDard)  
TUBE-TESTER ...**

**... MULTI-TESTER** which creates yet another Calstan triumph in the Radio Servicing Field.

● Released by SLADE'S RADIO PTY. for the discriminating Radio Dealer and Serviceman who appreciate and practise the finer points of efficient Radio Service. Here is an outstanding instrument for all round perfection, combining the multiple functions of a Valve Tester and Multitester. This instrument 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.

● AC Model 223 will test every valve used in Australia, including American and European P & V, and in addition to the emission test a Neon leakage indicator is fitted for individual electrode selection. Eleven steps for filament voltage from 1.5 to 30 volts is provided. The multitester range is:—  
AC and DC Volts: 5, 10, 50, 250, 1250.  
Milliamperes: 5 Ranges, 1, 5, 25, 100, 250.  
Ohms: 5 Ranges, from 1 ohm to 5 megohms.

● This is also an excellent instrument for lining up sets and as an "Multi-meter" operating in conjunction with the Power Supply an electrolytic condenser leakage test is available and condensers may be checked at 10, 25, 100, 150 and 250 volts, and a "GOOD"—?"—"BAD" meter scale provides the necessary indications.

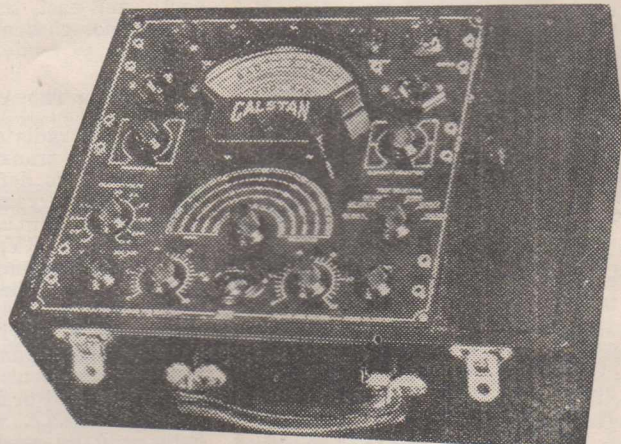
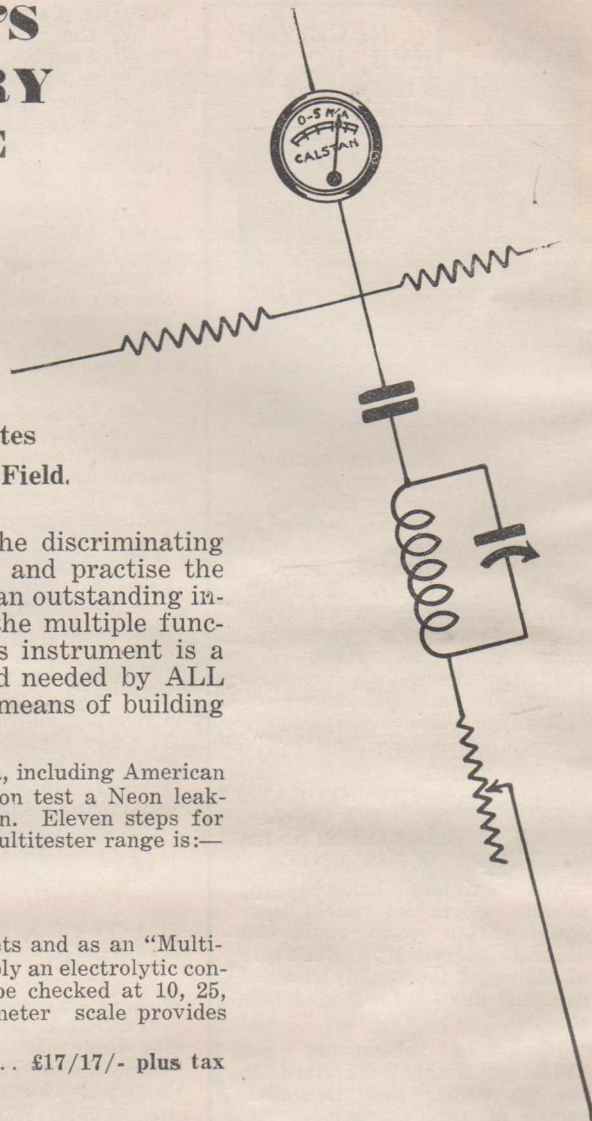
Model 223 (illustrated below) . . . . . £17/17/- plus tax

... and for the Country Radio Dealer.

● 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 Milliamperes and 4 ranges of Ohms.

D.C. Model, £18/18/-; Portable Model, £18/16/- both plus tax.

**Slade's Radio Pty. Ltd.  
Croydon, N.S.W.  
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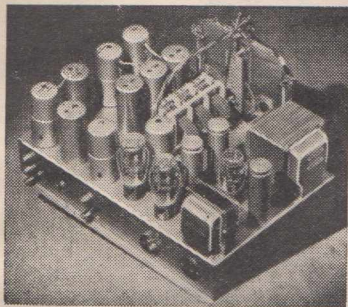
South Australia: Radio Wholesalers Ltd., Adelaide.

West Australia: Carlyle & Co., Perth; Norman L. Burnell and Co., 13 Queen Street, Perth.

Victoria: Australian General Electric Ltd., Melbourne; Arthur J. Veall Pty. Ltd., Launceston.  
Tasmania: Noyes Bros. (Melbourne) Ltd., Launceston.  
New Zealand: New Zealand Electrical Equipment Co.  
Stocks available from Turnbull and Jones, all branches.



## WANT A RECEIVER BUILT, LINED UP, OR SERVICED ?



—if so, we are fully equipped to handle the job for you. For years we have specialised in building to private order all types of receivers (A.C., D.C., A.C./D.C., vibrator, battery, dual-wave, all-wave or short-wave), amplifiers of all types (P.A. systems a specialty), auto and portable radios. Sets built to individual requirements, or we will design to suit any conditions.

**GET OUR QUOTE FOR CONVERTING YOUR RECEIVER TO INCORPORATE AUTOMATIC TUNING — WITH EITHER TELE-TUNER OR PUSH-BUTTON UNIT.**

We maintain hundreds of pounds worth of latest test equipment to ensure rapid and accurate servicing. Receivers of all types thoroughly checked over and aligned for a moderate charge.

Illustrated above is the "Fidelity Eight," described in the November and December issues of this magazine. Already we have built and installed over two dozen of these de luxe high-performance receivers for "Radio World" readers, with and without minor modifications to suit individual requirements. Cabinets can also be supplied if required.

Highest quality components are used, supplied at moderate prices. **TRY US FOR YOUR NEXT QUOTE.** Country readers are invited to take advantage of our special Buying Service, through which we can locate and purchase for you both standard and non-standard parts and equipment.

## PRECISION RADIO

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STRATHFIELD, SYDNEY.  
Phone . . . . . UM 7858.

starting place with the object of locating the hidden transmitter, a prize being awarded to the first operator to do so. Several of the parties will be equipped with portable battery-operated transmitters so that communication can be maintained with the main station en route.

Experimenters will include 2BV, 2EG, 2ABS, 2AFZ, 2AHB, 2TN, 2AHJ, 2MQ, 2AFG, 2WN. All enthusiasts (with or without receivers) desiring to take part are requested to get in touch with the secretary of the Club, so that last-minute details can be arranged.

On Tuesday, May 10, an interesting talkie night was held in the clubrooms, through the courtesy and co-operation of A.W.A. Ltd., who supplied the projection gear and films, operated by Mr. K. Johns. One of the films screened was the A.W.A. film, "Spanning Space," which illustrated in a very entertaining manner various phases of radio communications and receiver manufacture.

Visitors are always welcome at the clubrooms, 13 McPherson Street, Waverley, and meetings are held each Tuesday night at 8 p.m., the morse class for beginners commencing at 7 p.m.—J. Howes (2ABS). Secretary, 465 Pacific Highway, Artarmon.



## VK2EG, Sydney, N.S.W.

VK2EG is situated in a hollow on the Randwick edge of Centennial Park, the aerial swaying unostentatiously between a 40-foot mast and the house. With hills to the north, south, and east, this location was obviously not chosen for its radio possibilities.

### First On The Air In May, 1935.

2EG first radiated a signal on May 4, 1935. The transmitter was crystal-controlled, two defaced pennies sandwiching the crystal, and used a 46 amplifier on 7 m.c. The first contact was with W3CRY, much to the operator's satisfaction. Some DX was worked during the following months, despite the unfavourable location. One rare QSO was with Y1IM, of Mongolia. This signal was heard on 7 m.c. two consecutive nights, but has not been heard or heard of since. Late one night w.a.c. was completed unknowingly by working a stranger, FT4AF, who during the QSO mentioned "QRA, Tunis." Dozens of Africans have been worked since then.

In the three years, 1500 QSO's have been effected with 69 countries in 33 zones.

## Four-Unit Transmitter.

The transmitter is in four units. The exciter unit uses two type 53 valves as oscillator at 3.5 m.c., and three frequency doublers. These provide excitation at 7, 14, or 28 m.c., for a 46 buffer, which is link-coupled to the next unit. This is the power amplifier, and comprises an 800 and its associated gear. The 800 can be operated at its maximum input of 100 watts.

The two remaining units provide power. They take the form of a 1250-volt pack using 866 rectifiers, a 350-volt supply for oscillator and doublers, one of 500 volts for the buffer. Another pack biases the power amplifier. Relays are used to simplify switching from transmitter to receiver. Of necessity rather than choice the single-wire type of matched impedance feeder is used between transmitter and aerial. This has been adjusted for 20-metre operation, but is quite good at 10 metres.

For reception, nine valves are used in a superhet circuit which is very orthodox up to the audio end where three stages are used, including 2A3 output.

## Hurstville Amateur Radio Club

(Affiliated With The W.I.A., N.S.W. Division.)

The lectures on subjects for the A.O.C.P. are now progressing favourably, and members are steadily increasing speed on the code.

The club transmitter is on the air each Thursday and Tuesday nights and some week-ends, telephony being used at present. The line-up is a 46 C.O., 46 doubler, 46 buffer, 210 final. Speech equipment is a 57 resistance-coupled to a 56, transformer-coupled to a 211. Separate power supplies are used for each stage. Mike is a Neophone, antenna a half-wave Zepp.

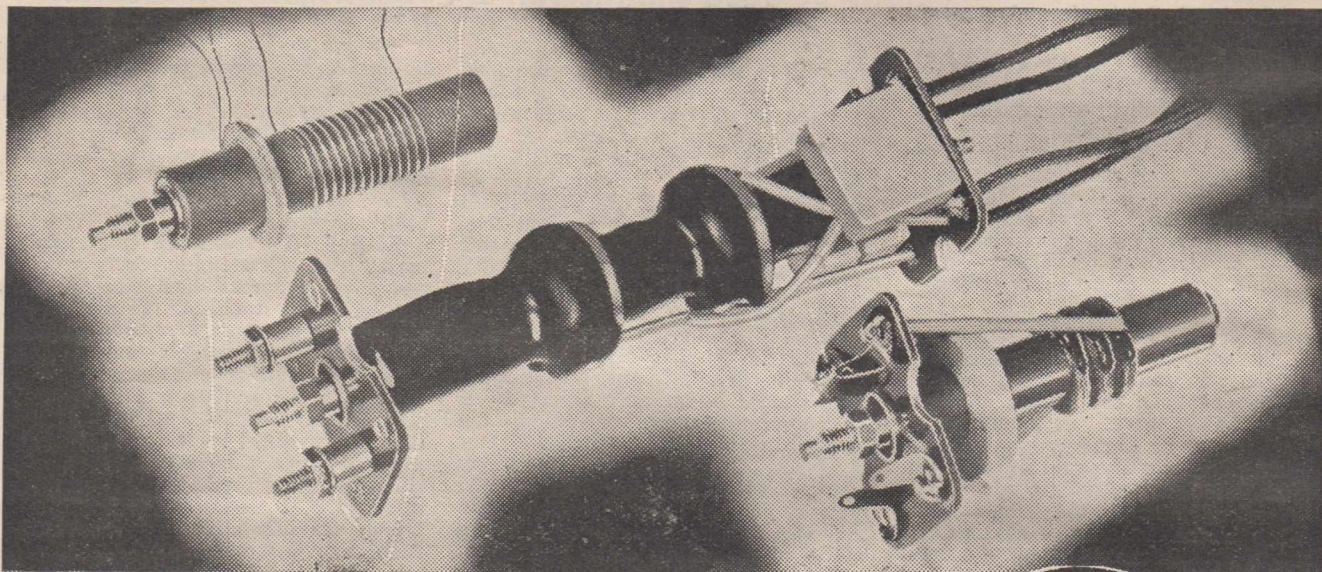
2VT is re-building a new rig, and 2AHF is at present QRL at a regional station. Any reports for these stations may be sent to the club which will acknowledge them. The frequency of 2MZ is approx. 14,370 k.c.

A visitor from "G" who has joined the club during her vacation in VK is Mrs. Chalk, wife of G31C.

Anyone interested in "ham" radio is always welcome at 316B Forest Road, Hurstville (opp. post office), either as a visitor or prospective member. Particulars of the club's activities may be had from the secretary, 34 Park Road, Carlton.—P. J. Healy (Publicity Officer).



# CROWN PERMATUNE IRON CORED COMPONENTS



## WITH THE MOST IMPORTANT FEATURES EVER FOUND IN COIL CONSTRUCTION

Now, at last, that bugaboo of set construction—frequency drift—has been laid low, by these newly developed Crown Iron cored components incorporating PERMEABILITY TUNING. Vibration and changing atmospheric conditions invariably cause frequency drift which results in “off-station” tuning, with its resultant distortion.

Crown “Permatune” I.F.’s and coils definitely prevent this drift by the use of permeability tuning! . . . permanence of alignment being obtained by means of an exclusive Crown mechanical locking feature.

Adjustment is obtained by INDUCTANCE variation, the iron core being moved up and down by means of a screw. Once adjusted the screw is locked in position with special LOCKING NUT which ensures permanence of adjustment under the most adverse conditions.

Constructed only with Belden Litz wire and “perthane” insulation and specially moisture-proofed, these new units are compact, easily mounted, and ensure maximum electrical and mechanical efficiency.



The sketch above shows how permeability tuning is obtained by moving the iron core up or down in the coil, permanence of setting being assured by a lock-nut and lock-washer. A special hollow “spin-tight” spanner—available from all distributors—may be used to tighten the lock-nut whilst the trimmer screw is held by the screwdriver.

### “PERMATUNE” SHORT-WAVE COILS TYPE CIX. PRICE 4/6.

First-class tracking—always so difficult to obtain on Short-Waves, especially when using an R.F. stage—is now definitely assured with these newly-developed Iron Cored “Permatune” S.W. coils, whilst the “Q” factor is greatly improved.

Measuring 2in. x ½in., the coils are ready for screwing direct to chassis or plate, and are available in two ranges.

Type Nos.: 12 to 35 m., CIX/12 aer., R.F., and osc.; 16 to 50 m.; CIX/16 aer., R.F., and osc.

### “PERMATUNE” BROADCAST COILS TYPE CIV. PRICE 7/6.

These coils are factory set to track with standard Crown dials, and S.C. Type “F” gangs. Matching being obtained by inductance variation with the “Permatune” iron core. Each coil may be readjusted to track with different dial calibrations. High impedance couplings ensure even sensitivity over the whole band—the unit fits into a 2¾in. x 1¾in. square can.

Type Nos.: CIV/aer., R.F., and osc./465.

### “PERMATUNE” I.F. TRANSFORMERS TYPE 1SP/465. PRICE 12/6.

Adjustment is obtained by the “Permatune” method of inductance variation—a single screw each end being used for adjustment; the usual compression type mica trimmers being replaced by ceramic moulded fixed mica condensers, tested to within plus or minus 2½% of capacity used. The unit is fitted in a 4¾in. x 1¾in. square can.

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# 32-Watt Amplifier Uses 6L6G's In Pushpull

FOR a considerable time past there has been a succession of enquiries for a satisfactory 30-watt amplifier which is free from any tendency towards instability or the development of high voltages in the plate circuit (states "Radiotronics," No. 86). Radiotron Circuit A135, shown on this page, should satisfy this demand and is also both simple and economical.

It will be seen that the circuit employs Radiotron 6N7G as a first stage amplifier and inverter, exciting two 6J7G resistance coupled pentodes in push-pull. These in turn excite the final stage, consisting of two 6L6G valves in Class AB<sub>1</sub> push-pull. The input circuit to the first grid may be arranged in the most convenient manner, a simple form of volume control suitable for a pick-up being indicated in the diagram.

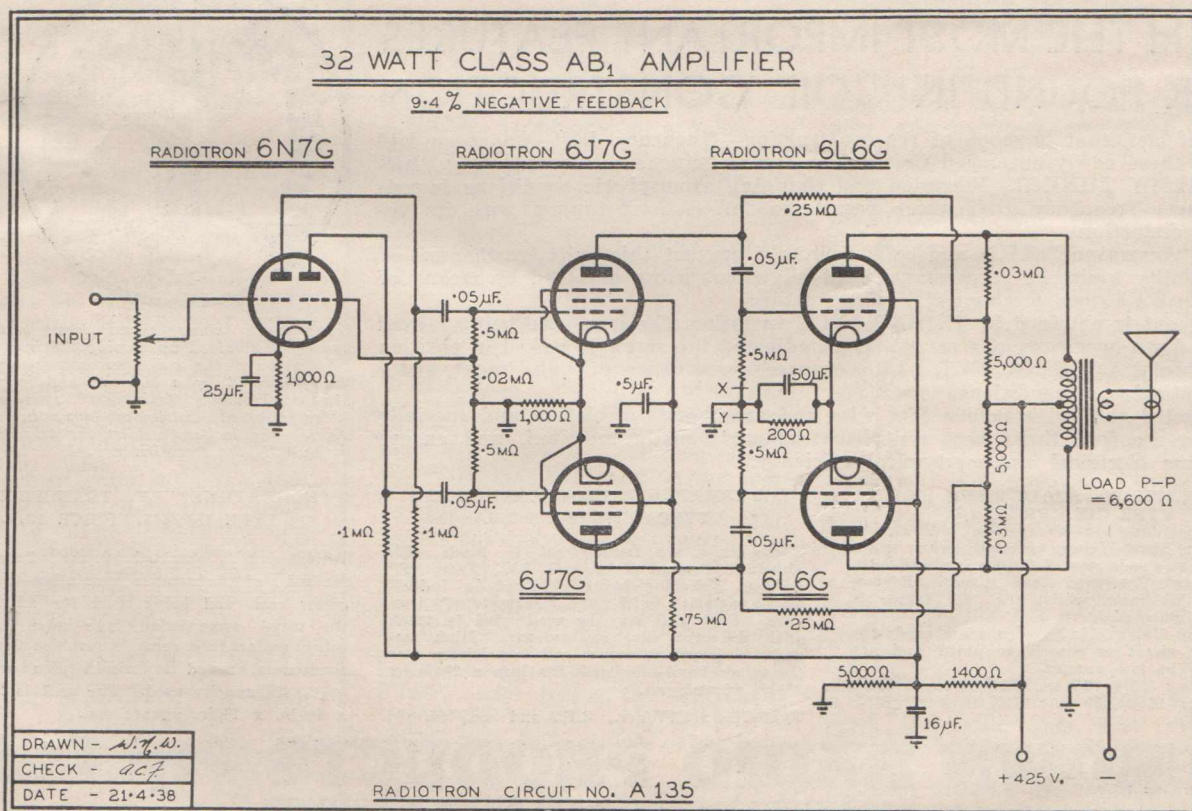
The 6N7G cathode bias resistor is by-passed by a condenser, principally in order to reduce hum caused by leakage between the heater and cathode of this valve. In a number of cases it may be found possible to omit this condenser. The grid input to the second unit of the 6N7G is taken from a tapping point on the grid resistor following the first unit. Although this is indicated in the diagram as a fixed

tapping point, it is highly desirable for the correct resistances to be found by trial, in order to give perfect balance between the two sides.

Since this balance is also affected by the 6J7G stage, it is desirable to check the balance in the grid circuit of the final stage. The method suggested is to insert a microammeter or 0-1 milliammeter at the points X and Y in turn, and to note the input at which grid current just commences to flow. The input should be identical for each of the two sides and if not so at the first attempt, the tapping point should be suitably adjusted. If so desired, a variable resistance could be used in place of fixed resistors, but in general it is preferable to employ fixed resistors as being less inclined to cause drift or noise. It will be seen that the cathode resistor of the two 6J7G valves is 1000 ohms and is un-

by-passed, by-passing being normally unnecessary, since any hum present in this stage would not be apparent. The values of screen dropping resistor and cathode bias resistor are exactly half those specified for a single valve under resistance-coupled pentode conditions.

Both 6J7G valves are used with series feedback arranged from a voltage divider across each side of the output load. Each voltage divider is arranged with resistances of 5000 and 30,000 ohms which, in conjunction with the shunting effect in the grid circuit of the valves, gives an effective negative feedback of 9.4%. The load on the 6L6G valves is 6600 ohms, plate to plate, this being the normal load for Class AB<sub>1</sub> operation with self-bias. No resistance capacity filter is necessary across the loudspeaker, owing to the use of feedback,





and for the same reason a tone control on the 6L6G stage will not be effective.

The grid resistors of the 6L6G valves are both 0.5 megohm, this being the maximum permissible with self-bias. The self-bias resistor of 200 ohms is by-passed by a condenser of 50 mfd., the effective bias being 25 volts. The plate voltage is 400 volts and therefore the supply voltage, which provides not only the plate voltage, but also the grid bias, must equal 425 volts. The screen voltage should be 300 volts, and this is obtained by means of a heavy voltage divider or bleeder across the 425 volt supply.

It will be seen that this divider draws a current of approximately 65 m.a., this being in addition to the currents drawn by the valves in the receiver. A 16 mfd. condenser is used to give by-passing and stability to the screen voltage. A voltage divider drawing less current will not maintain the screens at such a steady potential, and will therefore introduce distortion and tend to decrease the output. The total current from the 425 volt supply is approximately 213 m.a. with maximum signal.

The power supply should be one giving 425 volts at 213 m.a., and this supply must have good regulation. A simple form of supply would be Radiotron 83 with a transformer 500 volts R.M.S. each side, a choke input filter with 20 henries inductance and a suitable smooth-

ing condenser. The voltage delivered by the 83 valve will be a  $0.9 \times 500 = 450$  volts, less 15 volts drop in the valve or 435 volts actual. From this must be subtracted the drop in the filter choke, and if a choke of 100 ohms resistance is used, this will be about 20 volts.

The output voltage under these conditions would then be approximately 415 volts, a satisfactory approach to the maximum. Due to the slight decrease in voltage, the power output will be somewhat reduced and a further reduction would be caused by any additional resistance in the filter circuit.

**Energising Extra Speaker Fields.**

In certain circumstances the 5000 ohm resistor forming part of the bleeder could be replaced partly or wholly by the field coil of a loudspeaker, so as to avoid unnecessary waste of power. Two field coils, each of 2500 ohms, should be connected in series and each would then receive approximately 10 watts. Care should be taken in this case to see that the voltage drop from screens to earth is 325 volts maximum.

Since this circuit uses resistance coupling throughout, it is suggested as being a particularly attractive arrangement for a large amplifier, particularly when weight is a consideration. The fidelity and frequency re-

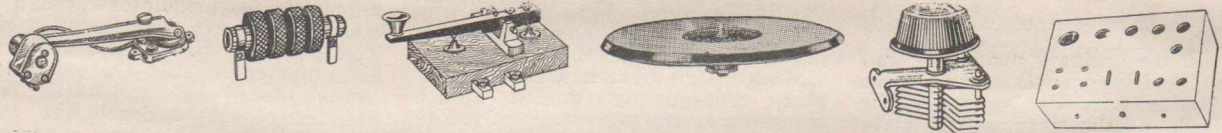
sponse are considerably better than would be the case in an amplifier without feedback.

**Australian-Made Solar Paper Condensers.**

Since their introduction last year, Australian-made E.T.C. Solar Sealdite paper condensers have found ready acceptance by the radio manufacturer demanding a reliable capacitor of proven capabilities.

That these condensers have established an excellent reputation for highest efficiency is due largely to the care taken in their manufacture. All raw materials are laboratory-tested, not only as to chemical quality, but also as regards physical characteristics and dimensions. Manufactured with precision machines by highly trained operatives, they are carefully inspected at every stage of their production, assuring high efficiency and extremely fine tolerances. During manufacture the capacitors are double impregnated by the vacuum process. R.M.A. standards are adhered to, so that ample protection is assured when the capacitors are put into operation at their rated voltages.

E.T.C. Solar Sealdite condensers are manufactured in a full range of capacities covering all the popular sizes. Working voltages are 200, 400, and 600. Special sizes are constructed to suit individual specifications.



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- Eddystone 100mmf. Transmitting Condensers . . 33/3
- R.C.A. 809 . . . . . 25/-
- Taylor T20 . . . . . 25/-
- Taylor TZ20 . . . . . 25/-

**Valve Manuals**

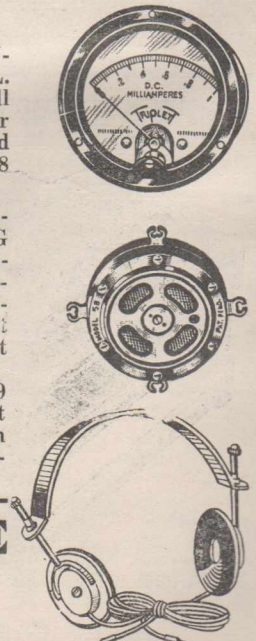
- "RC-13"—R.C.A. RECEIVING TUBE MANUAL. Complete details on all R.C.A. valves, together with application notes and technical information. 1/8 post paid.
- "TT3"—R.C.A. AIR-COOLED TRANSMITTING TUBES. Complete details on R.C.A. tubes, together with design information that will solve most of your problems. 2/2 post paid.
- PRICE'S RADIO 1938-39 CATALOGUE. The finest radio parts catalogue in Australia. Fully illustrated. Write for copy now.



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# A.O.C.P. Questions & Answers

A.O.C.P. EXAMINATION PAPER  
APRIL, 1937.

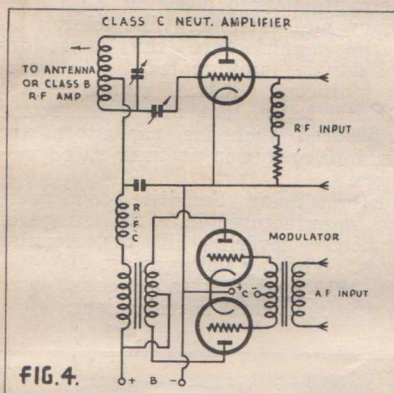
1 (a) Give a schematic diagram of a three stage shortwave C.W. transmitter employing a pentode crystal controlled oscillator.

A.: See January, 1938, issue, diagram on page 10.

(b) Draw also a suitable power supply deriving its primary voltage from A.C. mains.

A.: See January, 1938, issue, diagram on page 10.

2 (a) What is meant by percentage of modulation?



A.: In the ordinary process of amplitude modulation with a pure audio note having sinusoidal wave form the amplitude of the transmitted wave varies symmetrically about an average value equal to the amplitude of the carrier wave. With no modulation applied a steady carrier is trans-

mitted. When a modulating signal is introduced having, say, half the carrier amplitude, the modulated wave alternately increases to 1½ times the average value and diminishes to half at the frequency of the modulating signal. In these circumstances the modulation factor is 0.5, or the percentage of modulation is 50%. Thus the maximum departure from the average value of amplitude is a measure of depth of modulation, and can be expressed as a percentage according to the formula

$$\% M = \frac{I_{mod.} - I_{carr.}}{I_{carr.}} \times 100$$

It should be noted that the amplitude of a wave is its peak value, and in making calculations the peak currents (or voltages) should be measured. The r.m.s. value of a 100% modulated wave is only 22.6% greater than the r.m.s. value of the carrier current.

The above discussion assumes a pure sine-wave modulating signal. The wave form of speech is very complex, consequently during speech transmission the percentage of modulation is very variable. To avoid over-modulation on speech peaks the average depth of modulation should be well below 100%.

Published below is the second of a series of six articles comprising questions, with model answers, set in recent A.O.C.P. examinations. Specially written for the "Radio World" by . . . . .

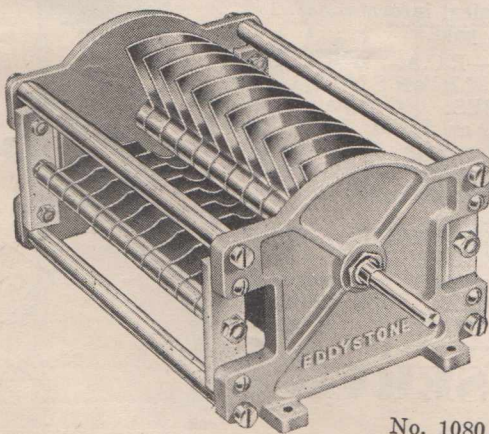
H. WHEELER (VK5HW)

(b) Explain briefly two systems of amplitude modulation. Illustrate your answer by simple diagrams.

A.: Fig. 4 illustrates plate modulation. The a.f. output from the modulator is super-imposed on the plate voltage of the modulated amplifier through the transformer. For 100% modulation the modulator and transformer should be capable of delivering an a.f. peak voltage equal to the plate voltage so that the resultant voltage will vary from zero to double the d.c. value. The class "C" amplifier power output varies directly with its plate power input, so that the envelope of the output wave will have the same shape as the modulating wave.

Fig. 5 illustrates suppressor-grid modulation of a pentode. In this system the modulation is effected by super-imposing the modulating voltage from the modulator through the transformer on to the suppressor bias. The bias and the modulator output are adjusted so that the r.f. output can be varied by modulation from practically zero to double the value obtained with stationary suppressor bias. The screen grid should be connected to the voltage divider as shown, and not to a separate source.

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Cat. No. 1081—3500-volt single ended 100 m.mfd., 34/6.

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Over 100 components are on view at your local distributor.

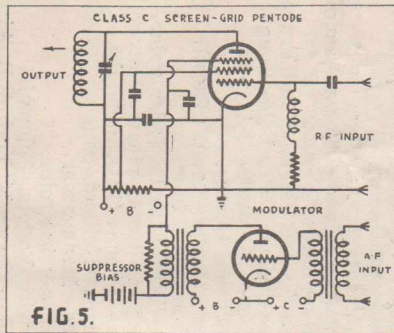
Inserted by:

**R. H. CUNNINGHAM (VK3ML)**

94 ROBINSON ROAD, HAWTHORN, VIC.

Australian representative of Strattons Ltd., Eng.





3. Given a 0-1 millimeter having a resistance of 99 ohms, what value of shunt resistance would you use to obtain a full scale deflection of 100 milliamps?

A.: The meter requires 1 milliamp. for a full scale deflection. If it is to be used to measure 100 milliamps, maximum 99 of the current must be

shunted past the meter. Since current is inversely proportional to resistance, the shunt must have a resistance 1-99th that of the meter, i.e., 1 ohm.

4. What is the purpose of a "bleeder" or "drain" resistor when placed across the output of a high tension power supply? What approximate value of resistance would you use in any particular case?

A.: See Feb. issue, page 36 (7).

5 (a) What is the primary object of the use of piezo-electric crystal in a radio transmitter, and what precautions are necessary to obtain the best results?

A.: See Feb. issue, page 35 (2).

(b) Give a schematic diagram of a piezo-electric controlled single valve circuit.

A.: See Feb. issue, page 36 (2).

6. What is meant by the following: Current loop; Voltage antinode; fundamental frequency; resonance.

A.: See Feb. issue, page 35 (1).

7. Give a schematic drawing of any receiver incorporating at least a detector and one audio frequency amplifier that would be suitable for reception of C.W. signals. What value of tuning condenser would give a wide band-spread on the 40 and 20-metre band?

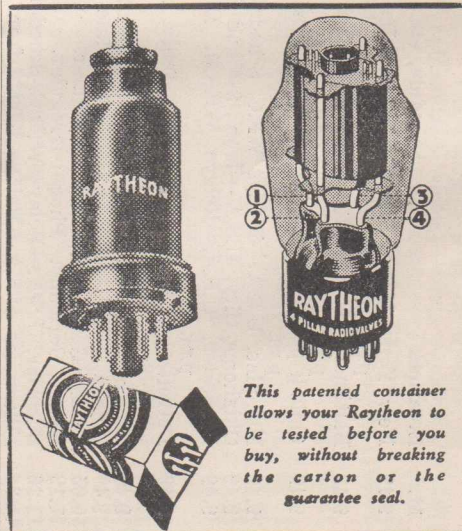
A.: See Fig. 6. The value of tuning condenser necessary to give a desired band-spread will depend on the system of band-spreading used. If only one condenser were employed it would need to be extremely small. With the circuit shown, C<sub>2</sub>, the band-setting condenser, should have a maximum capacity of .0001 mfd., and C<sub>1</sub>, the tuning condenser should have a capacity of .000025 to .0001 mfd., depending on the position of the tap on the coil.

A goodly apple rotten at the core



TO-DAY many people seem to have the same trouble with radio valves that Shakespeare associates with apples. Looks have never been a safe indication of the goodness of the core. You cannot see through the apple skin—but you can look inside a valve and see how many pillars it has to preserve its

vital accuracy. That's the core of a valve. Unless the elements have four pillars for perfect balance and rigidity, how can they hope to resist the jolts of use and the vibration of dynamic speakers and stay "good" valves? Raytheon are the only 4-pillar valves you can get. All others have only two pillars. But the price is the same. You'll find it worth while to say "Raytheon," or "Four-pillar valves, please!"



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Call.	Kc.	M.	Location.	Schedule, etc.	Call.	Kc.	M.	Location.	Schedule, etc.
HBV	18,450	16.26	Geneva, Switzerland.	Irregular.	GBC	17,080	17.56	Rugby England.	Phones ships.
HJY	18,440	16.27	Bogota, Colombia.	Phones CEC and OCL.	JZD	16,910	17.59	Nazaki, Japan.	Phones ships.
PCK	18,405	16.30	Kootwijk, Holland.	Phones Java (PLE and PMC).	ITK	16,385	18.32	Mogadiscio, It.	Somaland.—Phones IAC around 12.30 a.m.
FZS	18,345	16.35	Saigon, Fr. Indo-China.	Phones Paris.	PCL	16,305	18.39	Kootwijk, Holland.	Special relays & phones irreg.
WLA	18,340	16.36	Lawrenceville, U.S.A.	Phones England.	WLK	16,270	18.44	Lawrenceville, U.S.A.	Phones S. America.
GAS	18,310	16.38	Rugby, England.	Phones New York.	WOG	16,270	18.44	Ocean Gate, U.S.A.	Phones England.
YVR	18,299	16.39	Maracay, Venezuela.	Phones Germany.	KTO	16,240	18.47	Manila, P.I.	Phones Japan and U.S.A., 8 a.m.
IUD	18,270	16.42	Addis Ababa, Ethiopia.	Irregular.	FZR3	16,233	18.48	Saigon, Fr. Indo-China.	Phones Paris.
FTO	18,250	16.43	St. Assise, France.	Phones S. America.	GBA	16,140	18.59	Rugby, England.	Phones S. America.
KUS	18,220	16.46	Manila, P.I.	Phones U.S.A.	IRY	16,177	18.62	Rome, Italy.	Phones IDU, ITK.
GAW	18,200	16.48	Rugby, England.	Phones New York.	JVC	16,050	18.69	Nazaki, Japan.	Phones Hong Kong.
JVB	18,190	16.49	Nazaki, Japan.	Phones Java and U.S.A.	KKP	16,030	18.71	Kahuku, Hawaii.	Phones Dixon, U.S.A., 6 a.m.
CGA	18,180	16.51	Drummondville, Canada.	Phones GBB, Rugby.	FTK	15,880	18.90	Santiago, Chile.	Phones Lima.
PMG	18,135	16.54	Bandoeng, Java.	Phones Holland.	CEC	15,865	18.91	St. Assise, France.	Phones Saigon, 11 p.m.
LSY3	18,115	16.56	Buenos Aires, Arg.	Tests; broadcasts Sat., 8-9 a.m.	JVD	15,860	18.91	Nazaki, Japan.	Phones Shanghai and U.S.A.
TYEI	18,090	16.58	Paris, France.	Phones PLE.	LSL	15,810	18.98	Buenos Aires, Argentine.	Phones London & Paris.
PCV	18,070	16.60	Kootwijk, Holland.	Phones PLE.	XOJ	15,800	18.99	Shanghai, China.	Phones London & U.S.A.
KUN	18,060	16.61	Bolinas, U.S.A.	Phones Manila.	JYT	15,760	19.04	Kemikawa-Cho, Japan.	Tests with Dixon, U.S.A.
GAB	18,040	16.63	Rugby, England.	Phones Canada.	JJA	15,740	19.06	Chureki, Japan.	Tests; irregular.
KQJ	18,020	16.65	Bolinas, U.S.A.	Phone; irregular.	WIS	15,700	19.11	Hicksville, U.S.A.	Phones Africa.
WQB	17,940	16.72	Rocky Point, U.S.A.	Phones LSY, Arg.	JVE	15,660	19.16	Nazaki, Japan.	Phones Java & Siam, 6-8 p.m.
WLL	17,900	16.76	Rocky Point, U.S.A.	Tests with Geneva and Berlin.	OJF	15,625	19.20	Lima, Peru.	Phones CEC.
LSN	17,850	16.81	Buenos Aires, Arg.	Phone; irregular.	CO9XX	15,550	19.21	Tuinucu, Cuba.	Phones Dixon, 11 a.m. and 8 p.m.
PCV	17,810	16.84	Kootwijk, Holland.	Phones Java, 9-11 p.m.	HSC2	15,530	19.32	Bangkok, Siam.	Phones JVE.
TGW A	17,800	16.84	Guatemala City, Guat.	Irregular.	HS8PJ	15,530	19.32	Bangkok, Siam.	Broadcasts occasionally Mons.
GSG	17,790	16.86	Daventry, England.	Daily, mid-1 a.m.; 4-6.15 p.m.; 8.45-11.55 p.m.	CMA3	15,505	19.36	Habana, Cuba.	Phones and tests irreg.
JZL	17,785	16.87	Tokyo, Japan.	Irregular.	KEM	15,490	19.37	Bolinas, U.S.A.	Phones Java and China.
W3XAL	17,780	16.87	Bound Brook, U.S.A.	Daily exc. Mon., mid-9.45 a.m.	KKL	15,475	19.39	Bolinas, U.S.A.	Phones Manila and Japan.
W9XAA	17,780	16.87	Chicago, U.S.A.	Irregular.	KKR	15,460	19.41	Bolinas, U.S.A.	Phones Far East.
PHI	17,770	16.88	Hiuzen, Holland.	Daily exc. Wed., 10.25 p.m.-12.30 a.m.; Sun., 9.25-10.25 p.m., 11.30 p.m.-12.30 a.m.	IUG	15,450	19.42	Addis Ababa, Ethiopia.	Phones Rome, 12.15 a.m.
DJE	17,760	16.89	Berlin, Germany.	Daily, 11.10 a.m.-1 p.m.; 3.5 p.m.-8.50 a.m.; Sun., 2.10-3.25 a.m.	XEBM	15,440	19.43	Mazatlan, Mexico.	Irregularly 10 p.m.
W2XE	17,760	16.89	New York, U.S.A.	Daily, 9.20 a.m.-3 p.m.	KWE	15,430	19.44	Bolinas, U.S.A.	Phones Far East.
ZBW5	17,755	16.9	Hong Kong, China.	Irregular, 7 p.m.-1 a.m.	KWO	15,415	19.46	Dixon, U.S.A.	Phones Japan and Hawaii.
IAC	17,750	16.91	Pisa, Italy.	Phones ships.	HAS3	15,370	19.52	Budapest, Hungary.	Sundays mid-1 a.m. (Mons.).
HSP	17,741	16.91	Bangkok, Siam.	Phones Germany, 11 a.m. and 6 p.m.; phones JVE, 2 p.m.	DZG	15,360	19.53	Zeesen, Germany.	Irregular.
CJA3	17,710	16.94	Drummondville, Canada.	Phones Australia and Far East.	KWU	15,355	19.53	Dixon, U.S.A.	Phones Pacific Isles and Japan.
IAC	17,699	16.95	Pisa, Italy.	Phones ships.	DJR	15,340	19.56	Berlin, Germany.	Daily, 7.50 a.m.-1.45 p.m.; 11 p.m.-mid.
XGM	17,650	17.00	Shanghai, China.	Phones London, 10 p.m.	W2XAD	15,330	19.56	Schenectady, U.S.A.	Daily, 2 a.m.-midday.
IBC	17,620	17.03	San Paolo, Italy.	Phone; irregular.	W6XBE	15,330	19.56	Belmont, Calif, U.S.A.	New G.E. station soon in use
VWY	17,545	17.10	Poona, India.	Phones England (GAU, GBC, GBU).	OLR5B	15,320	19.58	Prague, Cz-Slovakia.	Daily exc. Sun., 9.30-10.30 p.m.; Suns, 9-10.30 p.m.
DFB	17,520	17.12	Nauen, Germany.	Phones S. America, 12.15 a.m.; phones Siam, 11 a.m. and 6 p.m.	GSP	15,310	19.60	Daventry, England.	Daily, 4.45-7 a.m.; 9.20-11.30 a.m.
VWY2	17,480	17.16	Poona, India.	Phones England, 10.30 p.m.	YDB	15,300	19.61	Soerabaya, Java.	Not in use at present.
DGR	17,341	17.30	Nauen, Germany.	Phone; irregular.	LRU	15,290	19.62	Buenos Aires, Argentine.	Daily, 9-11 p.m.
W2XGB	17,310	17.33	Hicksville, U.S.A.	Tests exc. Sun., Mon., 12.30-2.30 a.m.	HI3X	15,280	19.63	Ciudad Trujillo, D.R.	Relays HIX, 3.10-4.10 a.m.; Sundays, 10.40 p.m.-1.40 a.m. (Mons.).
W3XJU	17,310	17.33	College Park, U.S.A.	Experimental station for Washington Institute of Technology.	DJQ	15,280	19.63	Berlin, Germany.	Daily, 7.50 a.m.-1.45 p.m., 3.5 p.m.-7.30 a.m.; Suns, 2.10-3.25 a.m.
FZE8	17,280	17.36	Djibouti, Fr.	Somaland.—Irregular.	W2XE	15,270	19.65	Daventry, England.	Not in use at present.
DAF	17,263	17.38	Norddeich, Germany.	Phones ships.	GSI	15,260	19.66	New York, U.S.A.	Daily exc. Sun., Mon. 4-5-15 a.m.
CMA5	17,260	17.39	Habana, Cuba.	Phones and tests irregularly.	RIM	15,252	19.67	Tachkent, U.S.S.R.	Works Moscow 10 p.m.
DAN	17,260	17.39	Nordenland, Germany.	Phones ships; p.m.	WIXAL	15,250	19.67	Boston, U.S.A.	Daily 5.15-7 a.m.; Mons, 1.15-3 a.m.
WOO	17,120	17.52	Ocean Gate, U.S.A.	Phones ships.	TPA2	15,245	19.68	Paris, France.	Daily 9 p.m.-2 a.m.
					HS8PJ	15,230	19.70	Bangkok, Siam.	Irregularly Mons, 11 p.m.-1 a.m.



Call.	Kc.	M.	Location.	Schedule, etc.	Call.	Kc.	M.	Location.	Schedule, etc.
OLR5A	15,230	19.70	Prague, Cz-Slovakia.	Daily 9.30-10.30 p.m.	HBJ	14,536	20.64	Geneva, Switzerland.	Sunday, 9.45-11 a.m.
PCJ	15,220	19.71	Huizen, Holland.	Tues., 5-6.30 p.m.; Wed., 12.30-2 a.m.	LSN	14,530	20.65	Buenos Aires, Arg.	Phones New York.
W8XX	15,210	19.72	Pittsburgh, U.S.A.	Daily mid.-10 a.m.		14,500	20.69	Buenos Aires, Arg.	Phones Rio and Europe.
DJB	15,200	19.74	Berlin, Germany.	Daily 7.50 a.m.-1.45 p.m.; 3.5 p.m.-2 a.m.; Sundays, 2.10-3.25 a.m.	L5M2	14,485	20.71	Cartago, Costa Rica.	Phones C. America & U.S.A.
ZBW4	15,190	19.75	Hong Kong, China.	Irregular, 2.30 and 7 p.m.	YSL	14,485	20.71	San Salvador, Salvador.	Irregular.
RV96	15,183	19.75	Moscow, U.S.S.R.	Irregular.	YNA	14,485	20.71	Managua, Nicaragua.	Phones WNC.
GSO	15,180	19.76	Daventry, England.	Daily, mid.-1 a.m.; 4-6.15 p.m.; 8.45-11.55 p.m.	HPF	14,485	20.71	Panama City, Panama.	Phones WNC.
TGWA	15,170	19.77	Guatemala City, Guat.	Irregular, 2.30-5 a.m.	HRF	14,485	20.71	Tegucigalpa, Honduras.	Phones WNC.
12R05	15,170	19.77	Rome, Italy.	Testing.	TRM	14,484	20.71	Tela, Honduras.	Phones WNC.
XEWV	15,165	19.78	Mexico City, Mexico.	"Radio National."	TGF	14,485	20.71	Guatemala City, Guat.	Phones WNC.
OLR5C	15,160	19.79	Prague, Cz-Slovakia.	Irregular, 3 a.m.-3 p.m.	PLX	14,480	20.72	Bandoeng, Java.	Phones Europe.
JZK	15,160	19.79	Nazaki, Japan.	Irregular.	WFM	14,470	20.73	Lawrenceville, U.S.A.	Phones London and Paris.
SM5SX	15,155	19.79	Stockholm, Sweden.	Daily 2 a.m.	DZH	14,460	20.75	Zeesen, Germany.	Irregular.
YDC	15,150	19.80	Bandoeng, Java.	Daily, 9-10.30 a.m.; 1.30-5 p.m.; 8.30 p.m.-1.30 a.m.	GBW	14,440	20.78	Rugby, England.	Phones U.S.A.
GSF	15,140	19.82	Daventry, England.	Daily, 1.45-3 a.m.; 7.15-9 a.m.; 4-6.15 p.m.; 8.45-11.55 p.m.	RAEM	14,410	20.82	North Pole Base U.S.S.R.	Scientists.—Irregular.
HVJ	15,120	19.83	Vatican City, Italy.	Daily, 1.30-1.45 a.m.; Sun, Mon., 1-1.45 a.m.	DOT	14,410	20.82	Koenigs Wusterhausen, Germany.	Phone.—Irregular.
DJL	15,110	19.85	Berlin, Germany.	Daily 1.40-7.25 a.m.; 3-5 p.m.; 11 p.m.-mid.	IBC	14,410	20.82	San Paolo, Italy.	Phone; irregular.
WNC	15,055	19.92	Hialeah, U.S.A.	Calls Central America.	E7BA	14,410	20.82	Cadiz, Spain.	Nationalist station.
RKI	15,038	19.95	Moscow, U.S.S.R.	Broadcasts 3.15 p.m. (Mons.); phones Tachkent, 10 p.m.	W10XDA	14,250	21.00	Schooner "Morrisey."	Irregular.
HIR	15,038	19.95	Ciudad Trujillo, D.R.	Phones WNC.	EA9AH	14,200	21.13	Tetuan, Sp. Morocco.	Daily exc. Sun., 5.15-8 a.m.; 10 a.m.-noon.
YSL	14,985	20.02	San Salvador, Salvador.	Phone; irregular.	FET5	14,200	21.13	Burgos, Spain.	Nationalist station.
KAY	14,980	20.03	Manila, P.I.	Phones Pacific Isles.	PIJ	14,166	21.15	Dordrecht, Holland.	Saturdays, 3-3.30 a.m.
LZA	14,970	20.04	Sophia, Bulgaria.	Tues., Wed., Fri., Sat., 2.30-5.45 a.m.; Thurs., 2.30-7.45 a.m.; Sun., 2.30-8 a.m.; Sun., 5 p.m.-8 a.m. (Mon.); daily, exc. Sun., 8-9.30 p.m.	EA8AE	14,080	21.30	Las Palmas, Canary Is.	Nationalist station.
PSF	14,960	20.05	Rio de Janeiro, Brazil.	Phones Buenos Aires.	EA2BA	14,031	21.38	Jaca, Spain.	Nationalist station.
HJB	14,950	20.07	Bogota, Colombia.	Phones WNC.	GBA	13,990	21.44	Rugby, England.	Phones Buenos Aires.
HII	14,940	20.08	Ciudad Trujillo, D.R.	Phones WNC.	LSB	13,950	21.5	Buenos Aires, Arg.	Testing around 10.30 a.m.
HJA3	14,940	20.08	Barranquilla, Colombia.	Phones WNC.	SUZ	13,820	21.71	Abou Zabal, Egypt.	Phones Europe, 2 a.m.
PSE	14,935	20.09	Rio de Janeiro, Brazil.	Phones U.S.A. and Madrid.	OX2QY	13,700	21.90	Reindeer Pt., Greenland.	Irregular.
KQH	14,920	20.11	Kahuka, Hawaii.	Tests irreg.	KKZ	13,690	21.91	Bolinas, U.S.A.	Irregular.
JVG	14,910	20.12	Nazaki, Japan.	Tests irreg.	HJY	13,667	21.98	Bogota, Colombia.	Phones CEC.
OCJ2	14,845	20.21	Lima, Peru.	Phones other S. American stations.	SPW	13,635	22.00	Warsaw, Poland.	Daily 9-10 a.m.; Tues., Thurs., Sat., 3.30-4.30 a.m.
WQV	14,800	20.27	Rocky Point, U.S.A.	Phones Europe.	JYK	13,610	22.04	Kemikawa-Cho, Japan.	Irregular.
ROU	14,790	20.28	Omsk, Siberia, U.S.S.R.	Phones Moscow, 10 p.m.	ZMBJ	13,600	22.06	TSS "Amatea."	Daily around 4 p.m.
WEB	14,770	20.31	Rocky Point, U.S.A.	Phones Europe.	GBB2	13,595	22.07	Rugby, England.	Phones Canada.
IQA	14,730	20.37	Rome, Italy.	Broadcasts 9-11 a.m.	GBB	13,585	22.08	Rugby, England.	Phones Egypt and Canada.
PSF	14,690	20.42	Rio de Janeiro, Brazil.	Phones Arg. and U.S.A.	JVI	13,560	22.13	Nazaki, Japan.	Phones Manchukuo.
DFD	14,665	20.46	Nauen, Germany.	Phone; irreg.	WKC	13,465	22.28	Rocky Point, U.S.A.	Tests and relays irreg.
GBL	14,653	20.47	Rugby, England.	Phones JVH 4-10 p.m.	WKD	13,435	23.33	Rocky Point, U.S.A.	Tests and relays irreg.
TYF	14,640	20.49	Paris, France.	Phones Saigon and Cairo, 3 a.m., 6 p.m.	GCJ	13,415	22.37	Rugby, England.	Phones Japan (JVH) and China.
EHY-	14,620	20.52	Madrid, Spain.	Phones S. America.	WCT	13,410	22.37	San Salvador, Salvador.	Phones WNC.
EDM	14,605	20.54	Nauen, Germany.	Phone; irreg.	YSJ	13,410	22.37	San Salvador, Salvador.	Phones WNC.
DGZ	14,600	20.55	Nazaki, Japan.	Broadcasts irreg., 8 a.m.-2.30 p.m.; phones Europe 7 p.m.	WMA	13,390	22.40	Lawrenceville, U.S.A.	Phones England.
JVH	14,600	20.55	Nauen, Germany.	Broadcasts irreg., 8 a.m.-2.30 p.m.; phones Europe 7 p.m.	IDU	13,380	22.42	Asmara, Eritrea.	Phones Rome, p.m.
WMN	14,590	20.56	Lawrenceville, U.S.A.	Phones England.	WOJ	13,370	22.44	Hialeah, U.S.A.	Phone; irregular.
					YVQ	13,345	22.48	Maracay, Venezuela.	Phones WNC.
					CGA3	13,285	22.58	Drummondville, Canada.	Phones London and ships.
					DAF	13,275	22.60	Norddeich, Germany.	Phones ships.
					KHJ	13,220	22.66	Manila, P.I.	Phones; irregular.
					IRJ	13,220	22.70	Rome, Italy.	Phones Tokyo, 8 p.m.-mid.
					DGG	13,180	22.76	Nauen, Germany.	Phone; irregular.
					DAF	13,100	22.90	Norddeich, Germany.	Phones ships.
					VPD	13,075	22.94	Suva, Fiji Is.	Not in use at present.
					JZE	13,020	23.04	Nazaki, Japan.	Phones ships.



Call.	Kc.	M.	Location.	Schedule, etc.	Call.	Kc.	M.	Location.	Schedule, etc.
TYC	13,000	23.08	Paris, France.	Phones CNR, Morocco.	KZRM	11,840	25.34	Manila, P.I.	Irregular noon-1 a.m.
DFC	12,985	23.10	Nauen, Germany.	Phones Cairo and Manila.	CSW	11,840	25.34	Lisbon, Portugal.	Irregular, 2.30-4.30 a.m.
IAC	12,865	23.32	Pisa, Italy.	Phones ships.	OLR4A	11,840	25.34	Prague, Cz-Slovakia.	Daily 12.10-1.50 a.m.; 9.15 a.m.-1.35 p.m.; 9.30-10.30 p.m.
W10XAB	12,862	23.33	Reindeer Pt., Greenland.	Phones WEL.	W9XAA	11,830	25.36	Chicago, U.S.A.	Irregular, 10 p.m.-9 a.m.
W2XGB	12,862	23.33	Hicksville, U.S.A.	Testing.	W2XE	11,830	25.36	New York, U.S.A.	Daily, 5.30-9 a.m.
RKR	12,860	23.33	Novosibirsk.	U.S.S.R.—Phones daily, 10 p.m.	XEBR	11,820	25.38	Hermosilla, Mexico.	Relays XEBH, 5-7 a.m.; noon-3 p.m.
WOO	12,840	23.36	Ocean Gate, U.S.A.	Phones ships.	GSN	11,820	25.38	Davenport, England.	Not in use at present.
HJC	12,830	23.37	Barranquilla, Colombia.	Phones HJB, HPF & WNC.	I2RO4	11,810	25.40	Rome, Italy.	Daily, 8 p.m.-3.15 a.m.
HJA3	12,825	23.39	Rabat, Morocco.	Phones Paris.	COGF	11,805	25.41	Matanzas, Cuba.	Relays CMGF daily, 11 p.m.-3 p.m.
CNR	12,825	23.39	Pisa, Italy.	Phones ships.	OZG	11,805	25.41	Skamleboek, Denmark.	Irregular.
IAC	12,780	23.47	Rugby, England.	Phones ships.	OER3	11,801	25.42	Vienna, Austria.	Irregular 1-8 a.m.
GBC	12,780	23.47	Ciudad Trujillo, D.R.	Broadcasts, exc. Mon., 2.40 and 10.10 a.m.	JZJ	11,800	25.42	Tokyo, Japan.	Daily, 5.30-7 a.m.; 7.30-8.30 a.m.; 9-9.30 a.m.; 3.30-4.30 p.m.; 10-10.30 p.m.; 11 p.m.-12.30 a.m.
HIN	12,500	24.00	Norddeich, Germany.	Phones ships.	DJO	11,795	25.43	Berlin, Germany.	Not in use at present.
DAF	12,325	24.34	Bandoeng, Java.	Phones Sydney.	OAX5B	11,795	25.43	Ica, Peru.	Daily, 2-3 a.m., 7 a.m.-2.15 p.m.
PLM	12,300	24.39	Santiago, Chile.	Daily 2-4 and 7-11 a.m.; Mondays, 7 a.m.-1 p.m.	W1XAL	11,790	25.45	Boston, U.S.A.	Daily, 7.45-9.30 a.m.; Sun., 4.45-8.15 a.m., 9-9.30 a.m.; Mon., 6-9.30 a.m.
CG615	12,300	24.39	Wellington, N.Z.	Irregular.	DJF	11,780	25.47	Berlin, Germany.	New transmitter for Africa.
ZLU	12,295	24.40	Rugby, England.	Phones New York.	DJD	11,770	25.49	Berlin, Germany.	Daily, 7.50 a.m.-1.45 p.m., 3-5 p.m.
GBU	12,290	24.41	Manila, P.I.	Phones; irregular.	XETA	11,760	25.51	Monterrey, Mexico.	Testing new freq.
KUV	12,280	24.43	Paris, France.	Phones Far East and ships.	TGWA	11,760	25.51	Guatemala City, Guat.	Mon., Wed., Fri., 11 a.m.-3 p.m.
TYB	12,250	24.49	Reykjavik, Iceland.	Broadcasts Mon. 4.40-5.30 a.m.; phones England.	OLR4B	11,760	25.51	Prague, Cz-Slovakia.	Daily 12.10-1.50 a.m., 9.15 a.m.-1.35 p.m., 9.30-10.30 p.m.
TFJ	12,235	24.52	Paris, France.	Phones ships.	GSD	11,750	25.53	Davenport, England.	Daily, 3.20-9 a.m., 9.20-11.30 a.m., 12.20-2.20 p.m., 4-6.15 p.m.
TYA	12,215	24.56	Rugby, England.	Phones New York.	HP5L	11,740	25.55	David, Panama.	Daily, 7-10 a.m.
GBS	12,150	24.69	Zeesen, Germany.	Tests irregularly.	PHI	11,730	25.57	Saigon, Fr. Indo-China.	"Radio Philco." Daily, 2-4 p.m., 8.30 p.m.-12.30 a.m.
DZE	12,130	24.73	Algiers, Algeria.	Phones Paris, 3-9.30 p.m.	CJRX	11,720	25.60	Huizen, Holland.	Not in use at present.
TPZ2	12,120	24.75	Drummondville, Canada.	Phones Australia (VIV).	CR7BH	11,718	25.60	Winnipeg, Canada.	Daily, 7 a.m.-1 p.m.
CJA	12,100	24.79	Kootwijk, Holland.	Phones D.E.I.	TPA4	11,715	25.61	Laurenc Marques, Port East Africa.	Daily, 3.5-7 a.m., 3.5-4 p.m., 7.30-9.30 p.m., mid-2 a.m.; Sun., 8-10 p.m.; Mon., 1-4 a.m.
PDV	12,060	24.88	Nauen, Germany.	Phone; irregular.	SBG	11,710	25.63	Motala, Sweden.	Daily, 2-4.30 a.m., 4.20-5.5 p.m., 11 p.m.-mid.
DGL	12,035	24.93	Rockbank, Australia.	Phones Canada.	XEWB	11,710	25.63	Guadalajara, Mexico.	Irregular.
VLY	12,020	24.95	Moscow, U.S.S.R.	Daily 3.15-4 a.m.; 11.30 a.m.-2 p.m.; 9-10 p.m.; Sundays, 9 p.m.-4 a.m.	YSM	11,710	25.63	San Salvador, Salvador.	Irregular, 4.30-5.30 a.m.
RNE	12,000	25.00	Saigon, Fr. Indo-China.	Phones Paris.	HP5A	11,700	25.65	Panama City, Panama.	Daily, 1 a.m.-1 p.m.
FZS2	11,991	25.02	Ciudad Trujillo, D.R.	Relays HIX Wed., Sat. 11.10 a.m.-1 p.m.	CB1170	11,700	25.65	Santiago, Chile.	Relays CB89 daily, 9 a.m.-3 p.m.
H12X	11,960	25.08	Addis Ababa, Ethiopia.	Phones IAC around 3 p.m.	KIO	11,680	25.68	Kahuku, Hawaii.	Phones Far East.
IUC	11,955	25.09	Bolinas, U.S.A.	Tests irregularly.	PPQ	11,670	25.70	Rio de Janeiro, Brazil.	Phones U.S.A. & Argentine.
KKQ	11,950	25.10	St. Assise, France.	Phones Morocco & Argentine.	PPJ	11,660	25.73	Nazaki, Japan.	Irregular.
FTA	11,940	25.13	Managua, Nicaragua.	Phones C. and S. America.	VRR4	11,595	25.87	Stony Hill, Jamaica.	Phones WNC.
YNA	11,935	25.14	Valdivia, Chile.	Relays CB69 2 a.m.-2 p.m.	HH2T	11,570	25.93	Port-au-Prince, Haiti.	Irregular.
CB1190	11,910	25.20	Mexico City, Mexico.	Wed, Fri., 10.30 a.m.-3 p.m.; Sat., noon-3 p.m.; Mon., 3.30-5 a.m.	CMB	11,560	25.95	Habana, Cuba.	Phones New York.
XEW1	11,900	25.21	Rome, Italy.	10.30 a.m.-noon.	VIZ3	11,560	25.98	Fiskdale, Australia.	Tests irregularly.
IUY	11,900	25.21	Prague, Cz-Slovakia.	Irregular.	XGR	11,538	26.00	Shanghai, China.	Phone; irregular.
OLR4D	11,895	25.22	Mexico City, Mexico.	Daily, 9 a.m.-2.30 p.m.	SPD	11,530	26.01	Warsaw, Poland.	Test around 9 a.m.
XEXR	11,895	25.22	Aguaduce, Panama.	Daily 10.30 a.m.-12.30 p.m.	XAM	11,500	26.09	Merida, Mexico.	Irregular around 4 a.m.
HP51	11,895	25.22	Paris, France.	Daily, 3.15-9 a.m.; 5-8 p.m.	PMK	11,500	26.09	Bandoeng, Java.	Tests irregularly.
TPA3	11,880	25.23	Mexico City, Mexico.	Not in use at present.	COCK	11,435	26.21	Habana, Cuba.	Relays CMX daily, 9.55 p.m.-4 p.m.
XEXA	11,880	25.23	Prague, Cz-Slovakia.		CJA4	11,413	26.28	Drummondville, Canada.	Phones Australia.
OLR4C	11,875	25.26	Pittsburgh, U.S.A.	Daily 10 a.m.-2 p.m.					
W8XK	11,870	25.26	Soerabaya, Java.	Daily, 1.30-5 p.m.; Sun., 10.30 a.m.-5.30 p.m.					
YDB	11,860	25.29	Davenport, England.	Not in use at present.					
GSE	11,860	25.29	Berlin, Germany.	Not in use at present.					
DJP	11,855	25.31	Santiago, Chile.	New station soon on air.					
CB1185	11,850	25.32	Paris, France.	Testing around 8-11 a.m.					
TPB	11,845	25.33							



Call.	Kc.	M.	Location.	Schedule, etc.	Call.	Kc.	M.	Location.	Schedule, etc.
HBO	11,402	26.31	Geneva, Switzerland.	Sundays, 9.45-11 a.m.; Mon., 3.40-4.40 p.m.	PSH	10,220	29.35	Rio de Janeiro, Brazil.	Broadcasts 10 a.m.-noon.
DAF	11,340	26.46	Nordditch, Germany.	Phones ships.	DGD	10,210	29.38	Nauen, Germany.	Phone; irregular.
HIN	11,280	26.60	Cuidad Trujillo, D.R.	Irregular.	RIO	10,170	29.50	Bakou, U.S.S.R.	Phones Moscow, 1-8 p.m.
ZL74	11,050	27.15	Wellington, N.Z.	Phones Australia and England.	OPM	10,140	29.59	Leopoldville, Belg.	Congo.—Phones ORK 4-7 a.m. and around 6 p.m.
CSW2	11,040	27.17	Lisbon, Portugal.	Daily, 4.30-9 a.m.	RJR	10,080	29.76	Tiflis, U.S.S.R.	Phones Moscow.
PLP	11,000	27.27	Bandoeng, Java.	Relays YDB, 8.30 p.m.-2 a.m.	EDM.	10,070	29.79	Madrid, Spain.	Phones S. America.
OCI	10,970	27.35	Lima, Peru.	Phones Bogota.	EHY				
JZB	10,960	27.36	Nazaki, Japan.	Irregular.	JZB-				
	10,960	27.36	Tananarive, Madagascar.	Daily, 1-2 a.m., 3.30-3.45 p.m., 6.30-7.30 p.m.	TDB	10,065	29.81	Shinkyu, Manchukuo.	Phones Tokyo, 9.30-10 p.m.
HSG	10,955	27.38	Bangkok, Siam.	Irregular.	ZFB	10,055	29.84	Hamilton, Bermuda.	Phones New York.
FTH	10,940	27.43	St. Assise, France.	Phones S. America.	SUV	10,055	29.84	About Zabal, Egypt.	Phones Europe.
KTR	10,910	27.50	Manila, P.I.	Phones Berlin.	DZB	10,042	29.87	Zeesen, Germany.	Irregular.
DFL	10,850	27.66	Nauen, Germany.	Tests irregularly.	HJA3	10,040	29.87	Barranquilla, Colombia.	Tests irregularly.
KWV	10,840	27.68	Dixon, U.S.A.	Phones Hawaii.	KAZ	9,990	30.03	Manila, P.I.	Phones Java.
GCL	10,795	27.79	Rugby, England.	Phones Japan.	IRS	9,966	30.08	Rome, Italy.	Tests irregularly.
YNA	10,790	27.80	Managua, Nicaragua.	Phones S. America.	COCU	9,950	30.15	Habana, Cuba.	Relays CMCU 10 p.m.-3 p.m.
GBP	10,770	27.85	Rugby, England.	Phones Australia.	GCU	9,950	30.15	Rugby, England.	Phones New York.
GBJ	10,740	27.93	Nazaki, Japan.	Phones U.S.A., 5-10 p.m.	WCU	9,940	30.18	San Juan, Porto Rico.	Phones Miami.
JVM	10,680	28.09	Bandoeng, Java.	Phones Malaya and D.E.I.	TIZ2	9,940	30.15	San Jose, Costa Rica.	Phone; irregular.
PLQ	10,675	28.10	Lawrenceville, U.S.A.	Phones Bermuda.	HPF2	9,940	30.18	Panama City, Panama.	Phone; irregular.
WNB	10,670	28.12	Santiago, Chile.	Daily, 10-10.15 a.m.	HRF5	9,940	30.18	Tegucigalpa, Honduras.	Phone; irregular.
CEC	10,660	28.14	Rio de Janeiro, Brazil.	Phones U.S.A., Arg. & Eur.	YSG	9,940	30.18	San Salvador, Salvador.	Phone; irregular.
PSG	10,660	28.14	Nazaki, Japan.	Broadcasts daily, 5-11 p.m.; phones Europe irreg.	HKB	9,930	30.21	Bogota, Colombia.	Phones Rio de Janeiro.
JVN	10,660	28.14	Rocky Point, U.S.A.	Tests irregularly.	CSW	9,930	30.21	Lisbon, Portugal.	Daily, 8-10 a.m.
WEF	10,620	28.25	Madrid, Spain.	Phones S. America.	JDY	9,925	30.23	Dairen, Manchukuo.	Relays JQAK, 9.50-11 p.m.
EHX	10,620	28.25	Belize, BR.	Honduras.—Wed., Fri., Sun., 10.30-10.45 a.m.	DGM	9,920	30.24	Nauen, Germany.	Phone; irregular.
ZIK2	10,600	28.27	Lawrenceville, U.S.A.	Phones S. America.	LSN	9,890	30.33	Buenos Aires, Arg.	Phones New York.
WOK	10,550	28.44	Taihoku, Taiwan.	Broadcasts, relaying JFAK mid-1.25 a.m., 4.5-30 p.m.; phones Japan.	WON	9,870	30.40	Lawrenceville, U.S.A.	Phones England.
JIB	10,535	28.48	Sydney, Australia.	Phones England, 4-9 p.m.	EAQ	9,860	30.43	Madrid, Spain.	Irregular.
VLK	10,520	28.51	Drummondville, Canada.	Phones U.S.A.	IRF	9,835	30.5	Rome, Italy.	Testing; relays 2RO.
CFA4	10,520	28.51	Mogadiscio, It.	Somaland.—Phones Rome; irreg.	COCM	9,833	30.51	Habana, Cuba.	Relays CMC, 10 p.m.-3 p.m.
ITK	10,480	28.63	Nauen, Germany.	Phones Bangkok.	IRM	9,830	30.52	Rome, Italy.	Phones Egypt.
DGH	10,440	28.74	Medan, Sumatra.	Daily, 8.30-9.30, 10.30-11.30 p.m.	XGOX	9,800	30.61	Nanking, China.	Reported off air.
YBG	10,430	28.76	Paris, France.	Phones U.S.A.	LSI	9,800	30.61	Buenos Aires, Arg.	Test irregularly.
TYE3	10,430	28.76	Shanghai, China.	Phones Japan, 3 p.m.	GCW	9,700	30.64	Rugby, England.	Phones New York.
XGW	10,420	28.79	Kootwijk, Holland.	Phones Java, 10.30 p.m.	VLJ-	9,760	30.74	Sydney, Australia.	Phones Java & New Zealand.
PDK	10,410	28.80	Bolinas, U.S.A.	Phones S. America and Far East.	WOF	9,750	30.77	Lawrenceville, U.S.A.	Phones London and Paris.
KES	10,410	28.80	Rocky Point, U.S.A.	Tests irregularly.	COCQ	9,740	30.78	Habana, Cuba.	Relays CMCQ, 9.55 p.m.-4 p.m.
WCG	10,380	28.90	Nazaki, Japan.	Broadcasts irreg. around 8 p.m.	TGZ	9,720	30.86	Guatemala City, Guat.	Phone; irregular.
JVO	10,370	28.93	Teneriffe, Canary Is.	Relays EAJ4 daily, 5.15-8.15 a.m., 9.15-11.55 a.m. Relays Salamanca, 11.55 a.m.-1 p.m.	GCA	9,710	30.90	Rugby, England.	Phones S. America.
EHZ	10,370	28.93	Buenos Aires, Arg.	Tests irregularly.	LQA	9,700	30.93	Buenos Aires, Arg.	Tests irregularly.
LSX	10,350	28.98	Hamilton, Bermuda.	Phones U.S.A.	TGWA	9,685	30.96	Guatemala City, Guat.	Irregular.
ZFD	10,335	29.03	Ruyssedele, Belgium.	Daily, 5.30-7 a.m.	FZF6	9,680	30.97	Fort de France, Martinique.	Daily 2.30-3.30 a.m., 9.15-10.50 a.m.
ORK	10,330	29.04	Rio de Janeiro, Brazil.	Phones New York and Buenos Aires.	DZA	9,675	31.01	Zeesen, Germany.	Irregular.
PPM	10,310	29.10	Buenos Aires, Arg.	Phones Europe.	TIANRH	9,670	31.02	Heredia, C. Rica.	Daily, 11.30 a.m.-1 p.m., 2.30-3 p.m.
LSL2	10,300	29.13	Zeesen, Germany.	Irregular.	CR6AA	9,666	31.04	Lobito, Port. West Africa.	Uncertain (Sun., Thurs., 5.45-7.30 a.m. (?)).
DZC	10,290	29.16	Panama City, Panama.	Phones C. and S. America.	LRX	9,660	31.06	Buenos Aires, Arg.	Daily, 11.30 p.m.-1.30 a.m.
HPC	10,290	29.16	Bandoeng, Java.	Relays YDB, 8.30 p.m.-2 a.m.	PSJ	9,660	31.06	Rio de Janeiro, Brazil.	Phones Argentine.
PMN	10,260	29.24	Buenos Aires, Arg.	Phones U.S.A. and Europe.	CS2WA	9,650	31.09	Lisbon, Portugal.	Sun., Wed., Fri., 7.30-10 a.m.
LSK3	10,250	29.27	Antofagastan, Chile.	Tests 10 a.m.-12.30 p.m.	DGU	9,650	31.09	Nauen, Germany.	Phones Egypt.
CEC	10,230	29.33			HH3W	9,645	31.10	Port-au-Prince, Haiti.	Daily, 4-5, 10-11 a.m.
					YNLF	9,645	31.10	Managua, Nicaragua.	Daily, 3.30-5.30 a.m., 9.30 a.m.-1 p.m.



Call.	Kc.	M.	Location.	Schedule, etc.	Call.	Kc.	M.	Location.	Schedule, etc.
CXA8	9,640	31.12	Colonia, Uruguay.	Relays LR3, Buenos Aires, 9 p.m.-2 p.m.	ZBW3	9,525	31.49	Hong Kong, China.	Daily, 2.30-4 p.m., 7 p.m.-1 a.m.; Sun., noon-4 p.m., 6 p.m.-12.30 a.m.
I2RO3	9,635	31.13	Rome, Italy.	Daily, 3.30 a.m.-noon.	LKJI	9,525	31.49	Jeloy, Norway.	Daily, 8-11 p.m.
CFA5	9,630	31.15	Drummondville, Canada.	Phones U.S.A.	ZRH	9,523	31.50	Roberts Heights, S. Africa.	Daily, exc. Sun., 2.45-3.45 p.m., 8-10.30 p.m.; Sun., 6 or 6.30-7.30 or 8 p.m.
HJ7ABD	9,630	31.15	Bucaramanga, Colombia.	Testing 11 a.m.	HJ6ABH	9,520	31.51	Armenia, Colombia.	Daily, 9 a.m.-1 p.m., 11 p.m.-2 a.m.
JIB	9,630	31.15	Taihoku, Taiwan.	Relays JFAK around midnight.	OZF	9,520	31.51	Skamleboek, Denmark.	Daily, 5-9.40 a.m.
FZR	9,620	31.19	Saigon, Fr. Indo-China.	Phones Paris.	YSH	9,520	31.51	San Salvador, Salvador.	Irregular, 9 a.m.-1 p.m.
OAX5C	9,620	31.19	Ica, Peru.	Changed from 9580 k.c. Daily 9 a.m.-1 p.m.	XEDQ	9,520	31.51	Guadalajara, Mexico.	Irregular, 10.30 a.m.-3.30 p.m.
HJ1ABP	9,620	31.19	Cartagena, Colombia.	Daily 2-4 a.m., 8 a.m.-2 p.m.; Mon., 1-4 a.m., 6-9 a.m.	VK3ME	9,510	31.55	Melbourne, Australia.	Exc. Sun., 7-10 p.m.
HP5J	9,615	31.22	Panama City, Panama.	Daily 3-4.30 a.m., 9 a.m.-1.30 p.m.	GSB	9,510	31.55	Daventry, England.	Daily, 3.20-7 a.m., 9.20-11.30 a.m., 12.20-2.20 p.m., 4-6.15 p.m.
ZRK	9,606	31.23	Klipheuvval, S. Africa.	Daily exc. Sun., 2.45-3.40 p.m., 6.20-10.20 p.m., mid.-2.40 a.m.; Sun., 7-8.30 p.m., 11 p.m.-2.40 a.m.	HS8PJ	9,510	51.55	Bangkok, Siam.	Thursdays, 11 p.m.-1 a.m. (Fri.).
RAN	9,600	31.25	Moscow, U.S.S.R.	Daily from 10 a.m.-12.15 p.m.	HJ1ABE	9,505	31.57	Cartagena, Colombia.	Daily, 8 a.m.-1.30 p.m.
XEYU	9,600	31.25	Mexico City, Mexico.	Daily, 10 a.m.-1 p.m.	XEWV	9,500	31.58	Mexico City, Mexico.	Daily, 9 a.m.-3 p.m. Relays XEW.
CB960	9,600	31.25	Santiago, Chile.	Not in use at present.	HJU	9,500	31.58	Buenaventura, Colombia.	Tues., Thurs., Sat., 11 a.m.-2 p.m.
HBL	9,595	31.27	Geneva, Switzerland.	Sundays, 8.30-9.30 a.m.	PRF5	9,500	31.58	Rio de Janeiro, Brazil.	Irreg., 7.45-8.45 a.m.
PCJ	9,590	31.28	Huizen, Holland.	Sun., 4.25-4.40, 5-6 a.m.; Mon., 10.15-11.15 a.m., 11.25 a.m.-12.25 p.m.; Tues., 11.15 a.m.-12.45 p.m., 4.45-6.40 p.m.; Wed., 10-11.30 a.m., 11.45 a.m.-1.15 p.m.; Thurs., 10.15-11.15 a.m.	EAR	9,478	31.65	Madrid, Spain.	Irregular, 10.30 a.m.
VK6ME	9,590	31.28	Delhi, India.	12.30-1.30 p.m.	PLW	9,478	31.65	Bandoeng, Java.	Phones Australasia.
VK2ME	9,590	31.28	Perth, Australia.	Exc. Sun., 9-11 p.m.	KET	9,478	31.65	Bolinas, U.S.A.	Phones New York.
W3XAU	9,590	31.28	Sydney, Australia.	Sun., 4-6 p.m., 8 p.m.-2 a.m. (Mon.).	WET	9,478	31.65	Rocky Point, U.S.A.	Phones S. America & Bermuda.
GSC	9,580	31.32	Philadelphia, U.S.A.	Relays WCAU, 3 a.m.-10 or 11 a.m.	ICK	9,460	31.71	Tripoli, N. Africa.	Phones Rome, 8.30-10 p.m.
VLR	9,580	31.32	Daventry, England.	Daily, 9.20-11.30 a.m., 12.20-2.20 p.m.	TGWA	9,450	31.75	Guatemala City, Guat.	Not in use at present.
KZRM	9,570	31.35	Melbourne, Australia.	Daily, 6.30-11.30 p.m. (Sun. till 10.30); daily, exc. Sunday, 12.35-5.15 p.m.	HC2RA	9,440	31.78	Guayaquil, Ecuador.	Irregular around noon.
W1XK	9,570	31.35	Manila, P.I.	Daily, 7.30-9 a.m., 8 p.m.-mid.; Sun., 7 p.m.-1 a.m.	YVR	9,430	31.80	Maracay, Venezuela.	Tests.
DJA	9,560	31.38	Springfield, U.S.A.	Relays WBZ, 10 p.m.-4 p.m. (Sun. from 11 p.m.).	COCH	9,428	31.80	Habana, Cuba.	Daily, 10 p.m.-4 p.m.
TPB	9,550	31.41	Berlin, Germany.	Daily, 7.50 a.m.-1.45 p.m., 3.05 p.m.-2 a.m.	PLV	9,415	31.87	Bandoeng, Java.	Broadcasts, 9 a.m.-8.30 p.m.; phones Holland, 12.45 a.m.
OLR3A	9,550	31.41	Paris, France.	Testing.	XDR	9,400	31.92	Mexico City, Mexico.	Phones XAM, Merida, Yucatan.
XEFT	9,550	31.41	Prague, Cz-Slovakia.	Daily, 4.55-8.40 a.m., 11 a.m.-1.35 p.m.	PGC	9,375	32.00	Kootwijk, Holland.	Phones D.E.I.
YDB	9,550	31.41	Vera Cruz, Mexico.	Daily, 2.30-7 a.m., 10 a.m.-3 p.m.	W9XHW	31,600	9.49	Minneapolis, U.S.A.	Relays WCCO. Schedule unknown.
HH2R	9,545	31.44	Soerabaya, Java.	Daily, 9-10.30 a.m., 8.30 p.m.-2 a.m.	JZM	21,520	13.94	Nazaki, Japan.	Irregular.
DJN	9,540	31.45	Port-au-Prince, Haiti.	Irregular.	JIB	19,820	15.14	Taihoku, Taiwan.	Relays JFAK around mid.
VPD2	9,540	31.45	Berlin, Germany.	Daily, 7.50 a.m.-1.45 p.m.	I2RO6	15,300	19.61	Rome, Italy.	Testing.
JZI	9,535	31.46	Suva, Fiji Is.	Daily, 8.30-10 p.m.	EALAV	15,000	20.00	Salas, Spain.	Nationalist station.
HB9D	9,535	31.46	Tokyo, Japan.	Daily, 5.30-7 a.m., 7.30-8.30 a.m., 3.30-4.30 p.m.	KKW	13,780	21.77	Bolinas, U.S.A.	Special relays.
W2XAF	9,530	31.48	Zurich, Switzerland.	Mon., 12.1-2 a.m.; Fri., 4-6 a.m.	TYE2	13,760	21.80	Paris, France.	Phones U.S.A.
W6XBE	9,530	31.48	Schenectady, U.S.A.	Daily, 7 a.m.-4 p.m.	CGA2	13,745	21.83	Drummondville, Canada.	Phones Europe.
			Belmont, U.S.A.	New G.E. transmitter.	RIS	13,738	21.84	Tiflis, U.S.S.R.	Phones Moscow.
			Tananarive, Madagascar.	Daily, 1-2 a.m., 8.30-3.45 p.m., 6.30-7.30 p.m.	JYS	10,700	28.04	Milan, Italy.	"Radio Milano," till 9 a.m.
					HJ7ABD	10,630	28.22	Salamanca, Spain.	"Radio Pizarrales," Nationalist station.
					OLR3B	9,504	31.57	Prague, Cz-Slovakia.	Not in use at present.
						9,840	30.49	Kemikawa-Cho, Japan.	Irregular.
						9,630	31.14	Bucaramanga, Colombia.	Daily 1-3 a.m., 7 a.m.-2 p.m.



# Tracking Down Power Interference . . (3)

## Motor Car Interference.

Internal combustion engines, as used in cars, electric lighting plants and motor-driven ships or boats, often give rise to considerable direct radiated interference, and if radio is required close to the engine, as in the case of the car, means must be employed for reducing the amount of radiation and also preventing conducted and re-radiated disturbances.

The main sources of disturbance on a car are the battery charging generator, and the ignition circuit. The former causes interference because of its commutator, and the latter because there are regular surges in both the high tension and the low tension circuits. The generator is satisfactorily suppressed by fitting a .5 mfd "Chanex" contact suppressor, type H.17, capable of resisting the engine temperature, close to it on the engine frame with the pigtail lead connected to the unearthed brush of the generator.

If ignition is obtained from a coil, the circuit has to be suppressed in three places. A spark plug suppressor of 10,000 to 15,000 ohms, of which there are several makes now on the market, is connected in the high tension lead very close to each plug—a distributor suppressor, with a resistance of 10,000 to 15,000 ohms is connected in the high tension lead as it enters the distributor—the "Chanex" contact suppressor, type H.17, completes the equipment when fitted so that its case is connected to the engine frame, and its pigtail leads connected to the side of the coil not connected to the contact breaker.

With magnetic ignition the distributor suppressor is not fitted as the disturbance is not so pronounced, and the added resistance tends only to impair engine performance unless the magneto is exceptionally good. In this case the contact suppressor is fitted so that its case is at frame potential, and its pigtails connected on to the lead as it leaves the magneto on its way to the ignition switch.

The above particulars apply in general to the suppression at short wavelengths. The interference from petrol engines is more pronounced at high radio frequencies and tends to radiate hundreds of feet, but the suppressors mentioned above are still effective, and can be relied upon to give almost uniform suppression.

Any electrical contrivance such as a horn, petrol pump, self-starter, etc., can be suppressed by fitting a "Chanex" contact suppressor, type H.17, as fitted on the generator.

If the car radio receiver is required to pick up very weak signals or

**This third and concluding instalment deals with the suppression of specialised types of interference, and outlines the general procedure to adopt in locating sources of electrical noise.**

short wave signals, the following greater precautions may become necessary:—

1. The sparking plug leads may need a suppressor or resistance at each end.
2. The windscreen wiper, if electric, may need a 25 mfd. electrolytic condenser across it, and a choke connected in series with the windscreen wiper. If these cannot be fitted next to the wiper, the leads from the wiper to suppressors must be screened and the screening earthed.

## Adding Machines And Cash Registers.

These machines are a frequent source of interference, since they contain relays which are continually making and breaking. The best method of suppression is using a circuit as shown in Fig. "H." Alternately, a

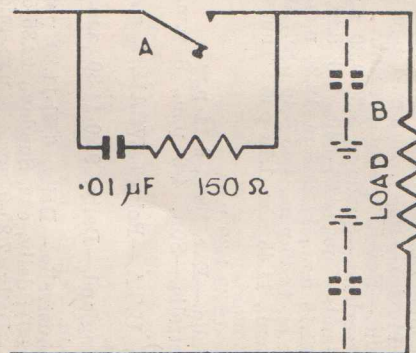


Figure "G."

somewhat simpler condenser suppressor can be used, as shown in Fig. "G," the choice depending largely upon the severity of the interference. It is important to note that leads between the switch and equipment, including the lead to the suppressor, should be properly screened, i.e., enclosed in metal casing, which is thoroughly bonded together and connected to earth.

## Refrigerators.

Electrically driven refrigerators often cause disturbance, particularly when operating on D.C., or when em-

ploying A.C. commutator motors, in which cases the interference has two separate components—due to commutator and to switch contact. The former usually is the main cause of complaint, and is satisfactorily suppressed with a "Chanex" type H.11 unit if an earth lead is taken to the machine, and a Type H.12 if there is no earth. As long as the suppressor is fitted with short leads to the actual brushes, it will usually be found that short wave interference will be considerably reduced in addition to that on the broadcast band.

The disturbance due to contacts, i.e., on thermostatic switch and on door-operated light switch, is greatly reduced by fitting a suppressor across the mains supply lead at a point immediately after where they enter the cabinet. In many cases one standard "Chanex" unit, type H.11, alone fitted at this point has been entirely satisfactory in suppressing both forms of disturbance, and this should be tried before more elaborate tests are made.

## Door Bells.

These are an excellent example of a vibrating contact. They will give a sharp burr in the set every time the bell is operated. Interference may be suppressed by the use of the circuit shown in Fig. "G."

## Multi-Contact Electric Signs.

These cause interference by reason of the continual make and break of the numerous circuits. It is, of course, possible to suppress each contact individually by using the methods just outlined, but a simpler remedy is to enclose the whole contact mechanism inside a metal box and run the leads to the lamp in lead-covered cable. The lead casing and box are earthed either direct or through an H.F. choke according to local conditions, whilst suppressors across the main may be fitted with advantage inside the metal box. A type H.11 "Chanex" condenser suppressor, connected across the main, is sufficient, the centre point being connected to the metal casing.



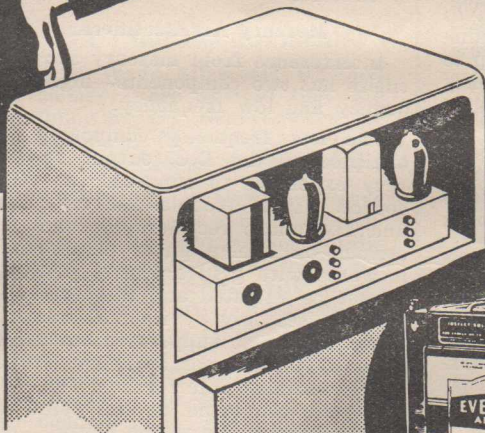
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### Neon Signs.

Electric signs of the high tension gas-discharged type are in common use to-day, and may cause interference under certain conditions. The current in these signs is of a ragged character, for actually the discharge ceases momentarily and restrikes every half cycle.

The sudden changes will give rise to high frequency oscillations, which will be radiated by the high tension wiring, including the sign itself, but fortunately the wave length of the disturbance is usually outside the broadcast band, so that interference is small. It is definitely possible to effect a cure of interference being generated by neon signs. It should be pointed out, however, that in the majority of cases, neon signs are being maintained by the manufacturers of the signs, and, where interference is traced to a neon sign, it is advisable to get in touch with the manufacturers of the sign, who are most anxious to assist in the reduction of interference generated by signs, rather than attempt to make any alteration to the actual sign.

### Medical Apparatus.

High frequency equipment is used to an increasing extent by the medical profession, and also in the form of ultra-violet apparatus by hairdressers. For such plant, damped waves are generated by a small spark transmitter, and the voltage is kept up to a very high value by a high frequency transformer. This voltage is applied to the patient, via one terminal, the other being connected either directly or capacitatively to the mains. The high frequency current thus flows through the patient to earth and back via the supply mains.

An arrangement more calculated to induce interference is difficult to conceive, particularly as the heavily damped wave has a considerable spread, just like an old-fashioned spark transmitter.

The remedy is to enclose the whole equipment in a shielded room so that the capacity currents go to the screen and not to earth. "Chanex" type H.11 condensers across the main lead will enable the H.F. currents to return to the apparatus without going outside the screen.

The screening need not be solid, and a fairly wide mesh gauze is adequate in most cases. The whole of the apparatus, including the patient, must be housed within this screen, which must be complete, doors and windows being screened as well as the walls, floors and ceiling. Any other outgoing leads, such as telephone wires, must also be condensed just inside the screen. An alternative to the wire screen, and considerably cheaper, is to paper the room throughout with metal

covered paper, which is not only cheap but quite an effective decoration.

### Sewing Machines And Dental Drills.

The high speed of the motor in such equipment causes a pronounced commutator ripple, and "Chanex" type H.14 suppressors should be fitted. Note should be made as to whether the motor is earthed by means of a three-core flex, or is of the un-earthed type. The addition of the condenser suppressors should be in accordance with the foregoing conditions. These motors are generally equipped

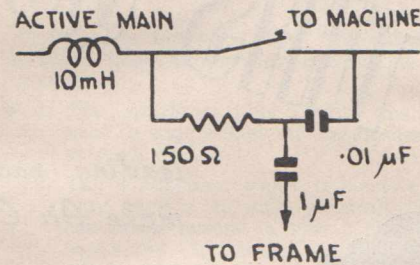


Figure "H."

with a foot starter, which gives rise to clicks, as it is brought into use. A .1 mfd. type F.11 "Chanex" condenser, across the first part of the switch to earth or the switch arm, is usually effective.

### Mercury Arc Rectifiers.

Interference from mercury arc rectifiers has two components—high frequency and low frequency.

The low frequency component is a ripple on the D.C. output and is very expensive to suppress at the source. It is troublesome on three and six phase rectifiers, but not so serious on twelve phase plants, and is worse with grid control types. It cannot be radiated and therefore enters the set only by its mains leads, hence it is best suppressed at this point by the listener by using a type H.11 "Chanex" interference suppression unit connected at the point of entry of the mains to the house.

The high frequency component can be suppressed quite easily and inexpensively at the source. It is propagated and radiated from both the A.C. and the D.C. sides of the rectifier.

The usual cure is 1 mfd. condensers from every electrode to earth. The type H.11 unit is convenient for dealing with every two electrodes providing the R.M.S. volts do not exceed 240 to earth. If 500 volts to earth the H.11 unit must be used with its two condenser units in series to earth, i.e., an electrode to one main terminal, earth the other main lead and the earth connection is cut off at the entry to the condenser unit and is left unconnected. If condensers do not suffice, 250 or 500 M.H. chokes must

be inserted in each electrode.

### Lifts.

The interference caused by lift installations is picked up by the mains or any other conductors passing close to the control panel and the motor. Considerable disturbance is conducted by the electric mains and re-radiated, but in many cases more trouble is caused by high frequency current proceeding along the flexible control cable and radiating from there.

If the lift is over 20 yards away fit a "Chanex" type H.11 2 x .1 mfd. suppression condenser unit to the listener's main switch at the point of entry to the house. If the lift is nearer than 20 yards, we suggest that the P.M.G. Department be notified, and no work should be carried out without first notifying the firm responsible for the maintenance of the lift.

### Noisy Wiring.

If the lead-covered wiring or the metal conduit of the house wiring is making contact with any other conductor such as the water or gas pipe or iron girder or another cable or conduit, there will be violent radio crackling noises, when people walk about the house, or "motor cycles" noises in the loud speaker when a certain water tap is turned on, and the cure, obviously, is to separate or to bond the rubbing conductors, but if the seat of the disturbance cannot be found, a partial cure is to fit a type H.11 "Chanex" suppressor at the power point and by-pass the interfering component to ground before entering the set.

### Manufacturer's Type Suppressors.

Manufacturers of certain appliances, i.e., vacuum cleaners, hair dryers, refrigerators, sewing machines, etc., are already fitting suppressors inside their machines, and "Ducon" offer a comprehensive service to manufacturers of this type of apparatus, whereby they test the machine and design the most economical and efficient skeleton type suppressors for internal fitting, and at all times they are pleased to advise and assist in problems inherent with the design of similar apparatus.

### General Hints For Locating Interference Sources

A summary of the procedure to adopt in analysing interference is as follows:—

- (1) Disconnect the aerial and earth and short circuit the aerial and earth terminals. With the battery set this will remove all trace of interference. With the mains operated set some interference may remain. If so, this is due to direct conduction through the mains, and is usually in the form



of hum. If not, suitable condenser suppressors, pending the location of the actual source of trouble, should be fitted at the mains entry to the house.

- (2) Obtain a battery set of approximate sensitivity to the existing set. Switch off the house mains at the main switch. If the interference remains it is due to direct radiation or re-radiation. If it disappears it is due to mains radiation.
- (3) If evidence points to direct radiation, or re-radiation, examine the surroundings to decide which is the most likely. The presence of power, telephone or tram lines in the vicinity would indicate that re-radiation is the most likely source, necessitating an alteration to the position of the aerial.
- (4) Direct radiation can be located by inspection, as a general rule, assisted, if necessary, by the use of a portable set. If this is present, the interfering source should be suppressed with "Chanex" condenser suppressors, and shielded aerial system will also assist the suppressing work.

#### THE EFFECT OF A.V.C.

It is generally found that the interference is strongly of one particular type, and the location of the source of trouble and the fitting of appropriate "Chanex" condenser suppressors will therefore remove the great part of the trouble. With the modern type of receiver, however, it may be found that the result would be little, if any better.

This is because most of the up-to-date receivers are fitted with A.V.C., which automatically adjusts the amplification of the set to the strength of the incoming signals. Therefore, any reduction in the interference signal may cause an increased amplification which will bring up interference from other sources which were previously masked, whilst in extreme cases the valve noises in the set itself may be increased by the added amplification so that the total noise is just as bad.

Due allowance must therefore be made for this factor. Where possible a receiver without A.V.C. should be used when testing the effect of any particular suppressing device, or the A.V.C. in the existing set thrown out of action temporarily. The sources of interference can then be located and cures effected one by one in order of magnitude. In some cases completely quiet working is only obtainable by fitting several different forms of suppressors, each dealing

with its own share of the disturbance.

#### IMPORTANCE OF GOOD AERIAL SYSTEM.

It must be emphasised that the receiving aerial itself has a marked influence on the strength of the interfering signals, and on reception. In particular the indoor-aerial, so popular because of the high sensitivity of modern receivers, is a great aid to interference. It is right in the interference zone, and picks up disturbance far more than it does the signals. In tests conducted by the B.B.C., and detailed in a paper entitled "RECEIVING AERIALS AND ELECTRICAL INTERFERENCE" it was pointed out that with an indoor aerial the interference can be much greater than with an outdoor aerial properly located.

#### Types Of Interference.

The following is not intended to be a complete list of the various apparatus that may create interference, but only to serve as a general guide in locating interference of the generated type. Before endeavouring to locate generated interference, tests

#### DX Club Requirements.

All-Wave All-World DX Club members are advised that the following DX requirements are obtainable from Club headquarters, 214 George Street, Sydney.

**REPORT FORMS.** — Save time and make sure of supplying all the information required by using these official forms, which identify you with an established DX organisation. Price . . . 1/6 for 50, post free.

**NOTE PAPER.**—Headed Club notepaper for members' correspondence is also available. Price, 1/6 for 50 sheets, post free.

**DX CLUB STICKERS.**—Enlarged two-colour replicas of the Club badge, in the form of gummed stickers, designed for attaching to envelopes, QSL cards, etc. Price, 5 dozen for 1/6, post free.

**DX CLUB LOG SHEETS.**—Designed by the Shortwave Editor, these headed and ruled log sheets are indispensable to dxers who wish to keep a simply-prepared and accurate list of loggings. Price, 3 dozen for 1/6, post free.

should be made to ensure the interference is not borne by the mains, in which case the cure is simply a "Chanex" Type H.11 suppression condenser at the point of entry to the building.

#### Heavy Buzzing Or Rushing Sounds.

Air purifiers; battery chargers; diathermy machine and medical apparatus; neon signs; flour bleachers; oil burner ignition systems; violet ray and X-ray equipment.

#### Clicking.

Lift control; flashing signs; ovens; mercury arc rectifiers; traffic signals; sign flashers; electric typewriters; incubators; telegraph relays.

#### Whirring Or Whining Noises.

(often accompanied by crackling).

Adding machines; barbers' clippers; beauty parlor equipment; cash registers; dental machines; dictaphones; dish washers; dough mixers; electric fans; home lighting plants; floor polishers; generators; humidifiers; small blowers; electric addressographs; lifts; refrigerators; telephone magnets; toy electric mains; vacuum cleaners; valve grinders; washing machines; hair dryers; massage machines; motor generators; portable electric drills; printing presses; sewing machines.

#### Rattles, Buzzes And Rapid Clicking Noises.

Buzzer and trembler bells; vibrating rectifiers; dental machinery; dial telephones; lift controls; motor car ignition systems; sewing machines.

#### Crackling Or Spluttering Noises.

Bad connections; defective light or power sockets; lift controls; high tension lines; tramcars; loose connections in house wiring; partially earthed power line.

Direct radiation from interfering plant is in two parts. The first is the radiation from the machine itself, and the second is radiation from the wiring immediately adjacent to the machine.

In most cases complete cures can be effected by the connection of "Chanex" condenser suppressors or condenser choke suppressors at the terminals of the machine, which will not only minimise the direct radiation to a large extent, but it will prevent mains-borne interference being carried from the machine along the supply network.





*Smaller size*  
**...GREATER PERFORMANCE**

The Simplex S/M type moulded mica condenser marks an important milestone in condenser progress. It brings you basically new improvements of far-reaching significance in mica condenser design. New method of assembly reduces size of unit . . . minimises danger of shorts.

One-piece contact does away with possibility of fractured joints and subsequent failure of unit.

Improved methods of heat treatment during moulding ensure permanency of calibration. Triple-tested for greater accuracy.

Type S/M, available in capacities from .000005 microfarads to .01 microfarads.  
 Type P/T (Pigtails) measuring only 5/8" by 5/8"—capacity range .000005 microfarads to .001 microfarads.  
 (All Simplex condensers are subjected to a test of at least 1,000 volts A.C. and D.C.)

"Favoured by Famous Factories"

**SIMPLEX CONDENSERS**

Manufactured by Simplex Products Pty. Ltd., 716 Parramatta Rd., Petersham, N.S.W.  
 'Phone LM 5615.

**Round the Shacks . . . . . 8**  
**- VK 3PB -**

Owner-Operator: J. P. Boyd, 40 Grant St., East Malvern, S.E.5, Victoria.

HE transmitter valve line-up at 3PB at present is a 59 tritet with an 80m. crystal, 6L6G buffer on 40 (doubler on 20) and a pair of 46's in push-pull in the final P.A. These are plate-modulated by another pair of 46's in class "B." The input to the r.f. final stage is varied between 20 and 45 watts.

There is, I think, a point of interest regarding the modulation transformer system being used at present at 3PB. There is nothing new in using a power transformer for modulating; VK3SO does very well indeed with this coupling; in that he gets 13 1/2 watts out of a single 6L6 modulator. However, at 3PB I have utilised two inexpensive 100 mill. power transformers hooked up as shown in the sketch. The expense of the system is only a fraction of the cost of a tapped modulation transformer.

"T1" is an ordinary 100 mill. power transformer with 385v. each side of the centre tap in the secondary. One side only of this secondary is used in the plate supply to the r.f. final. A filament winding is used to monitor the quality of the modulator. The primary is connected to the primary "T2," which is another power transformer with a standard 200v.-240v. primary and a secondary with 160v. a side. The normal secondary of "T2" is here used as the primary, being in the plate circuit of the modulating valves.

In order to get a good match to the r.f. load, it is only necessary to adjust the taps on the (normal) primaries of each transformer until the total turns ratio is about right to reflect the correct impedance into the modulator valves for a given r.f. load resistance.

Of course, as the d.c. plate currents of the modulator and r.f. stages pass through different transformers, there is little likelihood of either core becoming saturated. I have no doubt

that audio power is lost by this method and that peaks are plenty, but while using this system I have had some really excellent reports on the quality.

And quite by the way, I would like to point out that before rushing to complainants of B.C.L. QRM with one's hands full of comparatively expensive wave-traps, it is a good idea to try first an old style choke, made up of about 2 1/2 in. of close-wound 35 s.w.g. on a 1/2 in. wooden dowel. I have to date found this entirely adequate, as it is effective in cutting out the popular amateur bands yet leaving the broadcast band unscathed.

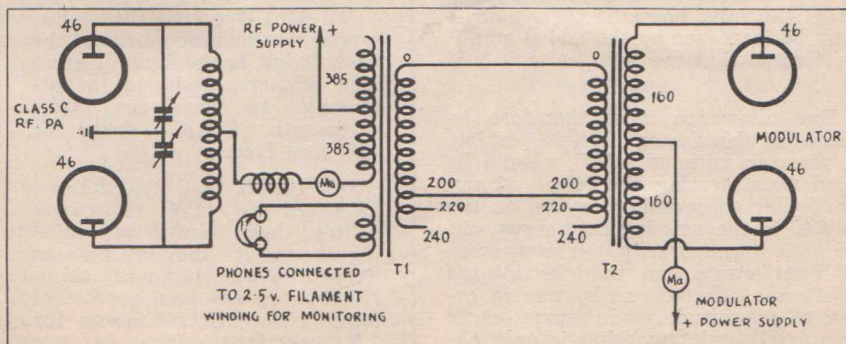
I am most interested in low definition (for a start) television, and would be very glad to hear of others who are also experimenting with this phase of the game.—J. P. Boyd (VK3PB), Burdes, 40 Grant Street, East Malvern, S.E.5, Victoria.

**Electro-Technical Journal: Overseas Publication Available.**

The knowledge that is gained by the performance of many interesting experiments at Philips research laboratory is available to the readers of "Philips Technical Review," which is published at Eindhoven, Holland.

The Review covers a wide field of scientific research, light and illumination; radio and television, sound, recording and reproduction; X-rays; cathode rays; telephony; electro-technical apparatus; materials and their research—all come within its scope. The material is concisely written and, while sponsored by scientists, is set out in such lucid and simple form as to be readily applicable.

The subscription (10/- per annum) may be paid to Philips, Sydney, but subscribers will receive their copies direct from the laboratory at Eindhoven. A volume consists of 12 monthly issues, January being the commencing issue.



Two power transformers are used in 3PB's modulator stage.



# What's New In Radio

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

## Price's Radio Service Releasing 1938-39 Catalogue Shortly.

Messrs. Price's Radio Service, of 5 Angel Place, Sydney, advise that their 1938-39 catalogue is now in the course of preparation, and will be released within several weeks.

For some years past this firm has specialised in catering for the requirements of amateur transmitters and shortwave fans, and in consequence has now a range of up-to-date American, English and Australian lines that for variety must be unequalled anywhere else in Australia. In addition, a wide range of Radiomac components, designed and manufactured specially to meet local requirements, will be included in this year's catalogue, several of the most important of these being featured for the first time.

Containing more pages and more illustrations than last year's catalogue, this latest edition is to be printed on better quality paper, and is altogether a more expensive production. Readers wishing to obtain copies at the earliest possible moment are invited to write in immediately to the address given above. Copies will then be posted to applicants free and post free the moment the catalogue is released.



## Ever Ready Sponsor "Critical Moments" Over 2UW.

One of the newest features to be released by 2UW last month was the first of a series of dramatic real-life incidents entitled "Critical Moments." Sponsored by the Ever Ready Co. (Aust.) Pty. Ltd., Rosebery, N.S.W., and scheduled for 7.50 every Sunday night, the episodes are particularly entertaining, and as the series develops should enjoy a large following.



## Compact Delta A.C./D.C. Multi-meter.

A new test equipment release by Messrs. W. G. Watson and Co. Pty. Ltd. is the Delta model D 666 a.c./d.c. multi-meter. Particularly compact—the overall dimensions are 6½ in. x 4 in. x 3¾ in. deep—the instrument is particularly well-finished, and is housed in a lacquered box with an engraved metal panel.

The meter employed in this instrument is a Triplett type 321 incorporating a knife-edged anti-parallax pointer to ensure accurate readings. The same scale calibrations are employed for both a.c. and d.c. readings, a separate pair of connections being provided for a.c. measurements, together with a two-way change-over toggle switch.

Ranges comprise 0-10-50-250-125 volts a.c. or d.c., 0-1-10-50-250 d.c. milliamperes and two resistance ranges, 0.2 to 500 ohms and 100 to 100,000 ohms. On the low range, very accurate indications are obtainable down to a fraction of an ohm. A single heavy duty cell serves both ranges.

Altogether, this new multi-meter forms a particularly attractive proposition for servicemen and set-builders, as it is compact, accurate and low-priced, as well as possessing a high degree of flexibility.

Further details may be obtained on request to Messrs. W. G. Watson &

Co. Pty. Ltd., 279 Clarence Street, Sydney.



## Philips Valve Works Inspection.

Although many of those engaged in the Sydney radio trade have inspected the Philips Australian valve works, Camperdown, many have not yet had an opportunity of doing so.

In future, inspection will be by invitation only, and those who have not yet seen over the factory, but who are desirous of doing so, are advised to write or ring Mr. R. Fitzgerald or Mr. G. Hume [Philips Lamps (A/asia Pty. Ltd., Philips House, 69-74 Clarence Street, Sydney, BW2121] and leave their name and address.

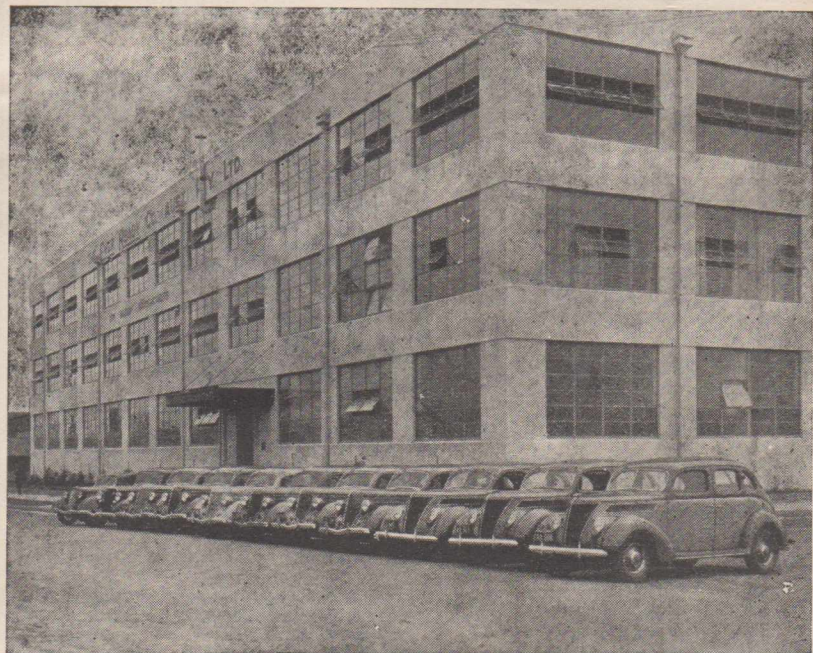
They will then be forwarded an invitation card enabling them to inspect the valve works at 7.30 p.m. on June 21. The factory will be under normal working conditions, and dealers, servicemen and others will be able to observe every progressive detail of modern valve manufacture.



## Schick Electric Dry Shavers

Radio and electrical dealers will be interested to note the introduction to the Australian market of the Schick electric dry shaver, for which Messrs. Martin de Launay Pty. Ltd., corner Clarence and Druitt Streets, Sydney, are N.S.W. distributors to the trade.

The Schick shaver has proven itself an immense success, nearly 2,000,000



A portion of the Ever Ready fleet of cars used by the company's country and metropolitan representatives. It is by providing their men with such up-to-the-minute transportation that the Ever Ready Co. (Aust.) Pty. Ltd. maintains friendly contact with retailers throughout the Commonwealth.



of them now being used all over the world. Anticipated sales of electric dry shavers this year in the United States alone are approximately 4,000,000, which gives an idea of the possibilities of the line.

The Schick shaver completely eliminates the use of water, soap, brush or razor blades, consumes scarcely enough electricity to turn a meter, and plugs into a 240-volt A.C. or D.C. power-point or electric light socket. Obviously the Schick proves itself to be very economical, and quite apart from the time saved and the added convenience, will very soon pay for itself. In addition, the Schick is guaranteed for twelve months against any faulty materials and workmanship.

Martin de Launay Pty. Ltd. have available a 2-colour folder which sets out full details of the Schick electric dry shaver, and which will be sent post free on request to readers writing the address given above.



### New Astatic Pick-Ups And Microphone.

Three new Astatic lines of which stocks have lately been landed by the Australian representatives, E.T.C. Industries Ltd., comprise the Tru-Tan

B10 and B16 crystal pick-ups, and the Astatic D104 crystal microphone.

In the new Tru-Tan pick-ups, Astatic engineers have developed a design that assures finer reproduction and longer record wear.

- (1) The exclusive off-set head design which, by holding the needle practically true to tangent throughout the entire playing surface of a record, assures finer reproduction and longer record life.
- (2) The handy Astatic reversible action of this same off-set head which allows it to be turned completely around so that needle can be dropped in from above.
- (3) The exclusive Astatic double row ball bearing in the base swivel.

The Tru-Tan has a maximum tracking error not exceeding 1.5° from true tangency, in comparison with the average Sin. straight arm pick-up er-



The Astatic type B-10 Crystal Pick-up error of 15° and the average straight arm pick-up error of 10°. This unusually low deflection from perfect

alignment is accomplished by the unique, off-set head design.

### The Astatic D104 Crystal Microphone.

Due to continued research work and new and improved methods of design, the Astatic D104 crystal microphone possesses many features in advance of competing microphones.

Possessing superior frequency response, there is absolutely no background noise and the response is not affected by movement of the microphone while in use. Economy of installation is also evident, as there is no button current, no field current or polarising voltage, and due to its high impedance it may be connected direct to the grid, thus saving the cost of an input transformer.



In the Astatic D104 all sensitive parts have been carefully protected from deterioration due to humid atmosphere, all materials are absolutely stable and each microphone carries with it a one-year guarantee against failure due to defective workmanship or material.

Further information on the above lines is available free on request from E.T.C. Industries Ltd., 470-480 Elizabeth Street, Sydney.



### In Latest "Radiotronics."

The circuit, with application data, of a 32-watt amplifier using push-pull 6L6G's in the output is published in Radiotronics No. 86, lately released by Amalgamated Wireless Valve Co. Pty. Ltd.

Also included are characteristics and ratings of the Radiotron type 902 2in. cathode ray tube, together with a circuit showing a typical application in an oscillograph.

Other articles of interest are entitled "Mixing Systems," "R.C.A. Application Note On Wide Angle Tuning Indicators," and "Radiotron 1851-Television Amplifier Pentode."

Accompanying this latest issue is a further batch of characteristics charts covering the 6A8G, 6B8G, 6F6G, 6J7G, 6U7G and 5Y3G.



### Rola Isocore Transformer Eliminates Electrolysis

Designed primarily to eliminate electrolysis—a common cause of receiver break-down—the new Rola Isocore speaker transformer is now fitted as standard equipment on all permanent speakers having a 1in. voice coil, and is optional equipment on all electro-dynamic speakers with a 1in. voice coil.

Input transformer breakdowns have

## New Palec Test Oscillators!

Battery and A.C. Operated

"The Palec" All-Wave Oscillators are the ultimate in compact efficiency and mark a great improvement in overall Oscillator performance. SPECIFICATIONS: VERNIER DIRECT READING DIAL, calibrated in kilocycles and metres. (No Charts). The five ranges take in all the commercial bands between 150 k.c. and 16,000 k.c. (2,000—19 metres) while the second harmonic of band five provides a strong signal down to 32,000 k.c. for future requirements.

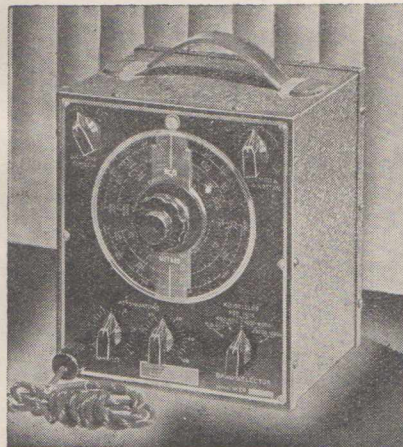
**ATTENUATION:** The most outstanding feature of the Model "DR" and "DE" is their attenuation capabilities on all bands. Cast aluminium coil and attenuator cases, together with correct Signal Generator design, has reduced the minimum leakage ACTUALLY to below 1 microvolt. It enables the operator to align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

**ACCURACY:** A high degree of stabilised accuracy is achieved over the well-spread bands (frequency ratio only 2:1), particularly at essential points, such as the intermediate frequencies of 175 and 465 k.c., etc.

**MODEL DR:** Is equipped with two Valves, operated from enclosed batteries. Price £10/15/-, Plus Tax.

**MODEL DE:** Is equipped with three Valves and is operated from the 200-250 volt A.C. line. (Effective line filters prevent feed back of the signal, ensuring excellent attenuation. Price £11/15/-, Plus Tax.

Both models are readily portable, measuring only 7½in. x 9in. x 6in.



\* Send for new 16-Page Catalogue

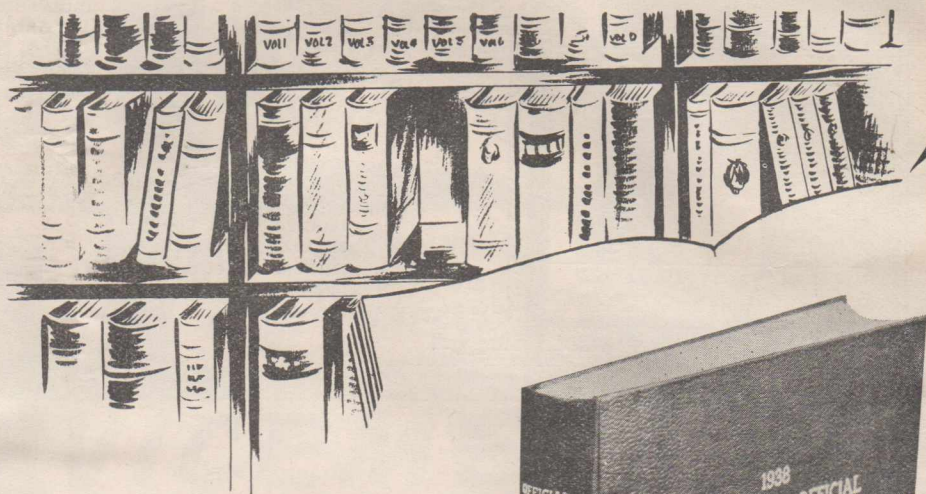
## Paton Electrical Instrument Co.

90 Victoria Street, Ashfield, Sydney

Manufacturers of Cathode Ray equipment, Meters and full range of Testing equipment.





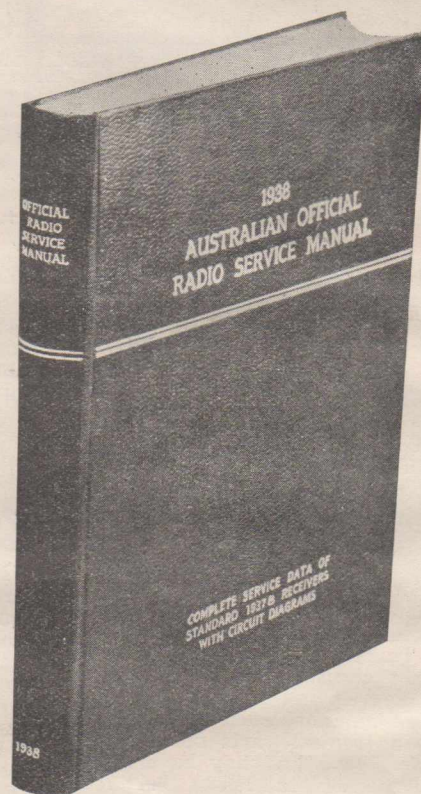


## A Reference Library in One Book!

This book covers Circuits and Essential Characteristics of Australia's 1937 Nationally Known Brands of Radio Receivers, including Circuit, Voltage and Current Analysis and Component values.

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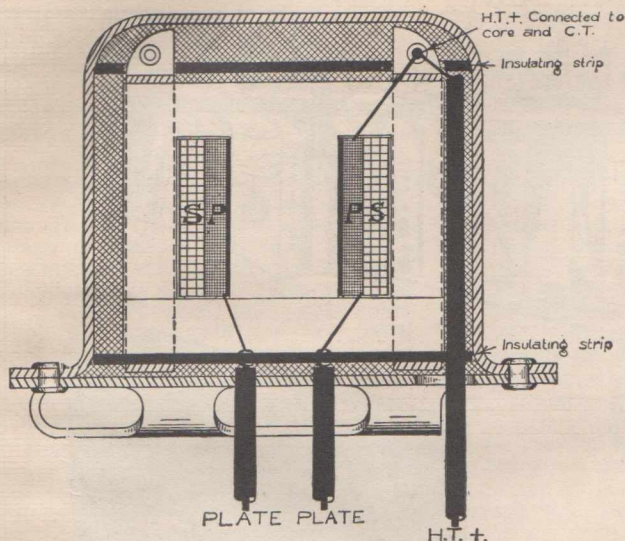
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Order from your wholesaler, bookseller, or the publishers, "The Electrical and Radio World," Box 1538V, G.P.O., Brisbane.

# The Australian Official Radio Service Annual





A cross-sectional view of the new Rola Isocore input speaker transformer, designed to eliminate breakdowns due to electrolysis.

been traced, in almost every instance, to electrolysis, caused by minute leakage of current from the primary winding of the transformer to the speaker frame itself. This effect is cumulative and is therefore more evident with battery receivers, because unless special precautions are taken, the primary winding is maintained at a positive potential with respect to the frame for twenty-four hours per day, whether the receiver is in use or not.

Under normal conditions, transformers which are carefully insulated, vacuum impregnated and then sealed, will give long and satisfactory service. There is no wax, however, which will not absorb moisture to some slight degree, and under conditions of extreme humidity such as is encountered in tropical parts of Australia, sufficient moisture may be absorbed to considerably accelerate the effects of electrolysis. The effect of moisture is multiplied many times by the presence of acid battery fumes, if the speaker transformer is in close proximity to the accumulator.

The laminations and windings of the Isocore transformer are clamped together in one complete assembly unit that is sealed into a drawn steel can, from which it is insulated electrically. The laminations and clamp are connected internally to the "B" positive end (or centre tap) of the primary winding. Thus, as these metal parts are at the same electrical potential as the primary winding, leakages, and consequent electrolytic action are obviated.

The drawn steel can and sealing compound with which it is filled offer further protection, in that they are designed to offer maximum exclusion of accumulator fumes, and at the same time afford mechanical protection and attractive appearance.

#### Core Section And Windings.

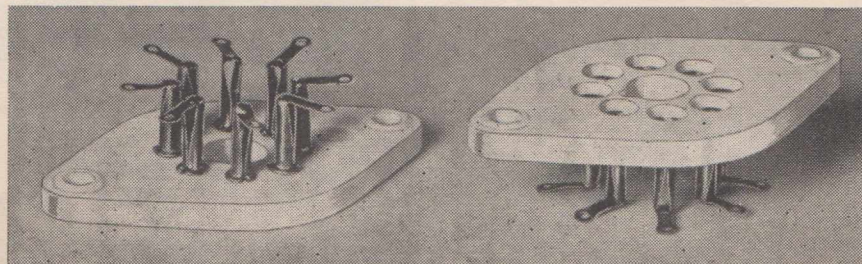
Isocore transformers have a core section of 11/16in. x 13/16in. and a suitable winding can be supplied to match any regular output valve or valves, or to match transmission lines of any specified load.

#### Raymart Octal Ceramic Sockets Now Available.

New Raymart lines of particular interest to amateurs and shortwave enthusiasts recently landed by the Australian representatives, Messrs. John Martin Pty. Ltd., of 116 Clarence St. Sydney, include the type VA8 octal ceramic valve socket illustrated below.

Widely recognised as one of the finest insulations in general use, the "RMX" ceramic used in these sockets ensures highest efficiency for shortwave and ultra shortwave work.

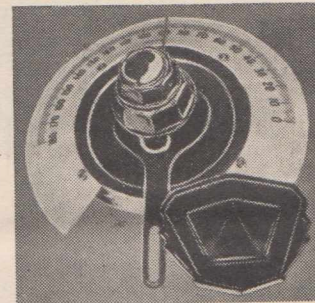
Many other lines also landed recently included ceramic feed-through bushes, which will supply a long-felt need for high frequency or high voltage use. They will also be found particularly useful for mounting components above the metal chassis, where adequate insulation from the latter is essential. There are two types available—FTS for a 4BA hole and FTL



The new Raymart type VA8 octal ceramic socket.

for a 2BA. Raymart type FS feeder spreaders, designed for a 600-ohm line, are also now available. Highly glazed, these are light in weight and ensure minimum losses even when exposed to atmospheric influences. They are ideal for zepp transmitting serials.

Illustrated below is the Raymart type SMD dual-speed micro-disc dial



Raymart type SMD dual-speed vernier dial.

incorporating the well-known Utility micro movement. Concentric knobs ensures easy reading. These dials are particularly smooth in action, and are free from any trace of back-lash.

A catalogue containing further details of these and the many other Raymart lines is available free on request from the address given above.

#### E.T.C. Industries Ltd. Introduce Latest Push-Button Switches.

Notable as a strongly advertised feature in the new season's radio receivers, and as one of the much-publicised innovations overseas, is the trend from dial-tuning to push-button tuning.

The consistent demand for push-button units has been met by E.T.C. Industries Ltd. by the introduction of the E.T.C. Yaxley push-button tuning unit.

Two basic types of switches are produced, those intended for r.f. operation and those designed for use with a small specially-constructed motor to operate the tuning condenser. The more popular type at present is the



THREE DAYS WORK ON THAT 6-VALVE JOB AND I HAVEN'T FOUND THE TROUBLE YET - IF ONLY THERE WAS SOMEONE I COULD ASK!

JONES' RADIO HAS INTERMITTENT RECEPTION AGAIN, NO WONDER THEY REFUSE TO PAY ME!


I'M STUCK ON THAT REFLEX CIRCUIT - WHAT'LL I DO?

OTHER SERVICE MEN ARE MAKING REAL MONEY - WHY CAN'T I?



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and most versatile instru-  
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**MODEL 1200-E UNIT.**

25,000 OHMS PER VOLT D.C. measurements and resistance readings to 40 megohms with this new super sensitive Volt-Ohm-Milliammeter. Instrument reads D.C.: 10-50-250-500-1000 volts at 25,000 ohms per volt; 0-50 microamperes; 1-10-50-250 milliamperes; low ohms, backup circuit, 1/4 to 1000; 40,000 ohms, 4 and 40 megohms; A.C. 10-50-250-500-1000 volts. PRICE, £11/15/-.

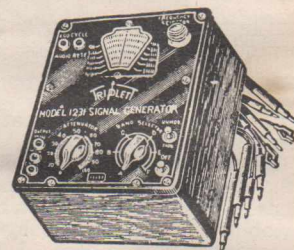
**MODEL 1220-A UNIT.**

For servicing sets using metal, glass-metal or glass tubes. Has five sockets—with standard RMA markings. Panel also includes eight automatic switch type and ten single action jacks. Makes all series and parallel meter connections through the set sockets to all parts of the circuit. Automatic in operation. Used in conjunction with any Triplet Volt-Ohm-Milliammeter. Extra connections may be added, where necessary, at a very slight cost. PRICE, £4/5/-.

Write for the new illustrated catalogue giving full details of the complete Triplet range of test equipment and measuring instruments. (This catalogue also features a comprehensive range of the well-known Readrite portable test equipment.)

**MODEL 1231 UNIT.**

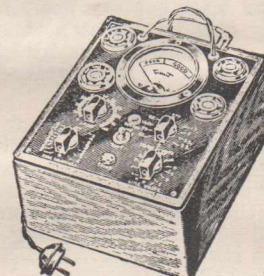
Model 1231 All-Wave Direct Reading D.C. Signal Generator now has built-in trimmer calibrated coils for accuracy of 1% on broadcast, intermediate and shortwave bands. Six bands cover 120, 30,000 D.C.—all fundamentals. PRICE, £10/10/-



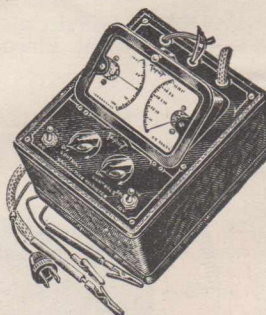
Model 1231 Unit.

**MODEL 1210-A UNIT.**

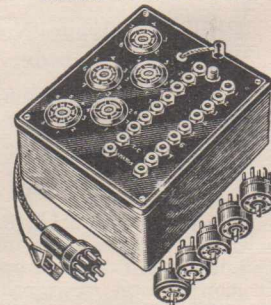
Tests all types of tubes. Direct reading. Coloured GOOD and BAD scale. Line voltage regulation. All short tests. Cathode leakage test. Individual tests on diodes and full wave rectifiers. PRICE, £10/5/-.



Model 1210-A Unit.



Model 1200-E Unit.



Model 1220-A Unit.

Exclusive Factory Representatives for Australia and New Zealand:—

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The new Philips EL3G high slope pentode, reviewed on this page.

r.f., which selects any one of a number of pre-tuned circuits as desired. These circuits can be tuned by means of a semi-fixed compression type condenser, or by the variation of the permeability of the circuit by means of an adjustable iron core.

Designed with inter-locking contacts so that it is possible to have only one contact at a time, the switches are noiseless, positive in their action and low r.f. resistance is assured under all conditions.

The standard switch has eight positions which allows for tuning any one of eight stations, while a wide variety of circuit arrangements is obtainable by the use of various contact shoes. Full particulars regarding these switches are available from E.T.C. Industries Ltd.



### Philips Release New EL3G Pentode.

The production of high slope pentodes is an important achievement in Australian valve manufacture. Philips valve factory has recently released stocks of the high slope power pentode type EL3G. It is electrically equivalent to the EL3, but it is fitted with an octal base in order to meet the demands for a h.s. pentode for use in conjunction with other valves of the "G" series.

An input of 3.6 volts provides sufficient drive for an output of 4.3 watts when using the EL3G in a conventional circuit arrangement. This valve has a mutual conductance

(slope) of 9.5 m.a./v. Fixed bias operation is not recommended for this valve. For socket connections and other ratings, readers are referred to Philips Valve Chart, which is available upon application to Philips Radio Division, Philips House, 69-73 Clarence Street, Sydney.



### Eddystone Vernier Dials.

As one of the first essentials in shortwave work is a high-grade vernier tuning dial, shortwave fans and amateurs will be interested in the two Eddystone precision dials reviewed below.

The model 1070 full-vision dual-speed dial is beautifully smooth in action without back-lash at both the 20 to 1 and 100 to 1 speeds. For high frequency work the movement is specially designed to eliminate noise.

The open vision scale is clearly readable and is divided into 100 graduations, while half-division markings ensure accurate settings of the indicator pointer.

The movement can be mounted either on the panel or baseboard. The dial face fits on the front of the panel, so that unless it is desired to illuminate the scale from the back, no large opening has to be cut. The dial can be used on panels up to a ¼ in. thick and takes a standard ¼ in. spindle. The escutcheon is finished in oxidised silver.

### Type 1085 Precision Slow Motion Dial

A high-grade precision dial with slow motion ratio of 6.1 and vernier indicator, the model 1085 provides an accurate and powerful drive for high-class test and laboratory equipment or transmitters. The brass scale is 4 in. in diameter, is nickel-finished, and has machine-patterned markings with black filling. A 2½ in. instrument control knob gives positive finger grip.

These two dials, and in fact all Eddystone products, are available from the Eddystone distributors listed below:—

### Eddystone Distributors.

N.S.W.: Price's Radio Service 5 and 6 Angel Place, Sydney; United

Radio Distributors Pty. Ltd., 234 Clarence Street, Sydney. Queensland: J. B. Chandler and Co., 43 Adelaide Street, Brisbane. Tasmania: W. and G. Genders Pty. Ltd., Cameron Street, Launceston and Liverpool Street, Hobart. Victoria: P. & L. Wireless Services Pty. Ltd., Hardware Street, Melbourne. South Australia: Flinders Radio, 102 Flinders Street, Adelaide. Western Australia: Carlyle & Co., 915-917 Hay Street, Perth.



### Home Recording Outfit Offers Fascinating Possibilities.

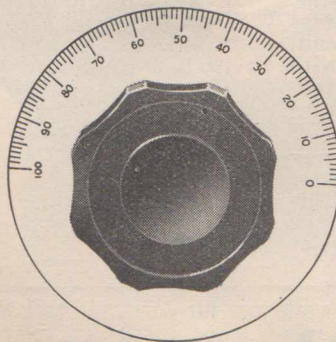
A fascinating field for experimenting that is new to most set-builders and amplifier enthusiasts is that of home recording.

With the Permarec home recording unit, for which Murdoch's Ltd., George Street, Sydney, are Australian agents, nothing special in the way of additional apparatus is required in order to make first-class recordings that have an estimated life of several thousand playings. Designed for use with any standard radio receiver or amplifier, the unit can be used with a spring or electrically-driven gramophone motor with complete success, as the recorder requires very little more power to give satisfactory operation than would be absorbed, for example, by playing a 12-inch record.

The traversing mechanism is driven from the spindle of the gramophone motor by a flexible coupling and two bevel gears. With a reduction ratio of about 1 to 2.25, and normal turntable speed, this gives about 90 threads to the inch on the record.

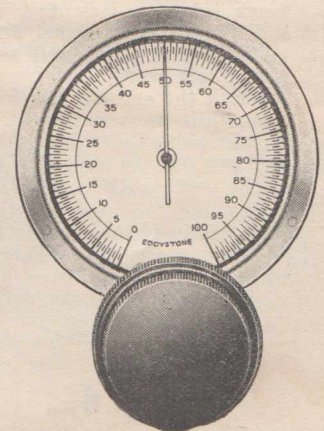
For recording broadcast matter, practically no additional apparatus other than the recording unit is required, for the cutting head is of the high resistance type and can be connected across the primary winding of the speaker output transformer, with a fixed condenser in one of the leads. For recording speech and music in the home, a microphone is needed, the Reiss unit described in the "Radio

(Continued on page 47.)



★  
Left: The Eddystone 1085 precision slow-motion dial.

Right: The model 1070 full-vision dual-speed dial.





The



# All-Wave All-World

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

# DX News



### Experimenting With The "Fidelity Broadcast Five"

I feel sure that readers of the "A.R.W." will be interested in an account of my experiences with the "Fidelity Broadcast Five," and a few improvements I have effected. I gave the circuit a try-out some time ago, and I am very pleased with the results.

There is no doubt that the 2A3 can give delightful reproduction, due to its very small percentage of 3rd and 2nd harmonic distortion, and to its very low impedance, which flattens out cone resonances in the speaker, especially when the field of the speaker is well energised. I am using an Amplion S.A. speaker attached to a baffle board which is screwed across the fanlight over a door between two rooms, the fanlight having been taken out.

#### Entire Partition Becomes Baffle.

Thus, when the door between the two rooms is shut, the whole partition becomes a large baffle, and it is possible to hear the reproduction just as well in either room, as it sounds the same from either the front or the back of the speaker. This allows an excellent reproduction of low notes.

I am using a standard 385-volt 100 mill. power transformer and I have omitted the resistor used in the original circuit, in the first stage of the filter. Thus I get about the same voltage on the plate of the 2A3, and the hum, using the field of the speaker alone for filtering, is not noticeable, although I must state that I am using two 8mfd. condensers on the rectifier side of the field, and an 8 and a 4 mfd. on the other side.

Also, instead of self bias on the 2A3, I am using back bias, which seems to allow a slightly greater undistorted power output, probably approaching 4 watts. Although this method of obtaining bias is not recommended by the valve makers when using a .5 meg. resistor in the grid circuit, I have had no trouble with it, and I have two 2A3's and have used both of them in the set alternately for some time, so evidently they contain little or no gas.

#### 57 Driver Gives Tremendous Gain.

The first thing I noticed about the set was the terrific gain obtained with

the 57 pentode as audio amplifier, as it was never necessary to advance the volume control further than about a quarter of the full travel to fully load the grid of the 2A3. But, as I was using a 2000 ohm bias resistor for the 57, instead of the 3000 specified, I was probably getting greater gain. This made the .5 meg. volume control too sudden in its action, and also slightly noisy when being turned, so I decided to make an alteration to remedy these two defects. Of course, I could have reduced the gain of the 57 by using a larger bias resistor, or a smaller value of load resistor, but I decided to retain the high gain as it was a good thing to have, since it meant that only a very small portion of the full diode load was shunted by the grid leak of the 57, about 50,000 ohms, on full volume, shunted by 1

megohm. Thus the A.C. resistance of the diode load was practically the same as its D.C. resistance, and harmonic distortion on heavily modulated passages is avoided.

So, to retain this advantage, and yet get rid of the too sudden and noisy action of the .5 meg. volume control, I shunted it with a 50,000 ohm resistor, and replaced the 100,000 ohm r.f. filter resistor with a 500,000 ohm, thus keeping the total resistance of the diode load about the same as before, but greatly reducing the a.f. voltage appearing across the volume control.

I now found that the 2A3 could be nicely driven to full volume on most stations with the control full on, and the action was much smoother and noiseless. I am using air core i.f.'s,

(Continued on page 46.)

## 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.]

B26  
C32





# Short-wave Review

CONDUCTED BY

**ALAN H. GRAHAM**

## Conditions' Falling Off ★ B.B.C. Plans For Tests ★ Many New Stations ★ Latest Information On Cubans.

### Conditions Falling Off.

Both from personal observations and from the reports of the "Radio World" official observers, it is obvious that reception conditions have fallen off quite considerably during the past month. This generalisation applies equally to almost all wavelengths. Most readers will also have noted that conditions have been very erratic; some days being well up to standard, others almost a complete blank.

Ultra high frequency reception has practically ceased—at least, as far as the writer is concerned. This merely duplicates the experience of last year, and it may be as late as August before the police transmitters are again coming in. The 9.49 m. broadcast band is not likely to stay "out" so long, but it is also very poor during the winter months.

★

### B.B.C. And The Tests.

Information from London indicates that the B.B.C. has completed plans for the Australian relay of the Test matches. One of the five frequencies devoted to the Australian service will be exclusively devoted to the relay, which will commence at midnight. The frequency used will be determined just prior to the transmission, and will be selected in accordance with the conditions prevailing at the time.

It has been proved that the Empire transmissions are not satisfactory before midnight, and therefore it was thought advisable to commence the broadcasts with a resume of the play before the lunch adjournment, followed by a ball-to-ball description of the remainder of the play for the day.

★

### News Of Many New Stations.

#### Turkey.

Yet another station for 19 m. This time located at Ankara, Turkey. Frequently, 15,195 k.c., wavelength 19.75

m. The station will be on the air in a few months, using the call TAQ.

#### Uruguay.

As the Argentine government has refused to issue licenses for any additional S.W. transmitters, many Buenos Aires companies are planning stations in Montevideo, Uruguay, across the Rio de la Plata. Details of the calls, etc., of these new transmitters are:—

CXA-1	25.1 m.	CXA-13	48.75 m.
CXA-3	49.38 "	CXA-14	19.79 "
CXA-5	31.61 "	CXA-15	30.82 "
CXA-6	31.41 "	CXA-16	19.51 "
CXA-7	25.56 "	CXA-17	16.85 "
CXA-9	31.78 "	CXA-18	19.61 "
CXA-10	25.22 "	CXA-19	25.65 "
CXA-11	50.68 "	CXA-20	30.97 "
CXA-12	25.1 "	CXA-21	11.48 "

#### British West Indies-St. Kitt's.

A new station of the Caribbean Broadcasting Co. is now transmitting on 46.99 m. Reports are requested. Best times to log this newcomer are from 7-7.45 a.m. daily, or from 1-1.45 a.m. on Mondays.

#### Latest on the Cubans.

So much confusion has been caused of late by the antics of the Cuban stations, in their rapid transition from one frequency to another, that most S.W.L.'s will appreciate an attempt to list the Cuban stations now on the air. Part of the following must necessarily be guesswork, but here goes, anyway.

Call.	K.C.	M.
COCO	6010	49.92
COCD	6130	48.94
COHB	6280	47.77
COCW	6330	47.36
COJK	8665	34.64
COKG	8965	33.44
COBZ	9020	33.26
COCA	9100	32.95
COBX	9200	32.59
COBC (?)	9350	32.06
COCH	9430	31.80
COCQ	9750	30.78
COCM	9790	30.64
or	9865	30.41
COBC	9980	30.04

COCX	11420	26.25
COGF	11800	25.42

#### Guatemala.

A new station at Ciudad de Quezaltenango (whew!); uses the call TGQA when relaying B.C.B. TGQ. It operates on 6400 k.c., 46.88 m., with a power of only 200 w. Schedule to hand is: Daily except Monday, noon-2 p.m.; Saturday, midnight-4 p.m. (Sunday); and Monday, 4-6 a.m.

#### Italy.

Rome is now broadcasting the Syrian or Arabic hour daily from 3.10-3.55 a.m. The programme consists of news in Arabic, then music and songs of Abdul Waheb and Em Keltoon on records. The transmitters used are 2R04, 25.4 m., and IRF, 30.52 m.

Because of QRM from HJ7ABD and CXA8 interfering with reception of 2R03, Rome has been testing new frequencies on 17,820 and 15,300 k.c. (16.8 and 19.6 m.).

#### Egypt.

Several powerful shortwave transmitters are just about ready to take the air. They are located in Cairo. Details of calls and frequencies are expected to be to hand in the future.

#### India.

VUD-2 is the call of the new Delhi transmitter operating on 9590 k.c., 31.28 m. Schedule is 12.30-3 and 5 p.m.

Calls, etc., of other Indian stations are:—

Call.	K.C.	M.
VUD-4	15,290	19.62
VUE-3	15,160	19.79
VUD-3	11,870	25.26
VUE	6,085	49.3

#### French Somaliland.

FZE-8 at Djitbouti, French Somaliland, on 17.3 m., is now scheduled to broadcast test transmissions on the first Thursday in each month, at 11-11.30 p.m. Being situated off the regular bands, this station should be fairly easy to identify.

★

### Reports From Observers.

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

DX here is now only fair, and it makes one start checking up all the



soldered joints on the antenna, thinking of better antennae systems, and also retrimming the set in an endeavour to squeeze one more "R" out of it.

Generally speaking, conditions have been falling off steadily. The outstanding characteristic of reception has been its erraticness. To make matters worse, the noise-level above 49 m. is getting worse; chiefly man-made static and leaking H.T. lines during damp evenings and foggy mornings. The only period during which conditions have shown any improvement is between 8 and 10 a.m., when the Americans are coming in well.

Reviewing the various bands, the best stations are:—

16 m.: W3XAL and PHI.  
19 m.: HAS3, LRU, TPA2, OLR5A, W8XK and YDC.  
25 m.: CR7BH, TPA4, JZJ, OLR4A, W8XK and RNE.  
31 m.: 2R04, KZRM, ZBW3, HS8PJ, XEWW, COCH and W1XK.  
49 m.: COCD, YDA2, W3XAL, VQ7LO, W3XAU, CR7AA, COCO, Rangoon.  
Also SPW (22), SPD (26), COXC (26), EHZ (28), ORK (29), COBC (30), COCM (30), PMH (44) and 90-100 m. N.I.R.O.M. stations.

Fair results have also been obtained on the amateur bands, chiefly at the beginning of the month; for lately, conditions have fallen off considerably. Best loggings include the Africans ZS2AX, ZS5CL, ZS1AX and SU1WM.

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

DX conditions have been very poor here in Adelaide. During the last two weeks there has been practically nothing audible. The best station logged of late has been LLR, 30.95 m., who have been heard testing on several occasions around 6.30 a.m. They announce as the "Voice of the Argentine."

Another good station is EAR on 30.43 m. (the call is not EAQ as formerly). They are on the air at 8.45 a.m. and 9.40 p.m., Spanish time (corresponding to 7.40 a.m. and 6.45 p.m. A.E.S.T.). Last Sunday I heard them at 6.45 p.m. at great strength. They open with the Spanish National Anthem and the following announcement: "This is the voice of Republican Spain on 30.43 m. broadcasting at 8.45 a.m. and 9.40 p.m., Spanish time, and bringing you the latest news from Spain regarding the war. Write us at Box 951, Madrid, etc." They then give the news, sounding a gong with each item.

Amateur conditions are just fair. On 10 m. a few Americans and K6's are to be logged; while the 20 m. band has fallen away badly.

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

Conditions this month have been quite poor; one being extremely lucky to drag in any signal above the high noise-level. A bad power leak has been a great handicap these past weeks, and so far all efforts to overcome the trouble have failed.

Just at present the best time for reception is between 6 and 6.30 a.m., when all bands are good. One of the best signals is from CSW on 27 m. COCO on 49.9 m. have "gone silly" during the last couple of days. They have been on the air without a break in their transmission for the last 48 hours, to my knowledge. Their signals are very powerful, too.

Best stations on the various bands are:—

13 m.: W2XE and GSJ.  
16 m.: W3XAL and DJE.  
19 m.: PCJ, DJL, DJR and YDC.  
25 m.: JZJ, W8XK, TPA3, GSD, RNE and 2R0.  
26-30 m.: CSW (27), JVN, PLP, COCX, ZLT and PMN.  
30-31 m.: LLR, W2XAF, EAR, CSW (30), T14NRH, VPD2, KZRM, XEWW, HS8PJ, W1XK, JDY, YDB, COBC, COCQ and CXA8.

### QSL Card Contest Closes On August 15.

Members of the All-Wave All-World DX Club with QSL cards of their own are invited to send in samples to headquarters as entries in a special QSL Card Contest, for the most attractive QSL card design.

The suggestion for the contest was made by Mr. J. C. Linehan, of Adelaide, S.A. (AW323-DX), Official Shortwave Observer for South Australia. Mr. Linehan has also generously donated a trophy to the value of two guineas to be awarded to the winner. The form this will take has not yet been decided upon, but probably the winner will be given his choice of a suitably-inscribed cup or a Replogle Combination World Globe and Time Converter.

Members are advised that all entries must reach the "Radio World" office, 214 George St., Sydney, no later than Monday, August 15. The result will be published, together with a reproduction of the winning card, in the September "Radio World."

Entries should be endorsed "QSL Card Contest," but the cards should be left blank.

Mr. A. R. Payten (recently appointed as second N.S.W. Observer).

Conditions have undergone a great change during the past two weeks: Indeed, I at first suspected that something had gone wrong with the receiver. Night conditions have taken a very definite change for the worse—on several occasions VK6ME was the only station worth anything.

Over a period of, say, two weeks, VPD2, 31.4 m., has been the outstanding station during the evenings, both for strength and quality.

In the early mornings EAQ are excellent, especially during the English news session. CSW on 27 m. have been even better; QSA5 on 27 m. have up to closing at 7.30 a.m.

Daylight reception is fairly good. After midday TPA4 are good, especially after 1 p.m., when the news is given in English. RNE are even stronger when they come on the air at 1.45 p.m. Their male announcer speaks slowly and clearly with a slight American accent, and is 100% copy. This 1.45 p.m. transmission comprises news in English, together with long discussions of recent developments in foreign affairs.

At 3.30 p.m. Daventry arrive in full force on both 25 and 31 m.; if anything, the former band is the better of the two. Later in the evening they are best on 16 m.; while the early morning transmissions are best on 31 m.

On the 11th, at 5.50 a.m., I heard PCJ on 31 m. giving a description of the new trans-Atlantic liner, "City of Amsterdam," together with interviews with various passengers who were on her for her maiden voyage.

The new Argentine station, LLR, 30.95 m., came through yesterday (14th) at 6.46 a.m. On Saturday at 7 a.m. they give a series of interesting talks regarding the Argentine. Five languages are used—Spanish, French, German, Italian and English. The English (?) announcer has a very pronounced American accent, and as he frequently exceeds the speed limit, he is very difficult to follow.

Two Japanese stations logged are JVT on 44 m., and JIB, 28.4, relaying JFAK. The latter is very good after midnight.

I nearly forgot to mention a Spanish station on 29 m. Signals are very strong, but are rather distorted. It was obviously a Nationalist station. (Undoubtedly EAJ43 (or EHZ, as it is listed occasionally), Tenerife, Canary Is. on 28.93 m.—S.W. Ed.)

The amateur bands have been very good, the Americans on 20 m. being outstanding.

Mr. J. K. Sorensen (Queensland).

The most noticeable feature of the month's reception has been the falling off on 20 m., where the amateurs have been much less numerous.



On the higher wavelengths static has been very troublesome. Only 9MI is consistent on the 49 m. band.

The stations heard at midnight are gradually weakening. The German stations are barely audible on 19 and 31 m. KZRM is weakening a trifle, but JZJ is steady.

In the late afternoons both Zeesen and Daventry are good, especially on 19 m. On the same band PCJ is fair in the early evenings, though fading out after 7 p.m.

Mr. E. Neill (Queensland).

I have been able to DX only from 6-8 a.m. during recent weeks, and have found conditions very good during this period. EAQ is very strong at 6.45 a.m., with news of the Spanish war, often reaching "R" max.

Two new Italian stations have been logged recently, relaying programmes from 2RO. These are IQA and IRW, operating on 20.3 and approximately 25 m. respectively.

Since the beginning of the month XEWW (31.5 m.) have improved considerably. Most of the regular American stations are very good at present.

★

#### Amateur Review : Calls Heard

(Except where otherwise stated, all the calls listed below were heard on 20 m. All are 'phone stations.)

#### EUROPE.

France: F3DI, F300, F3GR, F8XT, F8DC, F8LX (Kemmis, La Roche, Scrensen).

England: G2PU, G2TI, G2TR, G2WD, G2CZ, G2DV, G5RV, G5KA, G5QN, G5ZG, G5OV, G5UF, G5DR, G6DT, G6BY, G6WX, G6XR, G8MX, G8LP, G8VJ (Kemmis, La Roche, Linehan, Sorensen).

Belgium: ON4MZ, ON4VK (Kemmis, Linehan).

Holland: PAUN, PAEO (Kemmis, La Roche).

#### AFRICA.

Egypt: SU1WM (La Roche).  
South Africa: ZS2AX, ZS3F, ZS5CL (Kemmis, La Roche).

#### ASIA.

Ceylon: VS7GJ (La Roche).  
China: XU8AC, XU8UF, XU8RB (Kemmis, La Roche, Linehan).

Japan: J2MI, J2NF, J2OI, J2KG, J2LL, J2NG, J2SA, J2MJ, J5CC (Kemmis, La Roche, Linehan, Payten, Sorensen).

Malaya: VS1AI, VS1AO (Kemmis, La Roche, Linehan).

Philippine Is.: KA1HP, KA1MG, KA1ZL, KA1JZ, KA1FX, KA1BH, KA1AF, KA1ME, KA1HS, KA1AR (Kemmis, La Roche).

Dutch East Indies: PK1ZZ, PK1MJ, PK1JR, PK1JZ, PK1RK, PK1MX,

PK1VY, PK2WL, PK3AA, PK3VL (Kemmis, La Roche).

Hawaiian Is.: 10 m., K6LCV, K6OQM, K6OQE (Linehan); 20 m., K6BNR, K6GQF, K6KGA, G6NZQ, K6OQE, K6NCO (Kemmis, La Roche, Linehan, Sorensen).

Hong Kong: VS6AG (Sorensen).

Burma: XZ2EZ (Linehan).

#### AUSTRALASIA and OCEANIA:

New Zealand: 10 m., ZL3BJ, ZL3KZ, ZL3AJ, ZL2BE (Linehan).

Pitcairn Is.: VR6AY (Kemmis, Sorensen).

#### NORTH AMERICA.

Alaska: K7FBE (Kemmis).

Canada: VE3ME, VE3YF, VE4JJ, VE4LX, VE5OT, VE5ACN, VE5H1, VE5VP, VE5ABD, VE5PE, E5BF, VE5NY, VE5VO (Kemmis, La Roche, Linehan, Payten).

U.S.A.: 10 m., W6ASJ, W6NCR, W6GCX, W6LBZ (Linehan).

Newfoundland: VO6D (Kemmis).

#### CENTRAL AMERICA.

Mexico: XE2FC, XE1K, XE1HV (Kemmis, Linehan, Payten).

#### SOUTH AMERICA.

Chile: CE3AC (Kemmis).

Argentina: LU1FC, LU1HI, LU4BC, LU5ZZ (Kemmis, Linehan).

Ecuador: HC1FG, HC1FK (Kemmis).

Peru: OA4C, OA4AF, OA4AI, OA4R (Kemmis, Linehan, Sorensen).

Venezuela: YV4AB (Linehan).

#### WEST INDIES.

Cuba: CO2OY, CO2CC, CO2WY, CO2SH, CO2LY, CO2HY (La Roche).

Jamaica: VP5PZ (Linehan).

Porto Rico: K4SA (Linehan).

Dominican Republic: HI7G (Kemmis).

★

#### Amateur Frequencies.

The following list of 20 m. amateur frequencies will be of interest to dxers:—

14,060	.. ..	YV5AG, Caracas
14,065	.. ..	G5RV, Chelmsford
14,080	.. ..	CO2XX, Habana
14,080	.. ..	CO2LY, Habana
14,080	.. ..	CO7VY, Camaguey
14,080	.. ..	F3HM, Riom
14,080	.. ..	J2MI, Tokyo
14,090	.. ..	ZE1JR, Salisbury
14,090	.. ..	G5KH, London
14,090	.. ..	CO2EG, Habana
14,100	.. ..	CO2RH, Habana
14,100	.. ..	HI3N, San Pedro de Macoris.
14,100	.. ..	XE1BT, Pachuea
14,100	.. ..	EA9AH, Tetuan
14,100	.. ..	PK4JD, Billiton
14,110	.. ..	XU8RB, Shanghai
14,120	.. ..	CO2JJ, Habana
14,130	.. ..	G6XR, Coventry
14,135	.. ..	G5YB, Plymouth
14,135	.. ..	G6LK, Guildford
14,140	.. ..	J2NG, Tokyo
14,280	.. ..	TI2HP, San Jose
14,280	.. ..	G6BY, London
14,310	.. ..	VP4GA, Trinidad
14,340	.. ..	G5SY, Torquay
14,395	.. ..	YV1AQ, Maracaibo

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Enclosed please find remittance for 10/6, in payment for an annual subscription to the "Australasian Radio World," commencing with the.....issue.

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Country.....

Note.—N.Z. Subscribers can remit by Money Order or Postal Note.

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



# HOURLY TUNING GUIDE

## When And Where To Search

Compiled by ALAN H. GRAHAM.

In order to assist beginners and less experienced dxers, it is intended to publish monthly a special tuning guide, setting out at what times to listen for the more easily logged stations. It should be noted that the guide is not intended to cover all stations audible; for full details as to when and where to look for the best catches are given elsewhere. Moreover, the fact that a station is shown as being on the air at a particular time is no guarantee that reception must follow as a matter of course.

All times are given in Australian Eastern Standard Time.

Key to abbreviations used: S, Sundays only; M, Mondays only; T, Tuesdays only; W, Wednesdays only; Th, Thursdays only; Sat, Saturdays only; Th.

Midnight to 1 a.m.	19.8 YDC	
	19.82 GSF	
13.93...GSJ	19.84 HVJ	
13.97 GSH	19.85 DJL	
13.99 DJS	25.0 RNE	
16.86 GSG	25.34 TPA3	
16.88 PHI	25.4 2RO4	
16.89 DJE	25.49 DJD	
19.63 DJQ	27.27 PLP	
19.68 TPA2	28.48 JIB	
19.71 PCJ (Th.)	29.24 PMN	
19.74 DJB	31.4 OLR3A	
19.8 YDC	48.7 VPB	
19.82 GSF	49.83 DJC	
25.4 2RO4	49.9 COCO	
25.45 JZJ	58.3 PMY	
27.27 PLP	70.2 RV15	
28.48 JIB		
29.24 PMN	2-3 a.m.	
30.61 XGOX	13.97 GSH	
30.78 COCQ	16.86 GSG	
31.38 DJA	16.88 PHI (Th)	
31.28 VK2ME	16.89 DJE (M)	
	19.63 DJQ (M)	
31.45 DJN	19.74 DJB (M)	
31.49 ZBW3	19.71 PCJ (Th)	
31.55 HS8PJ	19.82 GSF	
(F)	19.85 DJL	
31.8 COCH	25.24 TPA3	
32.9 COCB	25.4 2RO4	
32.59 COBX	25.49 DJD	
33.2 COBZ	25.53 GSD	
48.7 VPB	48.7 VPB	
49.9 COCO	49.31 VQ7LO	
49.98 Rangoon	49.83 DJC	
58.3 PMY		
70.2 RV15	3-4 a.m.	
	16.86 GSG	
1-2 a.m.	16.88 PHI (Th)	
13.93 GSJ	16.89 DJE (M)	
13.97 GSH	19.63 DJQ (M)	
13.99 DJS	19.71 PCJ (Th)	
16.86 GSG	19.74 DJB (M)	
16.88 PHI	19.85 DJL	
19.63 DJQ	25.2 TPA3	
19.68 TPA2	25.49 DJD	
19.71 PCJ (Th)	25.53 GSD	
19.74 DJB	31.13 2RO3	

31.55 GSB	31.28 W3XAU
49.31 VQ7LO	31.35 W1XK
49.59 GSA	31.41 OLR3A
49.83 DJC	31.46 JZI
	31.55 GSB
4-5 a.m.	39.93 JVP
16.86 GSG	49.59 GSA
16.88 PHI (Th)	49.7 OLR2B
19.65 W2XE	49.83 DJC
19.71 PCJ (Th)	
19.85 DJL	7-8 a.m.
24.52 TFJ	19.56 DJR
25.2 TPA3	19.56 W2XAD
25.49 DJD	19.63 DJD
25.53 GSD	19.65 W2XE
29.04 ORK	19.72 W8XK
31.13 2RO3	19.74 DJB
31.4 OLR3A	19.76 GSO
31.55 GSB	19.82 GSF
49.31 VQ7LO	19.85 DJL
49.7 OLR2B	25.0 RNE
49.83 DJC	25.2 TPA3
	25.42 JZJ
5-6 a.m.	25.45 W1XAL
16.86 GSG	25.49 DJD
16.87 W3XAL	25.53 GSD
19.56 W2XAD	27.17 CSW
19.6 GSP	31.09 CS2WA
19.65 W2XE	31.13 2RO3
19.67 W1XAL	31.28 W3XAU
19.72 W8XK	31.32 GSC
19.85 DJL	31.35 KZRM
22.0 SPW	31.35 K1XK
(T, Th, Sat)	31.38 DJA
24.52 TFJ	31.45 DJN
25.23 TPA3	31.46 JZI
25.48 DJD	31.48 W2XAF
25.53 GSD	31.55 GSB
27.17 CSW	31.58 PRF5
28.93 EAJ43	49.75 OLR2B
29.04 ORK	49.83 DJC
31.13 2RO3	
31.28 PCJ	8-9 a.m.
(M, W)	19.56 DJR
31.41 OLR3A	19.63 DJQ
31.46 JZI	19.65 W2XE
31.55 GSB	19.72 W8XK
39.95 JVP	19.74 DJB
49.59 GSA	19.76 GSO
49.7 OLR2B	19.82 GSF
49.83 DJC	25.0 RNE
	25.2 TPA3
6-7 a.m.	25.42 JZJ
16.86 GSG	25.45 W1XAL
16.87 W3XAL	25.49 DJD
19.56 W2XAD	25.53 GSD
19.6 GSP	25.60 TPA4
19.65 W2XE	30.31 CSW
19.67 W1XAL	31.09 CS2WA
19.72 W8XK	31.13 2RO3
19.85 DJL	31.27 HBL (S)
22.0 SPW	31.28 W3XAU
(T, Th Sat)	31.32 GSC
25.0 RNE	31.35 KZRM
25.24 TPA3	31.35 W1XK
25.49 DJD	31.48 W2XAF
25.53 GSD	31.49 LKJ1
27.17 CSW	31.55 GSB
31.13 2RO3	
31.28 PCJ (W)	Noon-1 p.m.

9-10 a.m.	25.26 W8XK
19.56 DJR	25.49 DJD
19.56 W2XAD	25.53 GSD
19.6 GSP	25.60 TPA4
19.63 DJQ	31.28 PCJ (F)
19.72 W8XK	31.32 GSC
19.74 DJB	31.38 DJA
19.8 YDC	31.41 OLR3A
22.0 SPW	(T, Th, Sat)
25.42 JZJ	31.45 DJN
25.45 W1XAL	31.48 W2XAF
25.49 DJD	31.55 GSB
25.53 GSD	1-2 p.m.
25.61 TPA4	19.56 DJR
30.31 CSW	19.63 DJQ
31.09 CS2WA	19.66 GSI
31.13 2RO3	19.74 DJB
31.27 HBL (S)	25.49 DJD
31.32 GSC	25.53 GSD
31.35 W1XK	25.61 TPA4
31.38 DJA	31.28 PCJ (F)
(M)	31.32 GSC
31.41 OLR3A	31.38 DJA
31.45 DJN	31.41 OLR3A
31.49 LKJ1	(T, Th, Sat)
31.48 W2XAF	31.45 DJN
31.55 GSB	31.48 W2XAF
38.48 HBP (S)	31.55 GSB
49.1 GSL	
10-11 a.m.	2-3 p.m.
19.56 DJR	25.61 TPA4
19.6 GSP	31.48 W2XAF
19.63 DJQ	3-4 p.m.
19.74 DJB	13.99 DJS
19.8 YDC	16.86 GSG
25.26 W8XK	16.89 DJE
25.49 DJD	19.63 DJQ
25.53 GSD	19.74 DJB
25.61 TPA4	19.76 GSO
31.13 2RO3	19.85 DJL
31.25 RAN	19.82 GSF
31.28 PCJ	25.42 JZJ
(M, T, Th)	25.53 GSD
31.32 GSC	31.28 VK2ME
31.38 DJA	(S)
31.41 OLR3A	31.38 DJA
(M)	31.45 DJN
31.45 DJN	31.55 GSB
31.48 W2XAF	49.18 W3XAL
31.49 LKJ1	49.5 W8XAL
31.55 GSB	
11 a.m.-noon.	4-5 p.m.
19.56 DJR	13.99 DJS
19.6 GSP	16.86 GSG
19.63 DJQ	16.89 DJE
19.74 DJB	19.63 DJQ
19.74 DJB	19.74 DJB
25.26 W2XK	19.76 GSO
25.49 DJD	19.85 DJL
25.53 GSD	19.82 GSF
25.61 TPA4	25.24 TPA3
31.13 2RO3	25.42 JZJ
31.25 RAN	25.53 GSD
31.28 PCJ	31.28 VK2ME
(M, T, Th)	(S)
31.32 GSC	31.38 DJA
31.38 DJA	31.45 DJN
31.41 OLR3A	31.55 GSB
(M, T, Th, Sat)	49.5 W8XAL
31.45 DJN	
31.48 W2XAF	5-6 p.m.
31.55 GSB	13.99 DJS
	16.86 GSG
Noon-1 p.m.	16.89 DJE
19.56 DJR	19.63 DJQ
19.63 DJQ	19.74 DJB
19.66 GSI	19.76 GSO
19.74 DJB	19.82 GSF



25.23 TPA3	25.24 PMN	30.78 COCQ	32.09 COBC	W2XGL-W2XGO—Harrison, N.Y. (P.).
25.52 GSD	30.23 JDY	31.28 VK2ME	32.59 COBX	W2XGP—Kenilworth, N.J. (P.).
28.14 JVN	30.61 XGOX	(S)	33.2 COBZ	W2XGQ-W2XGZ—Jersey City, N.J. (P.).
31.28 VK2ME	31.23 VK2ME	31.35 W1XK	44.64 PMH	W2XHA-W2XHB—Jersey City, N.J. (P.).
(S)	(S)	31.38 DJA	48.7 VPB	W2XHK—Scarsdale, N.Y.
31.38 DJA	31.28 VK6ME	31.45 DJN	49.5 W8XAL	W2XHL—New Rochelle, N.Y.
31.45 DJN	31.38 DJA	31.49 ZBW3	49.9 COCO	W2XHM—Harrison, N.Y. (P.).
31.55 GSB	31.45 DJN	31.51 HS8PJ	49.98 Rangoon	W2XHP—Kingston, N.Y.
	31.45 VPD2	(Th)	58.3 PMY	W2XHQ—Millburn, N.J.
6-7 p.m.	31.49 ZBW3	31.8 COCH	70.2 RV15	W2XHR-W2XHT—Millburn, N.J. (P.).
13.99 DJS	31.55 VK3ME			W2XHU—Newark, N.J. (P.).
16.89 DJE	34.0 VPD3			W2XHW—Union, N.J.
19.63 DJQ	44.64 PMH			W2XHX-W2XHZ—Union, N.J. (P.).
19.31 PCJ (Th)	48.7 VPB			W2XI—Kenilworth, N.J.
19.74 DJB	49.5 W8XAL			W2XIA—Harrison, N.Y. (P.).
25.23 TPA3	58.3 PMY			W2XIC—Woodbridge, N.J.
28.14 JVN	70.2 RV15			W2XQ—Elizabeth, N.J.
31.28 VK2ME				W3XAC—Abington, Pa.
(S)	10-11 p.m.			W3XAG—Elkins Park, Pa.
31.38 DJA	13.93 GSJ			W3XAO—Camden, N.J.
31.45 DJN	13.97 GSH			W3XAR—Brookline, Pa.
	13.99 DJS			W3XAV—Suffolk, Va.
7-8 p.m.	16.86 GSG			W3XBA—Bethlehem, Pa.
13.99 DJS	16.88 PHI (S)			W3XBB-W3XBC—Bethlehem, Pa. (P.).
19.71 PCJ (Th)	16.89 DJE			W3XBD—Atlantic City, N.J.
19.74 DJB	19.58 OLR5B			W3XBE-W3XBF—Atlantic City, N.J. (P.).
25.57 Saigon	19.63 DJQ			W3XBG—Norfolk, Va.
28.14 JVN	19.68 TPA2			W3XBJ—Harrisburg, Pa.
31.38 DJA	19.74 DJB			W3XBK-W3XBO—Harrisburg, Pa. (P.).
31.45 DJN	19.8 YDC			W3XBP—Wilmington, Del.
31.49 ZBW3	19.82 GSF			W3XBQ—Atlantic City, N.J. (P.).
31.55 VK3ME	19.7 OLR5A			W3XBR—Sharon Hill, Pa.
	19.85 DJL (S)			W3XBS—Ventnor, Atlantic City, N.J. (P.).
8-9 p.m.	25.4 2RO4			W3XDA—North Plainfield, N.J.
13.93 GSJ	25.45 JZJ			W3XDB-W3XDC—North Plainfield, N.J. (P.).
13.97 GSH	25.57 Saigon			W3XDN-W3XDQ—Bethlehem, Pa. (P.).
13.99 DJS	27.27 PLP			W3XDU-W3XDV—Atlantic City, N.J. (P.).
16.86 GSG	28.14 JVN			W3XED—Longport, N.J. (P.).
19.68 TPA2	29.24 PMN			W3XF—Ventnor, Atlantic City, N.J.
19.71 PCJ (W)	30.23 JDY			W3XG—Ventnor, Atlantic City, N.J. (P.).
19.74 DJB	30.61 XGOX			W3XH—Ventnor, Atlantic City, N.J. (P.).
19.8 YDC	30.78 COCQ			W3XS—Ardmore, Pa.
19.82 GSF	31.28 VK6ME			W3XT—Lansdowne, Pa.
25.4 2RO4	31.28 VK2ME			W3XU—Philadelphia, Pa. (P.).
25.57 Saigon	(S)			W3XZ—Danville, Va.
27.27 PLP	31.35 W1XK			W4XAC—Salisbury, N.C.
28.14 JVN	31.38 DJA			W4XAE-W4XAF—Birmingham, Ala. (P.).
29.24 PMN	31.45 DJN			W3XAG—Rome, Ga.
31.28 VK2ME	31.49 ZBW3			W4XAH—Columbia, S.C.
(S)	31.8 COCH			W4XAI—Kingsport, Tenn.
31.38 DJA	32.09 COBC			W4XAK—Charlotte, N.C. (P.).
31.45 DJN	32.59 COBX			W4XAL—Charlotte, N.C.
31.49 ZBW3	44.64 PMH			W4XAM—Savannah, Ga.
31.55 VK3ME	48.7 VPB			W4XAN—Tallahassee, Fla.
31.45 VPD2	49.5 W8XAL			W4XAP—Kinston, N.C.
34.0 VPD3	49.98 Rangoon			W4XAQ—Brunswick, Ga.
44.64 PMH	58.3 PMY			W4XG—Miami Beach, Fla.
70.2 RV15	70.2 RV15			W4XI—St. Petersburg, Fla.
				W4XJ—Winston-Salem, N.C.
9-10 p.m.	11 p.m.-midnight.			W4XK—Durham, N.C.
13.93 GSJ	13.93 GSJ			W4XL—Hickory, N.C.
13.97 GSH	13.97 GSH			W4XM—Chattanooga, Tenn.
13.99 DJS	13.99 DJS			W4XR—High Point, N.C.
16.86 GSG	16.86 GSG			W4XS—LaGrange, Ga.
16.89 DJE	16.89 DJE			
19.58 OLR5B	16.88 PHI			
19.63 DJQ	19.56 DJR			
19.68 TPA2	19.63 DJQ			
19.7 OLR5A	19.68 TPA2			
19.71 PCJ (W)	19.74 DJB			
19.74 DJB	19.8 YDC			
19.8 YDC	19.82 GSF			
19.82 GSF	19.85 DJL			
19.85 DJL (S)	25.4 2RO4			
25.0 RNE (W)	25.42 JZJ			
25.4 2RO4	25.57 Saigon			
25.57 Saigon	27.27 PLP			
27.27 PLP	29.24 PMN			
28.14 JVN	30.61 XGOX			

## American Police Radio Calls

Contributed by ALAN H. GRAHAM.

(Note: In the following list, the abbreviation "P" indicates "portable.")

W1XAO—Boston, Mass.	W1XCU—Sharon, Mass.	W3XBD—Atlantic City, N.J.
W1XAA—Brookline, Boston, Mass.	W1XCA—Sharon, Mass. (P.).	W3XBE-W3XBF—Atlantic City, N.J. (P.).
W1XBL—Quincy, Mass.	W1XCX-W1XCZ—Massachusetts State Police (P.).	W3XBG—Norfolk, Va.
W1XBM-W1XBR—Quincy, Mass. (P.).	W1XDA-XDB—Massachusetts State Police (P.).	W3XBJ—Harrisburg, Pa.
W1XBY-W1XBZ—Medford, Mass. (P.).	W1XDG—Quincy, Mass. (P.).	W3XBK-W3XBO—Harrisburg, Pa. (P.).
W1XCA-W1XCC—Medford, Mass. (P.).	W1XDH—Cohasset, Mass.	W3XBP—Wilmington, Del.
W1XCU—Sharon, Mass.	W1XDK—West Hartford, Conn.	W3XBQ—Atlantic City, N.J. (P.).
W1XCA—Sharon, Mass. (P.).	W1XDL-W1XDM—Hull, Mass. (P.).	W3XBR—Sharon Hill, Pa.
W1XCX-W1XCZ—Massachusetts State Police (P.).	W1XDT—Manchester, N.H.	W3XBS—Ventnor, Atlantic City, N.J. (P.).
W1XDA-XDB—Massachusetts State Police (P.).	W1XDU-W1XDV—Manchester, N.H. (P.).	W3XDA—North Plainfield, N.J.
W1XDG—Quincy, Mass. (P.).	W1XDW—Hull, Mass.	W3XDB-W3XDC—North Plainfield, N.J. (P.).
W1XDH—Cohasset, Mass.	W1XDX-W1XDZ—Hull, Mass. (P.).	W3XDN-W3XDQ—Bethlehem, Pa. (P.).
W1XDK—West Hartford, Conn.	W1XEA—Hull, Mass. (P.).	W3XDU-W3XDV—Atlantic City, N.J. (P.).
W1XDL-W1XDM—Hull, Mass. (P.).	W1XHC—Hartford, Conn.	W3XED—Longport, N.J. (P.).
W1XDT—Manchester, N.H.	W1XHD-W1XHH—Hartford, Conn. (P.).	W3XF—Ventnor, Atlantic City, N.J.
W1XDU-W1XDV—Manchester, N.H. (P.).	W2XAJ—Port Jervis, N.Y. (P.).	W3XG—Ventnor, Atlantic City, N.J. (P.).
W1XDW—Hull, Mass.	W2XCA—Union City, N.J.	W3XH—Ventnor, Atlantic City, N.J. (P.).
W1XDX-W1XDZ—Hull, Mass. (P.).	W2XCB-W2XCF—Union City, N.J. (P.).	W3XIS—Ardmore, Pa.
W1XEA—Hull, Mass. (P.).	W2XCG—Bayonne, N.J. (P.).	W3XT—Lansdowne, Pa.
W1XHC—Hartford, Conn.	W2XCJ—Bayonne, N.J.	W3XU—Philadelphia, Pa. (P.).
W2XAJ—Port Jervis, N.Y. (P.).	W2XCS—Eastchester, N.Y.	W3XZ—Danville, Va.
W2XCA—Union City, N.J.	W2XCT—Eastchester, N.Y. (P.).	W4XAC—Salisbury, N.C.
W2XCB-W2XCF—Union City, N.J. (P.).	W2XDD—Deal, N.J.	W4XAE-W4XAF—Birmingham, Ala. (P.).
W2XCG—Bayonne, N.J. (P.).	W2XDE-W2XDF—Deal, N.J. (P.).	W3XAG—Rome, Ga.
W2XCJ—Bayonne, N.J.	W2XEA-W2XEH—Bayonne, N.J. (P.).	W4XAH—Columbia, S.C.
W2XCS—Eastchester, N.Y.	W2XEL—Eastchester, N.Y. (P.).	W4XAI—Kingsport, Tenn.
W2XCT—Eastchester, N.Y. (P.).	W2XEM—Newark, N.J.	W4XAK—Charlotte, N.C. (P.).
W2XDD—Deal, N.J.	W2XEN—Roselle, N.J.	W4XAL—Charlotte, N.C.
W2XDE-W2XDF—Deal, N.J. (P.).	W2XES—Englewood, N.J.	W4XAM—Savannah, Ga.
W2XEA-W2XEH—Bayonne, N.J. (P.).	W2XFA—Jersey City, N.J.	W4XAN—Tallahassee, Fla.
W2XEL—Eastchester, N.Y. (P.).	W2XFB-W2XFK—Jersey City, N.J. (P.).	W4XAP—Kinston, N.C.
W2XEM—Newark, N.J.	W2XFL-W2XFT—Elizabeth, N.J.	W4XAQ—Brunswick, Ga.
W2XEN—Roselle, N.J.	W2XFU—Plainfield, N.J.	W4XG—Miami Beach, Fla.
W2XES—Englewood, N.J.	W2XFV-W2XFZ—Plainfield, N.J. (P.).	W4XI—St. Petersburg, Fla.
W2XFA—Jersey City, N.J.	W2XGC—Ploughkeepsie, N.Y. (P.).	W4XJ—Winston-Salem, N.C.
W2XFB-W2XFK—Jersey City, N.J. (P.).	W2XGG—Bayonne, N.J. (P.).	W4XK—Durham, N.C.
W2XFL-W2XFT—Elizabeth, N.J.	W2XGH—Roselle Park, N.J. (P.).	W4XL—Hickory, N.C.
W2XFU—Plainfield, N.J.	W2XGJ—Roselle Park, N.J. (P.).	W4XM—Chattanooga, Tenn.
W2XFV-W2XFZ—Plainfield, N.J. (P.).	W2XGK—Harrison, N.Y.	W4XR—High Point, N.C.
W2XGC—Ploughkeepsie, N.Y. (P.).		W4XS—LaGrange, Ga.
W2XGG—Bayonne, N.J. (P.).		
W2XGH—Roselle Park, N.J. (P.).		
W2XGJ—Roselle Park, N.J. (P.).		
W2XGK—Harrison, N.Y.		



# Fourth S.W. DX Contest Won by W. T. Choppen of N.Z.

**A** LARGE and exceedingly high-class entry of over 50 verifications was received for the "Radio World" fourth DX Contest, which closed on May 1. The task of determining the winner of the handsome Replogle Globe was again very difficult.

After taking into account all the relevant factors, the judges decided in favour of Mr. W. T. Choppen, of Timaru, New Zealand. The winning verification was from TG2X, Guatemala City, Guatemala, operating on 5940 k.c., or 50.47 m. Several factors led to the decision in favour of Mr. Choppen's entry. The time of reception of TG2X was most remarkable when the wavelength of the station is considered: Mr. Choppen logging them at 12.10 p.m. Aust. E.S.T. In addition, Mr. Choppen used only a small receiver—a three-valve Super-Gainer; the antenna was a 50ft. vertical.

In addition to the winning verification, Mr. Choppen submitted cards from CR7BH, YV4RB, COCD and YDA7 (91.7 m.).

### Honourable Mention.

Honourable mention goes to two competitors, Messrs. La Roche and Simpson—the latter having carried off the Globe awarded in the third contest.

Mr. La Roche (Perth, W.A.) entered a card from the South African amateur, ZU5AC. This verified reception on 40 m. of ZU5AC's 'phone signals. As the power used was only 18 watts, the card represented a fine feat of DX. Mr. La Roche uses a five-valve receiver.

Mr. Simpson (Concord West, N.S.W.) entered a fine collection of verifications, three of which were selected by the judges for honourable mention. These were from CFRX, Toronto, 49.4 m.—first report from Australia; YSD, San Salvador, 37.99 m.; and FZES, Djibouti, 17 m.

- W4XT—Tuscaloosa, Ala.
- W4XU—Raleigh, N.C.
- W4XV—Greensboro, N.C.
- W4XW—Greenville, S.C.
- W5XB—Fort Worth, Tex.
- W5XF—Amarillo, Tex.
- W6XAQ—Phoenix, Ariz. (P.).
- W6XBF—Piedmont, Calif.
- W6XBG-W6XBJ—Piedmont, Calif. (P.).
- W6XCN—San Diego, Calif. (P.).
- W6XBR-W6XBS—Highland Park, Detroit, Mich. (P.).
- W6XBT—Springfield, Ohio.
- W6XBU—W6XBZ—Springfield, Ohio. (P.).
- W6XCA-W6XCD—Springfield, Ohio (P.).
- W6XCK-W6XCL—Springfield, Ohio (P.).
- W6XDL—Modesto, Calif.
- W6XDM-W6XDP—Modesto, Calif. (P.).
- W6XDZ—Modesto, Calif.
- W6XEG—Salt Lake City, Utah (P.).
- W6XEH—Long Beach, Calif.
- W6XEI-W6XER—Long Beach, Calif. (P.).
- W6XFE—Alhambra, Calif.
- W6XFF-W6XFH—Alhambra, Calif. (P.).
- W6XFX—Merced, Calif. (P.).
- W6XFY—Merced, Calif. (P.).
- W6XFZ—Visalia, Calif.
- W6XGA—Visalia, Calif. (P.).
- W6XGB—Fresno, Calif. (P.).
- W6XGC—San Gabriel, Calif.
- W6XGD-W6XGF—San Gabriel, Calif. (P.).
- W6XGG—Turlock, Calif.

- W6XGN—Santa Barbara, Calif. (P.).
  - W6XGQ—Salinas, Calif.
  - W6XGR-W6XGX—Salinas, Calif. (P.).
  - W6XGY-W6XGZ—Turlock, Calif. (P.).
  - W6XHA—Watsonville, Calif.
  - W6XHB-W6XHC—Watsonville, Calif. (P.).
  - W6XHD-W6XHE—San Bernardino, Calif. (P.).
  - W6XHG—San Anselmo, Calif.
  - W6XHH-W6XHI—San Anselmo, Calif. (P.).
  - W6XHJ-W6XHM—Pittsburgh, Calif. (P.).
  - W6XHN—Pittsburgh, Calif.
  - W6XHO—Santa Rosa, Calif.
  - W6XHP-W6XHQ—Santa Rosa, Calif. (P.).
  - W6XHR—Monrovia, Calif.
  - W6XHS-W6XHT—Monrovia, Calif. (P.).
  - W6XHU—San Buenaventura, Calif.
  - W6XHV-W6XHY—San Buenaventura, Calif. (P.).
  - W6XHZ—Long Beach, Calif. (P.).
  - W6XIA—Oceanside, Calif.
  - W6XIB-W6XIC—Oceanside, Calif. (P.).
  - W6XID—Beverly Hills, Calif.
  - W6XIE-W6XIP—Beverly Hills, Calif. (P.).
  - W6XIQ—Antioch, Calif.
  - W6XIR—Antioch, Calif. (P.).
  - W6XIS—Alhambra, Calif.
  - W6XIT-W6XIV—Alhambra, Calif. (P.).
  - W6XM—Stockton, Calif.
- (To be continued.)

# Boost your Signals from R4 to R9+

**"NOISEMASTER"**  
Aerial Kit drags up  
signals out of the mush  
to overload your speaker

**D**O mush and hellish noise drown these sought-for, rarely heard distant stations? Let the "NOISEMASTER" Engineered All-Purpose Aerial Kit drag them in and boost up signals to overload your speaker. "NOISEMASTER" wipes out noise and local static, and boosts up signals, even as much as from R4 to R9 plus!

No one else would ever dare make such a claim—no other aerial of ANY TYPE can give you such incredible performance, because "Noisemaster" is the only Aerial Kit authorised to use the wonderful American invention "ANTENNEX." It acts like a purifier and cleans out every trace of locally created noise, leaving all stations beautifully clear at astounding volume.

Besides, you get in the "Noisemaster" Kit 200 feet of special aerial wire, 12 specially designed transposition blocks, earth clamp, lead-in strip, screws, lightning arresters, 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 noisetroubles end! Send this special form for your "Noisemaster" Aerial Kit NOW, and have revealed to you a glorious new thrill in reception that makes you feel your set is new again.

## Send for yours without Delay

Antennex (A'sia.) Corporation  
Box 3868 T, G.P.O., 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 .....

.....

A.R.W. 6/38.



# DX News and Views

A page for  
letters from  
DX readers

## Good DX Despite Interference.

Just a few lines to let you know how DX is getting on down here. My aerial does not aid good reception, as it is near a power transformer, flashing neon sign, frigidaires, etc., which cause interference, but my new 1938 all-wave Radiolette settles the matter, and so far I have quite a number of verifications.

The following is a list of my latest loggings: VE5VO, VK3PB, KZRM, VK3KY, VK5DI, VK5KX, VK4GG, K6AGA, K6LKM, KA1AP, VK7CL and K6KGA. I think some of the amateurs must collect unused stamps, as they do not reply.

Wishing the "Radio World" the best of success.—W. A. Shaw (AW-297DX), Devonport, Tasmania.

## Latest Shortwave Loggings.

Just a few lines to report on last month's loggings. The conditions here during this month have been much better, and I have heard the following broadcast stations on shortwave:—JZJ, XEWW, CSW, PCJ, COCQ, COCM, and the Empire stations. All were very good, with JZJ, PCJ and XEWW the strongest. Amateurs: VK6WS, K6's KGA, BNR, KGS, MXM, .MVP, .KA1AP, .W2HFS, XU6TL, VE5's VO, HU, EF, OT, W4's KT, BMR, W5BEE, 8 W6's and 1 W7. I have just received a very nice card from DJB, Berlin.

Best wishes to the "Radio World"—it is a great book.—Mervyn Tippet (AW380DX), Koongal, Queensland.

## "Two-Day "Fade-Outs" Last Month.

My DX on the 20-metre band last month was not too good, as there were a few fade-outs lasting for about two days. Following are my loggings:—

W1's HKK, GR, FMP, W3's GQG, GDY, TWN; W4's DRZ, EP; W5's

## "Fidelity B.C. Five."

(Continued from page 39.)

but found that these were rather too selective for good high-note response, so I moved the coils  $\frac{1}{16}$  in. closer, which brought them to the point where they just commenced to double peak, passing a band about 8 k.c. wide with fairly sharp cut-off beyond. This adjustment allows a delightfully natural reproduction on local stations, which are often a pleasure to listen to.—J. P. Stewart, Bundamba, Q.

BZF, FNY, ATB; W6's BOS, IXZ, KKG, AHP, LAJ, BYR, JPW. BUT, JYH, NKP, MPS, NMI; W7's DAA, DX, ARK, DNP, AMQ; W8's FDF, LVE, AAJ, BWC; W9's EMI, MM, CIH, TSR, ELX, UJS, TGX, SBV, EOZ, TB, VE4ZK, VE4KF, VE5CD; K6's KPF, KEF, LKN; F8's IQ, AM, KW; PK's 1VY, 2AY, 4JD; G2NM, G5NI, G8LP, ZL2BI, LU1HI, CT1AY, HC1FG, J5CC, XU8EF, CE3AA, SU1RD, YR5AA, HH5PA (all on 'phone).

I have received verifications from VK's 4RH, 5LW, 5TR, 6WS, 4LK, 7RZ, 2AFE, 5KX, 4GE, and a very nice card from PCJ for which I waited eight months. I sent a report to J2MI and received the same letter back five months later from the Dead Letter Office. The letter had been

## ROUND THE SHACKS

Amateur operators desirous of having their transmitters and activities featured under this heading are requested to forward details to "Reporter," C/- "Radio World," 214 George St., Sydney. Articles should be similar in style to those already appearing in the series, and should, where possible, be accompanied with photographs of operator and transmitter.

to Japan and I have been informed since that some European "hams" refuse letters from S.W.L.'s, so it is a waste of time reporting to them.—Charles H. Thorpe (AW342), North Rockhampton, Queensland.

## May Loggings And Veries.

I received five more verifications this month from VK's 6ME, 3EF, 5FL, 5DC and 3TR, and have only two more to receive from VK's 5RL and 2TM. The "Shortwave Review" for May had plenty of information of stations and amateurs. Stations logged during May include the following 20 m. amateurs:—

11 W1's, 11 W2's, 2 W3's, 6 W4's, 5 W5's, 13 W6's, 1 W7, 10 W8's, 8 W9's, 2 PK1's, 1 PK3. Commercials: W1XK (31.55 m.), W2XE (25.36 m.), VPD2 (31.45 m.), PLP (27.27 m.), JVN (28.14 m.), JZJ (25.45 m.), ZBW (31.49 m.), ZLT (27.15 m.), OLR4A (25.34 m.), CS2WA (31.09 m.), and COCH (31.8 m.).—Wm. Bantow (AW-353DX), Victoria.

## Latest Shortwave News.

CBII70, 11,700 k.c., in Chile, broadcasts an Anglo-American programme at 11 to 11.45 a.m., A.E.S.T., daily, and verifies with a very attractive card.

TI4NRH on 9698 k.c. with his tenth anniversary programmes dedicated to various radio clubs, etc., is being clearly received with good volume in New Zealand.

Listeners in the Dutch East Indies pay the N.I.R.O.M. each month a licence fee which decreases as the number of listeners increases, e.g.—

Jan., 1935, 10,050 listeners=	3 guilders
" 1936, 24,000 "	=2½ "
" 1937, 40,000 "	=1½ "
" 1938, 53,000 "	=1½ "

Programmes of the Brazilian Hour go on the air through the auspices of the Federal Government of Brazil over shortwave station PSH, 10,220 k.c., and PSE, 14,935 k.c. Every Tuesday this department broadcasts an English programme between 11 and 11.30 a.m. A.E.S.T. Both stations are located in Rio de Janeiro and verify with card, showing picture of city, in yellow and black.

Radio Tananarive, Madagascar, broadcasts simultaneously on the following frequencies:—10,500, 9510, 6073 k.c.; every Wednesday, Friday and Saturday at 3.30 to 3.45 p.m., 6.30 to 7.30 p.m., 1 a.m. to 2 a.m., A.E.S.T. The above schedule was received on their verification card.—W. T. Choppen (AW61DX), Timaru, N.Z.

## DX "Scoop" For 353DX.

Just a few lines to let you know that the QSL forms are still successful, and I have now received 24 verifications by using them. During April cards were received from VK's 4UY, 7RZ, 3BZ, 3EH, 3FB, 5LB, and a letter from ZLT saying that they do not usually verify, but being a special occasion they advised that the times and particulars quoted in my report agree with the station log. They also stated that the station is engaged in the public commercial service and is not intended for general reception.

Reports are out to VK's 3JR, 3LN, 3TW, 3ME, 3JQ, 3EF, 6ME; TI4NRH and KZRM. During April the following 20 m. amateurs were heard:—W2ZC, 2EVI, 2AZ, 3ER, 3CZJ, 6BKY, 6AH, 6IKQ, 6MCW, 6AT, 6IDY, 6EUW, 6CQG, 6MHL, 8CMA, 8PL, 9TOO, 9MCA, 9IPA, 9UJS, ZL2CJ, ZL2QL, OA4AI, KA1JZ, KA1MH, PK1MX, PK1ZZ, VS1AI, XU8RB,

(Continued on page 48.)



# Ex-Fingerprint Expert Conducts PCJ Session

**Schedule Now Changed To 3.30 - 5 p.m. On Tuesdays.**

PCJ "fans" have all been very busy lately making a note on their Radio Charts of PCJ's altered transmission time, for the usual Tuesday night Australian broadcast now takes the air from 3.30-5 p.m. each Tuesday. It is conducted by L. G. Wybrands, one of the most popular announcers connected with Philips experimental transmitter.

Visitors to PCJ who have met Mr. Wybrands say he is nearly always to be found busily engaged reading Australian newspapers and magazines, and he admits that it is one of his greatest ambitions to make a trip to Australia. Judging by his immense popularity with European listeners, however, his ambition has little chance of being realised.

Wybrands was originally a fingerprint expert who had become an authority on this branch of criminal work by studying the systems used by the principal nations of the world. One day, while he was still attached to the Dutch police department, he was invited to give a talk at the Philips station at Hilversum. Directors of the studio who happened to be listening to the speaker were impressed by his fine voice and diction. He was offered a position in the studio, and, rather to their surprise, he gave up his police career and became a radio announcer.

Since taking over his new position he has exhibited the same enterprise which has characterised Australian and American programme impresarios. In spite of his police training

he believes that "red tape" is something to be cut. He doesn't hesitate to go to his objective in the most direct way, an attribute that is not always credited to Continentals.

One of his episodes was related recently by Hans Merx, a well-known singer who has since returned to America after a concert and radio tour abroad.

When the Oxford Group was holding a meeting in Utrecht, it occurred to Mr. Wybrands that the speakers of the movement should be given a chance to talk to the world over short wave PCJ. He commandeered a huge motor-bus, drove to Utrecht, convinced the Oxford Group leaders of the value of the event, and within a few minutes was on his way back to Hilversum with a loaded bus. The members spoke in turn, and were immediately rushed by car to the Hook of Holland, from which port they were sailing for London.

Such spontaneous features are not unusual in Australia and America, but Europeans are more leisurely in their movements. Under ordinary conditions and with someone less energetic than Announcer Wybrands at the helm, it might have taken days and perhaps weeks to have made the broadcast possible.

## VK2ME, 3ME And 6ME— Schedules For July

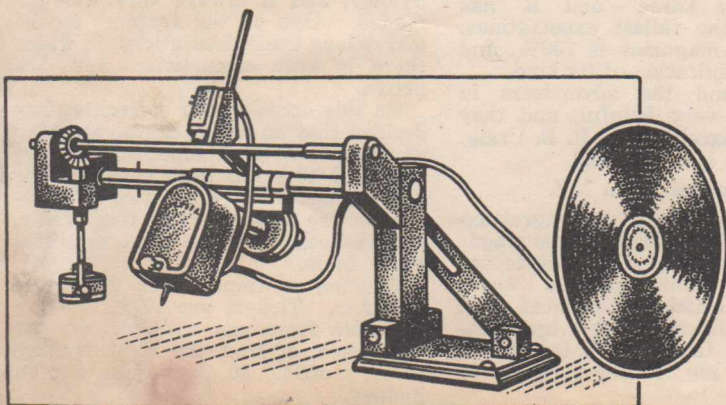
The following transmission schedules will be observed by shortwave



Announcer L. G. Wybrands, who conducts the Australian session over PCJ.

stations VK2ME, VK3ME and VK6ME during June:—

	VK2ME (31.28 m., 9590 k.c.)	
	Sydney Time.	G.M.T.
Sundays:	3-5 p.m.	0500-0700
	7.30-11.30 p.m.	0930-1330
Mondays:	2.30-4.30 a.m.	1630-1830
	VK3ME (31.5 m., 0510 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)	



## Permarec Home Recording System.

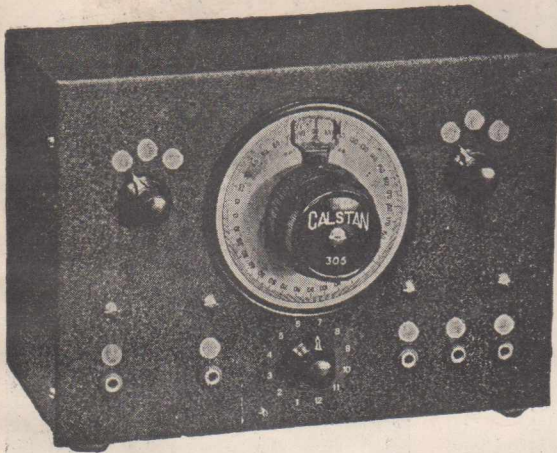
(Continued from page 38.)

World" for December, 1937, being ideal, as it is inexpensive and has excellent sensitivity.

In next month's "Radio World" an article will be published describing in detail the process for making records using this equipment, and constructional details will be given of an inexpensive amplifier designed to be used in conjunction with the recorder.

Left: The Permarec home recording outfit.





★  
The Calstan all-wave test oscillator, which is now available in kit form.  
★

### Calstan All-Wave Oscillator Available In Kit Form.

(Continued from page 5.)

ible in its applications, and should prove invaluable to servicemen and dealers requiring a comprehensive instrument built in portable form. A detailed review will be published in next month's "Radio World."

### Incorrect Price In Calstan Advertisement.

The attention of readers is drawn to the fact that the price listed for the Calstan D.C. multimeter valve-tester combination in the advertisement inserted by Slade's Radio Pty. Ltd. on page 15 of this issue is incorrect. Shown as £18/18/-, it should be £18/6/-.

### DX News And Views.

(continued from page 46)

K6CMP, K6BNR. Commercials:—W2XAD (19.56 m.), W8XK (19.72 m. and 25.26 m.), NIROM (31 m.), JVN (28.14 m.), OLR3A (31.41 m.), KZRM (31.35 m.), and WBCA, WBCB (31 m.).—Wm. Bantow (AW353DX), Edithvale, Victoria.

#### Says Club QSL Forms Are Excellent.

I wish to acknowledge receipt of my certificate, badge and report forms. I think they are excellent, particularly the QSL's. Any station which would not verify after receiving a report on one of the forms would be the reverse of courteous.—T. Johnston-Lord (AW336DX), Port Kembla, N.S.W.

#### Thirty Americans Logged On May 1.

The 20-metre band is picking up now, and on May 1 it was jammed with amateurs, mostly Americans, and the following stations were logged:—30 Americans, K6FAB, K6BNR, K6OQE, K6ISG, KALMH, KA1ZL, VE5CT, VE5ACN, VE4VD, VE4MO, G2NA, J2MI, GM2UU, XU8ET and VR6AY. VK's 2-8, W's 1-9, G6DT, G2AK, K6's MPU, OGN, KRG, DCK; F3JD, PA1AP, KA's 1YL, 1ER, 2AB, 2OV, 1PH, X3QA, PK's 1MX, 2WL, 3GD; HK1Z, HA7G, VP5JS, ON4VK, NY2AE; XU's 80I, 8RB, 8MC, 8HB, CO7CZ, CO2RA, HI5X, HI7G, CE1AX, CE1AH, TI2IC, VS7GJ, CN8TK. FI8AC; ZL's 2NP, 2OQ, GM5NW and VO7GJ. I have reports out to 17 stations, and since joining the Club have received 31 verifications.—F. Combe (AW365DX), Victoria.

#### Is Using Equivalent Of All-Wave Bandsread Two.

Enclosed please find membership application form. I have been taking "Radio World" each month from the word "go," and eagerly look forward to every issue. I think it one of the very finest radio magazines published,

as it is of interest to everyone. It is to be congratulated on its consistently interesting articles and circuits.

I have been studying radio with the A.S. of R.E., also I.C.S., for the last 5½ years—the further one goes into radio the more interested one becomes.

I am at present experimenting with s.w. coils on a small job, using a 19 as detector and first audio, and 1F4 in the output, and it certainly has me amazed at the outstanding performance on the b.c. and s.w. bands, also the volume on b.c. loud speaker. The sensitivity is very good and selectivity very fair indeed. With my superhet I am also adding an r.f. stage and "B" class audio, which should lift it up quite a lot. I have used sirufer intermediates and they certainly made it a lot livelier.

I have also to congratulate you on your Club and its activities, and think it a wonderful idea from many points of view indeed, particularly for the friendships one may make with other members. Hearty congratulations and a prosperous future to "Radio World."—Don Fowler (AW385DX), Beerburum, Queensland.

#### "Empire" A Fine Performer.

I have built the set described in your December issue—the a.c. "Empire All-Wave Three"—and it has come up to the fullest expectations. I think your magazine is 100%, and is the best publication of its kind.

I have found the advertisers in your journal very helpful, and they fulfil orders excellently.—R. B. Craig, Christchurch, New Zealand.

#### A Bouquet From N.Z.

May I extend hearty congratulations to you for your excellent magazine. For the money I've yet to see a magazine containing so many worthwhile articles, technical and otherwise. Also my sincere appreciation of Alan Graham's notes, which have enabled me to keep right up to the minute.

My rig consists of a six-tube super tri-wave, and a two-tube s.w. set. The antenna is an inverted "L," 100ft. overall and 37ft. high, N.N.E./S.S.W. I've just completed a coil to take my two-valve down to 10 metres.—Con. A. Stiglich (AW335DX), Dunedin, New Zealand.

### QSL Exchange Bureau.

The following readers would like to exchange QSL cards with other readers:—

Merton M. Heath, P.O. Box 7, Dryden, Washington, U.S.A.

Charles H. Thorpe (AW342DX), 25 Charles Street, North Rockhampton, Queensland.

Alan Thomas Berry (AW394DX), Hawthorne Street, Roma, Queensland.

### Radio Industry Ball On Saturday, July 2.

For the seventh consecutive year the Radio Industry Ball, under the auspices of the R.I.F. Club, of Sydney, will be held on Saturday, July 2, at David Jones' Ballroom. This is an annual event in the radio trade of Sydney, and is always very well attended. One of the features is the marvellous trade decorations, in which there is keen competition for the prizes.

On this occasion the committee has decided that no tables can be accepted as an entry in the competition if more than £12/10/- has been spent on the decorations. There are two prizes—one for the most effective trade table, and the other for the most beautiful trade table.

Dancing continues from 8.30 until 1.30 a.m. Tickets are 10/6, and are available from any member of the committee, or from the honorary secretary's office, 30 Carrington Street, Sydney.





*so CHEAP  
to build that  
thousands can  
afford it!*

*so EASY  
to build that  
every man or boy  
can assemble it  
in his spare  
time!*

USE THIS RADIOKES  
COIL KIT IN THE  
COMET D/W FOUR.

When building the "Comet Dual-Wave Four," use the Radiokes C-K-M-S Coil Kit. Priced at only 35/- complete. Post Free anywhere in Australia.

# KIT-SETS at VEALLS

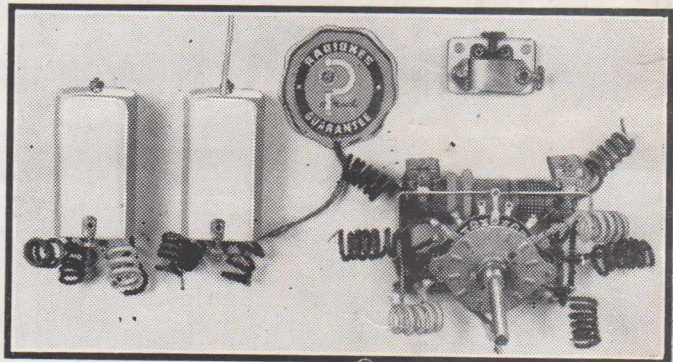
It pays to deal with Vealls—Six Big Stores packed with Radio and Electrical Goods at keen low prices. Write for quotations on complete Kit Sets, including valves and speaker, and remember, Vealls pay freight on Kitsets to your nearest railway station, either Victorian or Interstate.

## The Radiokes 1938 Dual-wave "MONEYSAVER"

**£6-19-6**

Fully described in the April issue of the "Aust. Radio World. Easy to build, easy to buy.

The Radiokes Dual-Wave A.C. Moneysaver Kit-Set is priced at only £6/19/6. Valves and speaker extra. Imagine the thrill of listening to all Australian reception plus overseas shortwave stations . . . Russia . . . America . . . France . . . England . . . Germany . . . Italy . . . Japan. Write for full details. Learn how easily you can build a D.W. Moneysaver. You can save pounds by building your own.



VEALLS PAY FREIGHT TO YOUR NEAREST STATION

### BUILD THE PORTABLE 4 IN A CONSOLE

The Outdoor Portable 4, undoubtedly Australia's most popular 4-valve Battery Portable, may be bought as a complete kit for only 11 gns. . . . Everything—including valves, speaker, batteries and cabinet—is included in the price.

For those who wish to build the Portable 4 chassis into a standard mantel or console cabinet,

Vealls will supply the complete kit for only 10 gns. with cabinet extra as selected.

Mantel Cabinets from . . . . . 32/6

Console Cabinets, 37/6, 42/6, 47/6 up to 85/-.

MONEY CANNOT BUY A BETTER 4-VALVER

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490 Elizabeth St., 243 and 168 Swanston St., Melb.  
299 Chapel St., Prahran. 3-5 Riversdale Rd., Camberwell.  
97 Puckle St., Moonee Ponds.  
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**SPOT WELDING IN PHILIPS AUSTRALIAN WORKS**

**T**HE steady hands and keen eyes of trained operatives perform many intricate tasks at Philips Australian Valve Factory.

On this machine, tiny components are being electrically welded into the valve mount. Attention to detail means better valves — and that means better radio!



**REPLACE WITH...**

# PHILIPS VALVES