

THE
AUSTRALASIAN

FEBRUARY 1, 1938
VOL. 2 — NO. 10
PRICE, 1/-

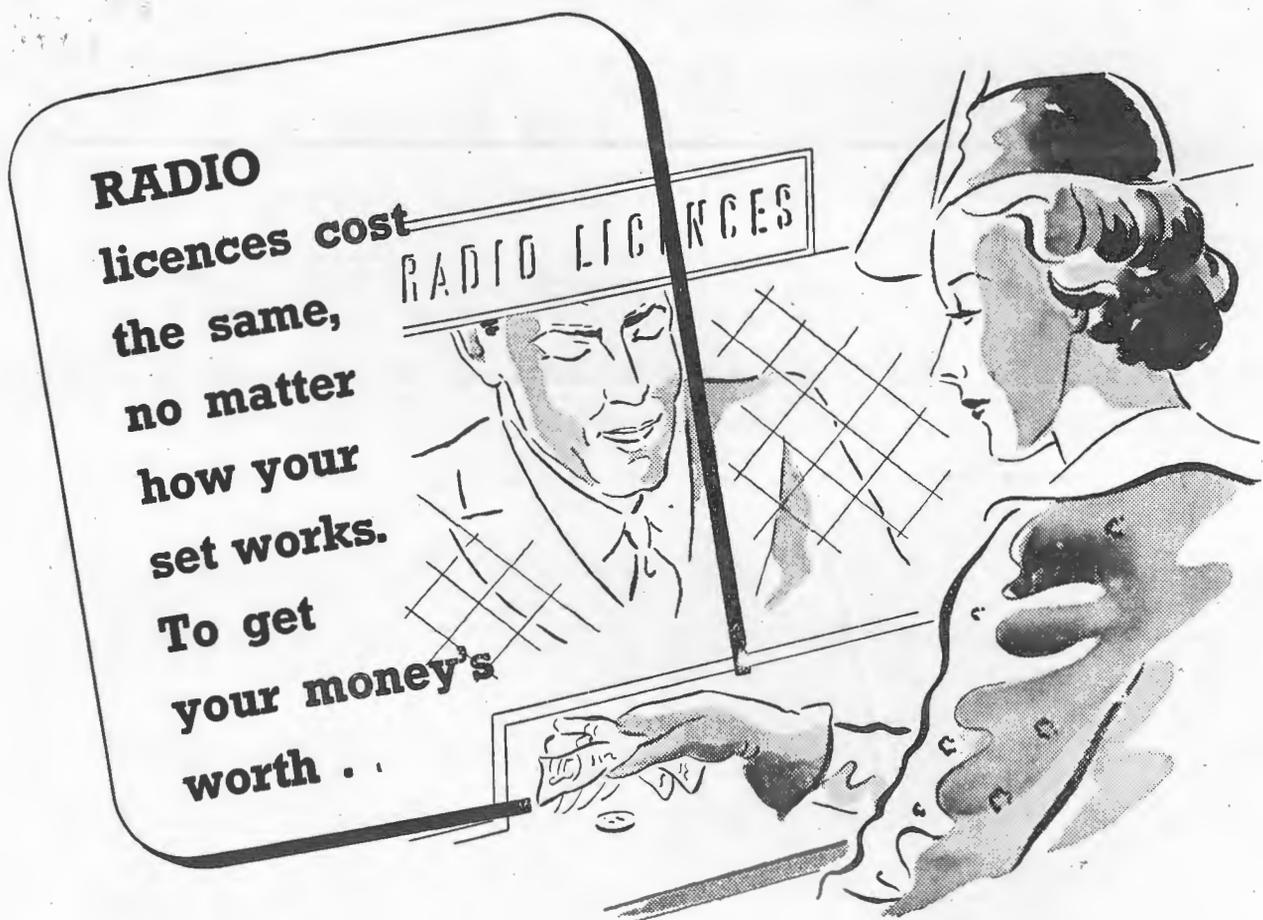
Radio World

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



—See Page 8

- "1938 FIDELITY DUAL-WAVE SIX": MORE ABOUT THE "EMPIRE
- ALL-WAVE THREE": VK2NO ADVANCED U.H.F. RECEIVER: RESULT OF
- THIRD SHORTWAVE DX CONTEST: LATEST WORLD SHORTWAVE NEWS.



Re-value with

★
★
Radiotrons

THE WORLD'S STANDARD RADIO VALVES

**AUSTRALIAN
GENERAL ELECTRIC
LIMITED**

Sydney, Melbourne, Brisbane
Adelaide, Hobart

**AMALGAMATED
WIRELESS (A/SIA) LTD.**

47 York Street, Sydney
167-169 Queen St., Melbourne

**NATIONAL ELECTRICAL
& ENGINEERING CO. LTD.**

Wellington
New Zealand

(Advertisement of Amalgamated Wireless Valve Co. Pty. Ltd.)

THE
RADIO
PIONEERS

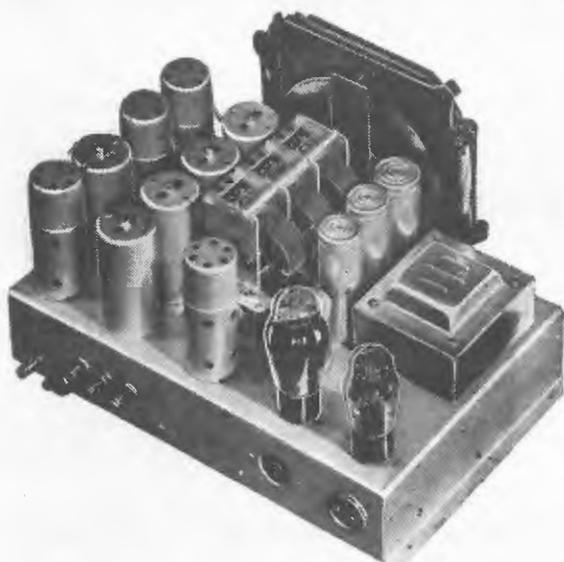
Fear's Radio News

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

FEAR'S
FOR
EVERYTHING
IN RADIO

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

Six-Valve All-Waver Has High-Fidelity Audio Channel



The "1938 Fidelity Dual-Wave Six," described this month, is a simplified and considerably less expensive version of the "De Luxe Fidelity Eight." Using a less powerful audio channel, this new "Six" is nevertheless capable of supplying an output that is more than ample for all domestic purposes, and the quality of reproduction is superb.

In all other respects the "Fidelity Six" provides a performance that is identical with that of the eight-valve version; both selectivity and sensitivity are excellent.

We can supply either DUAL or ALL-WAVE models as required, with or without "Magic Eye" tuning.

WRITE FOR OUR DETAILED QUOTE
Every Part Guaranteed as Specified.

BUILD AN "OUTDOOR" FOR THE EASTER HOLIDAYS

Make your holiday this Easter twice as enjoyable by building a "1937 Outdoor Portable Four" (de-



scribed in the "Radio World" for October and November, 1937).

Guaranteed under similar operating conditions to have more pulling power than many "sixes," it is a remarkable distance-getter and the ideal companion for all occasions.

Get YOUR kit now, supplied exactly as specified in the October and November "Radio World," complete with small aeroplane dial and crackle-finished panel.

Price with valves, batteries, carrying case, everything required £ 12 / 10 / -

Also supplied completely assembled, fully guaranteed £ 14 / 10 / -
aligned, tested and

Note: Usual trade discounts do not apply to above prices.



"1937 EMPIRE ALL-WAVE THREE"

(A.C. and Battery Versions)

Rapidly becoming one of Australia's most popular DX receivers, the "Empire All-Wave Three" is designed to provide maximum in worldwide reception at the lowest possible cost.

Both the battery version (illustrated above) and the A.C. model tune from 12 to 600 metres with a standard two-gang condenser. Both use a high-gain R.F. stage, with a screen-grid detector incorporating electron-coupled regeneration. Both R.F. and audio gain controls are provided. The battery version uses automatic bias, no "C" battery being required, while economical operation is ensured by low "A" and "B" drain.

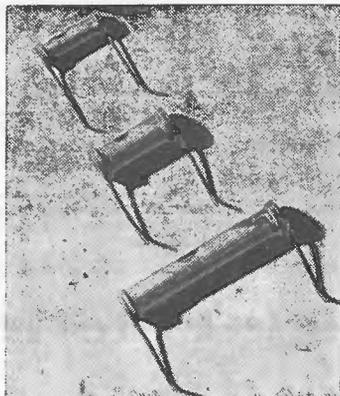


The A.C. model uses a 6D6 R.F. stage, 6C6 screen-grid detector with electron-coupled regeneration, choke-coupled to a 76 audio stage. It can be powered from any standard receiver using 6.3 volt valves, from a separate power pack, or by using the special combination power pack and amplifier unit featured in the December issue.

Ideal DX receivers for both short-wave and broadcast, these "Empire" models give you more stations per £1 outlay than any other.

WRITE FOR OUR DETAILED QUOTE.

Every part guaranteed as specified.



Carbon Resistors that are really **NOISELESS**

Here, at last, is silent operation with a capital "S"; resistors that can be depended upon to give noiseless trouble-free operation. And as well:—

- ★ Bifrost resistors are **PERMANENT**. They have the same values after long, heavy use at their rated load as when they leave the factory.
- ★ The resistance is always the same, regardless of the voltage applied, and, therefore, overloads do not affect the resistance.
- ★ Their value does not change when used at any frequency.
- ★ In addition to a comprehensive range in the higher values, **BIFROST** resistors are now available in $\frac{1}{2}$ and $\frac{1}{4}$ -watt ratings, covering values from 5 to 500 ohms. Another triumph for Bifrost!

Following stringent tests applied to recognised makes of resistors, Bifrost have been chosen as standard by leading receiver manufacturers throughout Australia—undoubted proof of their superiority.

BIFROST

CARBON RESISTORS

Manufactured in Australia by

WM. J. MILLS

187 Catherine Street,
Leichhardt, N.S.W.

'Phone: Pet. 2191.

THE AUSTRALASIAN RADIO WORLD

Incorporating the
ALL-WAVE ALL-WORLD DX NEWS.

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

Vol 2.

FEBRUARY 1, 1938.

No. 10.

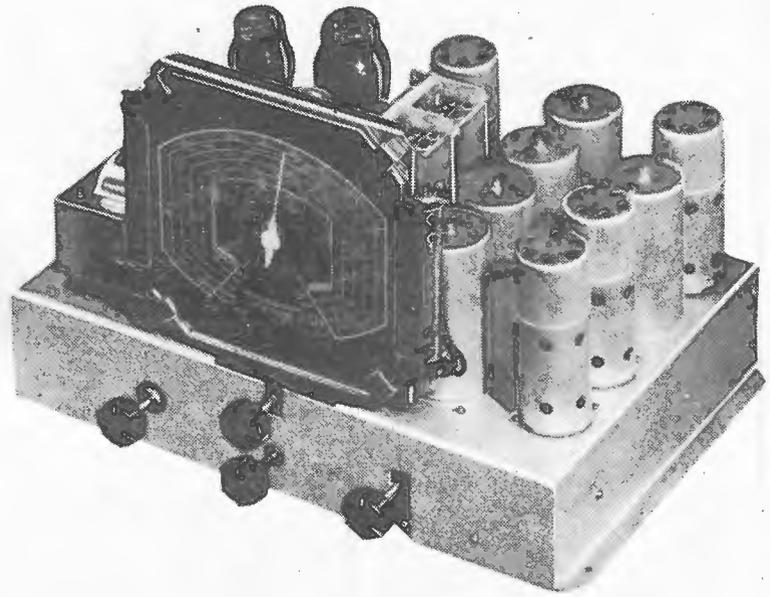
CONTENTS:

The Fidelity Dual-Wave Six	
New Ever Ready Factory Opened By Prime Minister	8
Radio Ramblings	10
More About The A.C. Empire All-Wave Three	14
Aden Amateur Station On The Air	16
Five Metres In S. Australia	18
VK2NO Advanced U.H.F. Receiver	19
Radio Valves In The Making (2)	24
Radio Step By Step (14)	27
Lavishly-Equipped Radio Service Workshop	29
What's New In Radio	32
Breaking Into The Amateur Game (13)	35
The All-Wave All-World DX News	37
Shortwave Review	38
Third S.W. DX Contest	41
Round Table QSO Smashes Previous Record	42
Around The Shacks (6)	43
1937 Eventful Year For Shortwave Dxers	44
DX News And Views	47

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.

The 1938 Fidelity Dual Wave Six



The completed receiver, which uses one of the latest Efco dials with the scale specially graduated to track with the Fox-radio coil kit. The three lower controls are, left to right, r.f. gain control, main volume control, and wave-change switch.

IN the December, 1936, issue of the "Radio World," details were published of a high-fidelity audio amplifier using a 6C6 driving a single 2A3, while in the January issue a five-valve receiver incorporating this audio channel was described. This was the "Fidelity Broadcast Five." Because of the unusual high quality of reproduction it gives, this receiver has proved widely popular among readers to whom tone is just as important as sensitivity and selectivity.

During 1937 a push-pull version of this amplifier was developed in the

Amalgamated Wireless Valve Company's laboratory, and was incorporated in the "De Luxe Fidelity Eight," described in the November and December issues of last year.

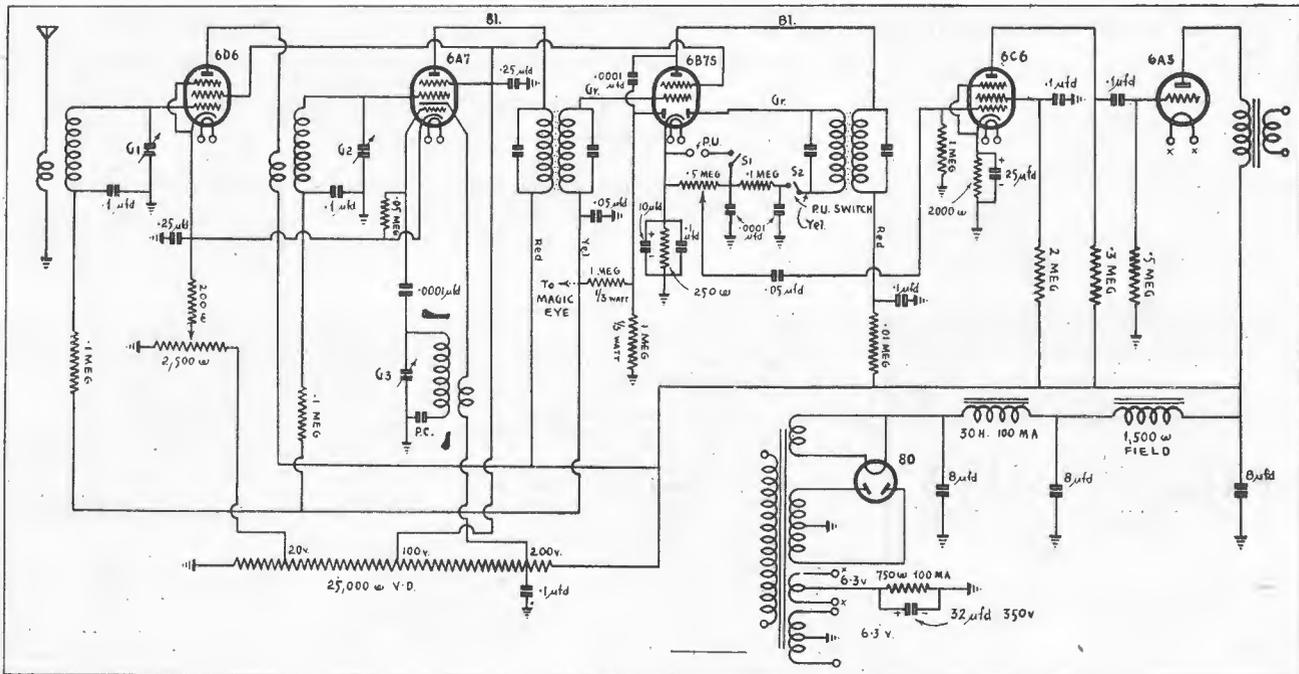
A Third "Quality Output" Receiver

To complete this range of "quality output" receivers, the "1938 Fidelity Dual-Wave Six" has been developed. About midway in cost between the five and eight-valve models mentioned above, this latest design incorporates the tuner section of the "Fidelity Eight" combined with the audio channel of the "Fidelity Broad-

cast Five."

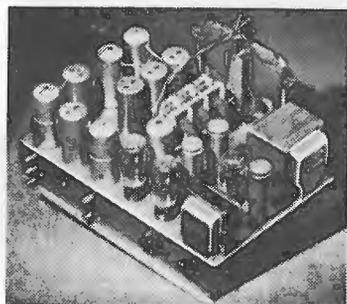
Thus the valve line-up is as follows:—6D6 r.f. amplifier, 6A7 mixer oscillator, 6B7S i.f. amplifier, diode detector, diode a.v.c. rectifier, 6C6 first audio stage driving a 6A3 (or 2A3), and an 80 rectifier.

While there are occasions when the more powerful push-pull output can be taken full advantage of, the single 2A3 in the "1938 Fidelity Dual-Wave Five" will, when fully loaded, deliver just on three watts to the speaker, which is far more than ample for all ordinary domestic needs.



The circuit of the "1938 Fidelity Dual-Wave Six," described in the accompanying article.

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.

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 a 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.

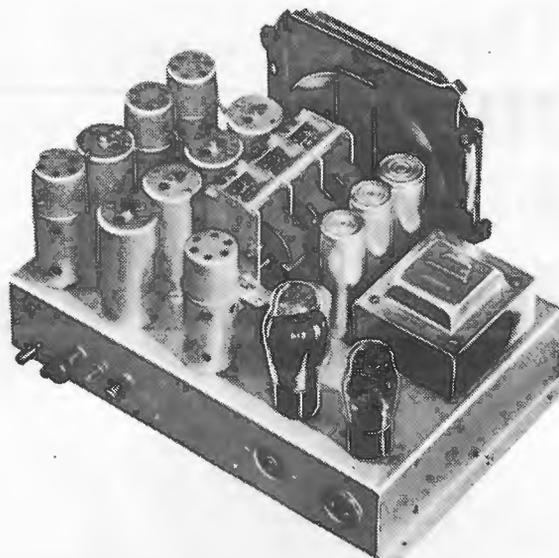
Highest quality components are used, supplied at moderate prices. TRY US FOR YOUR NEXT QUOTE. Country readers are invited to take advantage of our special Buying Service, through which we can locate and purchase for you both standard and non-standard parts and equipment.

PRECISION RADIO
L. T. MARTIN, M. Inst.
R.E. (Aust.)

20 CARRINGTON ST. NORTH,
STRATHFIELD, SYDNEY.

'Phone UM 7858.

A rear view of the "1938 Fidelity Dual-Wave Six." The 32 mfd. wet electrolytic by-passing the 750-ohm bias resistor for the 2A3 is almost hidden behind that valve, which is second from the right.



Standard Components Used Throughout

As in the "Fidelity Eight," the coil kit used in this receiver is a Fox-radio, comprising a dual-wave coil unit with two iron-cored intermediates. The two-colour tuning dial used is calibrated specially for this kit.

If a 2A3 is used in the output, a Radiokes type L-100 power transformer will be found suitable for the job. If a 6A3 is used, however, two 6.3-volt windings will be required instead of the 6.3 and 2.5 volt provided with the L-100.

The chassis can be purchased ready stamped and drilled, though

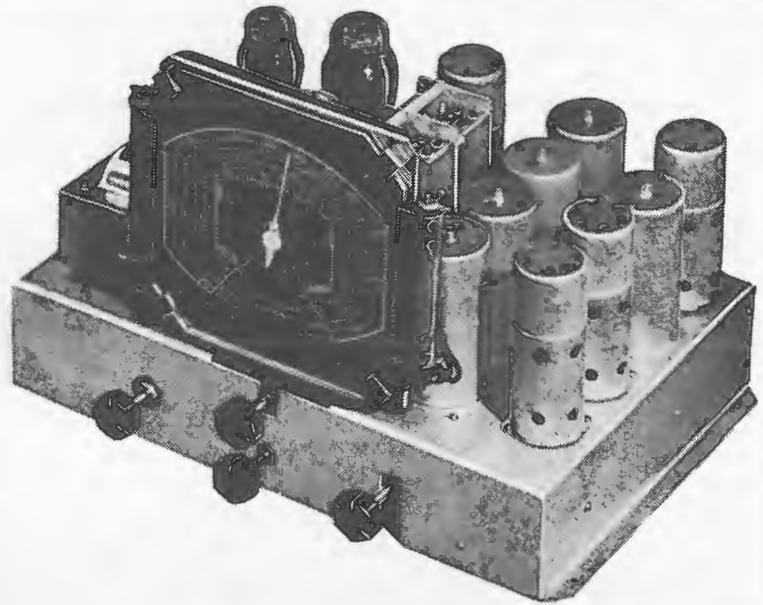
for those with facilities for preparing their own, a sketch showing full dimensions will be published next month.

A 30-henry 100 m.a. smoothing choke is also required. This should be of fairly compact dimensions, as it is mounted underneath the chassis, near the power transformer, as shown in the under-chassis photograph. The voltage divider is mounted on the opposite wall, while in the centre of the chassis, towards the rear, is located a bracket on which the volume control is mounted. A length of 1/4" brass rod and flexible coupler provide the means for making the necessary extension to the shaft. The pick-up switch is mount-

"1938 Fidelity D.W. Six."—List of Parts

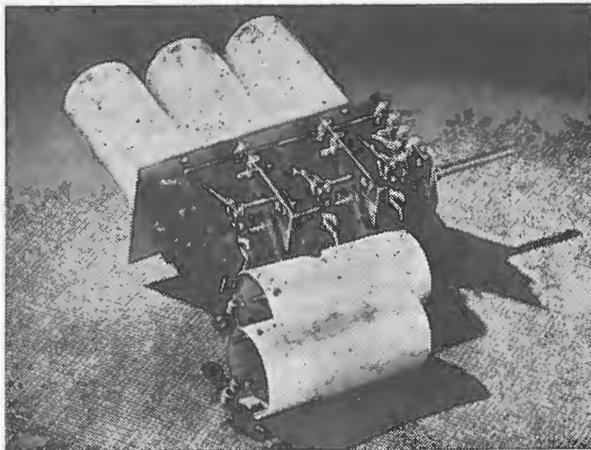
- 1—steel chassis to specifications (15in. x 10in. x 3in.), with one small steel bracket, as per sketch.
- 1—power transformer to specifications (385v. C.T., 385v., 5v. 2a., 6.3v. 3a., 6.3v. 1a.) (Radiokes).
- 1—smoothing choke to specifications, 30 h., 100 m.a. (Radiokes).
- 1—dual-wave coil unit with 2 iron-core intermediates (Foxradio).
- 1—3-gang condenser (Stromberg-Carlson).
- 1—full vision dial (Efco).
- 2—7, 2—6, 3—4-pin wafer sockets (Stromberg-Carlson).
- 1—power socket and plug.
- 4—valve shields.
- 1—5 megohm potentiometer (Yaxley).
- 1—2,500 ohm potentiometer (Radiokes, Microhm).
- 1—25,000 ohm voltage divider (Radiokes).
- 1—single-pole double-throw rotary switch.
- 4—knobs.
- 1—length of power flex and plug.
- 4—terminals, 2 red, 2 black (Dalton).
- 4—grid clips.
- 1—extension shaft.
- 1—flexible coupler.
- 1—5/16in. length 1/8in. brass rod.
- FIXED CONDENSERS:**
- 4—.0001 mfd. mica (Simplex P.T.).
- 2—.05 mfd. tubular (Solar).
- 7—.1 mfd. (Solar).
- 2—.25 mfd. (Solar).
- 1—10 mfd. dry electrolytic (Solar).
- 1—25 mfd. dry electrolytic (Solar).
- 1—32 mfd. wet electrolytic, 350v. working (Ducon).
- 3—8 mfd. wet electrolytics, 600v. working (Solar).
- RESISTORS:**
- 1—200 ohm carbon (E.T.C.).
- 1—250 ohm carbon (E.T.C.).
- 1—2,000 ohm carbon (E.T.C.).
- 1—10,000 ohm carbon (E.T.C.).
- 1—50,000 ohm carbon (E.T.C.).
- 3—100,000 ohm carbon (E.T.C.).
- 1—300,000 ohm carbon (E.T.C.).
- 1—500,000 ohm carbon (E.T.C.).
- 3—1 megohm (2—1.3 watt) (E.T.C.).
- 1—2 megohm carbon (E.T.C.).
- 1—750 ohm wirewound, 100 m.a. (Renrade).
- VALVES:**
- 1—6D6, 1—6A7, 1—6B7S, 1—6C6, 1—6A3, 1—80 (Radiotron, Mullard, Ken-Rad, Raytheon, Philips).
- SPEAKER:**
- 1—dynamic speaker to match single 6A3, 1,500 ohm field (Amplian, Rola).
- MISCELLANEOUS:**
- 4—6.3v. dial lamps; push back; solder tags; nuts and bolts; 2 yards 16-gauge tinned copper wire for earth-line.

ANOTHER TRIUMPH for FOXRADIO!



Once again a "FOXRADIO" Coil Kit has been chosen for this new and outstanding "Radio World" design—a 6-valve dual-wave superhet incorporating a high fidelity audio amplifier—the

"1938 Fidelity Dual-Wave Six"



Identical in performance with the famous "De Luxe Fidelity Eight," except that a single 2A3 is used in the output, the "1938 Fidelity Dual-Wave Six" gives exceptionally high quality of reproduction combined with excellent sensitivity and selectivity. Considerably cheaper to build than the "Fidelity Eight," this new design will appeal to readers who do not require an output of more than 3 watts, which is more than ample for all normal domestic requirements.

CALL IN OR WRITE FOR OUR QUOTE AND LIST OF PARTS FOR THE COMPLETE KIT.

The secret of this new receiver's amazing performance lies in the "FOXRADIO" Coil Kit. Comprising aerial, r.f. and oscillator coils with switch and two 465 k.c. iron-core intermediates, this kit greatly simplifies construction and ensures maximum results.

Complete Coil Kit £5/10/-.

New and Improved "Portable"

More compact, powerful and efficient than ever, this year's "Outdoor Portable Four" is the greatest portable in years.

Outstanding features are: Full Automatic Volume Control. Smaller Size and Lighter Weight. Simplified Chassis Layout. Improved Aerial System. Greatly Improved Tone. Better Interstate Reception.

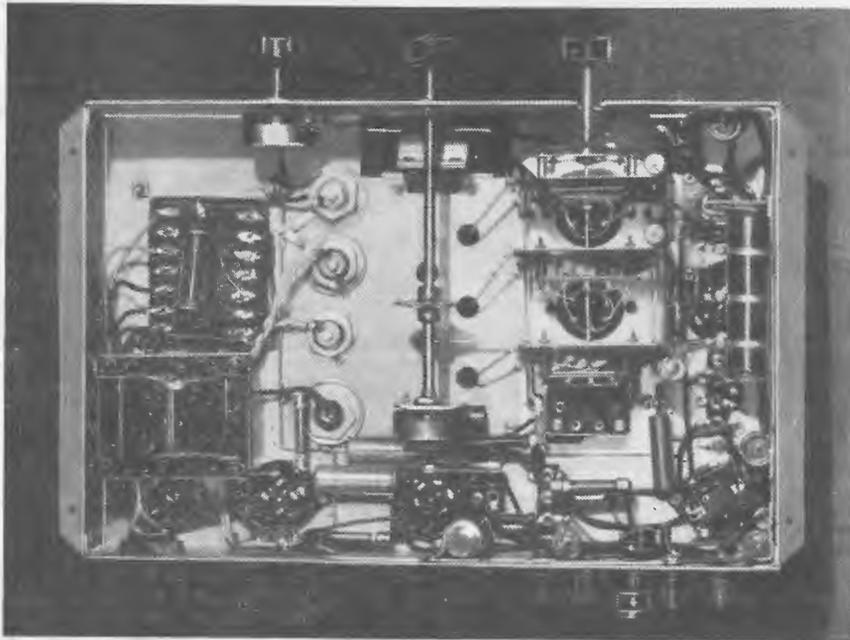
Write for our list of parts and price for the complete kit, including valves, batteries, speaker and cabinet.



FOX & MacGILLYCUDDY LTD.

MERINO HOUSE, 57 YORK STREET, SYDNEY.

Telephone: B 2409-10 Telegrams: Foxradio.



An under-chassis view of the receiver. Note the location of the 30-henry smoothing choke, and the method of mounting the volume control on a bracket near the rear of the chassis.

Marchesa Marconi To Arrive In April

THE Minister in Charge of the 150th Anniversary Celebrations Committee (Mr. Dunningham), announces that he has received advice from Sir Ernest Fisk that Her Excellency the Marchesa Marconi will be coming to Sydney as the guest of the Institution of Radio Engineers, Australia, of which Sir Ernest is the President, on the occasion of the World Radio Convention. The Marchesa Marconi will be accompanied by her daughter Elettra, and they have arranged to arrive in Sydney during the first week of April.

The Marchesa Marconi, before her marriage in 1927 to the late Marchese Marconi, was the Countess Maria Cristina Bezzi-Scali, a young and beautiful member of an old family of the Roman aristocracy. Her father and mother were both members of distinguished families and

(continued on page 48)

ed on the back wall of the chassis. The three lower front controls are, left to right:—r.f. gain control, volume control and wavechange switch. No tone control is provided, though

one could easily be fitted if desired. Next month the construction of the set will be outlined in detail, and a diagram will be published showing the point-to-point wiring.

BUILD THE

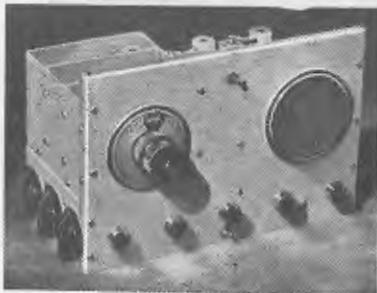
RADIOTRON BATTERY AMATEUR RECEIVER

BUT INSIST ON

RADIOMAC

SPECIALISED SHORTWAVE COMPONENTS

THE RADIOTRON BATTERY AMATEUR RECEIVER



is easy to build with a RADIOMAC kit of parts. Kit is complete in every detail, and includes drilled chassis, wound coils, RADIOTRON valves, Amplion speaker, ready to assemble and wire, £16/7/6

Or perhaps you do not wish to build it yourself. Then we will assemble and test it for you. Price complete, ready to use, but less batteries £21

COMPONENTS

SPECIALLY DESIGNED FOR THIS RECEIVER

- "RADIOMAC" drilled chassis, with panel and all shields 27/6
- "RADIOMAC" beat frequency oscillator unit 3/6
- "RADIOMAC" 460 k.c. Iron Core I.F. Transformers 6/- each
- "RADIOMAC" Plug-in Coils (set of 12) 35/-
- "RADIOMAC" special R.F. choke 1/-
- "RADIOMAC" Honeycomb R.F. Choke 1/-

PRICE'S RADIO SERVICE 5 & 6 ANGEL PLACE SYDNEY.

(D. G. McINTYRE)

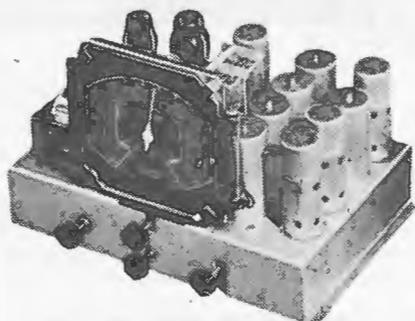
THE BIGGEST SELLING PORTABLE IN AUST.

WHY?

Because its amazing performance, economy in operation, maximum portability, ease of construction and low first cost have never previously been offered and cannot be equalled. Imagine it . . . for only 11 Guineas, VEALLS will supply the Complete Kit of Parts—everything, including Valves, Batteries, Speaker, and ready-made Cabinet—nothing else to buy. Positively amazing value for an amazing portable . . . one that you can take anywhere, sure in the knowledge that it will give you really worthwhile reception.



COMPLETE KIT ONLY 11 GNS.



1938 FIDELITY 6

See the description and constructional details of the 1938 FIDELITY DUAL-WAVE SIX elsewhere in this issue . . . then order the parts from VEALLS—you cannot buy at a lower price or be served with a faster service.

THE COMPLETE
KIT OF PARTS
ONLY

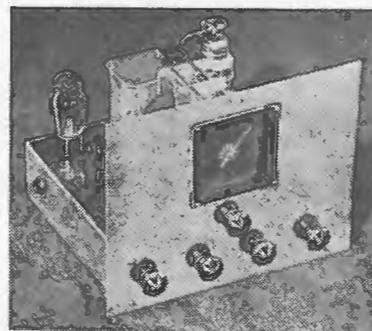
£18-0-0

The Empire A.C. Allwave 3

Experience the thrill
of world-wide reception

£8/19/6

For only £8/19/6 VEALLS will send, freight paid to your nearest railway station, the Complete Kit of Parts to build the EMPIRE ALL-WAVE THREE. See further details of this remarkable three-valver elsewhere in this issue.



ORDER FROM THE FASTEST MAIL ORDER IN AUST.

VEALLS

ARTHUR J. VEALL PTY. LTD.

243-249 Swanston St., Melbourne, C.1.
168 Swanston St., Melbourne, C.1.
299-301 Chapel St., Prahran, S.1.
3-5 Riversdale Rd., Camberwell, Vic.
Central 3058 (7 lines)

You want
POWER



CLYDE
gives lasting
POWER

The scientific construction of Clyde Batteries ensures long and reliable life—a life of unflinching power to give your receiver its best always and under all conditions.

Striking testimony of the outstanding quality and dependability is borne out by the fact that the Royal Australian Navy use Clyde Batteries exclusively in the fire and gun control turrets, while the manufacturers of the famous Outdoor Portable Four think enough of Clyde Batteries to have used them for every model of this portable set. There are types for all vibrator-receivers. Ask your local dealer for Clyde Radio Batteries—Clyde Batteries for power, durability and endurance.

**THE
CLYDE ENGINEERING
CO. LTD.**

61-65 Wentworth Avenue,
SYDNEY.

Obtainable from all leading Radio and
Electrical Stores throughout Australia.

New Ever Ready Factory Opened By Prime Minister

Successful Function On January 25

ON Tuesday, January 25, following a luncheon tendered by the Ever Ready Co. (Aust.) Ltd. to many leading representatives of the radio and other industries, the new Ever Ready factory at Rosebery, Sydney, was officially declared open by the Prime Minister, The Rt. Hon. J. A. Lyons.

The chair was taken by Mr. R. P. Walter, managing director of the Ever Ready Co. (Aust.) Ltd., who opened proceedings by reading congratulatory messages from associated Ever Ready companies in London and America and from the New Zealand branch of the Australian company.

Mr. Walter, in his following address, extended on behalf of his company a very hearty welcome to all present. The new factory, he stated, represented in concrete and steel the confidence which both their overseas principals and themselves had in the further development of not only the dry battery industry, but of secondary industries in Australia generally.

With regard to the building itself, the floor space covered an area of 80,000 square feet, while in its construction 10,000 tons of concrete had been used, as well as 500 tons of steel reinforcing. The area of windows throughout the building covered a little over 27,000 square feet.

At the conclusion of his speech, Mr. Walter called on the Prime Minister, The Rt. Hon. J. A. Lyons, to perform the official opening ceremony.

Prime Minister Declares Factory Open

The capable manner in which the Ever Ready Company had developed the dry battery industry in Australia, and the splendid example that had thus been set to other overseas companies, were facts that were stressed by Mr. Lyons during his address.

"What appeals to me more than anything else," he said, "is the employment of our Australian people. There are 600 now employed in this factory, and Mr. Walter estimates another 300 people will be indirectly employed, and there are those who are dependent upon them. You will realise what an important section of the Australian people are getting their livelihood from this industry . . ."

At the conclusion of his speech the Prime Minister declared the factory officially opened.



Mr. R. P. Walter, managing director of the Ever Ready Company (Aust.) Ltd.

The Hon. E. S. Spooner Extends Congratulations

That the doubling of Sydney's population since 1913 was mainly due to the expansion of the city's manufacturing industries was stressed by the next speaker, the Hon. E. S. Spooner, Minister for Works and Local Government.

It was, he said, no exaggeration to estimate that at least two-thirds of the business of Sydney was due to the manufacturing industries established in the metropolitan area. This new factory, therefore, meant more than the employment for 450 workers—it meant the employment of at least an equal, and probably a
(Continued on page 48)

This Month's Front Cover

This month's front cover photograph shows Miss Jean Batten, the noted New Zealand air-woman, being televised recently in the B.B.C. studios in London. A map illustrating the route she took enabled viewers to follow her accompanying broadcast description of highlights of her last record-breaking flight from Australia to England.

BREVILLE Owner Logs 1825 Stations ... wins National DX Contest!



Mr. Ern Neill, Ipswich, Queensland, using an 8-valve Breville Receiver, won the first short-wave DX Contest conducted by the Australasian Radio World throughout Australia and New Zealand.

Here's how Ern. Neill achieved this Wonderful Record!

Mr. Neill began DX listening about two years ago, with a standard 8-valve Triple-wave Breville Receiver, which was purchased through the Ipswich Breville retailer, Mr. W. S. Harper, and had not been altered in any way.

Using an ordinary "L" type aerial, Mr. Neill has logged 1,825 stations (actually verified), besides many more whose call-signs were not identified. Mr. Neill reports that the original Radiotron Valves (three 6D6's, 6C6, 75, 76, 42, 80) are still functioning perfectly despite over two years of constant DX listening.

In recognition of this outstanding performance, Mr. Neill has been appointed official Queensland observer for the "Radio World" Short Wave Review.

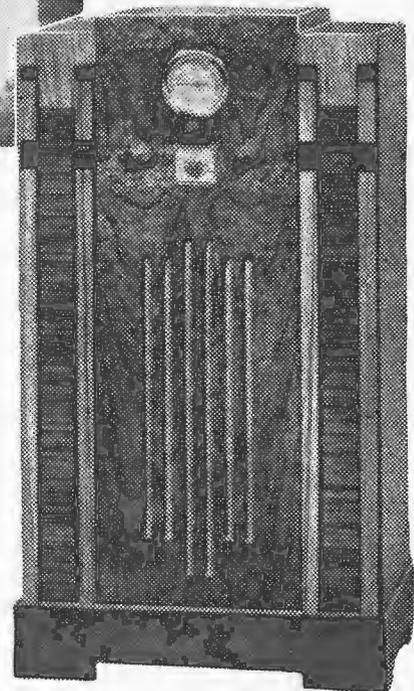
Over 50 points of superiority, over 50 outstanding developments, many of them exclusive, mark Breville as to-day's most outstanding most highly developed radio.

There is a Breville for every purse and purpose.

BREVILLE

Radio

Interested Dealers write for particulars of Franchise.



To Breville Radio Pty. Ltd., 67-73 Missenden Rd., CAMPERDOWN. Without obligation, send me FREE illustrated Booklet on Breville Radio Receivers.

Name.....

Address.....

R.W.I.

BREVILLE RADIO PTY. LTD.

Phone: L 3688 (2 lines)

67-73 MISSENDEN ROAD, CAMPERDOWN, N.S.W.

Telegrams: "BREVILLE," Sydney

AND AT BRISBANE & NEWCASTLE

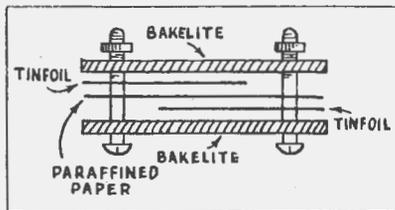
DISTRIBUTORS IN ALL STATES & N.Z.

Radio Ramblings

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

Improvising Small Fixed Condensers

If the correct sizes of small condensers are not on hand, and are required in a hurry, they can be made



in a few minutes from scrap materials as shown in the diagram.

Tinfoil plates and paraffined paper insulation (obtainable from most breakfast food packets) are clamped between two pieces of bakelite about $1\frac{1}{2}$ " by $\frac{3}{4}$ ", with two small bolts. A bolt passes through and makes contact with each set of plates, which are insulated from each other by the paraffined paper.

The size of the condenser will be approximately .0001 mfd. for each square centimetre of overlap between the two opposite plates. If two plates do not give the required capacity, add one or more, thus doubling or trebling the capacity, as the case may be.—H. W. Unger, Alectown, via Parkes.

★

Theory Of 5-Metre DX

Wanting to improve my band-spread, I tried everything, but the following was the best. "C1" is the usual tuning condenser and "C2" the fixed condenser which I added. It spreads the band from 3 degrees on dial to 10 degrees.

"C1" in my case was a .0001 mfd. midget variable, and "C2" a .0001 mfd. fixed.

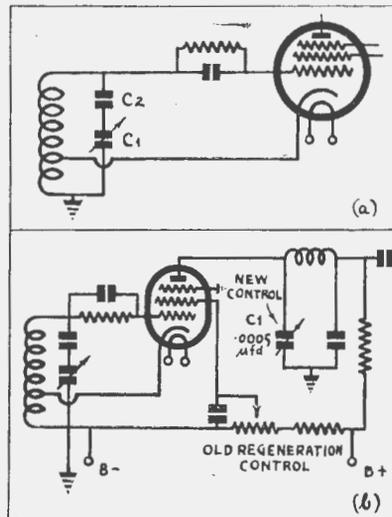
Regeneration can be improved by the following (shown in diagram):—The old regeneration control is set so as to obtain maximum sensitivity, and "C1," an old B.C.L. condenser, is the new control, which is much smoother and makes the old "blooper" a pleasure to operate.

The following might be of some interest to those interested in 56 m.c. DX. I recently read in an American radio mag. an interesting article by A. G. McNish, Department of Terrestrial Magnetism, Carnegie

Institute, Washington. He said that in a recent discovery it was found that fade-outs on shortwave occurred during sunspots. During these sunspots the s.w. radio signals were absorbed by the ionosphere instead of being reflected. These fade-outs occurred only during daylight. Signals on the ultra short waves, however, increased their range (were not absorbed). He says that the amount of sunspots is increasing, and the sunspot maximum, which will be the greatest since amateur radio began, is drawing near.

He believes that long distance communication may be established in a few months or years on five metres. He would also be glad to receive information of any DX on ultra short waves.

His article is very interesting, and occupies about three pages, various

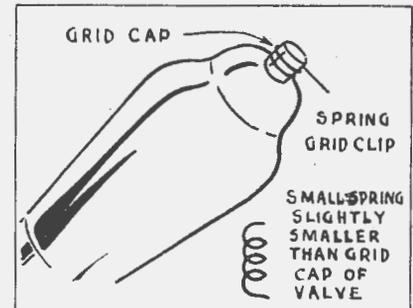


diagrams relating to experiments being shown. This should explain why 2NO has been heard in England.—K. W. Craig, Stockton.

★

Spring Makes Fine Grid Clip

This kink describing an emergency grid clip works so well that I use it most of the time. The spring should be slightly smaller in diameter than the grid cap on the valve, so that it will fit tightly. When putting the spring on, twist it slightly and it will go on easily and fit tightly. This clip can be made part of the grid



lead, thus eliminating the necessity for a soldered connection.—Ian L. Griffin (AW285DX), Marong.

★

Two Useful Tips

A few hints for your "Radio Ramblings" page, which I appreciate very much, along with the other articles, as I may be going for a "ham" ticket some day.

Portable sets which show a tendency to howl on account of microphonic vibration from the speaker may often be cured by placing over the valve a box lined with some cotton-wool.

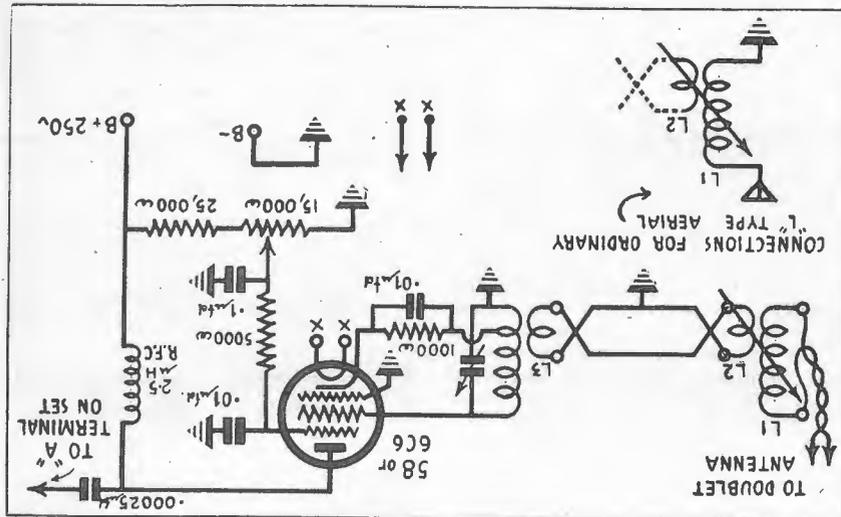
Speakers which have an adjustment on the back may be improved by soldering a piece of brass on the slot of adjuster, i.e., like a clock key. The adjustment can then be made much more easily and accurately.—N. Hocking, Palmerston North, N.Z.

★

Regenerative Pre-Selector Boosts Signals From R3 To R9

The writer has been a constant and appreciative reader of the "Radio World" for the past two years, and wishes to congratulate your good selves on such a fine publication. The "Shortwave Review" and shortwave station information are especially interesting and instructive. I also thank AW5DX for his regenerative pre-selector, the diagram and instructions for which were published in the December, 1936, issue. [Circuit and details re-published below.—Ed.]

The writer constructed this fine piece of apparatus from the instructions given, and was amazed at the results. A gain from R3 to R9 on some stations is no exaggeration.



The circuit of the regenerative pre-selector unit built by J. Anderson to specifications supplied in a previous issue by a "Radio World" reader.

amount of coupling to the receiver. The R.F. valve will slide smoothly into oscillation when the pre-selector is functioning properly. The point just below oscillation gives the greatest gain and selectivity.

The antenna coupling is made of two pieces of bakelite tubing each 1½ in. long. The larger one is 1½ in. outside diameter and the smaller one ¾ in. in diameter, so that the latter with its winding of 8 turns will slide readily inside the other tube. The larger tube has 20 turns of No. 28 d.s.c. wire close wound, which is connected to a doublet antenna.

The tuning condenser is of the midget type, well insulated and having a maximum capacity of about .0001 mfd. A small aluminium bracket supports the condenser at the

I find that it is best to wind a separate coil for each of the bands, the 19, 25, 31 and 49-metre bands. The tuning is then needle sharp, with an accompanying noise reduction and clearer signal.—Jno. Anderson, Wellington, N.Z.

Regeneration is slightly affected by the plate circuit load, requiring in some cases a trial adjustment of the

Details Of Regenerative Pre-Selector Unit

Details of the pre-selector unit mentioned above, and described in the December, 1936, "Radio World" by J. Biscoep, of Cronulla, Sydney, are as follows:—

... This unit strengthens signals from R2-3 to R8-9. I have received the amateur station, CO7HS, on the 20-metre band at R2, and with the booster attached it increased to R9. The name of the "booster," by the way, is the "Jones Regenerative Pre-selector."

It consists of a single regenerative R.F. amplifier stage placed ahead of any shortwave superhet. By the use of variable antenna coupling and cathode regeneration, results equivalent to those given by the usual two-stage R.F. pre-selector are obtainable. Signal-to-noise ratio is greatly increased and image interference reduced.

Regeneration is controlled by means of a 15,000-ohm wire-wound potentiometer which varies the screen voltage. The screen-grid series resistor of 5,000 ohms tends to prevent the regeneration control from introducing noises as the latter is varied. The plate voltage is fed through a small R.F. choke, which is effective over all bands. The plate circuit is connected through a coupling condenser to the aerial terminal of the main receiver, or this lead can be twisted around the first detector grid lead a few times to obtain capacity coupling. In the latter case, the trimmer condenser must be re-set for best results.



NEW RELEASE!

★
New "Palc" Instrument for Complete Valve and Circuit Analysis
★

The insistent demand for a complete Valve and Circuit Tester as one Unit, was responsible for the design and production of the remarkably advanced and compact Model "VCT". This instrument is crowded with new and useful features and will enable the Radio mechanic to check and test every component in a radio chassis—valves included.

SPECIFICATIONS AND FEATURES

- VALVE TESTING . . .** Shows the condition of all types of Valves on the Good-Bad scale as well as applying a Neon test for element leakage.
 - LOW OHMS . . .** A range of low ohms, reading from a tenth of an ohm (ten ohms half scale) is provided for coil, contact, and dry joint checks. Three other ranges supply measurements up to 10 megohms.
 - ELECTROLYTIC CONDENSERS . . .** All types of Electrolytic Condensers can be tested and checked on a Good-Bad scale.
 - PAPER CONDENSERS . . .** Paper and Mica Condensers tested for open circuited connections and leakage by the Neon flash method.
 - Ma's** in four ranges to 250 MA, D.C. volts in four ranges to 1,000 volts, A.C. and Output volts in four ranges to 1,000 volts.
 - Other points of interest are:—5in. type Meter with linear scale for A.C. readings.
 - VALVE RECTIFICATION** for A.C. and Output measurements.
 - NOTE:** This is a new development and enables the maximum of unvarying accuracy plus freedom from the effects of accidental overload. All of the above plus **QUICK AND SIMPLE OPERATION**, attractive appearance, sound construction, accuracy and compact size (11in. x 11in. x 6in.) make this instrument unique.
- Price, Model "VCT" (A.C. operated) £15/10/- plus sales tax. Terms available.

Manufactured by

Paton Electrical Instrument Company

90 VICTORIA STREET, ASHFIELD, SYDNEY
Manufacturers of Cathode Ray Equipment, Meters and full range of Testing Equipment

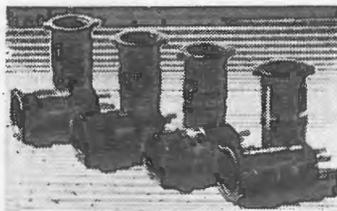


For that EXTRA PUNCH

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

RAYWAY LOW-LOSS HIGH-GAIN COILS

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



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

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

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

Standardised Products

Note new address:—

629 PARRAMATTA ROAD,
LEICHHARDT, SYDNEY,
N.S.W.

Phone - - - LM 5957

proper level for the dial shaft connecting bushing.

All parts are mounted on a piece of 12-gauge aluminium bent in the cathode tap or alteration to the shape of an inverted "U." The original piece should be 8½ in. long and 7 in. wide, with 1½ in. on the front edge and ¾ in. on the rear edge bent down so that the top of the chassis is 8½ in. x 4¾ in.

The antenna coupler mounts underneath one side of the chassis, and the regeneration control on the other side of the chassis. The entire unit can be housed in a metal cabinet 9½ in. long, 5 in. deep, and 6 in. high.

It is desirable to twist the antenna leads together, for the two leads into the pre-selector and the plate coupling lead should come out of the cabinet at the closest point to the aerial terminal on the main receiver. The lead should be as short as possible. Power for the unit can be obtained from the main receiver. If a doublet aerial is not used, one side of the aerial coil must be grounded.

In the circuit I would suggest using a 10,000 ohm wire-wound potentiometer instead of the 15,000 ohm potentiometer, and instead of using the 25,000 ohm resistor between "B+" and one side of the potentiometer, use a 15,000 ohm voltage divider and tap off the screen voltage so that when the potentiometer is full on, there is about 100 volts on the screen of the valve.

Here are the coil details for the 20, 40, 80 and 160-metre bands:—

COIL WINDING DETAILS

L1.—Same for all bands, 20 turns No. 28 d.s.c. close-wound on 1½ in. diameter formers.

L2.—Same for all bands, 8 turns of No. 28 d.s.c. close-wound on ¾ in. tubing.

Coupling between L1 and L2 variable (L2 slides into and out of L1).

R.F. Coil For 160 Metres

L3.—10 turns of No. 22 d.s.c. close-wound on 1½ in. low-loss formers.

L4.—60 turns of No. 22 d.s.c. close-wound and tapped 1¼ turns up from the ground end. L4 is wound on the same former as L3, and is spaced ½ in. from L3.

R.F. Coil For 80 Metres

L3.—7 turns No. 22 d.s.c. close-wound on 1½ in. former.

L4.—35 turns No. 22 d.s.c. close-wound and tapped ½ turn up from ground. Spacing between L3 and L4 to be ½ in.

R.F. Coil For 40 And 20 Metres

L3.—5 turns of No. 22 d.s.c. close-wound on 1½ in. former.

L4.—12 turns of No. 18 d.s.c. space-wound over a winding space of 1¼ in. and tapped ¼ turn from ground end.

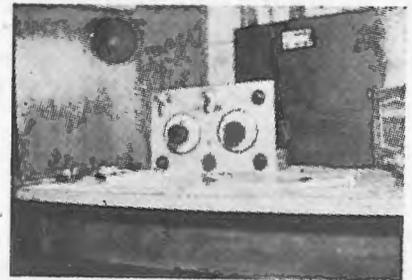
Note: The ground end of the L4 is the bottom of the coil. The top end of the L4 connects to the grid of the 58 or 6C6 in the pre-selector.



"Ultra-Gainer" Works Well On "10"

My new receiver is a Jones "Ultra-Gainer" (5 valves), which gives outstanding results.

It employs a 6D6 regn. r.f., 6L7 first det., 6K7 oscillator, 6K7 inter-



The "Ultra-Gainer" built by AW129DX.

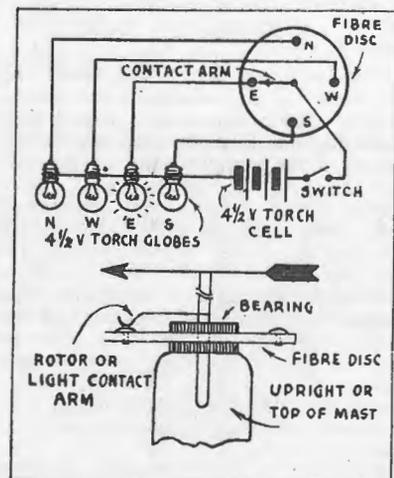
mediate frequency amplifier, and a 6A6 as a regenerative second detector (for c.w.) and audio amplifier. It works extremely well on 10 metres. On this band, in the last three weeks I have heard five continents at over R7, though have not heard any Europeans yet.

I am extremely interested in 2NO's 5-metre articles, and I must send my congratulations to him on his fine DX on this band. I think the "R.W." should publish a sensitive receiver for 5-metre work.—James Ferrier - Winninburn (AW129DX), Coleraine, Victoria.



Ingenuous Electrical Wind Indicator

A simple but effective electrical wind indicator can be made from an



ordinary wind vane with a fibre or bakelite disc on the stationary portion of the upright, or on the bearing itself, as shown in the sketch.

Fix studs in the disc at the compass points required (four only are shown for simplicity), solder a light gauge brass contact finger to the rotating shaft (which carries the wind vane) parallel to the vane, and set it so that it lightly touches the contacts as it turns. When erecting, set the north contact stud true to north and secure disc; swing the vane also to north. The brass contact finger or arm should now be on north contact, and by wiring as shown, the north globe will light. Mark this "North." Repeat this process of turning the vane to each point, and as a globe lights, mark its direction.

The globes may be mounted behind a panel with frosted glass concealing them, and the compass points printed on the frosted side (or back). The switch is used if lights are not in use. This system can be worked even if the den is in the cellar or a long distance from the wind vane.—G. Wall (AW324DX), Subiaco, Perth, W.A.

★

When Drilling Coil Formers

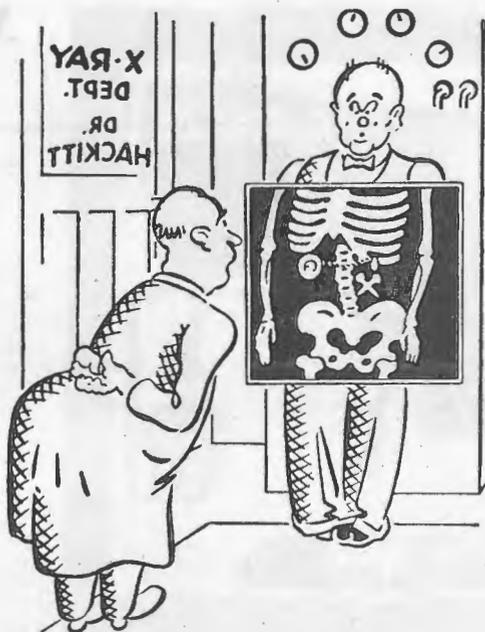
Here is an idea I use when drilling coil formers. Obtain a piece of broomstick and shave it down till a coil form just fits over it. Nail it to the bench so that it is jutting out a few inches. It will securely hold the coil forms while they are being drilled.—L. N. Taylor, Hurstville, N.S.W.

'Radio World' Binding Covers Available

Readers wishing to keep their back copies of the "Radio World" in safe and handy form for reference purposes are advised that special covers for Volumes 1 and 2 are available. Using a strong, durable leather board covered in dark blue book-cloth, they are attractively printed in gold with the title of the magazine, volume number and dates of issue.

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

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



Inside information is best

There's nothing like an X-ray for diagnosing defects in the human mechanism.

The metal age has deprived us of our X-ray of valves. A simple thing, with glass valves, merely to look inside and SEE its workmanship.

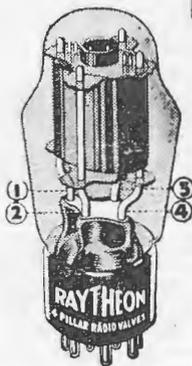
Metal stops you SEEING—More important than ever now, to ask "Is it a Raytheon?" . . . product of the greatest organisation in the valve industry.

Stands to reason, too, that the four pillars in a Raytheon support the fragile elements inside the tube more sturdily than the two of ordinary valves, and affords stronger protection against jolts and vibration.

Don't leave it to guesswork. ASK for Raytheon and don't be put off with pretenders! Raytheons cost no more, and they're the only 4-pillar valve on the market.

This patented container allows your Raytheon to be tested before you buy, without breaking the carton or the guarantee seal.

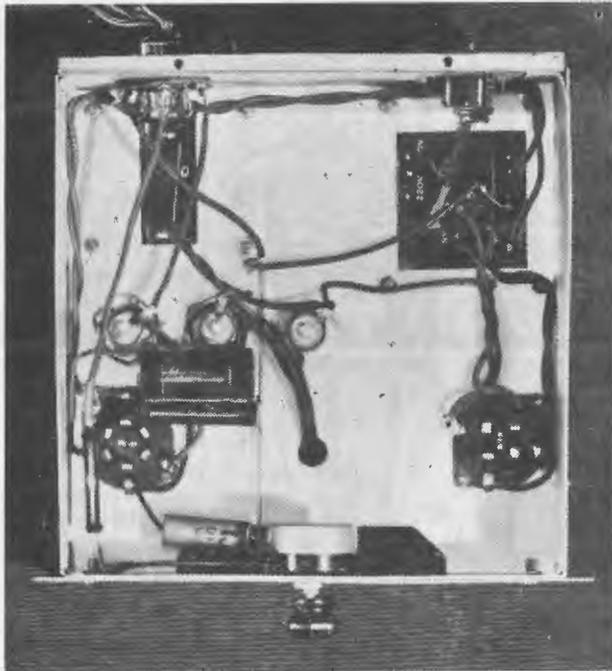
If unobtainable from your local dealer, write to Standard Telephones & Cables Pty. Limited, 258-274 Botany Rd., Alexandria.



RAYTHEON

THE MAKERS OF

4-PILLAR VALVES



More About The . . . A.C. Empire All-Wave Three

Some of the many applications of the combination power pack and amplifier unit designed for the "A.C. Empire All-Wave Three" are described in the article below.

This under-chassis view shows the simplicity of the wiring of the power pack and amplifier unit.

SINCE the description of the combination power pack and amplifier for the a.c. version of the "Empire All-Wave Three" was published in last month's issue, several inquiries have come to hand from readers wanting to know if this unit could be used with other a.c. short-wave receivers described in the "Radio World," such as the "Eaglet Two."

Numerous Applications For Unit

Actually, the unit could be used with any type of receiver using from one to five 6.3-volt .3 amp. valves. In fact, the number of valves that can be powered from the unit is limited only by the capacity of the power transformer. The 42 output pentode takes approximately 40 mills., and if a 25,000-ohm voltage divider is incorporated in the tuner section, as in the "A.C. Empire," another 10 mills. will be taken by this. Assuming that an 80 mill. power transformer is used, this leaves approximately 30 mills. for plate and screen current supply of the valves in the tuner.

The 6.3-volt 1-amp. heater winding in the Radiokes MU-80-6 power transformer specified will take care of the 42, which draws .7 amp. This leaves the 6.3 volt 3 amp. winding

free for supplying the heaters of the tuner valves and dial lights.

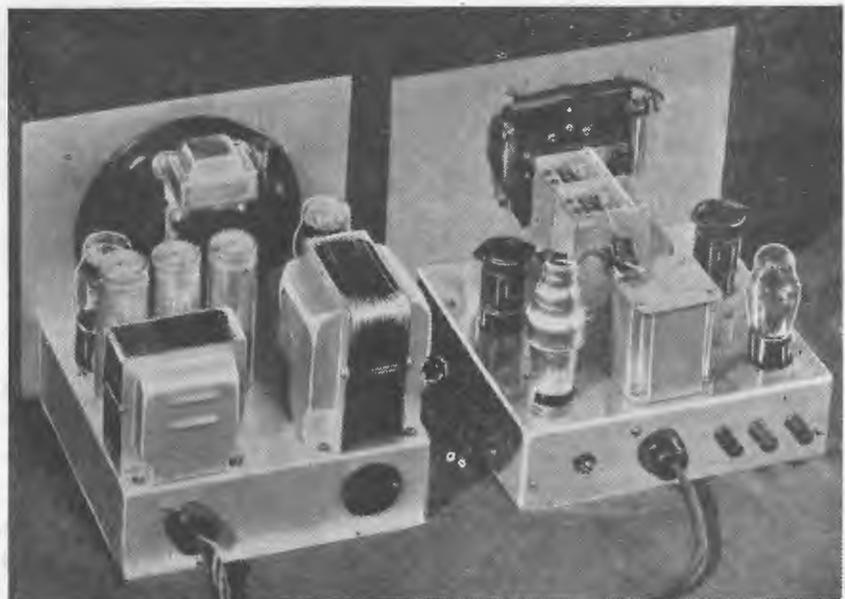
Thus the combination unit described last month has many applications, and readers will find it well worth while to build it up as a permanent piece of equipment for the shack.

In the original unit, a 5-pin power socket and 5-wire cable are used to carry "B—", "B+" and the heater supply to the receiver proper. The fifth lead carries the audio output from the latter to the 42 output pentode on the power pack chassis. A refinement that will be found particu-

larly useful if the unit is intended to become a standard piece of laboratory equipment would be to use a 7-pin socket and plug with a 7-wire cable, and incorporate a voltage divider under the chassis. The two extra leads could thus carry any two intermediate "B+" values that might be required.

Alternative Power Supplies For The "Empire"

For portable work, or for those living in non-reticulated areas, a vi-



A rear view of the "A.C. Empire All-Wave Three," with the amplifier and power pack on the left. A five-wire power cable connects the two units.

A definite success

REPLACE WITH



*“Reliable
in Every
Climate”*

Due to the highly accurate measures taken in the production of E.T.C. SOLAR “Sealdtite” Paper Capacitors they are outstandingly efficient and long-lived.

Doubly impregnated in wax, they are proofed against all moisture and are unaffected by change in weather conditions.

Always insist on . . .
E.T.C. SOLAR Capacitors.

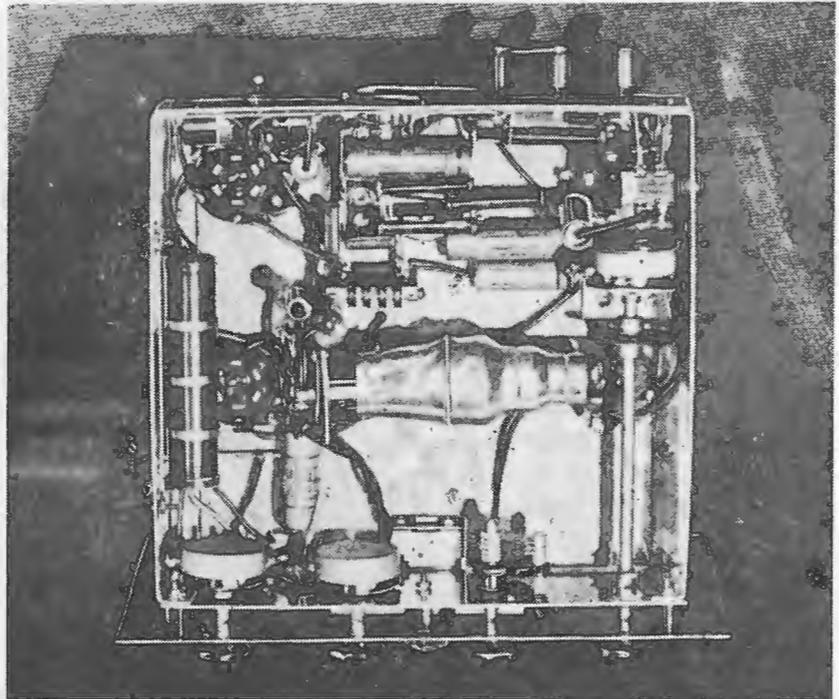
Manufactured by:

E.T.C. INDUSTRIES LTD.

(Late Eastern Trading Co. Ltd.)

SYDNEY & MELBOURNE

An under-chassis view of the "A.C. Empire Three." Note the method of mounting the r.f. valve horizontally, to ensure shortest possible grid and plate leads.



brator "B" unit such as that marketed by Radiokes Ltd. would also provide an excellent power supply for the "A.C. Empire," while a further alternative would be a Carter Generator.

Aden Amateur Station On The Air

Several members of No. 8 Squadron Royal Air Force have formed a Shortwave Club, built a transmitter, and are already on the air, using c.w. on 20 metres, from 1300-0730 G.M.T., except Mondays and Tuesdays (Saturdays from 1300 to approx. 2400 G.M.T.).

Until an official call has been allotted, they are using KSWC for a call-sign. This amateur should prove a good catch, and any dxer logging him should address report to L. A. C. Dean, No. 8 Squadron, Royal Air Force, Aden.

I would like to take this opportunity of congratulating you on your excellent magazine, which without a doubt compares more than favour-

ably with any overseas radio magazine. Every article in the "Radio World" is most interesting.—W. T. Choppen (AW61DX), Timaru, N.Z.



John Martin stocks everything radio and electrical at the lowest prices in the State. Same-day service a speciality.

Telephone: BW 3109 (2 lines)
Telegrams: "Jonmar" Sydney.

Home on the pig's back!

RAYMART

CRAFT A CREED

SHORT WAVE AND ULTRA SHORT WAVE GEAR ASSURES HIGHEST RESULTS

"The Friendly Wholesale House" is confident that every amateur will be extremely satisfied with Raymart results. This fine equipment is used extensively in overseas commercial radio . . . your assurance of dependability and efficiency. Write for catalogue of components. Ask for particulars of "Regal" Microphones, specially designed for voice reinforcement, and incorporating features of more expensive instruments.

JOHN MARTIN PTY. LTD.

RADIO & ELECTRICAL SUPPLIES

"THE FRIENDLY WHOLESALE HOUSE"
116-118 CLARENCE STREET, SYDNEY.



WHAT IS AN AIR CELL?

WHAT SORT OF AIR CELL SET TO BUY!

HOW TO BUILD AN AIR CELL RADIO

HOW DOES THE AIR CELL WORK?

COUNTRY LISTENERS!

Get this

32 PAGE BOOK

FREE

NO longer need the country dweller—beyond the reach of power mains—envy the city folk their all-electric Radio Sets. Air Cell operated Radio eliminates the drudgery and expense of taking heavy accumulators to town and back and paying for them to be recharged every few weeks. Gone are the annoying "fade-outs"—just when you particularly want to listen-in. The Eveready Air Cell needs no recharging, and under normal conditions of use gives more than a year of trouble-free service and maintains a constant and correct "voltage level" for perfect reception. Find out all about this marvellous innovation in country radio reception by sending to-day for this fully illustrated 32-page book, which describes in detail everything you want to know about this amazing new development in rural radio.



POST THIS COUPON NOW

EVEREADY AIR CELL

● THE EVER READY CO. (AUST.) PTY. LTD., SYDNEY

The Ever Ready Co. (Aust.) Pty. Ltd.
 Harcourt Parade,
 ROSEBERY, SYDNEY, N.S.W.

Dear Sirs,
 Please send me your 32-page book on the Eveready Air Cell and Air Cell operated radio sets. It is understood that this will place me under no obligation whatsoever.

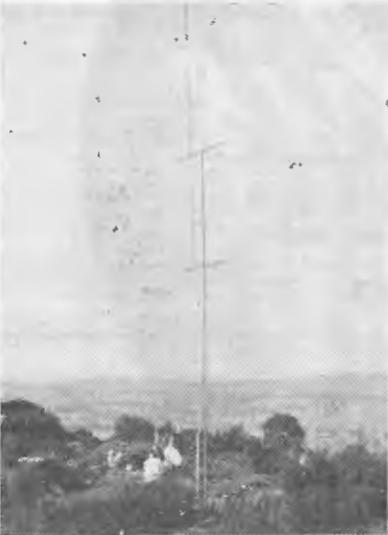
NAME _____
 ADDRESS _____

R.W.-2-38

Five Metres In S. Australia

Historic Spot Chosen For Experiments By VK's 5GF And GM

By R. W. GREGORY (VK5GU)



During a recent week-end, VK's 5GF and GM (Max Farmer and Ron Anderson) carried their gear to the summit of Mount Barker, 1,680 feet above sea level, for five-metre experiments with GF's portable rig, using the portable call VK5GY.

VK5BF (Frank Miller), of Murray Bridge, betook himself and gear to near Meningie, about 60 miles air-line from the Mount.

The rig at GY was a 6A6 as a T.N.T., modulated by a 42 with an input of about 2½ watts on 'phone and 5 on c.w. A five-valve resistance-coupled super was used to listen with, and the antenna was two half waves in phase mounted on a 30-foot pole, which was in six-foot sections to facilitate transport. Twisted pair feeders were used.

Arrangements had been made for the GY outfit to camp on the job overnight to get an early start, but fortunately the arrangements went astray—fortunately because a severe thunderstorm swept the State and didn't leave their intended "possie" out of it either. Owing to a series of delays, operations were not commenced until about 3 p.m., and efforts were made to contact BF on 40 metres. He was heard, but a record-playing station on the band heterodyned him badly.

The 40-metre rig is a compact job, built inside a gramophone case. The transmitter is a two-stage affair with a two-valve receiver, the output of which is used as the modulator for both rigs. Power input of three watts is obtained in the 40-metre rig in a Heising hook-up. A half-wave

Hertz hooked straight on to the tank takes care of the radiating.

Power for all filaments is obtained from a 6-volt accumulator. Batteries supply high tension for the receivers, while a genemotor performs a similar service for the transmitters.

At about 4.15 p.m., 5BF was worked on "five" for about three-quarters of an hour. He was received at R8, and gave GY R8 in return.

5BF was using a pair of 45's in push-pull, with 300 volts supplied by a bank of wet "B" batteries.

At about 5.15 p.m. heavy clouds appeared, and a move was made to get the gear down to the bottom. It took two trips, with heavy rain starting as the second was completed.

Mount Barker has historical interests. It was one of the points used by Col. Light in his first survey of the State, and it was from here that Captain Collett Barker (from whom the Mount got its name) saw the mouth of the Murray. While exploring the latter he lost his life at the hands of natives.

Other Five-Metre Experiments

In 1936, 5GF, working from the top of Mount Lofty, put an R9 signal about 75 miles to 5KL, who was located at The Hummocks. The gear used then was a pair of 201A's Telefunken modulated (3.7 w. input), and a four-element beam. There have been several unsuccessful attempts since, including an attempt from Mount Barker on Easter Sunday, 1937.

The top photograph was taken near the summit of Mount Barker, near the track over which the gear had to be carried. The second photograph was taken from the trig tripod on the summit, and shows the five-metre antenna. The vertical dark line at the top of the photo is the 40-metre aerial, which was tied to the trig tripod at one end and to a small pole at the other. Messrs. Farmer and Anderson are on the right, the former being furthest away from

the camera; the others are spectators who happened to come along.

The bottom photograph shows VK5GF on the right and VK5GM left. The latter is calling on 40-metre 'phone and has a Siemen's carbon microphone, "mike" transformer and battery in his hand. Immediately in front of him is the five-metre "super," and on the right is the portable 40-metre rig. On the right front is the genemotor, with filters, housed in a metal box.

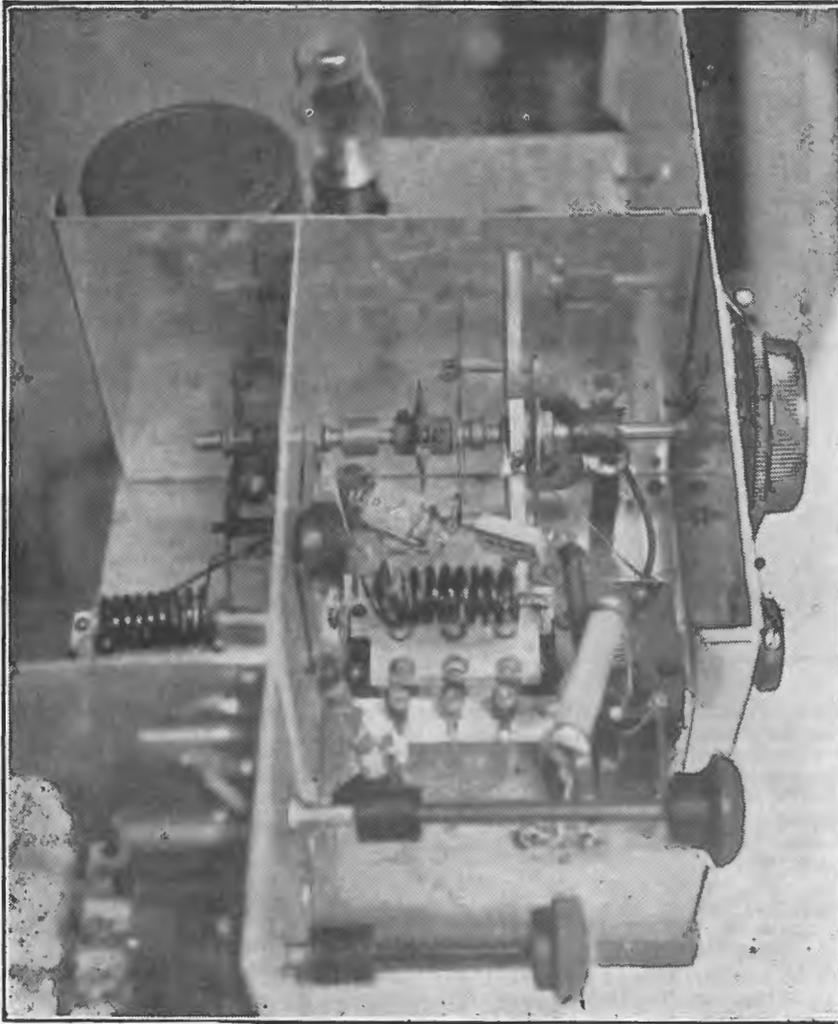


Fig. 3.—The receiver seen from the R.F. and detector end. The circular screening can at the top left contains the interruption coils for super-regenerative reception. The plate end of the 956 R.F. valve can be seen projecting through the interstage partition, just above the detector coil in the centre. The 954 detector is underneath the R.F. choke to the right of the detector coil. The coils in position here are for the five-metre range.

but such occasions are rare. The value of u.s.-w. communication lies rather in the constancy of a signal over a limited path, with the great advantage of practically no static or interference. By virtue of these advantages alone, ultra-shortwave communication will, in the future, come into wider use here, as in other countries.

In recent years, most of the work on receivers has been done with super-regenerators of a simple type. Such receivers will deal comfortably with a relatively strong signal, but unless carefully designed, they are of little use with weak signals. Super-regenerators were a natural accompaniment to the unstable modulated-oscillator form of transmitter—both being very broad in action. In the last three years, valves have advanced so much that the unstable u.s.-w. transmitter can be discarded. With stable transmissions it is possible to use a normal form of receiver, with greatly improved results. The advanced superhet copes with the requirements nicely, but so does the vastly

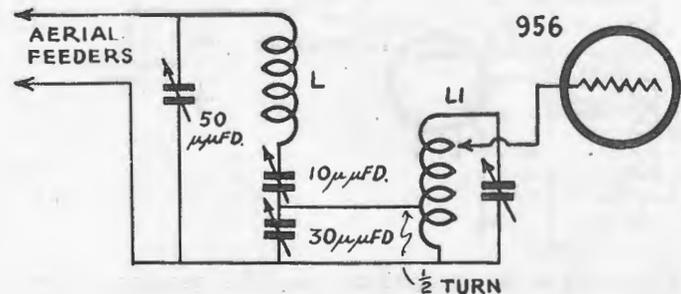
simpler but equally effective T.R.F. receiver.

With a few experimental stations using stable transmitters around Sydney, N.S.W., the writer decided to investigate the possibilities of a T.R.F. receiver, and after much trial the apparatus outlined here was developed.

The Circuit

This is given in Fig. 2. The receiver follows conventional T.R.F. practice, but is a good step ahead of

Fig. 4.—Circuit of the aerial-coupling unit. The grid of the 956 is tapped down the grid coil by two turns.

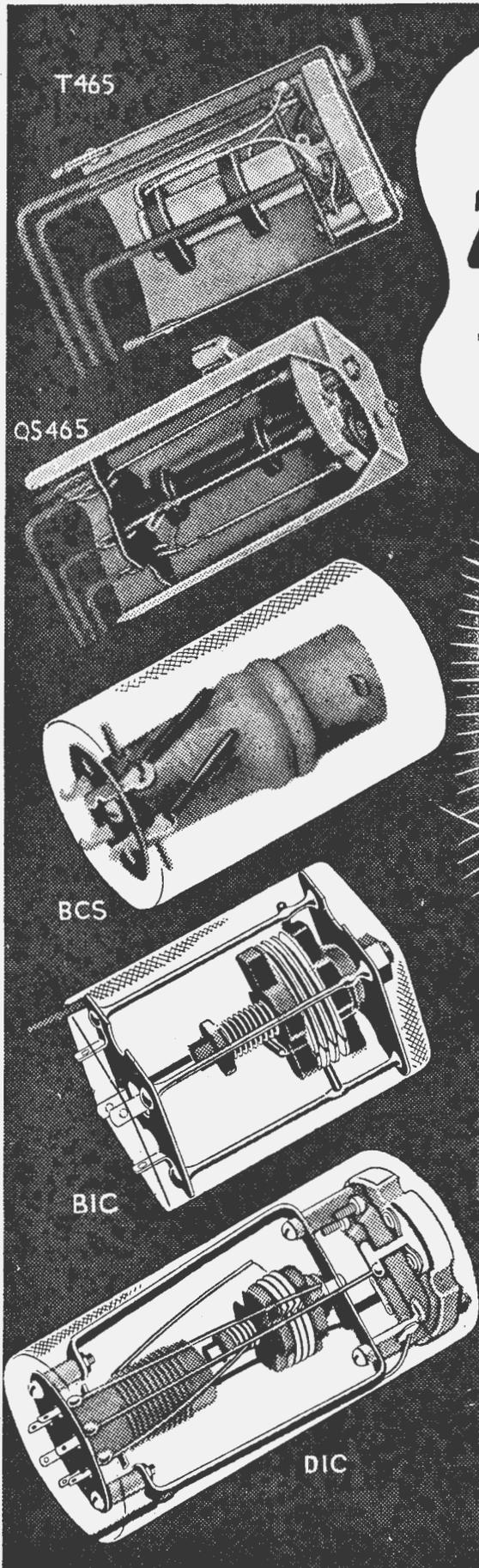


the average by the use of acorn valves in both R.F. and detector stages. These are Radiotrons, types 956 and 954 respectively. The audio amplifier is a single 41 pentode for headphone use, but with strong signals there is sufficient volume to operate a permag. speaker. For comparative purposes, super-regeneration is available by the turn of a switch, but this is only used where the transmission is of a very unstable nature. Normally it is dispensed with. The interruption oscillator valve is a Philips EBC3 used as a triode, and any triode such as the 76 or 37 can be used in this position.

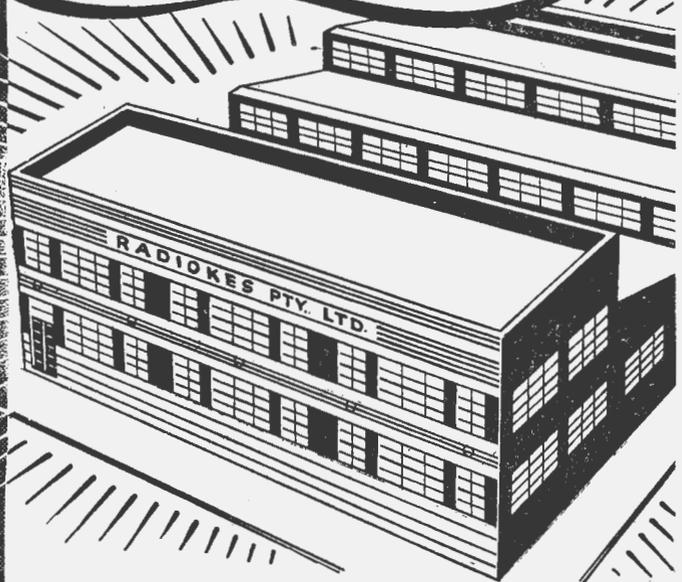
The R.F. stage is capacity-coupled to the detector, and this method was found to be more reliable than an attempt at primary coupling. The small condenser, a 15 mmfd. ceramic padder type, helps also to track the R.F. grid circuit, this being ganged with the detector. Ceramic insulation is used throughout, and the variable condensers are Raymart 15 mmfd. types. Eddystone condensers of the same capacity are equally suitable. No regeneration is used on the R.F. stage, as this was found to be unnecessary. The 956 valve gives real gain at five metres. The 954 detector has the cathode above earth by the inclusion of a small R.F. choke, and regeneration is controlled in the usual manner by screen grid potentiometer.

Choke-Coupled Audio Stage

Resistance coupling was first tried between detector and audio stages, but far better performance is obtained by the use of a high-impedance choke (Radiokes). A 500,000-ohm potentiometer is included in the grid of the 41 as volume control for headphone use.



Radio calls for
**RADIOKES
 COILS**
 from this magnificent
 new factory!



AMONG the latest-type machinery and elaborate testing equipment in this magnificent new Radiokes Factory, the unique GENERAL RADIO SIGNAL GENERATOR holds pride of place. It is a notable addition to the already complete testing resources of the Radiokes laboratories. Its many special technical advantages will assure you of an even higher standard of excellence and precision in Radiokes coils, I.F.'s and other similarly popular components.

advantages of a large, brand-new factory, Radiokes will even surpass its previous high standards. Ask for Radiokes. **INSIST UPON RADIOKES.**

Send this Coupon NOW for your copy of Radiokes' 1938 Catalogue. It's free, post free.

Specialising for fifteen years in manufacturing to the trade and the home constructor, Radiokes have earned the distinction of producing Australia's finest radio components, in Australia's larger specialising radio component factory. With all the resources and

Radiokes Pty. Ltd.
 Box 58, P.O.,
 Chippendale, N.S.W.

Send me right away a copy of your 1938 Catalogue.

Name

Address

.....

R.W.-Feb.

It looked as if ganging the R.F. and detector stages would be a troublesome process, but because of the special aerial tuning method employed, this presented no difficulty. The slight loading effect of the aerial coupler maintains resonance in the R.F. stage over each band. The interruption oscillator for super-regeneration is coupled to the detector via the screen grid, as shown, and a single-pole double-throw switch puts it in or out of circuit as required.

Aerial Coupling

The advantages of a tuned aerial coupling are more apparent at ultra-high frequencies than at lower frequencies, and the method used is shown in Fig. 4. It is really an impedance-matching network, and is very effective. With a coil to cover the range desired, two variable condensers are used, the 50 mmfd. across the two in series with the coupling coil. The 30 mmfd. condenser is an isolantite trimmer type for screwdriver adjustment. The coupling lead from the connection between this and the 10 mmfd. variable condenser is tapped on to the R.F. grid coil at half a turn from the ground end, as indicated in the circuit of Fig. 4.

The correct functioning of the coupling unit is arrived at when a setting of the 30 mmfd. condenser is

found where tuning the 50 and 10 mmfd. condensers to resonance with aerial and R.F. stage will not "pull" the R.F. stage. It is a method of aerial tuning that may well be applied to lower frequencies. Fig. 5 shows the assembly of this unit. As

the receiver was in the first place experimental, the unit was built separately on the side of the chassis after the receiver was completed.

Coils And Mountings

Because of stray capacity trouble, switching of the circuits for wave-change is out of the question with ordinary switching methods, so the ever-useful plug-in coil system is adopted. The coils for the 10-metre R.F. and detector circuits are on ceramic formers (Formo), and the 5 and 2½-metre coils are air wound with heavy gauge copper. With the acorn valves and the 15 mmfd. tuning capacities they approximate as follows:—

10 metres: R.F. and detector coils both have nine turns of 18-gauge copper on 1½ in. formers. The coil for the aerial unit is on a similar former with 10 turns of 22-gauge copper.

5 metres: R.F. and detector coils have nine turns of 12-gauge copper, ½ in. inside diameter. The coil for the aerial unit has four turns of 18-gauge copper on 1½ in. former.

2½ metres: R.F. and detector coils both have four turns of 14-gauge copper ¾ in. inside diameter, and the aerial coil is two turns of the same gauge on 1½ in. former.

These specifications are approximate, and some experimentation with turns will be necessary in individual receivers.

The interruption frequency coils for super-regeneration are made up on ½ in. dowel with three disks of thin bakelite 2 in. in diameter and

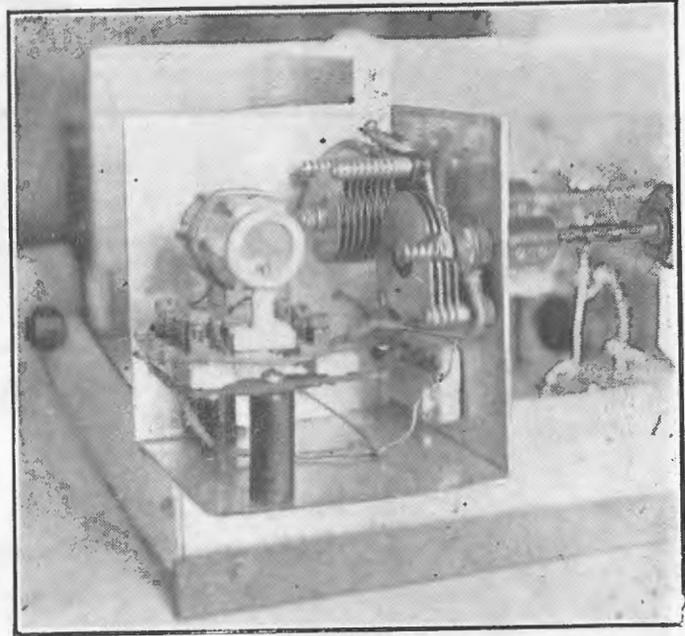


Fig. 5.—
Showing
the assembly
of the
aerial
coupler.

Advance U.S.W. Receiver.—List of Parts

Chassis, front panel, shield partitions, and brackets.

- 2—15 mmfd. midget variable condensers (Raymart, Eddystone, Radiokes).
- 1—15 mmfd. ceramic-insulated padder.
- Interruptor coils to specifications.
- 1—30 henry audio choke.
- 1—250 henry audio choke (Radiokes).
- 3—R.F. chokes to specifications.
- 2—single-pole double-throw switches.
- 1—vernier tuning dial (Eddystone).
- 1—50,000 ohm. potentiometer.
- 1—5 megohm potentiometer.
- 2—4-pin coil sockets (isolantite or steatite), 1—6-pin wafer socket, 1—"P" type socket.
- 1—4-pin power socket, with plug and cable.
- 6—terminals.
- 3—knobs.
- Headphones and speaker (latter optional).

FIXED CONDENSERS :

- 1—.00005 mfd. mica (Solar, Simplex).
- 1—.0001 mfd. mica (Solar, Simplex).
- 1—.0005 mfd. mica (Solar, Simplex).
- 1—.001 mfd. mica (Solar, Simplex).
- 3—.002 mfd. mica (Solar, Simplex).
- 2—.006 mfd. mica (Solar, Simplex).
- 2—.01 mfd. mica (Solar, Simplex).
- 1—.1 mfd. mica (Solar).
- 2—.1 mfd. mica (Solar).
- 1—25 mfd. dry electrolytic, 25v. working (Solar).

FIXED RESISTORS :

- 1—500 ohm carbon (E.T.C.).
- 1—1,000 ohm carbon (E.T.C.).
- 1—5,000 ohm carbon (E.T.C.).
- 1—10,000 ohm carbon (E.T.C.).
- 1—50,000 ohm carbon (E.T.C.).
- 1—100,000 ohm carbon (E.T.C.).
- 1—250,000 ohm carbon (E.T.C.).

1—1 megohm carbon (E.T.C.).

VALVES :

- 1—956, 1—954, 1—41 (Radiotron), 1—EBC3 (Philips).

MISCELLANEOUS :

Wire for coils (see text); nuts and bolts; push-back; solder tags.

Heterodyne Oscillator.—List of Parts

- 1—chassis and shield box.
- 1—6-pin wafer socket.
- 1—4-pin power socket.
- 1—15 mmfd. midget variable.
- 1—40 mmfd. midget variable.
- 1—r.f. choke to specifications.
- 1—50,000 ohm potentiometer.
- 1—valve shield.
- 3—knobs.
- 1—grid clip.

FIXED CONDENSERS :

- 1—.0001 mfd. mica.
- 2—.003 mfd. mica.

FIXED RESISTORS :

- 3—50,000 ohm carbon.
- 1—1 megohm carbon.

Aerial Coupler.—List of Parts

- 1—10 mmfd. isolantite midget variable (Eddystone, Raymart, Radiokes).
- 1—30 mmfd. isolantite midget variable (Eddystone, Raymart, Radiokes).
- 1—50 mmfd. isolantite midget variable (Eddystone, Raymart, Radiokes).
- Coil base, mounting pillars.

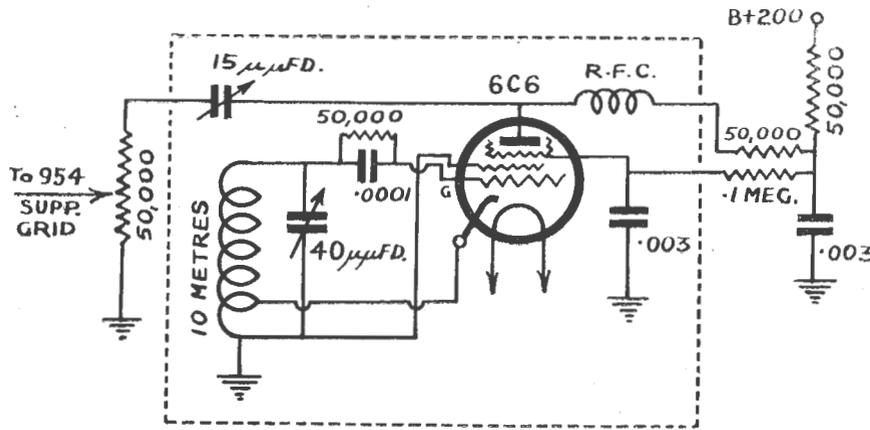


Fig. 6.—A successful experiment. Circuit of a heterodyne oscillator as an aid to C.W. reception.

spaced 3/8 in. apart. The grid coil has 1,400 turns of 38 D.S.C. and the plate coil 800 turns of the same gauge wire.

Heterodyne Oscillator For C.W.

A refinement for C.W. reception at ultra-high frequencies is outlined in the circuit of Fig. 6. Although the receiver behaves very smoothly with normal oscillating detector action, the effect of a separate heterodyne with the detector in a sensitive but non-oscillating condition was tried and found very efficient.

An oscillator was built up with a 6C6 on a screened box, and working at 10 metres. The output from this oscillator is fed to the suppressor grid of the 954 for coupling. With the receiver covering the five-metre range, the second harmonic of the oscillator is used to beat with the detector frequency. The 50,000-ohm potentiometer controls the intensity of the beat, and the effect is to steady signals. It was found that sufficient coupling is obtained, with the oscillator at 20 metres, by using the fourth harmonic.

Unless the oscillator is perfectly screened from the detector, there is a tendency to some interlocking when using the second harmonic. Just sufficient plate voltage is available through the resistor network to

produce oscillation in the 6C6, and this is all needed. Too intense oscillation will block the detector. The beat oscillator is not at all necessary for normal use of the receiver, but a scheme of this kind can be very useful in searching for weak DX sig-

Further Article If Required

Ample data are given in the accompanying article and illustrations to enable amateurs and advanced experimenters to duplicate VK2NO's latest 5-metre receiver without difficulty. However, any readers who would appreciate a more complete description of this set, with a point-to-point wiring diagram, are invited to write in, and if the demand proves sufficient, an additional constructional article will be published.

nals. It takes care of signal variation caused by fluctuating line voltage if a power pack is used for plate and heater supply to the receiver.

Power Supply

As the receiver stands, it may be used with a six-volt accumulator and

135 volts of B battery, but the power supply shown in Fig. 7 is used by the writer. This gives a perfectly humless and steady output. A Westinghouse HT9 dry rectifier (Amplicion) is used with a power transformer delivering 200 volts at 200 milliamperes. A winding for six volts at two amperes takes care of the valve heaters. A bleeder resistor is used in the output, in the form of the usual voltage divider with adjustable clips, and this is adjusted to give 200 volts. It is advisable to use no more than this voltage on the acorn valves. The system is that of a voltage doubling rectifier. The two 4 mfd. condensers are of the paper type, and the filter network comprises two 30-henry chokes and three 16 mfd. electrolytics.

General Points

It should be needless to stress that great care must be taken with short leads in the R.F. and detector grid circuits. These two tuned circuits must be kept as symmetrical as possible.

Acorn valves are admittedly expensive, but they give the best possible results, being designed for ultra-high-frequency work. The receiver could be duplicated with metal valves by using a 6K7 R.F. stage and 6J7 detector. Results would be only a little short of those obtained with the original on ten and five metres, but for higher frequencies there would be a distinct falling-off in signal gain. RFC1, RFC2 and RFC3 are five-metre R.F. chokes, consisting of 50 turns of 30 D.S.C. on 3/8 in. glass formers. Care must be taken with RFC2 to see that the capacity to earth is low, otherwise the detector may not oscillate smoothly over the whole tuning range.

In use, the receiver is so sensitive to C.W. signals at 56 m.c. that harmonics from stations working on 20 and 40 metres as far as 20 miles distant can be heard at R6. The weakest of 56 m.c. signals can be identified, and on one occasion the harmonic from JNJ Tokio, operating on I.C.W. at 13,050 k.c., was logged.

All necessary values are indicated in the circuit diagram of Fig. 2. If acorn valves are used, it will be necessary to make up the valve sockets with the clips provided with the valves, as no commercially-made sockets for these valves are yet available in Australia. Good insulating material must be used, and WT/22 (loaded ebonite) is suitable. Coil mountings can also be made up from this material.

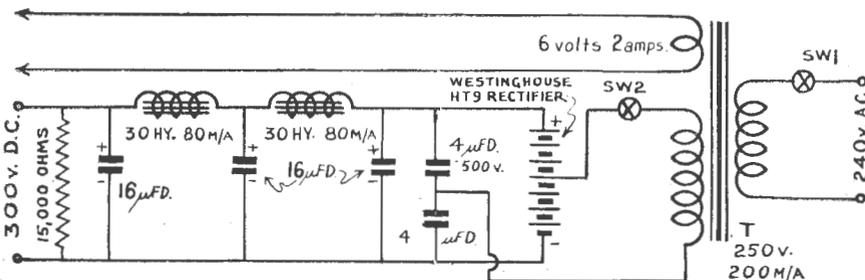
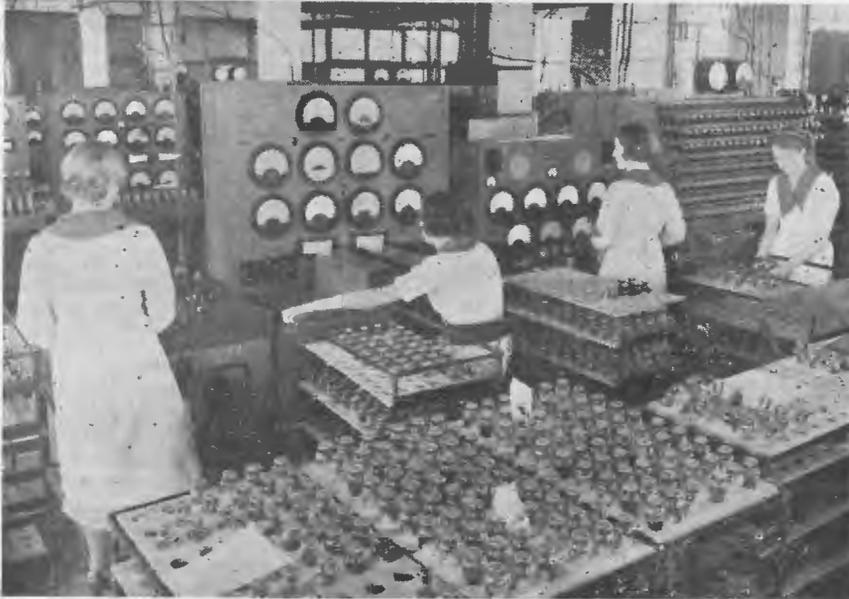


Fig. 7.—The humless A.C. power supply.

Radio Valves In The

Making.



The second instalment of a series of articles describing the latest technique in radio valve manufacture, as followed in the new valve works recently established in Sydney by Philips' Lamps (A'sia) Pty. Ltd.

Before each valve is ready for despatch, it undergoes a series of rigorous tests. Depicted here is a typical example of a testing section in the Philips Valve Works.

IN last month's issue of "Australasian Radio World" the manufacture of a modern radio valve was traced from "foot-making," through grid-making and bulb scouring, up to the point where carbon is sprayed on the inside of the bulb.

The assembling of the electrodes, anodes, grids and cathodes on the "feet" is a task which demands extreme skill and dexterity. In the many operations involving spot welding, for instance, the work is extremely intricate, and requires an infinite amount of painstaking care.

Rigid Inspection At Each Stage

It is impossible to stress too much the necessity for rigid inspection at each stage of valve

manufacture. If, during any single operation, a valve is seen to be imperfect in even the slightest respect, it is immediately rejected.

At this stage an efficient operative checks the accuracy of construction and flawlessness of a valve, and scans a complete test before it passes on to the "sealing-in" machine. If, for some unknown reason, a tiny welded contact is found faulty—a grid spiral a fraction of a millimetre out of alignment—the glass mount rendered imperfect by a minute crack—or if the valve manifests a flaw in any respect, it is removed from the batch.

The "Sealing-In" Operation

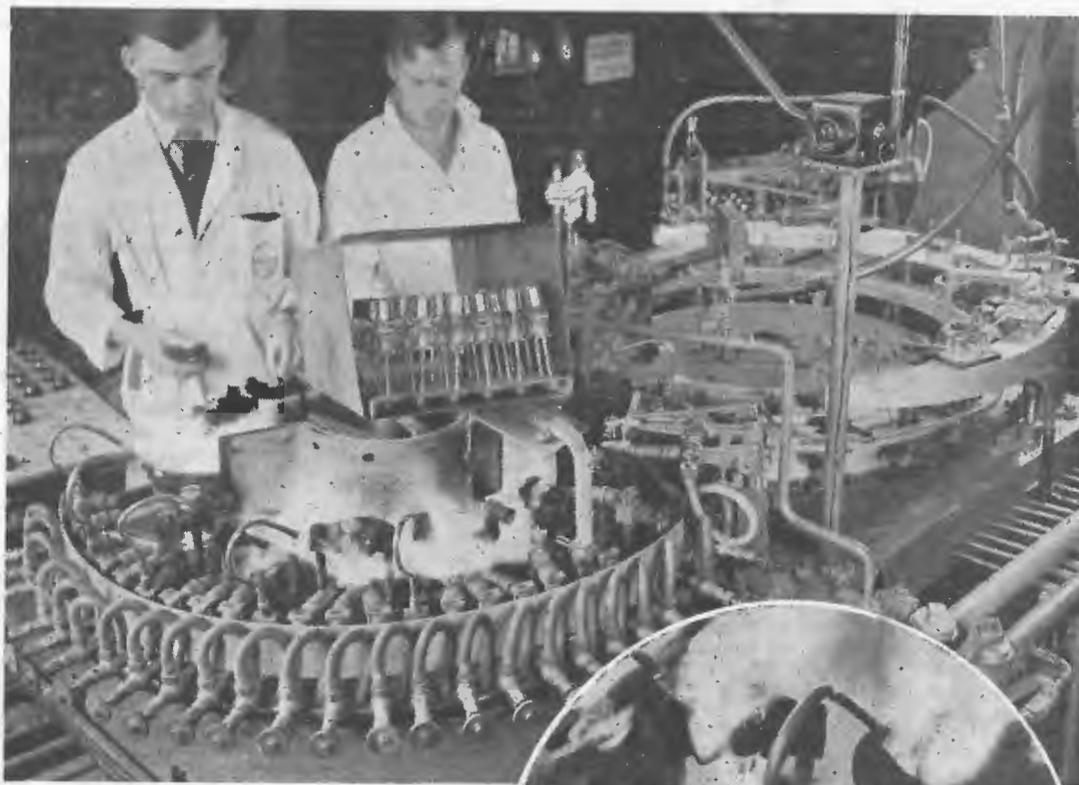
The process of "sealing-in," like that of "foot-making," is carried out by means of a rotary machine, which welds the bulb and the valve-mount by means of gas jets. Each valve passes around the machine on its own revolving carrier, so that the heat is evenly distributed. At the last set of jets, the superfluous molten glass falls away, and the mount and bulb are securely welded together.

After "sealing-in," the bulb is exhausted of air by means of a machine which, operating on the mercury pump principle, extracts the air from the bulb by means of the tubular glass stem incorporated in the "foot-making" process. The



The capping mill, which seals the bulbs to the bases after the latter have been treated with a specially prepared cement.

... 2



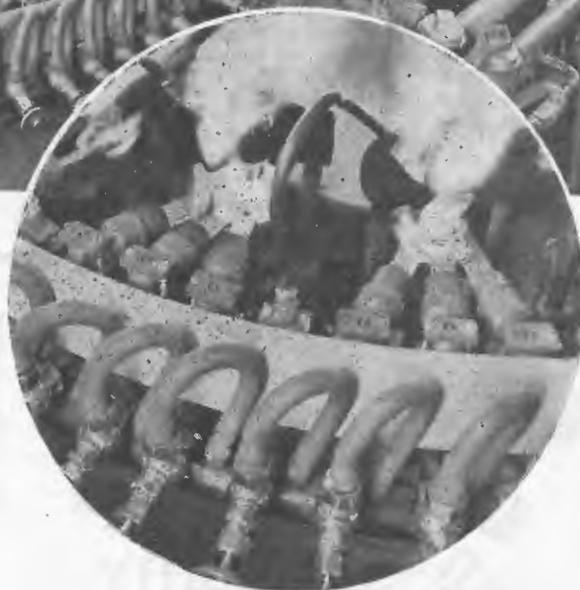
Above: A "sealing-in" machine, in which the valves, travelling around at regular intervals, have their mounts sealed to the bulbs by the heat from the gas jets. At right: The intense heat from the gas jets causes the lower portions of the valve to glow white-hot.

same machine removes all residues of gas through heating the metal parts by powerful eddy currents, and the cathode is activated.

The heat eventually explodes the "getter"—a small pellet composed of chemicals included during the earlier process of assembly. The sudden volatilisation of the pellet produces the mirrored effect on the inside of the bulb. This metal mirror is incorporated so that any gas residues which might subsequently be liberated in the bulb will immediately enter into composition with the chemical deposit.

Attaching The Bases Is The Next Step

Following the "sealing-in" process, the next procedure is that of attaching the bases on the otherwise completed valves. This involves three distinct operations, the first of which is to place a ring of cement around the inside top of the base, a uniform quantity being measured by a machine. The second operation is the insertion of the leads into their correct pins. The third operation is baking the cement—so that the base adheres firmly to the bulb—by passing the valve through a series of thin gas jets incorporated in a rotary machine.



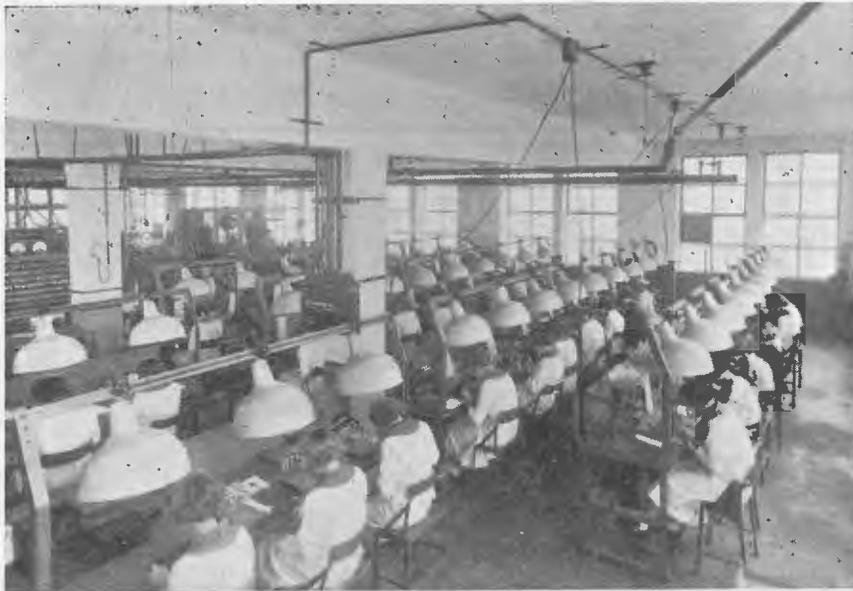
When the valves leave the capping mill, the lead-out wires still project through the open ends of the pins. These wires are filed off on a rapidly whirling rotary file; the pins are dipped into a flux and then into molten solder. This process effectively closes the ends of the pins and neatly rounds them off.

All valves are placed on the ageing rack for a fixed time to reduce gas and improve emission.

After the valves leave the ageing rack, they are complete in every respect so far as actual manufacture is concerned.

Stringent Tests Ensure Standard Production

They now undergo a series of gruelling tests, up to thirty-five, to ensure that their characteristics and actual receiver performance are up to



A general view of the main assembly section. Here the vital parts are mounted on the "foot"—or valve mount—before "sealing-in". The individual lighting fittings are specially designed to prevent eyestrain on the part of the operatives seated at the benches.

standard. It is essential, of course, that the valves should be heated up before efficient testing may be carried out. This, however, is automatically achieved while the

valves are on the ageing rack, from which they pass direct to the testing section.

A test line embraces such tests as the following:—Noise, saturation (in-

cluding various factors controlling performance), short circuit insulation and many others. In many cases, the tests are far more rigorous than those usually applied, and in all cases a valve which manifests the slightest degree of imperfect performance is immediately rejected.

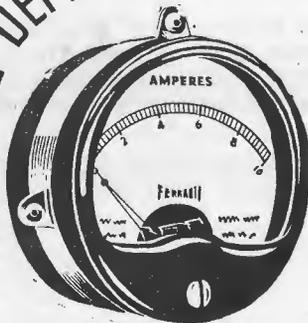
Before a valve is accorded a place in a radio set it must undergo a further series of tests, and certain valves are reserved for laboratory experiments. These final operations, including packing, will be described in the third and final article of the series in the next issue of the "Radio World."

Philips Open New Factory In Poland

Warsaw recently witnessed an impressive ceremony when Philips' new radio receiver factory was declared open. The event was attended by such authorities as the Polish Minister of Finance, the Minister of Commerce and Industry, the Netherlands Consul, and many important officials of the Philips organisation.

Dr. A. F. Philips, during his address, drew the attention of his distinguished audience to the progress which the factory had made since its inception in 1922. At that time, only 40 men were employed—to-day, a staff of 2,000 produces Radioplayers for the people of Poland.

54 YEARS' EXPERIENCE
RESEARCH AND GUARANTEE DEPENDABILITY



FERRANTI METERS

BRITISH MADE

2½ Inch and 2 Inch Scale

Available for every purpose in the following types:—

	Net Trade Prices
D.C. Moving Coil from	£2 12 6
Moving Iron from	1 17 6
Metal Rectifier from	4 17 6
Thermal R.F. from	4 2 6
Electrostatic from	4 17 6
2 in. D.C. Moving Coil from	1 15 6

RANGE

Flush, Portable or Projecting Patterns. Voltmeters, Microammeters, Milliammeters, Ammeters (A.C. and D.C.), Single, Dual and Three Range Types and Combination Volt-Milliammeters.

SOLE AGENTS NOYES BROS. (SYDNEY) LTD.

115 Clarence St., Sydney.
 11 Watt St., Newcastle.

'Phone: B 7581 (10 lines).
 197 Elizabeth St., Brisbane.

Radio Step By Step - - - 14

The Signal Through The Set

The ¹⁵fourteenth instalment of a series of articles specially written for beginners . .

^{four}In the past ~~thirteen~~ instalments of this series of articles, enough of the elementary theory of radio has been explained for readers to be able to follow the simple outline given below of the way in which a typical three-valve t.r.f. receiver operates. The circuit of this set is shown below.

Modulated Carrier Represented Diagrammatically

In a previous instalment it was explained how an unmodulated station carrier consists of a simple high frequency current alternating back and forth at an enormous number of times per second. This effect is illustrated by the curve in fig. 1 (a). Fig. 1 (b) represents a simple musical note with which the carrier wave is to be modulated, while fig. 1 (c) shows the two curves added, giving the resultant modulated carrier that is radiated from the aerial. This is the wave that is picked up by the receiving set.

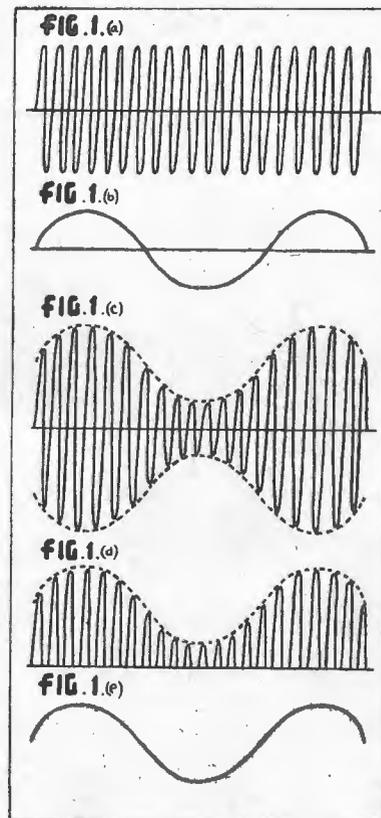
At the receiving end the aerial and earth form the two plates of a condenser, which means that the aerial will be charged and discharged at high frequency exactly as was the condenser in the simple oscillatory circuit described in instalment 6

(Feb., 1937, issue). This current induced in the aerial passes through the primary winding "L1" (see fig. 2). This is wound in close proximity to the earth end of the secondary winding "L2," and generally consists of about one-third of the total number of turns on the latter. The coupling between "L1" and "L2" is close enough to ensure that in passing through "L1" the aerial current sets up an induced current in "L2," thus feeding the signals into the set. With the number of turns on "L1" halved, the signal strength will fall off considerably, but the selectivity of the aerial circuit will be greatly improved. On the other hand, with the number of turns doubled, selectivity would become extremely poor and volume would again suffer, though to a less extent.

An important point to remember is that the earth should be of particularly low resistance, as with signals passing from aerial to earth and back again in something like a millionth part of a second, even a small resistance is to be avoided.

Designing The Tuned Circuits

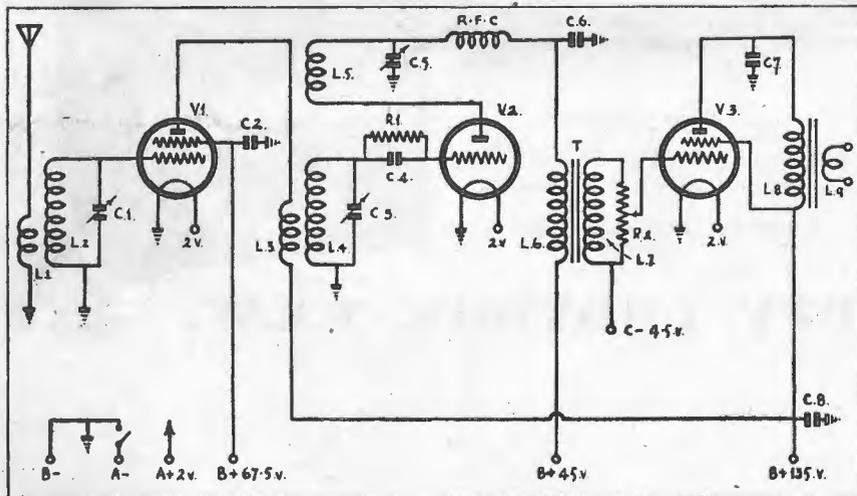
The inductance of "L2" (and, of course, that of "L4") is chosen so that the minimum and maximum



capacity settings of the tuning condenser "C1" (and "C2") represent the lower and upper limits of the waveband it is desired to cover. Using tuning condensers with a maximum capacity of .000385 mfd., an inductance of about 220 microhenries will enable the set to be tuned comfortably over the broadcast band, extending from 200 to 550 metres. If desired, the condensers "C1" and "C2" can be ganged together and operated by a single control. To compensate for any minor difference in inductance between the windings "L2" and "L4," each section of a condenser gang is provided with a small semi-variable trimmer connected in parallel across the main tuning condenser.

In sets of this type, the r.f. valve (V1) is invariably of the screen-grid variety, because it offers considerably more amplification than the neutralised triode, and at the same time gives considerably better stability. The introduction of the screen grid between the control grid and plate considerably lowers the tiny capacity existing between these two electrodes, and it is this capacity that causes back-coupling, with consequent instability.

So that the screen grid will not impede the flow of electrons from filament to plate, it is given a positive potential approximately equiva-



lent to that of the point in the electron stream at which it is inserted.

Screen By-Pass Condenser Essential

However, the amplified high frequency currents that appear on the screen must be short-circuited to earth if the valve is not to act like a triode, with the screen grid as the plate. This short-circuiting is accomplished by the by-pass condenser "C2," which is generally of a capacity ranging from .1 to 1 mfd. This condenser should be of a non-inductive type, and should be connected as closely as possible to the screen-grid lug on the valve socket, so that the by-passing effect will be fully effective.

The signals applied to the grid of the r.f. pentode (see fig. 1 (c)) appear in greatly enlarged form in the plate circuit and flow through the primary winding "L3" of the second coil. This winding is inductively coupled to "L4" in exactly the same manner as "L1" is coupled to "L2," and so the signals are transferred by induction to the second tuned circuit, consisting of "L4" and "C3."

V2 Is Leaky-Grid Detector

The next valve, V2, is a triode detector, leaky-grid detection being used in order to give greatest sensitivity. The grid leak "R1" and grid condenser "C4" are inserted to en-

able this valve to rectify the incoming signals, as explained in instalment number 12. Suitable values for these components are 1-2 megohms for "R1" and .0001 mfd. for "C4," though the substitution of other values fairly close to these will make no audible difference. Fig. 1 (d) illustrates the rectifying action of V2.

For greatest sensitivity, regeneration is incorporated, "L5" being the feedback winding and "C5" a small variable condenser of about .00015 mfd. capacity, used to control regeneration.

"R.F.C." is a radio frequency choke included in the circuit with the object of blocking r.f. in the plate circuit of the detector from passing through to the audio side of the set. "C6" assists this action in by-passing to earth any stray r.f. that happens to get through. A suitable value for this condenser is a capacity of from .0001 mfd. to .0005 mfd.

Thus the signal has now been received, amplified, rectified, and r.f. stripped from it, so that its waveform is similar to that shown in fig. 1 (e). If the primary winding "L6" of the audio transformer were now replaced by a pair of headphones, the signals would be audible.

However, for loud speaker operation, further audio amplification has to be applied, and this is accom-

plished by coupling the audio transformer "T" and the output pentode "V3." The operation of the audio amplifier will be dealt with in the next instalment.

VK2ME, 3ME And 6ME — Transmission Schedules For February.

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

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

Sundays: 4-6 p.m. 0600-0800
8 p.m.-Mdt. 1000-1400
Mondays: Mdt.-2 a.m. 1400-1600

VK3ME (31.5 m., 9510 k.c.)
Melbourne Time G.M.T.

Nightly
Monday to 7 p.m.-10 p.m. 0900-1200
Saturday
(inclusive)

VK6ME, Perth (31.28 m., 9590 k.c.)
Perth Time G.M.T.

Nightly
Monday to 7 p.m.-9 p.m. 0900-1100
Saturday
(inclusive)

THE IDEAL ALL ROUND TEST INSTRUMENT FOR THE CITY OR COUNTRY

THE CALSTAN A.C.-D.C. CIRCUIT TESTER, especially designed and constructed for Radio Dealers, Servicemen, and Students.

Test any Radio set . . . from the grid of the first valve to the output of the speaker with a CALSTAN A.C.-D.C. CIRCUIT TESTER. Here is a compact circuit tester that positively outperforms many instruments selling at much higher prices. The scale length of meter is 3¼ inches, optional leatherette or metal box.

It's RANGE which counts in Test Equipment—range in VOLTS, A.C. and D.C.—in MILLIAMPS and in OHMS. Wise Servicemen choose the CALSTAN A.C.-D.C. CIRCUIT TESTER, for they appreciate the importance of Precision, Accuracy, and Low Cost, which, combined with the wide range of this excellent instrument, make it a sound investment for increased new Servicing business.

RANGES:—

D.C. VOLTS :		MILLIAMPS :							
5,	10,	50,	250,	1,000	1,	5,	25,	100,	500
A.C. and OUTPUT VOLTS :					OHMS :				
5,	10,	50,	250,	1,000	0-2,000	0-20,000	0-200,000		

City Dealers' Model

A.C.-D.C., £7/17/6. (Plus Tax)

Country Dealers' Model

D.C., £5/15/-.



SLADE'S RADIO PTY. CROYDON, N.S.W.

UJ 5381

UJ 5382

DISTRIBUTORS:—

N.S.W.: Radio House Pty. Ltd., Sydney;
Martin de Launay Ltd., Sydney; Bloch and
Gerber Ltd., Sydney; Fox & Macgillycuddy
Ltd., Sydney; John Martin Ltd., Sydney;
Electric Service Co., Newcastle.

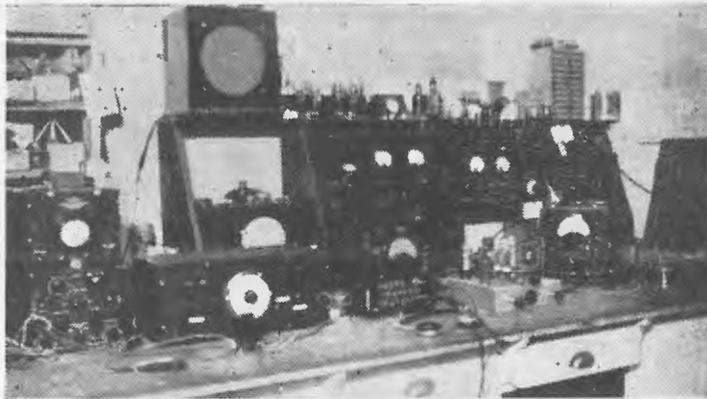
Victoria: Australian General Electric Ltd.,
Melbourne; Arthur J. Veall Pty. Ltd.

Queensland: J. B. Chandler and Co., Bris-
bane.

South Australia: Radio Wholesalers Ltd.,
Adelaide.

West Australia: Carlyle & Co., Perth.
Tasmania: Noyes Bros. (Melbourne) Ltd.,
Launceston.
New Zealand: New Zealand Electrical Equip-
ment Co.
Stocks available from Turnbull and Jones,
all branches.

Lavishly-Equipped Radio Service Workshop



Lakemba Radio Club Member Demonstrates Modern Test Equipment : "Radio World" Amplifiers in Action : Neat Lattice Radio Mast.

By W.J.P.

THE recent policy adopted by the Lakemba Radio Club in arranging official club visits to individual member's "shacks" is proving very popular, and, at the same time, is entertaining and instructive. It affords an excellent opportunity for members to gain new ideas both in the construction and layout of their own equipment.

A very interesting evening was recently spent at the home of Mr. L. T. Martin, of Concord. Mr. Martin's apparatus is a typical example of just what should be contained on the modern radio service bench. The photograph above shows the main test panel with associated equipment used in the checking, testing and fault-finding of electrical and radio equipment.

On the extreme left is the cathode ray oscillograph, with a beat frequency oscillator alongside. Both of these instruments play a big part in the testing of high fidelity amplifiers. Behind this oscillator is the modulated oscillator, which is mounted in the rack, while a general purpose 0-2,000 volt A.C.-D.C. meter is also in the same rack. Next to this is the condenser bridge, built to read capacity and leakage of electrolytic condensers, while breakdown voltage is applied from this when testing condensers in service.

The pair of meters on the right are in the valve tester, which is constructed to test valves under actual working conditions, and has an oscillator built in for the purpose of supplying a signal to the grids of valves being tested. On the extreme right is the 240-volt power board, fitted with the various plugs which are encountered these days. The machine bench is not visible in the photograph, but carries the lathe, drilling machines and vice.

Standing on the service bench is the multi-meter and vacuum tube voltmeter. An electric gramo motor and pick-up is mounted directly

underneath the drawer on the right, while the speaker on top of the rack is fitted with a multi impedance transformer capable of being adapted for any set in a few moments.

The demonstration conducted by Mr. Martin on the night of the visit proved without a doubt the utter futility of attempting to service the modern radio set properly without up-to-date service equipment. On the demonstration set, faults were located by means of the testing equipment which would have otherwise passed unnoticed.



This wooden lattice mast, designed and erected by Mr. G. Brown (VK2AHL), is strong, cheap, and easy to erect.

An adjournment was then made to a small auditorium room, where a practical demonstration was given of the "15 Watt Public Address Amplifier" (Dec. "R.W.") and the "7-Watt High Fidelity Amplifier" (Aug. "R.W."). Opinions differed somewhat as to the better of the two for actual musical reproduction, as some visitors favoured triodes, while others preferred pentodes, but it was generally admitted that both were very fine amplifiers in their class.

★

A Lattice Mast

In radio transmission the most important factor to be taken into consideration in the matter of radiation of energy is the antenna. The actual aerial mast or support is not so important, providing it gives the necessary elevation. An examination of amateur aerial masts reveals the use of anything from a clothes prop to a massive steel mast.

A suggestion for a simple, cheap and rigid mast as used by Mr. G. Brown (VK2AHL) is shown in the accompanying photograph. It is constructed from a number of lengths of oregon, oregon laths and hardwood, and bolted together with galvanized roofing bolts. The completed structure is perfectly solid, looks neat, requires but few stay wires, and, what is most important, is very cheap to construct.

If desired, an additional pole can be mounted on top, thus giving the antenna still greater height. For ultra-high frequency work, it would be ideal for the erection of a rotary beam aerial, while for those who desire an impressive antenna system to use at their station, the one illustrated is guaranteed to attract the attention of local B.C.L.'s.

As will be observed, one side is utilised for climbing to the top—quite a simple matter, as is demon-

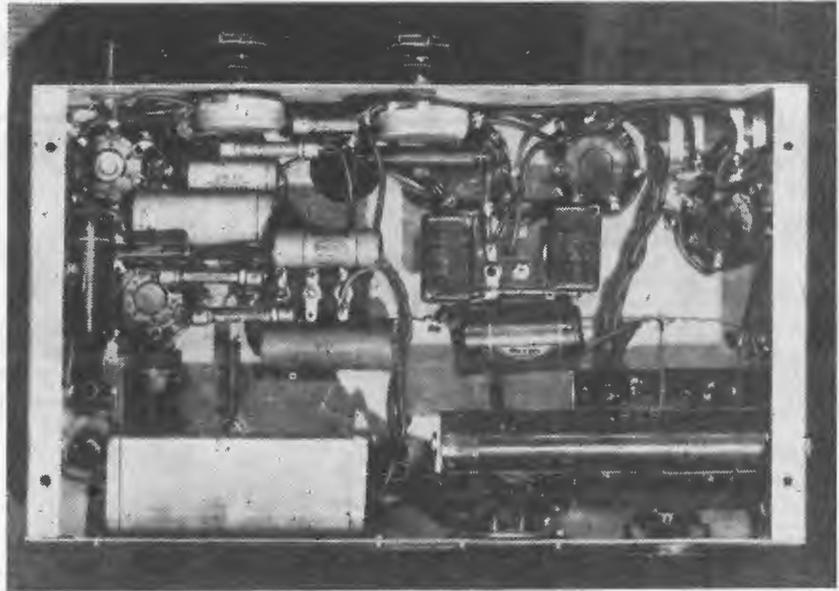
strated by the intrepid young man, Frank Bartlett, shown in the photograph.

★

Construction v. Destruction

A rather novel broadcast took place last month from one of the Sydney "A" class stations on a school educational session. An amateur QSO was conducted as between two "hams" over the air. The "QSO" served to explain in simple language just what transpires when amateurs make contacts over the air. The session was conducted by Mr. E. P. Hodgkins, VK2EH, of Lakemba, and as the other operator was unfortunately injured in a motor accident a few hours before, Mr. Hodgkins had to take both parts, changing his voice when required. Even personal friends of 2EH who heard the broadcast were unable to detect the two voices as one.

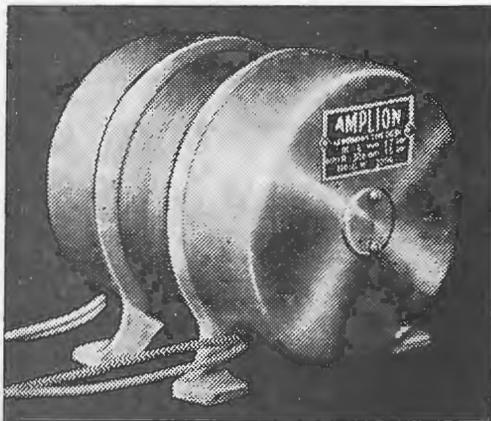
It is understood that 2EH and Mr. E. Treharne, VK2AFQ, both of whom are school teachers, do quite a lot to help the schoolboys to be radio minded. What a great achievement it would be if, in these troubled times, the true amateur spirit could be imbedded in the minds of young boys of all nations, and what a progressive step it would be in the direction of attaining international peace—"construction" might then



An under-chassis view of the 15-watt public address amplifier described in the December "Radio World." Philips Continental type valves are used throughout.

give place to "destruction." In many countries the general trend appears to be to teach the younger generation to destroy and hate, rather than to

build and preserve friendship, while amateurs themselves are often regarded as being of use only in time of war.



THE **AMPLION** "B" TYPE **GENEMOTOR**

WITH D.C. OR A.C. OUTPUT

The new Amplion "B" Type Genemotor has treble the output of the earlier type. A single machine will give outputs up to 500 volts, 100 watts either direct or alternating current (100 volt amps.), with any input from 12 to 240 volts Direct Current. The machines are all totally enclosed, being specially designed to operate at a 40° centigrade rise above ambient with free ventilation around machine, at full load.

Dimensions Height, 7¼"; Width, 6"; Length, 6"; Weight, 16 lbs.

The machines are practically noiseless in operation, easily smoothed, and are eminently suitable for many purposes, such as:—

- (a) Increasing low voltage Direct Current from 12 volts, etc., to 240 volts Direct Current, etc., for Public Address Equipment, etc.
- (b) Increasing low voltage Direct Current from 12 volts, etc., to 240 volts Alternating Current, for special requirements.
- (c) Converting Farm Lighting Sets of 32 volts, 50 volts, etc., Direct Current to 240 volts Alternating Current, for operating standard A.C. Receivers.
- (d) Converting Direct Current line voltages such as 110, 240 volts, etc., to 240 volts Alternating Current, for standard A.C. Receivers, etc.
- (e) Converting 240 volts Direct Current Power Supply to 240 volts Alternating Current for operating small Neon Signs, having corrected power factor.

PRICE: D.C. OUTPUT, £14/-/-; A.C. OUTPUT, £15/-/-.

For non-standard windings, add £2/-/-.

Telephone
B 6694
(3 lines)

AMPLION (A'ASIA) PTY. LTD., 66 Clarence Street, Sydney
MAKERS OF THE FAMOUS AMPLION LOUD SPEAKERS.

Telegrams
Amplion
Sydney.

PRECISION

Without

EXTRAVAGANCE



At to-day's low prices, "Instruments by Triplet" means **Precision Without Extravagance**

Shown above is the Triplet Model 1200-A Volt-Ohm-Millimeter. Has two instruments (A.C. and D.C.) in moulded case. Can be tilted to any reading angle. Scale readings: D.C., 10-50-250-500-1,000 volts at 2,000 ohms per volt; 1-10-50-250 M.A.; Low ohms .5-500; 1,500 ohms, 1.5 and 3 megohms. A.C. 10-50-250-500-1,000 volts. Resistance measurements have individual zero adjustments. Selector switch for all readings includes 22½ volts and 1½ volt batteries.

Price £9, or kit of parts complete down to last nut and bolt, with full assembly instructions and wiring diagrams, £7. Write for details.

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

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

Model 666 Universal Pocket Volt-Ohm-Milliammeter for measuring A.C. or D.C.

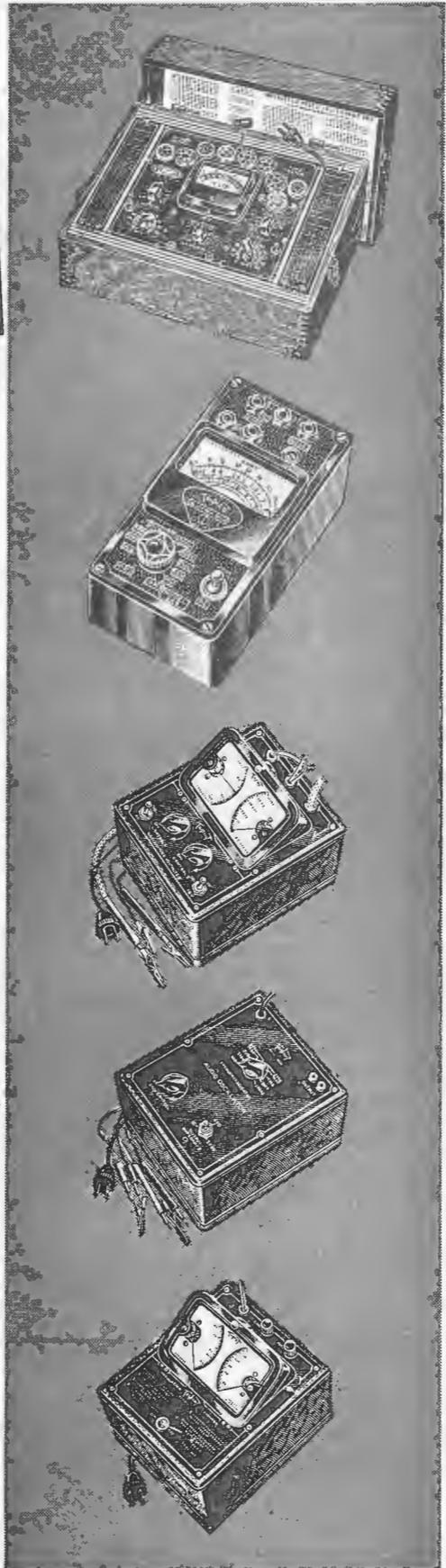
volts, ohms and mills. Price: £5/15/-.

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

Model 1260 Compact Portable Audio Frequency Oscillator. Price: £10/15/-.

Model 1295 Modulation Monitor with tilting type twin instrument. Price: £9/15/-.

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



Exclusive Factory Representatives for Australia and New Zealand :
W. G. Watson & Co. Pty. Ltd.

279 CLARENCE STREET, SYDNEY
 398 Post Office Place, Melbourne And at Hobart, Tasmania, Launceston
 Cnr. King & Bolton Sts., Newcastle and Wellington, N.Z.
 91a Currie Street, Adelaide
 Western Australian Distributor: ATKINS (W.A.) LTD., 894 Hay St., Perth
 Queensland Distributor: W. E. PETERMAN, 160 Edward St., Brisbane

TESTED AND



AT 1,000 VOLTS A.C. & D.C.

Now you can buy moulded Mica condensers tested at 1,000 volts A.C. and D.C.—Mica condensers that have extremely high resistance to moisture—Mica condensers you can depend upon for the utmost in reliability, accuracy and permanency of calibration. Simplex . . . the "Custom-built" condensers . . . are made in three types: Type M with a capacity range of .004 microfarads to .02 microfarads. Type S/M—.000005 microfarads to .01 microfarads; Type P/T (Pigtails) .000005 microfarads to .001 microfarads.

"Favoured By Famous
Factories"

SIMPLEX CONDENSERS

Manufactured by Simplex Products Pty. Ltd., 716 Parramatta Rd., Petersham, N.S.W.

'Phone LM 5615
Agents In All States

What's New In Radio

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

Television—Theory And Practice

The year in which television will be introduced to the public of Australia is apparently a matter of conjecture, though nothing is more certain than the fact that it will come eventually.

Those wanting to secure a practical working knowledge of this newest branch of radio before its advent will be interested in the latest textbook on the subject, "Television, Theory and Practice," by the eminent English writer, J. H. Reyner, B.Sc., A.C.G.L., A.M.I.E.E., M Inst. R.E.

This second revised and enlarged edition is one of the most up-to-date and comprehensive manuals available on the subject. Lavishly illustrated with half-tones and diagrams, it includes the very latest data on the work of numerous investigators.

The book is divided into two parts, covering receiving and transmitting technique. The first part includes chapters on the fundamentals of television, simple mechanical systems, the eye in television, the cathode ray tube, time base circuits, cathode ray reception, high definition mechanical systems, the television receiver and the ultra shortwaves. The second section on transmitting technique deals with photo cells, the television transmitter, film transmission, velocity modulation, and colour television.

★

Radioplayer 1252 Is Latest Philips Release

Released on Monday, January 10, the new Philips Radioplayer 1252 has already shown promise of being perhaps the most popular receiver which this company has ever produced.

A five-valve world-wide model, the Model 1252 incorporates "audio-scope" reproduction, and lists at 24 guineas. Other features include the use of an extra tuned circuit, giving greater selectivity; increased wave-band coverage, including the 13-metre channel; simplified three-position tone control; A.V.C.; Philips Octode frequency-changer; and an entirely new type of speaker. The dial, which is only slightly smaller than the large wide-vision "Twi-

light" dial featured in the 6702 and other Radioplayers, incorporates the same system of two-colour edge lighting, and the original Philips system of zoning Australian stations into States.

The cabinet of the 1252 is of the low-boy type, and combines beauty of proportion with graceful simplic-



The Philips Radioplayer Model 1252.

ity of design. The use of an unusual and modernistic "quilted" silk in the speaker grille is another attractive feature.

★

1938 "Radio Amateur's Hand- Book" Now On Sale

A review copy of "The Radio Amateur's Handbook" for 1938 was recently received from McGill's Agency, of Melbourne.

This handbook has long been recognised as an authoritative guide and inspiration to amateurs the world over, incorporating as it does each year all latest tried and proved developments in amateur radio technique made during the preceding twelve months. First published by the American Radio Relay League in 1926, there have been 24 printings to date, and no less than 450,000 copies have been distributed to members of the amateur fraternity during the past 15 years.

In the latest edition, comprising a

total of 564 pages, almost every chapter has been rewritten. An excellent innovation for those studying for the A.O.C.P. ticket is the entirely new chapter dealing with elementary radio principles and allied subjects. As well, there is a further chapter on radio circuit terms, definitions and equations.

There are twenty chapters in all, under the following headings:—The Story of Amateur Radio; Getting Started; Elementary Radio Principles; Radio Circuit Terms, Definitions and Equations; Vacuum Tubes; Workshop Practice; Receiver Design and Construction; Transmitter Design and Construction; Keying Methods; Radiotelephony; Ultra-High-Frequency Transmitters; Antennas; Power Supply; Emergency and Portable Equipment; Instruments and Measurements; Assembling the Station; Operating a Station; Message Handling and League Operation Organisation.

["The Radio Amateur's Handbook," 1938 Edition, edited by Ross A. Hull, published by the American Radio Relay League. Our copy from McGill's Agency, 183-185 Elizabeth St., Melbourne; price 7/6, postage 10d.]



Ferranti Meters, Test Equipment And Transformers

Two catalogues and a price list covering the world-famous Ferranti meters, test equipment and transformers have been received from the Australian representatives, Messrs. Noyes Bros. (Sydney) Ltd.

Catalogue No. 13 covers the range of 2" meters developed to meet the widespread demand for instruments similar in quality and performance to the 2½" dial class, but having smaller dimensions and lower price. These 2" meters are of the moving coil type, the standard cases being circular and made of polished black moulded insulating material, with a bakelite zero-adjusting screw at the front and two connection stems at the rear. Square flange flush-mounting instruments can also be supplied.

Catalogue No. 1 covers Ferranti 2½" instruments and test sets for a.c. and d.c. The meters listed and illustrated include the following types:—Moving coil for d.c. only, moving iron for a.c. or d.c. rectifier for a.c. audio frequencies, thermal for r.f., a.c. or d.c., electro-static for a.c. or d.c. Flush, projecting and portable patterns are available in nearly all ranges.

Among the Ferranti test equipment included in this catalogue are multi-range a.c. and d.c. test sets, two a.c./d.c. circuit testers, cell testers, ohmmeters, and separate multiplier units for moving coil and rectifier instruments.

A separate list gives price details

of all Ferranti meters, test sets and transformers.

The above literature is available, free and post free, to "Radio World" readers writing the sole agents, Messrs. Noyes Bros. (Sydney) Ltd., 115 Clarence St., Sydney.



Attractive Ever Ready Calendar For 1938 Now Available

Below is illustrated the Ever Ready calendar for 1938, a copy of which is being posted to every Ever Ready



dealer in the Commonwealth. Particularly attractive, both in design and in the high quality of its printing, this year's effort of the Ever Ready Co. (Aust.) Pty. Ltd. bids fair to surpass those of previous years in popularity.



Astatic Crystal Microphones And Pick-Ups

A pamphlet is just to hand from the Astatic Microphone Laboratory, Inc., of Youngstown, Ohio, U.S.A., describing latest releases in Astatic crystal microphones and pick-ups, for which Messrs. Eastern Trading Co., of Sydney, are Australian distributors.

Included among the lines available in Australia is the standard "S" type crystal pick-up, of which two models are available, the S-8 and S-12. Axial cushioning—a new development exclusive to the Astatic Laboratory, is included in both models. The pick-up arm is insulated from its supporting

base at the vertical pivots, on the axis of the arm, by a highly absorbent damping material. With the pick-up thus protected against motor-board vibration, motor noise is greatly reduced and speaker-pick-up feedback almost entirely eliminated. These "S" type pick-ups exert only about half the pressure on the record as the conventional magnetic type, which greatly prolongs the life of recordings.

The Model B-16 is a professional type pick-up, especially designed for use on lateral transcriptions of all sizes. This type is now standard equipment for all "A" class broadcast stations throughout Australia. The model "B-10" is of similar design, but is less expensive.

The two Astatic crystal microphones most popular in Australia at the moment are the models D-104 and D-2. The former, which is of rugged construction, and which gives exceptional quality performance, is widely popular among amateurs. The model D-2 is designed specially for public address work. Of dual diaphragm construction, it is essentially a non-directional unit, built to withstand shock.

Further details of the above Astatic crystal microphones and pick-ups are available free on request from Eastern Trading Co. Ltd., 470-480 Elizabeth St., Sydney.



New Radiotron Valve Releases —Tentative Data

6ZY5G:—Full wave rectifier with low drain cathode (6.3 v. 0.3 a.) employing two heaters, each drawing 0.15 a., internally connected in parallel. It is intended particularly for use with non-synchronous vibrators for battery or automobile receivers, where the low heater current is of advantage.

6AC5G:—Single high-mu triode for Class B output in large a.c. receivers. The heater rating is 6.3 v. 0.4 a., and the electrode structure is arranged with two grids internally connected so as to provide a high amplification factor.

1612:—Pentagrid amplifier similar to Radiotron 6L7, but intended particularly for use in amplifier applications where valves having especially low values of noise, hum and microphonics are required. These three types are not yet available from stock, but are expected to be available in the near future.

Cathode Ray Tubes 1800, 1801 And 914

Radiotrons 1800 and 1801 are Kinescope types particularly suitable for amateurs, experimenters, laboratories and technical schools for television picture reception. The 1800 is a nine-inch tube, and 1801 is a five-

**Boost your
Signals from**

R4 to

R9+

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

DO 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 "Noise-master" 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 noise-troubles 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,
Kembia Building,
48-60 Margaret Street, Sydney.

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

NAME

ADDRESS

A.R.W. 12/37.

inch tube. Both types are of the electromagnetic-deflection type, and employ viewing screens on which the picture appears with a yellowish hue. In making the announcement of these Kinescopes, it is emphasised that these cathode ray tubes are being made available for the convenience of experimenters, and that their release does not constitute a general commercial announcement by R.C.A. of television apparatus intended for sale to the public.

Radiotron 914 is a nine-inch high-vacuum cathode ray tube of the electrostatic type, employing a medium-persistence screen and intended for oscillographic use.

**Radiotron 809—R.F. Power Amplifier,
Oscillator, Class B Modulator**

Radiotron 809 is a three-electrode transmitting valve of the high-mu type for use as a radio-frequency amplifier, oscillator, or Class B modulator and audio-frequency amplifier. Because of its high perveance, the 809 can be operated at high plate efficiency with low driving power.

The plate connection is brought out through a separate seal at the top of the bulb to provide high insulation. The internal structure of the 809 permits operation of the maximum ratings at frequencies as high as 60 megacycles. The maximum plate dissipation is 25 watts for Class C telegraph and Class B services. Radiotron 809 is equipped with a ceramic base.

The 809 has a 6.3-volt filament drawing 2.5 amperes, and has an amplification factor of 50. Overall length is 6 $\frac{1}{8}$ " , diameter of envelope 2 $\frac{7}{8}$ ". List price is 25/-.

★

**New Amplion "B" Type Gene-
Motor Has Many Applications**

The release of the new Amplion "B" type heavy output Genemotor is very timely, in view of the increasing demand for portable transmitters, etc.

The type of Amplion Genemotor motor marketed up to the present time by Amplion (A/sia.) Pty. Ltd. is what they term their "A" type machine, which had a maximum output of 35 watts and a voltage limitation of 350 volts. Furthermore, it was available only with D.C. output. The new machine, however, while being only double the weight and size, has three times the output, a voltage of 600, and A.C. or D.C. output.

The machines can be supplied with any output desired, within the voltage and wattage limitations. They can, furthermore, be supplied with any input up to 240 volts D.C. They are not manufactured with voltages lower than 12, as this is considered inadvisable for such heavy type machines.

Machines with A.C. outputs are normally supplied with a frequency of 50 cycles. The machines, however, can be made as desired, with frequencies of 50 to 150 cycles at full load.

The machines are further designed in accordance with the requirements of the Civil Aviation Department; that is to say, the temperature rise does not exceed 38 degrees centigrade above ambient after one hour's running. It should be noted that the Civil Aviation Department permits a heat rise up to 40 degrees centigrade.

This new "B" type Genemotor is totally enclosed, except that there is no cover on the centre of the machine, thus permitting heat dissipation through the iron field.

The dimensions of the machine is: Height 7 $\frac{3}{4}$ " , width 6" , length 6" , and the weight is 16 pounds.

The machines are ideally suited for any of the following purposes:—

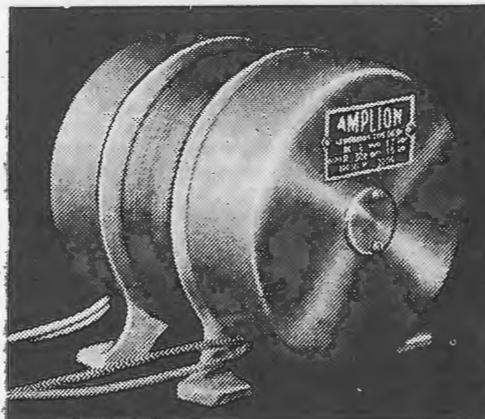
Low power transmitters.
Public address equipment.

Operating standard 240-volt A.C. receivers off 32-volt D.C. home lighting plants.

Operating standard 240-volt A.C. receivers in D.C. areas where the supply is 110 or 240 volts D.C.

Operating small Neon signs, etc.

It is interesting to note that the machines are entirely Australian in design and manufacture.



This new "B" type Amplion Genemotor can be supplied with any output desired, within the voltage and wattage limitations stated above.

Breaking Into The Amateur Game . 13

WITH the answers to the questions that were set in the January issue now published, our series of articles will conclude. Obviously, a subject with so wide a range could not have been fully dealt with in twelve short articles, and no attempt has been made to do so. Whole text-books have been written, each dealing with only one phase of radio, and it will be necessary for students to consult them if there is a real desire for deeper knowledge.

Our objective was the simple one of dealing broadly with the fundamental principles of wireless in such manner as they could be readily understood by students of average intelligence. Much space has been devoted to the elementary principles, as it is here that most aspirants for the A.O.C.P. fail. We have attempted to lay a solid foundation for the final super-structure, and there can be little doubt of the final ability of those of our readers who have thoroughly assimilated the information given.

Knowledge Of Regulations Essential

One requirement for the A.O.C.P. is a sound knowledge of the P.M.G.'s regulations covering experimental transmissions, and these can be obtained from the new handbook recently published by the Wireless Branch, which is on sale at all Post Offices, price one shilling.

We would like to offer a final word as regards the morse code. Many aspirants for a "ticket" make the mistake of attempting speed too early. Our advice to all prospective amateurs is:—Learn thoroughly how to "send" correctly. Space the dits and dahs as they should be spaced, also the period between words. Make the symbol cleanly—a dah is twice the length of the dit—in order that the receiving station can readily take your message. When these several points have been thoroughly mastered, an increase in sending speed will have no bad effect on the formation.

In receiving (under examination), should a letter be missed, forget it and leave a space. The reason for this advice is simple. A missed letter will only count ONE mistake, whereas by dwelling on the letter missed, it usually happens that SEVERAL others keep it company. As each letter, not word, counts, it will readily be seen how easily one missed letter could bring failure to a candidate.

For the many kindly letters of appreciation that have reached us through the Editor, we offer our sincere thanks. The knowledge that our series of articles has been of assistance is sufficient reward.

The concluding instalment of a series of articles on amateur radio, written for the "Radio World" . . .

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

Answers To Questions In Last Month's Instalment

1. **Current Loop:** A term used to indicate the point of maximum current flow in an a.c. or r.f. circuit.

Voltage Antinode: A point of maximum voltage in an a.c. or r.f. circuit.

Fundamental Frequency: A.C. current in a circuit is usually made up of two or more frequencies, the lowest and principal frequency being the fundamental.

QSL Forms, Notepaper, And Stickers

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

Resonance: For any combination of inductance and capacitance there is one frequency of applied voltage at which current flow is maximum.

2. (a) Piezo-electric crystal control in a radio transmitter has the effect of maintaining the emitted wave on a given frequency within a few cycles. To ensure best results the crystal holder must be plane on both surfaces, and the C.O. tube should not be heavily loaded or fed with high plate potentials.

2. (b) See Fig. 1.

3. From "Ohms Law":—
Watts:

= voltage × current in amps.

$$= \frac{500}{1} \times \frac{20}{1000} = 10 \text{ Watts}$$

Resistance:

= voltage divided by current in amperes.

$$= \frac{500}{1} \times \frac{1000}{20} = 25,000 \text{ ohms}$$

4. In tuning an M.O.P.A. transmitter, the first operation is to light all filaments and allow heaters (if any) to rise to normal temperature. Apply plate potential to the oscillator and adjust to desired frequency with any type of frequency meter having sufficiently accurate calibration. With low range D.C. m.a. meter in grid circuit, adjust P.A. grid tuning (if any) to obtain max. grid current reading.

Swing P.A. plate tank condenser through resonance; adjust neutralising condenser until grid meter does not "kick." Apply plate potential to P.A. and couple load, either antenna or equivalent. As an additional check on the neutralisation of the P.A., a pea lamp and loop may be coupled tightly to the P.A. tank while the condenser is tuned through resonance—without P.A. plate potential, of course. Lamp should not light.

5. (i) Badly adjusted crystal oscillator stage—too much r.f. crystal current, with resultant overheating of crystal.

(ii) Too heavy a load on crystal oscillator.

(iii) Self oscillation in one or all of the following stages.

(Prevention of foregoing)

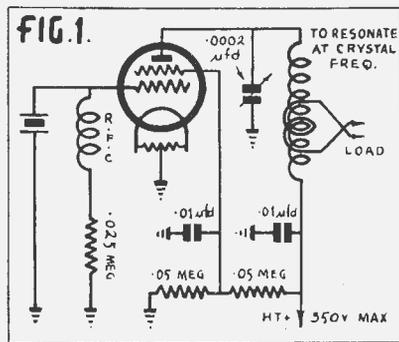
5. (i) Use a pentode C.O. with a max. plate potential of 350 v. and screen 120 v.

(ii) Loosen coupling to following stage and add an extra buffer if necessary to bring final excitation up to normal.

(iii) Instal shielding or change layout to obtain complete neutralisation of all stages operating with grid and plate circuits tuned to same frequency.

6. The actual meter portions of these two instruments are identical. The voltmeter uses series resistors or "multipliers," while the m.a. meter uses parallel or "shunt" resistors, to obtain the necessary ranges in each case.

A voltmeter is connected in parallel or "shunt" with the circuit under test; therefore the multipliers are



made as high as possible in order to consume as little current as possible.

In the case of a milliammeter, the shunts are made as low as possible in resistance in order to have as little extra resistance in the circuit as possible, since this type of instrument is connected in "series" with the circuit under test.

7. See Fig. 2.

When a choke input filter is used on a load, the resistance of which varies during operation, the output voltage remains much more constant than in the case of condenser input or the brute force style of filter.

A bleeder resistor of a value sufficiently low to absorb about 10 per cent. of the output power is connected in shunt with a power supply in order to keep the output voltage from building up to a value dangerous to the filter condensers, when the normal load is removed, as in a transmitter being keyed.

8. (a) 2 mfd., 4 mfd. and 6mfd. in parallel.

$$\text{Total "C"} = C_1 + C_2 + C_3 \\ = 2 + 4 + 6 = 12 \text{ mfd.}$$

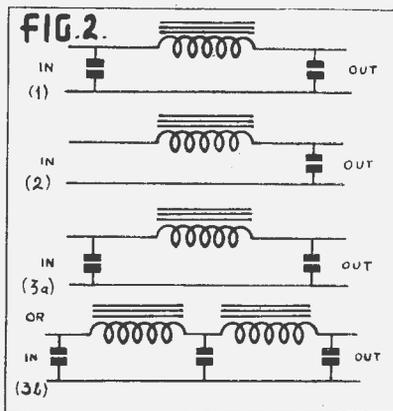
8. (b) In a series circuit.

2 mfd., 4 mfd. and 6 mfd. in series.

$$\text{Total "C"} = \frac{1}{\frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3}} = \frac{1}{\frac{1}{2} + \frac{1}{4} + \frac{1}{6}} \\ = \frac{1}{\frac{12}{12} + \frac{3}{12} + \frac{2}{12}} = \frac{12}{17} = 1 \frac{1}{11} \text{ mfd.}$$

9. **Reiss Microphone:** A block of marble or well-seasoned wood has a shallow cavity measuring about $1\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{16}''$ cut in one of the plane surfaces. Along each of the shorter sides a deeper slot is made ($1\frac{1}{2}'' \times \frac{1}{2}'' \times \frac{1}{2}''$), into which is fitted cylindrical pieces of polished gold-plated brass. Connections are brought out to the back, one to each of these contact pieces. A thin mica diaphragm is held over the $1\frac{1}{2}'' \times 2\frac{1}{2}''$ cavity by a square plate frame, which has inside measurements $1\frac{1}{2}'' \times 2\frac{1}{2}''$. The finest available polished carbon granules fill the enclosed space between block and diaphragm.

Sound waves striking the mica diaphragm alternately compress and release the enclosed granules, through which a current of up to 10 m.a. is made to flow from a 6-volt battery or less. In series with the microphone and battery is a transformer primary winding.



The action of sound waves on the diaphragm causes a pulsating current to flow in the transformer primary, and a corresponding a.c. voltage develops in the secondary winding. This voltage is amplified to a suitable level by an audio frequency amplifier.

The diaphragm type piezo-electric microphone: A light conical metal diaphragm is connected by a short metal bar to a pair of Rochelle salts crystals cemented together. Plated electrodes are attached to the crystals and form the two connections of the microphone. Sound waves striking the diaphragm cause the crystals to be vibrated mechanically, and by piezo-electric action an a.c. voltage is developed at the terminals, which is fed to an audio frequency amplifier and brought up to the desired level as before.

The velocity or ribbon microphone: A light corrugated ribbon of dural is lightly stretched between the poles of a magnet so that its motion

will be transverse to the magnetic field.

Sound waves striking the ribbon cause it to vibrate and cut the magnetic lines of force, resulting in a corresponding a.c. current flow in the ribbon and through the transformer primary shunted across the ribbon.

Since the impedance of the ribbon is very low, a transformer with only a few turns on the primary may have a considerably larger number on the secondary, making a comparatively high impedance ratio. The a.c. voltage developed across the secondary is again fed to an audio frequency amplifier to bring the voltage up to the desired level.

10. (i) When a Hertz antenna is to be erected in a limited space, such as the usual suburban "back yard," the first consideration should be to get the actual radiator portion as far away as possible from buildings, guy wires, and particularly other metal bodies. The method of feeding power to the antenna will depend to a great extent on the number of bands it is desired to operate with the single antenna. If the antenna is of the Zeppelin type, the feeder length should also come into consideration when the location is being decided. Care should be taken to avoid the necessity of having to "fold" back feeders to obtain sufficient length.

10. (ii) Height is a consideration which is closely associated with the former discussion.

Where it is impossible to erect the radiator proper over clear ground, a much greater mechanical height is necessary to obtain the same effective height.

10. (iii) Insulation and r.f. resistance may be chosen as another consideration.

Twelve or fourteen gauge copper wire or 7/20 stranded conductor will be quite satisfactory for amateur transmitting purposes.

Insulators of the "strain" variety are the best where the conductors are separated by a clear 3" or 6" section of Pyrex or porcelain, thus lowering the capacity between the antenna and supporting wire. The "egg" type insulator is, however, satisfactory if three or four are joined closely together by short lengths of wire to terminate the antenna.

Feeder spreaders should be glass, pyrex or porcelain rod.

[To assist the many readers studying for the A.O.C.P. exam., a series of articles covering questions and model answers for the past six examinations will shortly be commenced --Ed.]



The All-Wave All-World

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

DX News



“Radio World” Shortwave DX Contests To Continue

Owing to the widespread interest aroused by the first three “Radio World” Shortwave DX Contests, it has been decided to continue these competitions at four-monthly intervals. The next will close on May 1, and entries can be forwarded at any time up to this date. The rules are as follows:—

1. For this Contest a trophy (a Repligle World Globe with time converter, value 59/6) will be awarded to the reader who submits the best individual verification.

2. Verifications from any short-wave station between 5 and 100 metres may be submitted. Thus cards from broadcast, commercial, radio-telephone and amateur transmitters are all eligible.

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

4. Only verifications of reception between July 1, 1937, and closing date will be eligible.

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

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

7. The decision of the judges will be final; and the result of the third competition will be announced in the June, 1938, issue of “R.W.”

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

—The Shortwave Editor.

New 2KA Katoomba Being Erected

A new broadcasting station is being erected by Amalgamated Wireless for the Transcontinental Radio Company (2KA, Katoomba) on an elevated site at Wentworth Falls. The aerial system, which is almost completed, is supported on masts 185 feet high, and the commanding situation of the new 2KA will ensure sufficient radiation of their programme.

Power for the new station will be drawn from the 11,000-volt mains of the Blue Mountains Shire. The power of the transmitter will be 2,000 watts, although for the present the station will operate upon its licensed

power of 500 watts. The wavelength of 2KA is 385 metres.

VK's Logged In Three Days

From Jan. 2 to Jan. 4 I logged the following stations on my new dual-wave superhet:—VK2's ME, CB, HP, HL, ACL, AGJ, ADK, SV, YG, AX, JU, QR, AFO, LA, WQ, XH, ASE, AS, AFS, QI, WA, AFW, AGU, ADU, AFE, AEW, AFB, WK, ACW. VK3's VM, RM, FW, KR, WP, AK, ZL, MD, GQ, PE, FM, TZ, SE, FS, AS, PL. VK4's RX, WR, WF, SW, UX, FW, FV, LQ. VK5's DC, DX, GU, DU, AS. Also KA1MH testing on 20 metres experimental.—John Cooke, 11 Archer St., Chatswood.

ALL-WAVE ALL-WORLD DX CLUB Application for Membership

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

Dear Sir,

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

Name.....

Address.....

[Please print both plainly.]

My set is a.....

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

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

(Signed).....

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



Short-wave Review

CONDUCTED BY

ALAN H. GRAHAM

Police Stations Verify ★ New Stations And Schedules ★ Comprehensive Reports From Observers ★ Hourly Tuning Guide.

SINCE the last issue of the "Radio World," verifications have been received from a number of the American police transmitters logged last year. The stations concerned are W1XHC, Hartford (9.9 m., 150 watts); W6XPA, Los Angeles (9.9 m., 50 watts); W6XGC, San Gabriel, (9.9 m., 50 watts); W9XBA, Peoria (9.06 m., 50 watts); and W3XAR, Haverford Township (9.9 m.).

However, although verifications from police stations are coming in nicely, signals are more conspicuous by their absence. Both the 33,100 k.c. and the 30,100 k.c. bands have been completely dead of late, and it would appear that readers will have to work hard to win that special U.H.F. trophy now on offer.

Eleven Metres Fair

The high frequency broadcast bands provide rather a contrast. Nine metres is again poor, while 11 metres is steadily improving, with W6XKG (11.5 m.) there almost every morning, and W9XAZ (11.3 m.) showing up occasionally.

Ultra High Frequency Band Allocations

Of interest to U.H.F. fans is the information just to hand from America that the Federal Communications Committee has recently completed a comprehensive revision of the frequency allocations between 10 and 300,000 k.c. The new allocations include specified space for radio services interested in the preservation of life and property, for broadcasting, television, and experimentation.

The complete list of allocations is too lengthy to repeat in full, but the following will be of interest:—

- 21,400-21,600 k.c. (14.0-13.8 m.)—
International Broadcast band.
- 25,000-27,000 k.c. (12.0-11.1 m.)—
Broadcast band.
- 30,500-32,000 k.c. (9.83-9.37 m.)—
Police band.
- 33,000-34,000 k.c. (9.09-8.82 m.)—
Police band.

- 35,000-36,000 k.c. (8.57-8.33 m.)—
Police band.
- 37,000-38,000 k.c. (8.1-7.88 m.)—
Police band.
- 39,000-40,000 k.c. (7.69-7.5 m.)—
Police band.

★

Highlights Of The Month

Probably the most interesting station reported this month is W2XGB on 8,660 k.c., or 34.62 m. Owned and operated by Press Wireless Incorporated, this unusual American has been logged recently by Mr. J. C. Linehan, our South Australian Observer. W2XGB gives news bulletins at 12.30 a.m. and 8 a.m. (E.S.T.).

Official S.W. Observers

We have pleasure in announcing that the following Club members have been appointed as Official Shortwave Observers:—

Queensland: Messrs. Sorensen and Neill.

New South Wales: Mr. Kemmis.

South Australia: Messrs. Linehan and Bruce.

Tasmania: Mr. Collander.

Western Australia: Mr. La Roche.

New Zealand: Mr. Russell.

It has been decided that, for the present, two Observers will be appointed for each State. Dxcers living in the States listed above with only one Observer are invited to communicate with the Shortwave Editor, setting out the experience they have had in DX work, and also giving brief details of their receiving equipment.—Alan H. Graham, Shortwave Editor, 258 Lower Plenty Road, Rosanna, N.22, Vic.

Two stations in Formosa are now audible around midnight; both relay JFAK. JIB is the call allotted to the 28.48 m. transmitter, but no identification has been obtained from the one on 31.16 m. An English news session usually opens the programmes at midnight.

A highlight of the month has been the improvement on 25 metres, where a number of stations are now coming in very strongly, both morning and night. The Americans are good, and so are CR7BH and Saigon.

On 31 metres, conditions are also very fair, this band providing two stations worthy of inclusion in the "highlights" section, namely LKJ1, Norway, and OZF, Denmark, reported by Observers La Roche and Kemmis respectively.

Finally, the 20-metre amateur band continues to thrill dxcers by providing a never-ending sequence of distant, low-powered and unusual stations. (For full details see special amateur section).

★

Latest News From Overseas Stations

From South Africa comes news of greatly increased activity amongst shortwave broadcasters. A new station at Klipheulval now relays the Cape Town and Johannesburg broadcast stations. This new transmitter uses a power of 2 k.w., on 31.19 m., and a schedule to hand gives the hours of transmission as follows:—

Daily (exc. Monday): Noon-2.40 p.m.

Daily (exc. Sunday): 2.45 p.m.-3.40 a.m.

Sunday 11 p.m. to Monday 1.15 a.m.

It is understood that at other times ZTJ, Johannesburg, 49.2 m., carries the relay.

TGWA, Guatemala City, has been testing with a new transmitter, and is now operating on three new frequencies. At present, no regular schedules have been arranged, but it is believed that on Wednesdays and Fridays it is on the air from 11 a.m.-1 p.m. on either 30.96 or 25.51 m.

SHORTWAVE STATION OF THE MONTH 5

HS8PJ, BANGKOK, SIAM.

METRES: 31.55. **KILOCYCLES:** 9,510.
STANDARD TIME: 3 hours behind Australian E.S.T.
ANNOUNCER: Man.
DISTANCE FROM SYDNEY: Approximately 4,500 miles.
LANGUAGES: Ordinary announcements usually in English. Identifications first in Siamese, then English, then French.
TIMES OF TRANSMISSION: Every Thursday, 4-5.30 p.m. and 10.30 p.m.-1 a.m. (Friday).
REPORTS TO: Post and Telegraph Department, Technical Section, Bangkok, Siam.
IDENTIFICATION: Announcements as above. Opens with three chimes in ascending order; a similar signal often used before announcements.
REMARKS: Recently reported at good strength. HS8PJ also has allocations on 19.020 k.c. (15.77 m.) and 9,350 k.c. (32.09 m.).

The other wavelength to be used is 16.84 m.

CXA8, at Colonia, Uruguay, now relays regularly the programmes of one of the Argentine broadcast stations (which are just across the river Plate in Buenos Aires). The wavelength used is 31.1 m.—only 20 k.c. from LRX, which often carries the same relay programme, so take care not to confuse these two stations. Reports on CXA8 should be sent to Belgrano 1841, Buenos Aires, Argentina.

After a period of silence, XGOX is again being heard on 30.61 m. at 10 p.m., relaying XGOA.

"Radio Martinique" (Box 126, Fort-de-France) is now on 30.9 m. A lady announces at frequent intervals, and the station signs off with the "Marseillaise." The call FZF6 is sometimes allotted to this station, but it is doubtful whether this is correct.

The QRA of OZF is Mail and Telegraph Dept., Technical Division, No. 32 Bernstorffsgade, Copenhagen, Denmark.

In addition to regular transmissions on 19.78 and 31.58 m., XEWW, Mexico City, has also been testing on 34.9 m.

Two new Cubans are now on the air—COCU, on 45.5 m., relaying CMCU; and COCA, on 46.4 m., relaying CMCA. Both are located in Habana.

★

Reports From Observers

Mr. G. O. La Roche (West Australia) reports conditions generally as still fairly good, with evening reception best, daylight conditions being unsatisfactory. Comparing his list of stations logged with those reported in the eastern States, it is rather remarkable to find 48-49 m. so well represented. It appears that evening reception of the following is

still very good in the west:—VPB, Colombo; COCD and COCO; W3XAL and W8XAL; VQ7LO; and Rangoon.

On 19, 25 and 31 metres, conditions have remained steady, with the Americans to the fore—W2XE (16, 19 and 25), W2XAD, W8XK (19 and 25), W1XAL (25), W1XK and W2XAF.

The Europeans are very consistent in the mornings. Just to mention a few, there are TFJ, Rome (25 and 31 m.), HBO, TPA2-3-4, CSW (27 and 30 m.), EHZ (EAJ43), ORK CS2AA (ex-CT1AA), OLR3A, LKJ1. Neither of the Polish stations (SPD and SPW) are now audible.

Of the Eastern stations, the D.E.I. transmitters are outstanding. Saigon is poor now, but KZRM and ZBW3 are still going strong on 31 m.

The Cubans are just as good in the west as in the east, for in addition to COCO and COCD mentioned above, COCQ, COCH, COBC, COBZ and COCM are audible. The once reliable COCX has disappeared.

The 20 m. amateur band was rather poor towards the end of December, but opened up again with the New Year. However, there is still plenty of room for improvement. An interesting logging was ZU5L, Durban, South Africa, on 40 m.

Mr. J. C. Linehan (South Australia) writes:—

Dxing this last month has been a little better, especially in the evenings. At 11.30 p.m. (Adelaide time) conditions are very good between 19 and 25 m. The best stations of the month are CSW (30.1 m.); GSJ and GSH on 13 metres, both very strong between 8.30 and 11.30 p.m.; PHI, on 16.8 m.; VPD2, Rome (25.4 m.); KZRM; and, in the early morning, W8XK (19) and W2XE (25).

With regard to the amateurs, I heard a very interesting round table conference which was completed in

about 7 minutes. The stations involved were KAIME, KA1BH, KA-2DV, XU8RB, FI8AC, G6XR and G5LV. I was able to log all concerned. A similar hook-up of the following stations was completed in less than 3½ minutes—W4DLH, HK5AR, YU2CQ, G5NL, SU1KG and VK4JU.

I have been experimenting with a selective beam antenna, and it's excellent—one can beam a signal in from any direction at the turn of a knob. [Full details of this will be published at the earliest possible moment.—S.W. Editor.]

Mr. H. A. Callander (Tasmania) reports that reception has shown a slight improvement on all bands, the 20 m. amateurs being particularly good.

The B.B.C. transmissions have been heard very well on GSH (13), GSG (16), and GSA (49.59). [It is quite a while since the last-mentioned was reported.—S.W. Editor]. Of the Americans, W8XAL are fairly strong around 9.30 p.m., while W2XE and W1XAL are good on 25 m. in the mornings.

Mr. V. D. Kemmis (New South Wales) writes:—

Things here have been very dead indeed, QRN being the chief offender, together with an absence of decent signals to receive. During the month I have done a good deal of listening to the broadcast stations, particularly on 19.25 and 31 m., but have failed to log anything out of the ordinary. [What about OZF?—S.W. Editor.]

The 19 m. band seems to provide the best signals during the evening here, and also in the morning till about 8.30 a.m., when some of the American signals are quite good (W2XAD and W8XK).

The best broadcast stations are:—W3XAL (16); PCJ, YDC, W2XAD, W8XK (19); W2XE, JZJ, RNE (25); KZRM, YDB, VPD2, ZBW3, XEWW and OZF (31); W8XAL and 9M1 (49).

Mr. J. K. Sorensen (Queensland) has found reception marred to a considerable extent by heavy QRN, which, however, shows signs of abating. Only the most powerful signals are audible above the noise-level. Just after midnight the Daventry and Zeesen transmitters are very strong, DJN (31.45 m.) being exceptionally loud. JVN (28.14) is still the best of the evening stations. The League of Nations transmitter, HBO (26.3 m.), was heard very well in the New Year broadcast to Australia.

Mr. E. Neill (Queensland) has also found the noise level exceptionally bad. Storm after storm, accompanied by incessant QRN, have made reception almost out of the question. Conditions are the worst they have been for some considerable time.

Occasionally extra strong signals pierce the welter of noise, and at

times the following have been noted:—TYA2 (33); XGOX (30.1); HBO (26.3) and HBJ (20.64); W8XAL and VUC (49.1)—both very strong late at night; W2XAD and W2XE (25). Also the usual Daventry and Zeesen stations, among which GSD, GSG, GSJ, GSO, DJE, DJN and DJR are best.

Mr. R. Russell (New Zealand) devotes his time to a close examination of the 20-metre amateur band. The "highlight" of the month has been the All-Continent hook-ups. Apart from these, there is little to report, conditions being just fair, varying considerably from day to day. Even on 20 metres, QRN has been really troublesome.



Amateur Review

The following list of calls heard on 20 metres is ample proof that the band is in no way deteriorating. (All the "Radio World" Observers co-operated in obtaining these calls, but the work of Messrs. Russell, Linehan, Kemmis and Callander is deserving of special mention).

CALLS HEARD

EUROPE: G2IM, G5RV, G5ML, G5DT, G6XR, G6DP, G6LX and G6LU, England; F300, F3HN, F3GR, F8DC and F8XT, France; SV1NK, Greece.

AFRICA: SU1KG, Egypt; CN8AJ, French Morocco; ZU5Z and ZS6T, South Africa.

SOUTH AMERICA: LU1DV, LU1HI, LU1QA, LU3EV, LU3HK, LU4BL, LU4CZ, LU6KE, LU6VK, LU7BK, LU9KA and LU9BV, Argentina; OA4AI and OA4R, Peru; CP1AA, Bolivia; CX3BL, Uruguay; HK1Z and HK5AR, Colombian Republic; CE1AH, CE1AD, CE1AI, CE1AX, CE2BR, CE3AI, CE3AC, CE3DW, CE3AA, Chile; PY2AL, Brazil; YV4AX and YV5AC, Venezuela; HC1FG and HC1JB, Ecuador; VP3PHE, British Guiana.

CENTRAL AMERICA: TI2RA, TI2FG, TI2RC, Costa Rica; XE1KB, XE2FC, Mexico; NY2AE, Canal Zone.

NORTH AMERICA (and West Indies): VE5OT, Canada; VO6B, Newfoundland; HI5X, HI7G, Dominican Republic; VP9R, Bermuda; CO7CX, CO7CD, Cuba.

ASIA: FI8AC, French Indo-China; XZ2DY, XZ2EZ, Burma; HS1BJ, Siam; VU2CQ, VU2LL, VU2BG, VU2SE, India; VS7GJ, VS7RA, VS7RF, Ceylon; VS1AF, VS2AK, VS2AE, VS2AR, VS2AI, VS2AF, VS3AE, Malaya; VS6AB, VS6AG, VS6AH, Hong Kong; J2NF, J2NG, J2KJ, J2MI, J3FI, J8CF, Japan; XU8MC, XU8JM, XU8RB, XU8SL, China; KA1MH, KA1AF, KA1AP, KA1CS, KA1AX, KA1YL, KA1ZL, KA1BH, KA1ER, KA1MX, KA1HS, KA1ME, KA1MS, KA1GG, KA1MG, KA2OV, Philippine Islands; PK1MX, PK1RL, PK1BL, PK1MJ, PK1EP, PK1VY,

PK1AX, PK1GL, PK2JM, PK2RC, PK2WL, PK2HF, PK3AM, PK3CD, PK3VB, PK3SH, PK4VR and PK4DG, Dutch East Indies; K6BAZ, K6BNR, K6BJJ, K6CGK, K6KGA, K6KGJ, K6KMB, K6KRG, K6MZX, K6NTV, K6NZQ, K6OQE, K6KPS, K6BMI, K6GNW, K6MTE, K6MXM, K6OFW and K6OJI, Hawaiian Islands; K6OJG, Guam.

AUSTRALASIA: VK4HN, Papua.

Hourly Tuning Guide

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.

Key to abbreviations used:—S.—Sundays only; M.—Mondays only; W.—Wednesdays only; Th.—Thursdays only; F.—Fridays only. MIDNIGHT TO 1 A.M.

16.86, GSG; 16.88, PHI; 19.63, DJQ; 19.68, TPA2; 19.74, DJB; 19.8, YDC; 19.82, GSF; 25.4, 2RO; 27.27,

Special Trophy For Ultra-High-Frequency Reception

To stimulate interest in ultra-high-frequency reception, Mr. Alan H. Graham, Shortwave Editor of the "Radio World," is offering a special trophy for competition among readers. Conditions of this competition are as follow:—

1. The trophy will be awarded for the best verification from a 9-metre American police station, submitted to the Shortwave Editor before March 1, 1938.
2. Verifications must be specific, i.e., the frequency on which the station has been received must be clearly indicated.
3. In judging the entries, the judges will take into account the power of the station received, and the type of receiver used.
4. The decision of the judges will be final; the result of the competition will be announced in the April, 1938, issue of the "Radio World."
5. All entries should be addressed to the Shortwave Editor. All verifications submitted will be returned by registered post as soon as possible after the closing date.

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.

PLP; 28.48, JIB; 29.24, PMN; 30.61, XGOX; 30.78, COCQ; 31.38, DJA; 31.28, VK2ME (M.); 31.45, DJN; 31.49, ZBW3; 31.55, HS8PJ (F.); 31.8, COCH; 32.09, COBC; 32.59, COBX; 33.2, COBZ; 48.7, VPB; 49.9, COCO; 49.98, Rangoon; 58.3, PMY; 70.2, RV15.

1-2 A.M.

16.86, GSG; 19.63, DJQ; 19.68, TPA2; 19.74, DJB; 19.8, YDC; 19.82, GSF; 19.85, DJL; 25.0, RNE; 25.4, 2RO; 25.49, DJD; 25.53, GSD; 27.27, PLP; 28.48, JIB; 29.24, PMN; 48.7, VPB; 49.9, COCO; 58.3, PMY; 70.2, RV15.

2-3 A.M.

16.86, GSG; 19.82, GSF; 19.85, DJL; 25.4, 2RO; 25.49, DJD; 25.53, GSD; 48.7, VPB; 49.31, VQ7LO.

3-4 A.M.

16.86, GSG; 19.66, GSI; 19.85, DJL; 25.2, TPA3; 25.4, 2RO; 25.49, DJD; 25.53, GSD; 31.55, GSB; 49.31, VQ7LO.

4-5 A.M.

16.86, GSG; 19.6, GSP; 19.65, W2XE; 19.66, GSI; 19.85, DJL; 24.52, TFY; 25.2, TPA3; 25.49, DJD; 25.53, GSD; 29.04, ORK; 31.55, GSB; 49.31, VQ7LO.

5-6 A.M.

16.86, GSG; 16.87, W3XAL; 19.56, W2XAD; 19.6, GSP; 19.65, W2XE; 19.66, GSI; 19.67, W1XAL; 19.72, W8XK; 19.85, DJL; 24.52, TFJ; 25.2, TPA3; 25.49, DJD; 25.53, GSD; 27.17, CSW; 28.93, EHZ; 29.04, ORK; 31.28, PCJ (M., W., Th.); 31.55, GSB.

6-7 A.M.

16.86, GSG; 16.87, W3XAL; 19.56, W2XAD; 19.6, GSP; 19.65, W2XE; 19.67, W1XAL; 19.72, W8XK; 19.85, DJL; 25.0, RNE; 25.2, TPA3; 25.42, JZJ; 25.49, DJD; 25.53, GSD; 27.17, CSW; 31.28, W3XAU; 31.35, W1XK; 31.41, OLR3A; 31.55, GSB.

7-8 A.M.

16.87, W3XAL; 19.56, W2XAD; 19.63, DJQ; 19.65, W2XE; 19.72, W8XK; 19.85, DJL; 25.0, RNE; 25.2, TPA3; 25.42, JZJ; 25.45, W1XAL; 25.49, DJD; 25.53, GSD; 27.17, CSW; 31.09, CS2AA (CT1AA); 31.28, W3XAU; 31.35, KZRM; 31.35, W1XK; 31.38, DJA; 31.45, DJN; 31.48,

W2XAF; 31.55, GSB; 31.58, PRF5.

8-9 A.M.

19.56, W2XAD; 19.63, DJQ; 19.65, W2XE; 19.72, W8XK; 25.0, RNE; 25.2, TPA3; 25.45, W1XAL; 25.53, GSD; 30.31, CSW; 31.09, CS2AA (CT1AA); 31.27, HBL (S.); 31.28, W3XAU; 31.35, KZRM; 31.35, W1XK; 31.48, W2XAF; 31.55, GSB; 31.58, PRF5; 38.48, HBP (S.).

9-10 A.M.

19.56, W2XAD; 19.63, DJQ; 19.72, W8XK; 19.8, YDG; 25.45, W1XAL; 25.53, GSD; 25.61, TPA4; 30.31, CSW; 31.09, CS2AA (CT1AA); 31.27, HBL (S.); 31.32, GSC; 31.35, W1XK; 31.38, DJA; 31.45, DJN; 31.48, W2XAF; 31.55, GSB; 38.48, HBP (S.).

10-11 A.M.

19.63, DJQ; 19.8, YDG; 25.26, W8XK; 25.53, GSD; 25.61, TPA4; 31.25, RAN; 31.32, GSC; 31.38, DJA; 31.45, DJN; 31.48, W2XAF; 31.55, GSB.

11 A.M.-NOON.

19.63, DJQ; 25.26, W8XK; 25.53, GSD; 25.61, TPA4; 31.25, RAN; 31.32, GSC; 31.38, DJA; 31.45, DJN; 31.48, W2XAF; 31.55, GSB.

NOON-1 P.M.

19.63, DJQ; 25.26, W8XK; 25.53, GSD; 31.28, PCJ (F.); 31.32, GSC; 31.38, DJA; 31.45, DJN; 31.48, W2XAF; 31.55, GSB.

1-2 P.M.

19.63, DJQ; 25.53, GSD; 25.61, TPA4; 31.38, PCJ (F.); 31.32, GSC; 31.38, DJA; 31.45, DJN; 31.48, W2XAF; 31.55, GSB.

2-3 P.M.

25.61, TPA4; 31.48, W2XAF.

3-4 P.M.

19.63, DJQ; 19.74, DJB; 19.85, DJL; 25.61, TPA4; 31.28, VK2ME (S.); 31.38, DJA; 31.45, DJN; 49.18, W3XAL; 49.5, W8XAL.

4-5 P.M.

19.63, DJQ; 19.74, DJB; 19.85, DJL; 31.28, VK2ME (S.); 31.28, DJA; 31.45, DJN; 49.5, W8XAL.

5-6 P.M.

19.63, DJQ; 19.74, DJB; 25.23, TPA3; 28.14, JVN; 31.28, VK2ME (S.); 31.38, DJA; 31.45, DJN.

6-7 P.M.

16.86, GSG; 19.63, DJQ; 19.74, DJB; 19.76, GSO; 25.23, TPA3; 25.53, GSD; 28.14, JVN; 31.28, VK2ME (S.); 31.38, DJA; 31.45, DJN; 31.55, GSB.

7-8 P.M.

16.86, GSG; 19.63, DJQ; 19.71, PCJ (W.); 19.74, DJB; 19.76, GSO; 25.23, TPA3; 25.57, Saigon; 28.14, JVN; 31.38, DJA; 31.45, DJN; 31.49, ZBW3; 31.55, GSB; 31.55, VK3ME.

8-9 P.M.

13.93, GSJ; 13.97, GSH; 16.86, GSG; 19.63, DJQ; 19.71, PCJ (W.);

19.74, DJB; 19.76, GSO; 19.8, YDC; 25.53, GSD; 25.57, Saigon; 27.27, PLP; 28.14, JVN; 29.24, PMN; 31.28, VK2ME (S.); 31.38, DJA; 31.45, DJN; 31.45, VPD2; 31.49, ZBW3; 31.55, VK3ME; 34.0, VPD3; 44.64, PMH; 70.2, RV1S.

9-10 P.M.

13.93, GSJ; 13.97, GSH; 16.86, GSG; 19.63, DJQ; 19.68, TPA2; 19.71, PCJ (W.); 19.74, DJB; 19.76, GSO; 19.8, YDC; 25.0, RNE (W.); 25.57, Saigon; 27.27, PLP; 28.14, JVN; 29.24, PMN; 30.23, JDY; 30.61, XGOX; 31.28, VK6ME; 31.28, VK2ME (S.); 31.38, DJA; 31.45, DJN; 31.45, VPD2; 31.49, ZBW3; 31.55, VK3ME; 34.0, VPD3; 44.64, PMH; 48.7, VPB; 49.5, W8XAL; 58.3, PMY; 70.2, RV1S.

10-11 P.M.

13.93, GSJ; 13.97, GSH; 16.86, GSG; 19.63, DJQ; 19.68, TPA2; 19.74, DJB; 19.76, GSO; 19.8, YDC; 25.4,

2RO; 25.57, Saigon; 27.27, PLP; 28.14, JVN; 29.24, PMN; 30.23, JDY; 30.61, XGOX; 30.78, COCQ; 31.28, VK6ME; 31.28, VK2ME (S.); 31.35, W1XK; 31.38, DJA; 31.45, DJN; 31.49, ZBW3; 31.8, COCH; 32.09, COBC; 32.59, COBX; 44.64, PMH; 48.7, YPB; 49.5, W8XAL; 49.98, Rangoon; 58.3, PMY; 70.2, RV1S.

11 P.M.-MIDNIGHT.

13.93, GSJ; 13.97, GSH; 16.86, GSG; 16.88, PHI; 19.56, DJR; 19.63, DJQ; 19.68, TPA2; 19.74, DJB; 19.76, GSO; 19.79, JZK; 19.8, YDC; 19.85, DJL; 25.4, 2RO; 25.42, JZJ; 25.57, Saigon; 27.27, PLP; 29.24, PMN; 30.61, XGOX; 30.78, COCQ; 31.28, VK2ME (S.); 31.35, W1XK; 31.38, DJA; 31.45, DJN; 31.49, ZBW3; 31.51, HS8PJ (Th.); 31.8, COCH; 32.09, COBC; 32.59, COBX; 33.2, COBZ; 44.64, PMH; 48.7, VPB; 49.5, W8XAL; 49.9, COCO; 49.98, Rangoon; 58.3, PMY; 70.2, RV1S.

(Continued on page 48)

Third S.W. DX Contest Won by R. Simpson, of Sydney

ANOTHER large entry was received for the third "Radio World" DX contest, which closed on January 1. Once again the task of determining the winner of the Replogle Globe trophy was extremely difficult, as many of the verifications submitted were of the very highest class.

The winner of the trophy is that well-known dixer, Mr. R. Simpson, of Concord West, N.S.W., whose winning entry was a verification card from station HRN, Tegucigalpa, Honduras, operating on 51.1 m. HRN was logged by Mr. Simpson at 3.40 p.m. on Sunday, July 4, 1937—signals were QSA3, R5. For this reception Mr. Simpson used a home-built 10-valve superhet, with a N.-S. antenna 100 feet long and 50 feet high.

In addition to this winning entry, Mr. Simpson submitted three other verifications of very great merit. These were from CR6AA, Lobito, Portuguese West Africa (41.7 m.); ZEB, Bulawayo, Southern Rhodesia (48.78 m.); and ECN1, Barcelona, Spain (42.8 m.). Taken together, these verifications constitute a remarkable feat of DX.

Previous Winner Was Runner-Up

The runner-up this month was Mr. A. Maule, of Patea, N.Z. (who, incidentally, carried off the second trophy in last October). His best entry was a card from W10XDA, on board the schooner "Morrissey,"

which carries the Bartlett Arctic expedition. When heard, the vessel was located approximately 200 miles south of Greenland. W10XDA operates on the 20-metre amateur band with a power of 100 watts. Other cards submitted by Mr. Maule were: EA8AE, Los Palmas, Canary Islands; EI3J, Irish Free State (10 watts); TI5JJ, Costa Rica; K7FST, Alaska; and VP5PZ, Jamaica.

Honourable mention goes to Mr. W. T. Choppen, of Timaru, N.Z., for his reception of the Dominican station HI2X (25.08 m.) on a three-valve receiver. Mr. Choppen also entered verifications from CR7BH, Laurence Marques, Port. East Africa; PK1ZZ, Java, D.E.I.; and EA9AH, Spanish Morocco.

In response to several requests, the better-class entries submitted by other competitors are given below. This should enable readers to estimate the chances of their entries in subsequent contests—for the "Radio World" has decided to continue the present series at four-monthly intervals.

Mr. J. E. Linehan, of Adelaide, S.A.—The following 20-metre amateurs: CT1AY, K7FBE, YV5AK, OA4AL, ZU5N, VP6TR, CN8AJ and VS7MB. Also a card from HJ1ABP, 31.25 m.

Mr. G. O. La Roche, of Perth, W.A.—A card from TFJ, Iceland, on 24.5 m.

Mr. C. Broel, of Marrickville, (Continued on page 48)

Round-Table QSO Smashes Previous Record



Some views of W4DLH, with owner-operator "Bill" Burkhart, who represents North America in the Round Table hook-ups.

Six Amateurs In All-Continent Hook-Up Encircle Globe In Three Minutes Twenty Seconds!

By D. EVANS

"RADIO WORLD" readers will remember that this journal was the only Australasian publication which gave particulars of the All-Continent Hook-ups from December 19, 1936, to January 19, 1937, in which VK4JU represented this continent.

The record time during that period for a complete relay was eight minutes ten seconds, and this was internationally considered a record that could only be repeated but not broken. Wide publicity was accorded this feat in English, American, French and Japanese radio journals, and the obvious interest taken has evidently spurred the amateurs concerned to fresh efforts.

Listeners on the 20-metre band during the past few weeks must have become familiar with the calls W4DLH, VU2CQ, G5ML, HK5AR (ex HK1Z), SU1KG and VK4JU, for these were the participants who have put in some strenuous experimenting prior to their record-breaking relay.

Last year an attempt was made by Mrs. Dorothy Hall, W2IXY, to obtain a recording of the complete hook-up, and the desire to hear their own transmissions re-broadcast may have been the reason for the time taken on that occasion. On January 4, 1938, the communications were restricted to greetings, acknowledgments of reports, and reports on each station, which provided an excellent example of how world amateurs are able to demonstrate correct and efficient traffic handling when the occasion demands it.

The stations participating in the All-Continent Hook-up were W4DLH, Gould, Florida; VU2CQ, Bombay, India; G5ML, Kenilworth, England;

SU1KG, Alexandria, Egypt; HK5AR (ex HK1Z), Colombia; and VK4JU, Brisbane, Aust. Two changes from the original gang will be noticed. HK1Z operated under his new call, and SU1CH, of Cairo, was unable to take part, but his place was admirably filled by SU1KG, of Alexandria.

The relay was started by W4DLH at 13-18 G.M.T., who handed over to VU2CQ, Bombay. Then it passed in turn to G5ML, England, HK5AR, Colombia, and VK4JU, Brisbane, the last to take over being SU1KG, Egypt, who returned it to W4DLH, Florida.

When the time was checked at 1321.20 G.M.T., it was found that the circuit had been completed in three minutes twenty seconds—a truly wonderful piece of amateur work which definitely discounts the theories which have been formed regarding the "fluke" nature of last year's transmissions.

This repetition finally proves that all continents can hear and speak to each other when conditions are suitable. This research on world conditions during December and January may provide yet another commercial proposition which "hams" have pioneered, and with the near approach of the Cairo Conference, it might be well for some of those antagonistic representatives to digest the fact when they are making attempts to curtail the amateur frequencies.

The most notable achievements in high frequency radio have been the work of amateur experimenters, and no finer compliment could have been paid them than the readiness exhibited by English and American television companies in seeking the

co-operation of amateurs in the development of this latest branch of radio.

The result of the Cairo Conference will be awaited with intense interest. American amateurs are already organized for their attack on the Cairo citadel, and if wishes count for anything, they must certainly have the world of amateur radio with them. Such achievements as the All-Continent Hook-up is a justification of the work, time and money spent by men and women who have the real qualifications of the experimenter, and who are in the game not for pecuniary purposes, but the sheer enjoyment that can only be realised by achievement in a hobby that calls for keen thinking, tenacity and patience.

The antenna and rig used by VK4JU were the same as used for the last All-Continent Hook-up, and comprises a 210 crystal-controlled oscillator with 350 volts on the plate. The 20-metre doubler and the P.A. are 46's carrying 600 volts. A UX250 is used as modulator, the speech amplifier comprising a 57, 57 (class A) and 59 pent. The antenna is two half-waves in phase.

A check on the log at VK4JU gave the following interesting information:—

JAN. 4, 1938.	TIME: 1318 G.M.T.			
	My report.		His report.	
	QSA	R	QSA	R
W4DLH	5	6	5	6
VU2CQ	5	8	5	8
G5ML	2/3	3	3/4	4
HK5AR	5	5	5	5
SU1KG	4/5	4/5	5	6

Total distance covered: 52,000 miles.
Time to complete relay: 3 m. 20 s.

W4DLH is preparing a photographic souvenir of the occasion, which will carry pictures of all operators and their rigs. This will be reproduced in this journal when received.

Round The Shacks 6

- VK3ZK -

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

By "REPORTER"

AMATEUR station VK3ZK is owned and operated by Jim Stevens, and is located at West Gray St., Swan Hill.

The station came on the air on December 28, 1933, the rig then being a 210 as crystal oscillator. This was later replaced by 46 crystal oscillator and 210 P.A. Telefunken modulation was used, and although results were not startling, a number of contacts were enjoyed.

Transmitter And Receiver Details

About 18 months ago the present rig was constructed, the r.f. line-up being as follows:—6A6 Jones exciter, capacity-coupled to 45 buffer, link-coupled to an 801 P.A., link-coupled to a half-wave 80-metre zepp antenna.

'Phone is often used. 80 metres is the band used mostly, though occasionally 3ZK is heard on 40 and 20 metres. The audio line-up is as follows:—Crystal microphone, 6C6 resistance-coupled to a second 6C6 (head amplifier), r.c.c. to one triode section of a 6A6, speech amplifier, r.c.c. to a 42 triode driver, transformer coupled to a pair of 42 triodes, class AB modulation. The receiver is at present 58 electron-coupled detector, 2A5 audio.

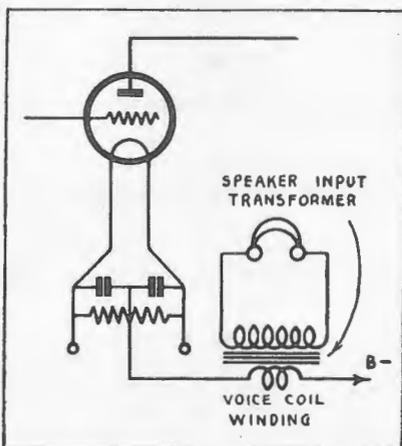
Over 2,000 QSO's To Date

The number of QSO's to date are 2,126, most of these being on 80 metres. As 3ZK hasn't been bitten by the DX bug, he hasn't W.A.C.—

3ZK uses this simple but effective arrangement for monitoring his 'phone transmissions.



Jim Stevens, owner-operator of VK3ZK.



the only DX worked is XU. He has contacted VK2, 3, 4, 5, 6, 7, and ZL1, 2, 3, 4, on 80 m.

The power used varies between 18 and 25 watts, depending on line voltage.

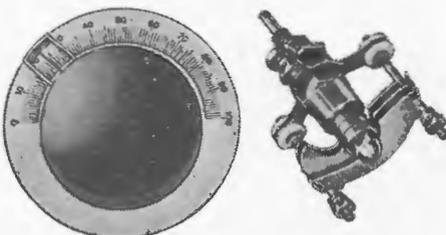
The type of monitor for 'phone use may be of interest. A speaker transformer and a pair of 'phones are all the components necessary. The voice coil winding of the transformer is connected in series with B— in the P.A., the 'phones being across the other winding, as shown in the sketch. This monitor has proved quite satisfactory.

The reason 3ZK joined the ranks of ham radio?—A desire to have a chat with chaps he could only listen to otherwise.

The "EDDYSTONE" bandspread method of short wave tuning is devised to simplify station selection. Two Condensers are used, the first or Tank Condenser being a compact Air Dielectric unit having a capacity range of 10 X 14 m.mfd. This is achieved with a patented stop device graduated in 10 steps. Each step covers a capacity of 14 m.mfd., band settings being accurately pre-determined and controlled by a black bakelite switch knob moving over a metal dial plate graduated 0-10.

Cat. No. 1042
PRICE, 11/-.

EDDYSTONE
Radio Components



Cat. No. 1043. PRICE, 12/6.

Parallel with the Tank capacity, the "EDDYSTONE" bandspread slow motion trimmer having 9-1 reduction ratio is used. It has a capacity range slightly greater than each separate step of the Tank Condenser. This enables each 10th section of the whole to be spread over 180° and provides a tuning ratio of 90-1. It gives a definite advantage in short wave tuning, in that a fairly large movement of the bandspread condenser is necessary to effect small changes in tuning, thus separating stations which with generally accepted tuning circuits appear too close to one another to allow clear operation, and has a smooth separation. No. 1043.

Eddystone Components are obtainable in all Capital Cities or from the Distributor: R. H. CUNNINGHAM (VK3ML), 1449 High St., Glen Iris, S.E.6, Vic.

1937 An Eventful Year

THAT 1937 was a "boom" year for shortwave reception will be readily admitted by any dxer who takes the trouble to look back through his log book of the past year; or, better still, glances over his verifications for the same period. QSL cards of the more-difficult-to-log stations seem to possess a subtle attraction for the really enthusiastic dyed-in-the-wool S.W.L., who seldom, if ever, tires of producing them for the admiration of less fortunate acquaintances.

And how 1937 has provided for the accumulation of such prized "veries"! If you have any cause to doubt this statement, just spend a few minutes perusing the following brief review of the highlights of 1937's shortwave doings—and be convinced.

From the wealth of material available for an article such as this, two facts seem to stand out—first, the rapid and sensational advances made in ultra high frequency reception (due, it is said, to intense sunspot activity, which has led experts to predict even better conditions in 1938; and second, the ever-increasing use being made of shortwave transmissions for the dissemination of propaganda, most aptly illustrated by the broadcasts from the war zones in Spain and in the East.

★

5-Metre 'Phone To England

As far as the ultra high frequencies are concerned, an announcement which appeared in the November issue of the "Radio World" must undoubtedly take precedence. Readers will recall that it concerned the reception of VK2NO's 5-metre 'phone signals by a listener in North Wales. Ten thousand miles on five metres! A few years ago—in fact, only a year ago—it would have read like something from Jules Verne; now it is an undoubted fact.

Unfortunately, the average S.W.L. is not possessed of equipment suitable for 5-metre work, therefore the channel between 25,000 and 35,000 k.c., within which are to be found two broadcast and two police bands in addition to the 10-metre amateur band, should be of more practical interest.

As far as the broadcast u.h.f. bands are concerned, both have been rather erratic throughout the course of the year, with two periods of really good reception in February-March and September-November respectively. It was as far back as May, 1936, that signals were logged in this country on the 31,600 k.c. (9.49 m.) channel. These proved to be from the Los Angeles station,

For S.W. Dxers

Many New Stations Logged ★ Ultra High Frequencies Provide Thrills ★ War Broadcasts Of Outstanding Interest ★ South Americans Roll In ★ Remarkable Results On 20m. Band.

By **ALAN H. GRAHAM**

Shortwave Editor "Radio World"

W6XKG, which subsequently (February, 1937) shifted its frequency to 25,950 k.c., 11.56 m., where it was heard very well during the winter months. Towards the end of the year, however, 11 metres became very patchy, and W6XKG was heard only at infrequent intervals. It was while in search of this station that W9XAZ, Milwaukee, was discovered on 26,400

W9XPD put in stronger signals on most occasions, these being sufficiently strong to overcome the opposition of QRM to such an extent that loggings of QSA4, R7-8 were sometimes possible. The writer was also lucky enough to log and verify another of the 9-metre transmitters—one of which most Australian listeners are ignorant—the 50-watt W9XHW, Minneapolis.

★

Police Transmitters

But of considerably more interest were the American police transmitters on 30,100 and 33,100 k.c. (9.9 and 9.06 m.). Signals from these stations often reached good speaker strength, being heard best in the months of February, September and October.

Unfortunately, the identification of these stations is rendered more than a trifle difficult at times by two factors—the absence of a reliable list of such stations and the rapid-fire announcements of the "despatchers" handling the messages broadcast. However, by dint of considerable patience, the writer was able to identify no less than twenty-five of these transmitters, and at the time of writing, verifications have been received from eleven of them.

★

War Broadcasts From Spain And The East

The second outstanding characteristic of shortwave work during 1937, as was pointed out above, was the war broadcasts from Spain and the East. Listeners' appetites for transmissions of this type were whetted by the broadcasts from Addis Ababa during the Italo-Abyssinian conflict.

At the commencement of the struggle in Spain, the broadcast stations (both commercial and ama-

DX Club Report Forms Great Time-Saver For Dxers

Every experienced dxer knows that the simplest and surest way of ensuring a verification from a station is to prepare the report on a form specially designed for the purpose. The Official Report Form of the All-Wave All-World DX Club is ideal. All the information appreciated by stations is given, and all that is necessary to complete a report is to fill in the blanks provided.

By using these forms, dxers can not only be certain of supplying every detail wanted by the station, but also they are identifying themselves with an established Club, and so are far more likely to receive back replies than if an ordinary letter were sent.

These forms are sold to members only at a price of 1/6 for 50, post free.

k.c., or 11.3 m. Signals from W9XAZ were seldom strong, despite the fact that it is one of the most powerful of the u.h.f. transmitters, using 500 watts.

On the 31,600 k.c. channel, QRM has always been a serious obstacle to the identification of signals heard. For some rather obscure reason, a quite considerable number of American broadcasters use this one frequency on closely corresponding schedules. The result is, at times, an almost indescribable mingling of heterodyne whistles and signals from an unknown number of stations.

Of these 9-metre stations, the most widely known is W8XWJ, Detroit, which is located on top of the famous Penokcot Tower. However, it was found that the St. Louis station

teur) were rapidly brought under the control of one party or the other, but were not used very extensively for propaganda during the early months of the war. The Republicans were the first to realise the possible advantages to their cause which might result from a systematic broadcast presentation of their case. Accordingly, they arranged for transmissions to be made in a number of languages over the powerful Madrid stations EAQ (30.4 m.) and, later, EAQ2 (EAR) (31.6 m.). The Nationalists were not long in following this lead, and finding in General de Llano an ideal exponent of their views, proceeded to wage this wordy warfare in real earnest.

Since these early days, the organisation of the radio activities of both sides has become increasingly important. The appeals are made not only to Spaniards, but to the nations of the world, for the great majority of the broadcasts have assumed a multi-lingual aspect—German, French, Spanish, Arabic, etc., being used.

Readers will not have failed to see mentioned the following war transmitters:—

Republican (Government): EAQ, EAQ2 (EAR), and a number of "party" transmitters, located chiefly in Barcelona and operating principally on the 40-metre amateur band. Of these, ECN1 (42.8 m.), ECP2 (41.9 m.) and EAP1 (42.3 m.) were the most important.

Nationalist (Insurgent): The now world-famous EA9AH, located in Tetuan, Spanish Morocco; logged by almost all dxers on 42 and 21 m. Also the Canary Islands stations EAJ43 and EA8AE, the former, on 28.93 m., being especially consistent.

On many occasions the broadcasts from Madrid provided dxers with a real thrill, as the transmissions were carried on during insurgent air raids, with the roar of anti-aircraft guns plainly audible in the background.

★

Eastern War News

The outbreak of hostilities in China was a signal for a repetition of the events in Spain. Almost immediately, the two sides of the question were placed before the world. A new transmitter on 30.2 m., Radio Darien, nightly presented the Japanese view, while XGOX, the station of the Nanking Government, spoke for China.

Of greater interest, however, were the activities of the American N.B.C. in its efforts to provide first-hand information for its listeners. In September, several stations located in Shanghai were heard relaying news either to the N.B.C. network via the R.C.A. stations in California, or to Manila. XOB1 and XRC1 were the calls heard by many 20-metre amateur fans.

Yet another aspect of these broadcasts was the handling of traffic by

Shanghai amateur stations, which operated right throughout the bitter struggle for the city. Almost every listener heard XU8MC on his daily "skeds" with amateurs in the Philippines, Hawaii and America.

★

Africans Now Easier To Log

Most dxers will agree that the logging of African stations in any considerable number is a feat in which justifiable pride may be taken. Indeed, until last year the receipt of even one African "veri." was sufficient to raise the average S.W.L. to a high pitch of excitement. But 1937 saw the number of more or less easily logged Africans so greatly increased that it seemed as if one might become blase tuning them in. This state of affairs was brought about by the colonial activities of several European powers.

On assuming control in Abyssinia, the Italians instituted a comprehensive 'phone service between Rome and the more important colonial centres. Reports on such stations as IUD, Addis Ababa, 16.42 m.; ITK, Mogadiscio, 18.32 m.; IUG, Addis Ababa, 19.41 m.; IDU, Asmara, 22.42 m.; IUC, Addis Ababa, 25.09 m.; ICK, Tripoli, 31.71 m., were speedily verified by the Ministry of Marine in Rome.

★

French Colonial 'Phones

In the French colonies, too, a number of very interesting stations came on the air for telephony work with Paris. The best of these from a DX point of view was the station "Poste Bizertin," located in Tunis, North Africa, which tested on 48.7 and 24.3 m., being heard in Australia on the latter wavelength.

★

Some Southern Africans

All the above-mentioned transmitters, you will have noticed, are located in North Africa, but several new and rather important loggings of South Africans were noted during 1937. For example, that elusive 'phone station on 15.8 m., ZSS, was at length verified on its nightly contact with GAQ, Rugby. Also another South African whose "veri" is held by probably not more than one dxer in Australia was a 1937 logging—ZEB, Bulawayo, Southern Rhodesia, operating on 48.8 m.

Following the example of Italy and France, Portugal commenced the construction of a series of colonial transmitters in both Angola and Mozambique (Portuguese West and East Africa). Who will fail to recall CR7AA and CR7BH in Laurence Marques? Or CR6AA in Lobito?

Finally, we must include Madagascar with the Africans. And how the interest in "Radio Tananarive" was accentuated by the lack of reliable information! However, this mystery was finally solved by the news that the station now transmits regularly on 49.9 and 31.5 m.

★

PCJ's Anniversary

Turning to Europe, it can be said that the celebration by station PCJ of its tenth anniversary (from November, 1937) was all-important.

To commemorate the occasion, PCJ

Have Your "RADIO WORLD" Posted To You Direct

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

Name.....

Street and No.....

City..... State.....

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.

has recently completed a new 60 k.w. transmitter and a novel beam antenna. This latter is a massive steel structure which can be rotated on circular tracks by remote control from the operator's station. In this way the beam can be directed with considerable precision, and it has been calculated that the power radiated will have the same effect as the radiation of a dipole aerial operating with a power of 2,000 k.w.

At the present moment this experimental aerial system will only be used on the 31-metre band; other wavebands will be similarly equipped later.

★

That New Polish Station

As was mentioned in a recent issue of the "Radio World," a new Polish station is now being eagerly searched for by dxers. "Radio World's" competent West Australian observer, Mr. G. O. La Roche, was probably the first listener in Australia to report this new 26 m. transmitter. Located in Warsaw, SPD uses a power of 2 k.w. and has a directional antenna towards North America when relaying SPW.

Early in 1937 the Swedish amateur station of the Royal Technical University of Stockholm, call SM5SX, was heard on 25.6 m. Subsequently this frequency was taken over by a new government station, SBG, SM5SX returning to purely amateur work on 20 m.

Another feature of reception from Europe was the large number of 'phone stations which were audible. In this matter it would be as well to mention once again that verifications are still obtainable for correct reports on English, French and German 'phone stations. The last mentioned proved especially reliable verifying for DAF, DFB, DFD and DFZ; while the Engineer-in-Chief's Office in the G.P.O., London, checked up on GAQ, GAS, GBL, GBC, GBB, GCP, GBS and GBU.

★

Many New Stations In Asia

Fare from Asiatic stations during 1937 was very varied, with a wide range of new stations and new countries logged and verified. Of great interest was a recent report of reception of a Persian 'phone station, EPB, Teheran, heard on 19.87 m. Other Asiatics ('phone only) heard during the year, and worthy at least of passing mention, were ZGB, Kuala Lumpur, Malaya, on 22 m.; and a number of Chinese stations heard so well shortly before the outbreak of the war in that country. Readers will readily recall XOJ (18.9 m.), XGW (28.79 m.), and XTC (32.2 m.) in Shanghai; XTK, Hankow; and XTV, Canton.

Rangoon And Colombo On 49 Metres

During the winter months, when the 49-metre band was reasonably free from the troublesome noise-level which is so frequently its bane, a new station in Rangoon, Burma, provided listeners with an opportunity of adding one more country to their log. Operating on 49.94 m. around midnight, Rangoon put in a nice steady signal for some months. Less than 150 k.c. from its frequency another good Asiatic "catch" was heard regularly at about the same time, namely, Colombo, Ceylon, on 48.7 m.

One cannot fail to mention "Radio Philco," in Saigon, French Indo-China, for their good signals on 25.57 m. (although little was heard of their simultaneous tests on 49.75 m.); also there was HS8PJ, Bangkok, Siam, to cause recently a slight flutter by transferring their regular Thursday night transmissions from 32.09 to 31.5 m., on which latter wavelength they are still being heard very well.

Of considerable interest, too, was the reappearance in the shortwave sphere of KZRM, Manila, which recently conducted tests on 31.35 and 25.35 m. Intended primarily for the Philippine Islands, these transmissions were so well reported on by listeners all over the world that KZRM hope to continue these experimental broadcasts, possibly on new frequencies.

★

Solar Expedition Heard : Hindenburg Disaster

Apart from the loggings of u.h.f. stations on 9.49 m. previously referred to, there was little to enthuse over during 1937 as far as the Americans were concerned. On 16, 19, 25 and 31 m., the usual stations were logged at the usual times; 49 m. was extremely disappointing, but this was more than compensated by an extraordinary improvement on 13 m., where W2XE and W8XK were heard at good strength on several occasions. Strangely enough, the least satisfactory band provided one of the thrills of the year, the description of the Hindenburg disaster over W2XE being heard on their 49 m. allocation.

A series of transmissions of interest were those in connection with the scientific expedition to record the solar eclipse of June 8. Sponsored by the National Geographic Society and the United States Navy, in co-operation with a number of other bodies, the expedition was located on Enderby and Canton Islands, in the Phoenix group. The N.B.C. transmitter, WMEF, on board the U.S.S.

"Avocet," kept the world advised of the progress being made, using the 17, 23 and 34 m. ship channels.

★

Many New Mexicans

Quite a number of new Mexican stations provided some interesting DX during the winter and early spring, when the Latin-American stations rolled in in fine style in the afternoons. Such transmitters as XEFT (49.02 m.), XEDQ (31.5 m.), XEBR (25.38 m.), XEBT (50.08 m.), XEUZ (49.02 m.), XEWI (25.21 m.), XEYU (31.24 m.), XEPW (49.1 m.) and XEWW (19.79 and 31.58 m.) were fairly easy to add to one's log. The last mentioned, XEWW, rewarded listeners' reports with one of the handsomest QSL cards on record.

However, the highlight of the year was the verification of HRN, Tegucigalpa, Honduras, on 51.1 m., by the winner of the third "Radio World" DX Contest, Mr. R. Simpson.

The other Central American republics also provided some interesting reception. In Panama, two new stations took the air on the 25 m. band, HP5A, Panama City, 25.6 m., and HP5I, Aguadulce, 25.22 m. In Guatemala, TG2, 47.55 m., and TGWA, originally on 31.75 m., but recently testing on 30.9 and 25.5 m., were outstanding—and remember, OM's, there is no need to enclose reply coupons with reports to these stations, as they enjoy governmental franking privileges. And finally, the latest country seriously to enter the shortwave sphere is the tiny republic of Salvador, where new stations in YSM (25.64 m.) and YSH (31.52 m.) are testing.

★

South Americans—Peruvians Active

The South Americans were heard better last year than ever before. This was especially so in the case of Peru, in which country many new transmitters commenced transmissions, which were well received in Australia. The following are but a few:—OAX4Z, Ica, 49.25 m.; OAX4P, Huancayo, 49.0 m.; OAX4G, Lima, 48.15 m.; OAX1A, Chiclayo, 48.98 m.; OAX4K, Lima, 46.68 m.; OAX4T, Lima, 31.3 and 33.03 m.; OAX5C, Ica, 31.11 m.; OAX5A, Ica, 25.43 m.

For some time during the winter, a station on 24.39 m. defied identification. However, it eventually proved to be "Radio Service," Santiago, Chile; call, GB615. Latest advice is to the effect that a new frequency on the 25-metre band will be used in future, with the call CB1170.

As for the others—well, the Colombians (such as HJ1ABE, HJ4ABH, HJ1ABB, HJ1ABP, etc.), Venezuelans, Brazilians and Argentinians

(Continued on page 48)

DX News and Views

A page for
letters from
DX readers

Latest Loggings And Verifications

I have not gone in very extensively for verifications, and in the past have confined myself, with a few exceptions, to the less powerful broadcasting stations. So far I have cards from TGWA, CSW, HIN, HI1X, HI2X, KZRM, COCH, 9ML, XEWI, ZBW, COBC, W9XAA, CT1AA, CR7AA, CR7BH, VPD and TIPG, and have reported to CQN, LZA, Burma, OAX4J, XEWW, OAX5C, CX8A, 7LO, OXF, JDY, Salamanca, COCM, COBC, TI4NRH, ZRH, but have not yet received verifications. During the last two or three weeks I have been concentrating on the 49 m. band in the early mornings from 4.45 onward, and have found this band to be very interesting at this time. The following have all been heard at good volume: RV59, ZRH (49.96), DJC, OLR2B, 7LO, YUA and GSA.

There is another station which appears to be a mystery. It is on approximately 49 m., appears to be Loyalist Spain, opens at 6 a.m. with "Internationale," gives talks right through to 7 a.m., when it closes first with clock chimes and strike of 12, then carillon for two or three minutes, finishing up with the "Internationale." The strike of 12 has me tricked, unless, of course, it is not meant to be a clock at all. Sometimes they finish their talk at 6.55, and then remain silent until 7, when they close as usual.

Was lucky to hold ZRH Pretoria one morning from 5 a.m. until closing at 7 a.m.—usually there is much interference. They broadcast partly in Dutch and partly in English, and are good early, but are very weak by closing time. 7LO is also excellent until closing at 5.15 a.m.

Have you noticed that COBC have changed their wavelength and are down to about 30 m., just below JDY? Another little-mentioned station was heard a couple of weeks ago in the person of TI4NRH, Costa Rica, closing at 11 p.m. Sunday night. A few days ago, YUA, Belgrade, was heard at good strength round about 5.30 a.m. on 49.18, but they begin then to weaken rapidly. This can be heard practically any day, subject, of course, to the fluctuating conditions.—J. N. Prior (AW340DX), Coonamble, N.S.W.

Card From British Guiana Expedition

My latest loggings on 'phone are: VP3PHE, HI7I, HI3E, KA1AF, KA-1MH, FI8AC (Fr. Indo China), SM-7YA, SM5VJ, SU1DB, G5RN, G6DT, XU8RB, VS7RA, VS7GJ, VS2AI, PK-1VY, PK1JR, PK1BL, PK1VX, PK-2WL, GM6WD, SM5SD, and numerous VKI, 2, 3, 4, 5, 6 and 7, and W1-9.

On C.W.:—VR4AD (Br. Solomon Isles), K5AA, VR2FF, K5AG, HA-3Q, SM5KJ, G5YU, PA4EA, K6NXB, also FI8AC and numerous VK, ZL and W hams. VP3PHE, by the way, is the Holden Expedition of the American Museum of Natural History. Reports should be addressed c/o. N.B.C., R.C.A. Bldg., Rockefeller Plaza, New York City. They are investigating plant life, etc., and expect to be in British Guiana for some months, so go it, chaps.—Con. A. Stiglish (AW335DX), Morninston, Dunedin, W.1, N.Z.

Latest ZL And VK B.C. Veries

The following stations have been verified since I last wrote:—2GZ, 2KO (N.S.W.), 3HA (Vic.), 4BK, 4LG (souvenir card of test transmission; is now 4QR) (Q'land), 7UV (Tas.), and 1YA (N.Z.).

I would like to exchange QSL cards with other dxers.—F. Dubbo (AW305DX), City Road, Beenleigh, Q'land.

Norwegian Boat S.S. Troja Verified

I received the following verifications before joining the Club:—VK2's ABF, ADE, ADT, AP, ZX; VK3AL; VK4's KO, LP, KL, FN, LQ, UX, NO, RS, RM, LW, CD, HA, VH,

TY, SA, XM; VK5's GM, LB, TR; VK6's MU, MW, and K6BNR, KYNZQ, KA1ME, VE5OT, all on 'phone. I received a card from the wireless operator on the s.s. Troja, a boat from Norway on a visit to Gladstone (Q.). The operator visited the shack of VK4NO, and I received the card through the latter station. The call letters on the card were LAM-350.—Mr. Charles H. Thorpe (AW342DX), 25 Charles St., North Rockhampton, Q'land.

Useful Book From Daventry

I sent a full report to Daventry some time ago, despite the fact that this station will not verify, and I had in return a nice letter of thanks from the Engineering Section of the B.B.C., and a book, "The Empire Broadcasting Service." This consists of 56 pages of photos, illustrations, and s.w. hints.

Regarding a suggestion of mine in the "Radio World" of June last, that Club Members correspond with one another, using the list published now and again, I have an overseas club member from Cuba in touch with me now.

There would be probably more response if the Club members' full addresses were included at the bottom of letters, etc., published.—Gordon Young (AW245DX), Paterson St., Teneriffe, N.I. Brisbane, Q'land.

★ QSL Exchange Bureau

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

B. Russell (AW201DX), Taumarunui, New Zealand.

DX Club member George Lance, of Hamilton, Vic., is an enthusiastic dxer, and has a fine collection of QSL's from all parts of the world.



Third S.W. DX Contest

(continued from page 41)

N.S.W.—Cards from amateur stations F18AC, EA9AH, VS7GJ, G6DT and PK6WF. The reception of the last-mentioned was rather interesting, as PK6WF is a portable transmitter with a geological expedition in New Guinea.

Mr. T. D. Dowling, of Swan Hill, Vic.—Cards from CN8MS and GM6HZ.

Mr. W. Plant, of Newcastle, N.S.W.—A card verifying 'phone reception of HI7G on 20 metres, using only a one-valve receiver (a twin triode 19 type valve).

Mr. H. A. Matthews, of Ellerslie, Vic.—Card from GPGX, confirming first S.W.L. report from Australia.

1937 An Eventful Year For S.W. Dcxers

(Continued from page 46)

tine stations rolled in steadily. The transfer of the former 31 and 49 m. Colombians to approximately 62 m. will be regretted by Australian listeners.

★

A Host Of Cubans

From the West Indies came a stream of signals from an apparently inexhaustible number of Cubans. Not so long ago these "CO" stations were a rarity; last winter they "popped up" everywhere, causing no little confusion by the similarity of some of the call-signs. COBC, COBZ, CODX, COGF, COJK, COCM, COCQ, COCX, COCO, COCD, and so on ad infinitum.

Cuba's next-door neighbour, Haiti, also has a considerable number of shortwave stations, but the majority of these are exceptionally low-powered, hence the infrequency with which they are logged in this country. A newcomer on 25.08 m., however, created some interest—HI2X—which was heard several times broadcasting the drawing of a lottery.

★

20-Metre Amateurs Excellent

No review of 1937 would be complete without some mention of the 20-metre amateur band. Reception there was amazing, the results obtainable being such that many dxers camped on this band for indefinite periods, and, in so doing, probably missed golden opportunities of logging many of the unusual stations referred to above.

However, such concentration had its compensations in the form of some splendid QSL cards, the writer having handled some outstanding exhibits in connection with the "Radio World" DX Contests).

Marchesa Marconi To Arrive In April

(continued from page 6)

friends of the Royal Family in Italy.

Elettra Marconi, who is 7 years of age and a god-daughter of the Queen of Italy, takes her name from the yacht "Elettra," in which Marconi had for many years carried out important wireless research and conducted many experiments of world-wide importance. It will be particularly remembered that Marconi sent wireless signals from the yacht "Elettra," then somewhere in the Mediterranean, which automatically caused the lights to be switched on at the Sydney Town Hall on the occasion of the Radio Show being held there in 1929.

Brisbane A.T.R.S. Meeting Held On January 19

By W. J. HUDSON

The next meeting of the Trained Radio Servicemen's Institute will be held at the rooms in Albert Square, Brisbane, on January 19. After the general meeting, Mr. Harmer will lecture on "Frequency Changing And Harmonics," and regular weekly lectures will begin on January 26, while on Wednesday nights a lecture and discussion will take place on service problems. The next examination will be held in March. Mr. Haybrook lectures on January 26 on "Audio Systems."

We have had inquiries for service mechanics from firms, making it evident that the Institute is rapidly becoming known as a recognised source of fully qualified men.

A burning question for some time has been our country branch exams. It is now proposed to hold country exams. before a local J.P., but this scheme is not yet finalised.

We extend an invitation to all radio men to attend the lectures scheduled above. Full particulars can be obtained from Mr. Brayne, of Trackson's Ltd., K. Elliot, of Harold's Radio, or from Dave Laws, of Crammond Radio. Our president, Mr. Cantelin, is in Melbourne at present.

I noticed quite an epidemic during the holidays of members who have built the "Companionette Three" described in the "Radio World." This little set makes a very handy portable. There is an extraordinary variety of car top aerials to be seen in Brisbane. Surely someone can produce a neat, efficient aerial for a metal top sedan car?—it should be easy to sell.

Dr. Van Der Pol Coming

A WORLD-FAMOUS Dutch radio scientist, Dr. van der Pol, will be an official guest of the Institution of Radio Engineers (Australia) at the World Radio Convention to be held in Sydney in April during the 150th Celebrations. He will arrive at Sydney on the day the Convention opens, April 4, by the s.s. Nieuw Holland, and will return, via America, by the s.s. Niagara, departing on the final Convention day, April 14.

Dr. van der Pol was born January 27, 1889, at Utrecht, Holland. He studied experimental physics under Professor J. Ambrose Fleming in London, 1916-17, and with Professor Sir J. J. Thomson at Cambridge, 1917-19. In 1920. Dr. van der Pol received his Doctor of Physics degree in Utrecht. He was a member of the scientific staff of Philips, Holland, from 1922 to 1925, being appointed chief of Philips scientific research in 1925—a position which he still holds.

Dr. van der Pol has played a very prominent part in scientific circles in Europe as President, Commission de Radiophysique, Union Radio Scientifique Internationale; was representative of the U.I.R. European radio broadcasting at the Washington International Radio Conference in 1927, and also at the International Radio Conference at The Hague in 1929, again at Copenhagen in 1932, and at Madrid in 1933.

He is a Fellow of the I.R.E. in America, and was a vice-president of that body in 1934. The Medal of Honour for 1935 of the Institute of Radio Engineers, America, was awarded to Dr. van der Pol for his fundamental studies in the field of circuit theory and electromagnetic wave propagation phenomena.

During the forthcoming Radio Convention in April, he will deliver a lecture, the subject of which will be "Beyond Radio," when he will consider the relations existing between radio and other sciences.

Ever Ready Factory Opened

(Continued from page 8)

greater, number in work quite outside the factory activities, and the circulation of these workers' wages into every avenue of the State's trade and commerce."

Guests Inspect Factory

Following the luncheon, parties were organised under the direction of officials of the Company, and were conducted on a tour of inspection of the factory.

The VELCO PORTABLE AMPLIFIER

Vealls are Amplifier Experts and are always ready to assist you with your problems. Here is a special portable amplifier designed by Vealls experts and offering a value unobtainable elsewhere in Australia. The illustration at right shows the amplifier closed and measuring only 17" × 17" × 9½". In the illustration below, the case has been opened and the two detachable sides are shown. These form self-supporting stands for the speakers, and also provide the necessary baffles. Longer leads can, of course, be fitted to enable the placing of the speakers at either end of the hall, or more distant from the amplifier and microphone.



15 Watts Output



**FOR PUBLIC ADDRESS - - CROONERS - -
DANCE HALLS, BAZAARS AND PARTIES**

Write for FREE FOLDER

Write for free folder fully describing the range of Velco Amplifiers for Crooners, Bands, Public Address, etc. Your name and address on the margin of this advertisement or on a Post Card will bring a copy by return mail.

COMPLETE AMPLIFIERS FROM

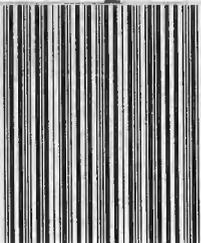
7½ Watt, Price £16/10/- up to

30 Watt Types, From £28/10/-.

VEALLS

EVERYTHING RADIO AND ELECTRICAL
243-249 SWANSTON ST., MELBOURNE, C.I.,
at Prahran and Camberwell. Central 3058 (7 lines).

- * Separate inputs are provided for both the Pick-up and Microphone.
- * Chassis—Black Crackle finish.
- * Case—Leatherette covered and provided with drop flaps for weather protection of the Speakers.
- * Speakers—2 Rola K8 Speakers are fitted. Either one or both speakers may be used as desired.
- * Cable—50 ft. Speaker Cable is supplied.
- * Crystal Type Microphone, not the "Harlie" type illustrated.
- * Weight—Only 38 lbs. complete.
- * Supply—To operate from 200-240 volts A.C.
- * Output—15 watts undistorted. Sufficient for a hall holding 200 couples when dancing.
- * Price—£22/15/- complete, ready to plug into lighting socket.
- * For Battery operation, Price £32/15/- Accumulator extra.



No
621.38405
AUS



WORLD LIBRARY OF AUSTRALASIA
 NATIONAL WIDE reception
 with short wave bands to cover
 the 13 metre channel — an extra
 tuned circuit, resulting in better
 selectivity — Audioscopic
 Reproduction, an exclusive
 Philips development. All these
 radio luxuries are not found in
 any low priced world - wide

receiver other than the NEW
 Philips 1252 Radioplayer. Hear
 it at your local Philips Accredited
 Retailer's store.

Philips Radioplayers are a product of the world's
 largest radio manufacturers, and are sold only
 through specially selected Accredited Retailers.
 Should you not be sure of the name and address
 of your nearest Philips Retailer, phone or write to
 Philips Lamps (A/asia) Pty. Limited, Sydney, New-
 castle, Brisbane, Melbourne, Adelaide or Perth. We
 shall be pleased to arrange a demonstration.

PHILIPS *radioplayers*

MADE BY THE MAKERS OF PHILIPS LAMPS & VALVES

(Advt. of Philips Lamps (Australasia) Ltd. (Radio Dept.), Head Office and Showrooms, Philip House, 69-73 Clarence St., Sydney.) 7R32