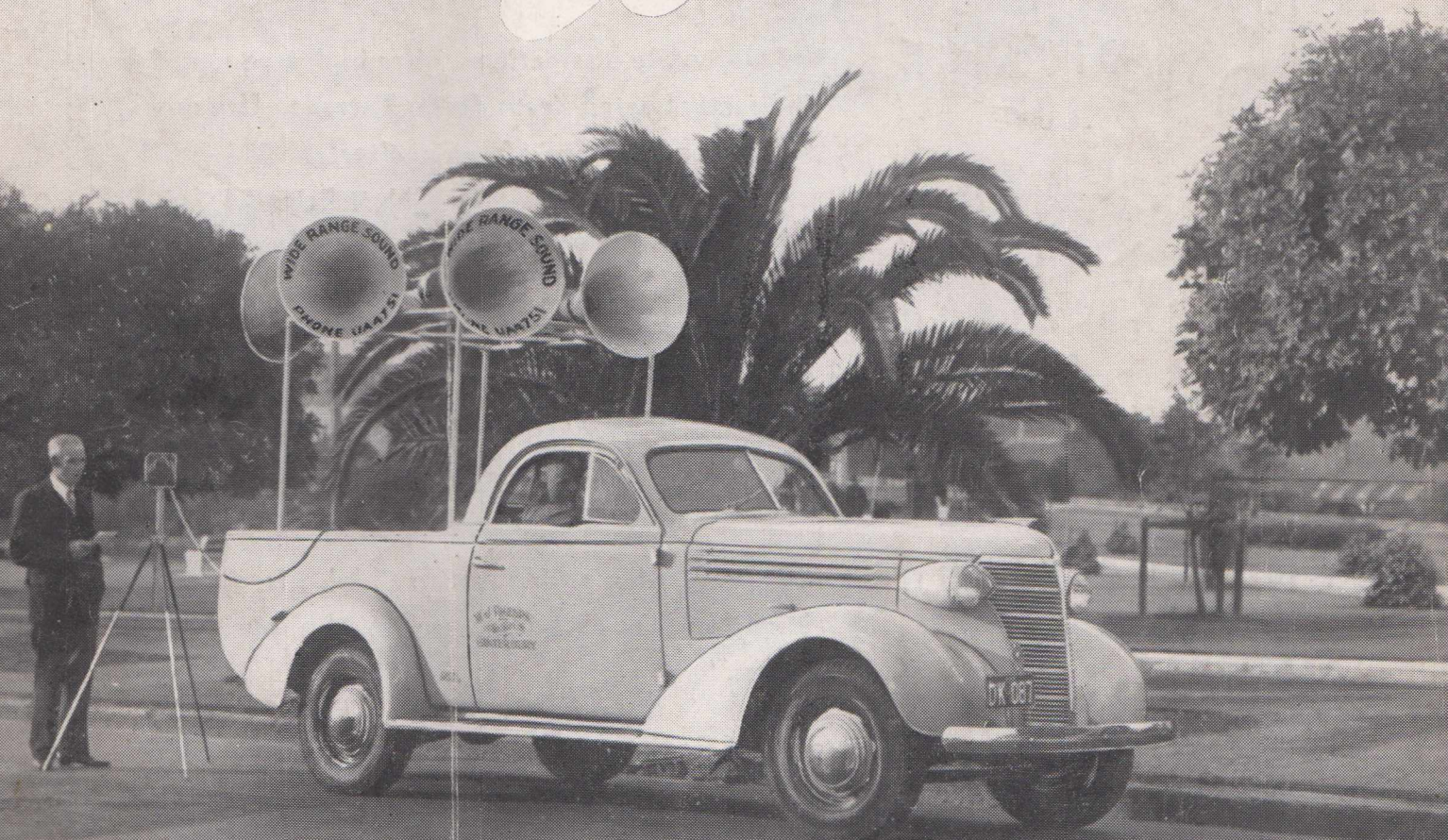


THE  
AUSTRALASIAN

MARCH 10, 1939  
VOL. 3 — NO. 11  
PRICE, 1/-

# Radio World

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



—See Page 8

- BUILDING A POCKET MULTIMETER : 2ND AMATEUR BAND SUPERHET :
- 5 AND 10-METRE PHONE AND C.W. TRANSMITTER : LEARNING THE MORSE
- CODE : LATEST WORLD SHORTWAVE NEWS : HOURLY TUNING GUIDE.



# Radiotrons

*For your Radio World, 5 & 10 metre  
Crystal Controlled Transmitter*

## RADIOTRON 6L6G

21 watt plate dissipation Beam Power Tetrode.  
Use one in the exciter unit for the crystal  
oscillator-doubler. List Price £1:0:6.

## RADIOTRON 807

25 watt plate dissipation—ultra high frequency,  
indirectly heated Beam Power Tetrode. Use one  
in the second stage of the exciter.

Nett Price £1:7:6.

## RADIOTRON 802

10 watt plate dissipation, indirectly heated  
screened R.F. Power Pentode. Use one in the  
third exciter stage and two in the push-pull  
buffer.

Nett Price £1:2:6.

## RADIOTRON 809

25 watt dissipation ultra high frequency  
High-Mu Triode. Use two in the push-pull  
"final."

Nett Price £1:5:0.

In addition, use one each of Radiotrons 82, 83, and 5Z3 for your bias supply, buffer and "final" bridge rectifier, and exciter pack respectively. List Prices: 82, 16/-; 83, 16/6; 5Z3, 16/-.

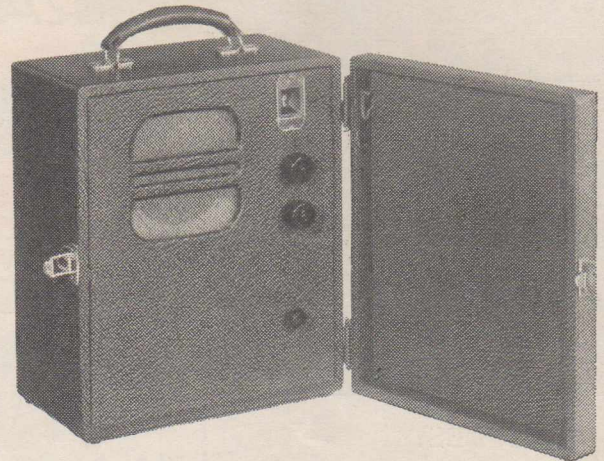
# RADIOTRONS

THE WORLD'S STANDARD RADIO VALVES

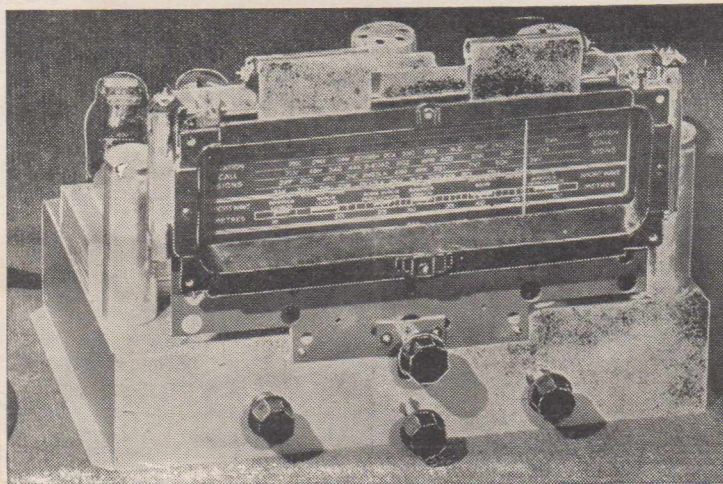


# INTER-STATE . . . . . on a few feet of aerial!

Elsewhere in this issue will be found a reception report from a builder of the "One-Four Portable Five," in which he states that, "using only a few feet of aerial lying on a table, the dial is full of local and inter-state stations." Other "Radio World" readers can get equally sensational results by using our special FOXRADIO kit of parts. This kit is supplied to builders with every item as specified in the original article.



Our quote for the complete kit of parts to build the "One-Four Portable Five" will be sent to you on request, post free, by return mail. WRITE NOW.



**WRITE FOR OUR QUOTE**  
for a complete kit of parts, sent free by return mail

## 1939 SKY-KING DUAL-WAVE FIVE

Giving an even better all-round performance than last year's model, the "1939 Sky-King Dual-Wave Five" is a receiver anyone can build with perfect results. For DX work on both broadcast and shortwave, for volume and for tone, it is the finest and most up-to-date 4/5 yet offered to set-builders. Only finest quality parts supplied with each kit—ORDER YOURS NOW!

### TRY OUR 24-HOUR MAIL ORDER SERVICE

We maintain a special Mail Order Service for the convenience of country clients—kits are packed and despatched within 24 hours on

receipt of your order. Complete kits of parts are available for any receiver described in "Radio World."

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# Public Address WORK...

THE BROWN TYPE  
150 PROTECTION UNIT  
IS INDISPENSABLE

## FEATURES:

● Small throat opening and acoustic transformer effect of baffle plate provides maximum air loading of vibrating diaphragm.

● Proper focussing allows minimum wastage. Unit delivers up to 5 times effective power available from same speaker unit used with flat or box baffle. Reduces feedback. Allows more amplifier gain to be used.

## SPECIFICATIONS:

Overall length of assembly is 35½", the horn having a mouth diameter of 23¾"... The flare of the horn is demountable for transport purposes, and the throat and loud speaker housing may be placed inside the flare. Capacity ranges from 5 watts (Rola 8/21) to 14 watts (8/42). Can be used on electrodynamic and permanent magnet reproducers. Units are of specially spun 16-gauge aluminium throughout with heavy rolled bead to reinforce the bell-mouth opening. Finished in standard iridescent Rola grey.

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267 Clarence St., Sydney.

'Phone: M 2544.

# THE AUSTRALASIAN RADIO WORLD

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

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

Vol. 3

MARCH, 1939

No. 11

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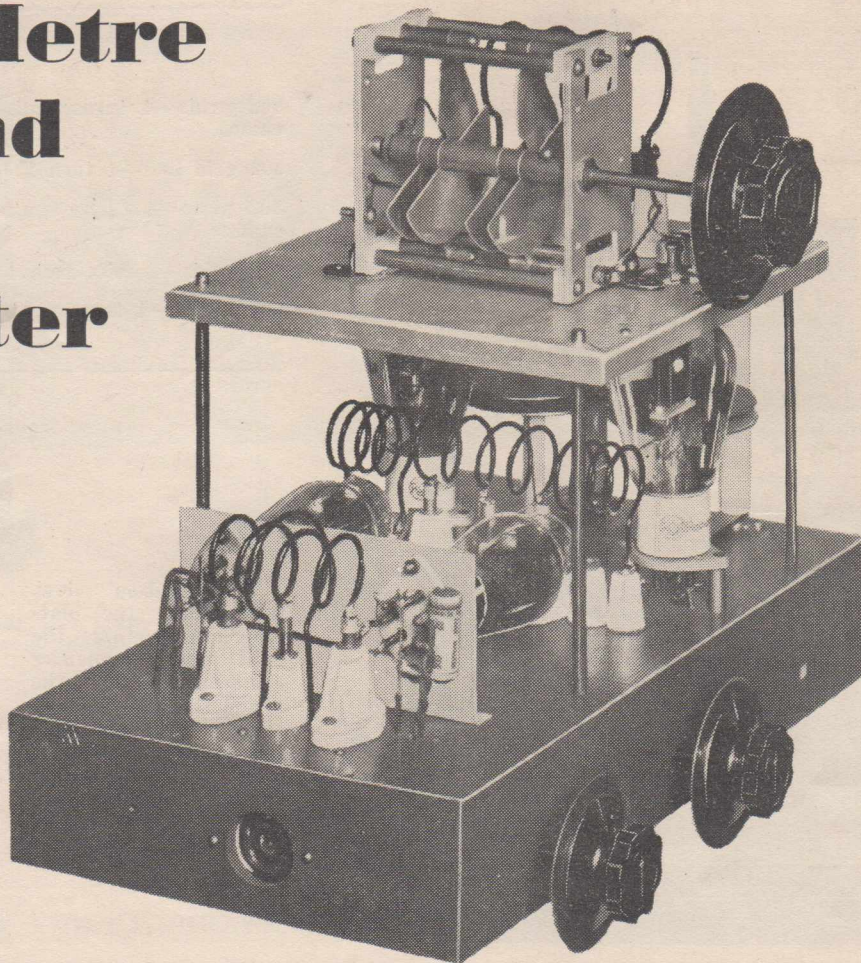
Subscription rates: 1/- per copy, 10/6 per year (12 issues) post free to Australia and New Zealand. Subscribers in New Zealand can remit by Postal Note or Money Order.



# 5 and 10-Metre 'Phone and C.W. Transmitter

In this instalment constructional details are given of the buffer and final amplifier unit illustrated alongside. Operational procedure is also outlined.

By VK2MQ



LOOKING at the front view of the rack (published in last month's instalment) and starting from the left on the bottom row, is the 802 plate condenser, wave-change switch (5 to 10), and 802 grid condenser. The second row of controls, starting from the left, comprises oscillator tuning, and then 807 doubler tuning. Then come the controls for the buffer and final amplifier.

In the case of the 10-metre quadrupler (807) a bias of -75v. was considered enough. This bias is well below cut-off, and the 802 (5m.) has been driven so hard that with 7 mills. flowing in the grid circuit, -325 volts bias is developed.

The layout of the parts for the exciter should not be altered to any great extent, as this unit was rebuilt four times before the writer was completely satisfied with it. Mounted on stand-off insulators above the chassis are the tuning condensers for the 6L6 and 807 plates, while directly underneath the chassis and also mounted on feed-throughs are the 802 grid and plate tuning condensers.

### Voltage And Current Readings.

Following are a few of the readings taken under load during tests of this exciter unit:-

6L6 plate	500 volts	25 m.a.
807 grid	-75 "	5 m.a.
807 plate	5 to 30v.	70 m.a.
802 grid	325 "	7 m.a.
802 plate	530 "	25 m.a.

(The 802 plate current quoted above is that taken under no-load conditions; with load, this increases to 65 m.a.)

Complete metering of the transmitter is accomplished by a 50 milliamper grid meter and a 250 milliamper plate meter. These are provided with plugs which are insulated in each stage as required.

The present article covers details of wiring and assembly of the buffer and final amplifier operating on 5 and 10 metres. It is felt that the various photos and drawings will serve to illustrate most of the salient points, as the individual will wish to make certain changes and alterations to fit his particular needs and component parts. It is recommended, however, that the layout be followed, as the placement of parts as shown has been proved to be very effective.

### Design Ensures Shortest Possible Leads

Since the appearance of the buffer and final amplifier unit differs somewhat from the conventional, a word

or two in explanation may be in order. The double deck arrangement is not a flight of fancy, but was used in order to provide shortest possible leads to all components. Previous experiments have shown the absolute necessity for short, direct leads from the various components.

The general view above shows the arrangement of parts, looking at the unit from left front. On the lower deck will be seen the coils for the grids of the 802's, which lie horizontally, and the coils which couple the plates to the grids. Then come the 809's, and finally the neutralising complete condenser, coil and the r.f. choke.

### Symmetrical Arrangement Is Essential

When wiring the buffer and final amplifiers, care should be exercised to make sure that each lead employed in the grid and plate circuits is exactly the same length on each valve. If this care is taken, a perfectly symmetrical push-pull and final will result which will neutralise very easily. This precaution also will prevent any unbalance in the circuit,



### Coil Data

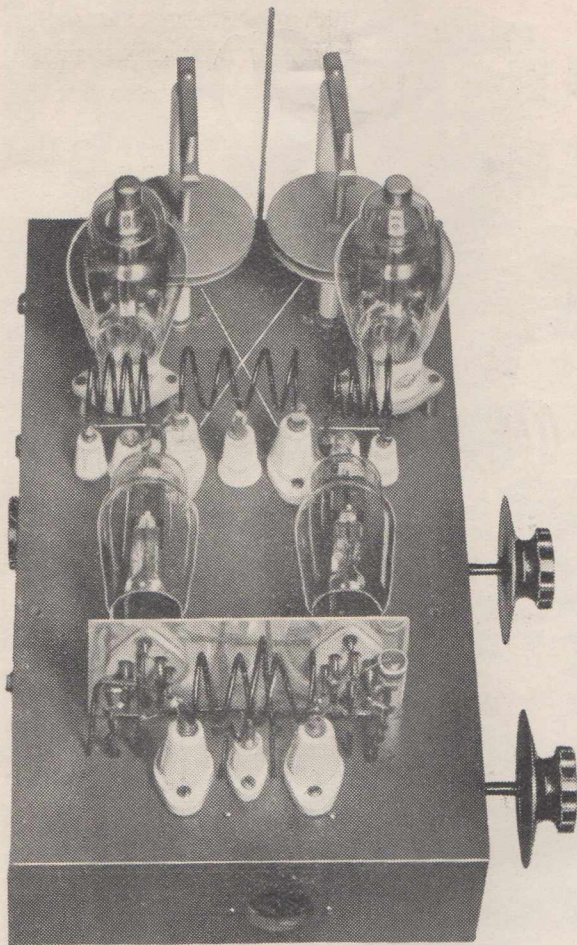
802 grids—4 turns centre-tapped,  $1\frac{1}{4}$ " diam., len. 2", 12 ga. enam.

802 grid link—1 turn 2" diam.

802 plate—4 turns centre-tapped,  $1\frac{1}{4}$ " diam., len. 2", 12 ga. enam.

809 grids—2 coils each 4 turns,  $1\frac{1}{4}$ " diam., len. 1".

809 plates—4 turns centre-tapped,  $1\frac{3}{4}$ " diam., len 4".



This end-on view, taken with the platform supporting the final tank condenser removed, shows the symmetrical layout adopted to ensure high efficiency.

While an 801 will work single-ended with fair efficiency on 56 m.c., the efficiency of a single-ended 802 is rather low, so it was replaced with 802's in push-pull which provided a little more than was required to drive the 809's.

It is not necessary to neutralise the 802's buffer, but care must be taken to ensure that the input and output circuits are kept as far apart as possible without increasing the length of the leads to the valves.

Many valves were tried as buffers, but none equalled the 802's for output on 56 m.c. There is enough output from the pair of 802's to light up a 25-watt lamp to maximum brilliancy, this of course being more than enough to drive the 809's.

which would tend to cause one valve to show more plate dissipation than the other.

We might add at this time that this procedure should be followed when constructing any u.h.f. push-pull buffer or amplifier, for the slight addition of time involved in taking this precaution is more than repaid by the trouble-free performance of the equipment when completed. In addition to this, the appearance is also improved, although this is of a minor nature as it is results that count.

In the actual construction of the unit, it is advisable to build the buffer stage first and line it up; no trouble should be experienced here.

The 802's buffers are mounted horizontally in order to keep the leads as short as possible.

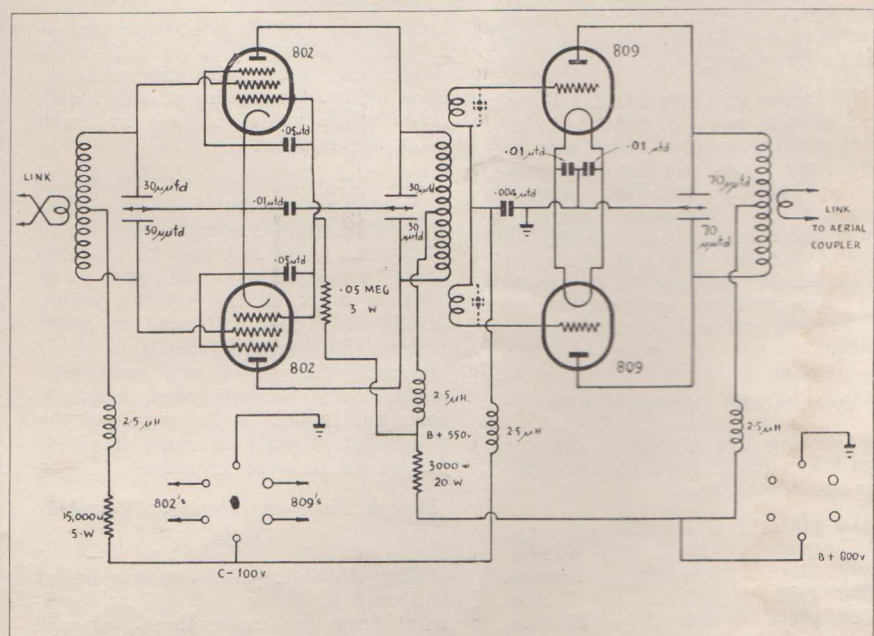
#### Push-Pull Preferable On U.H.F.

It is highly desirable to use most valves in push-pull at ultra high frequencies,

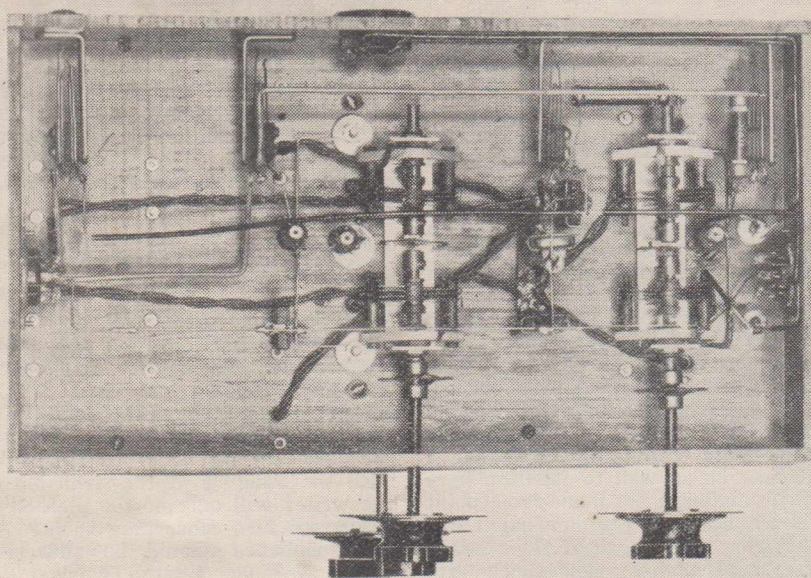
The circuit of the buffer amplifier and final amplifier unit, which uses a pair of 802's and a pair of 809's in push-pull.

as this effectively reduces the inter-electrode capacities across the tuned circuits, thus giving better L-C ratios.

The plate current of the 802's runs about 45 m.a. per valve under load, and the screen should have about 250 volts on it.







An under-chassis view, showing the two pairs of midget variables used for the tuning of the buffer amplifier grid and plate circuits.

**Link-Coupling Details**

The grids of the buffer are link-coupled to the 56 m.c. doubler on the unit below, a 2-turn 1 1/4" link being used to take the output from the doubler, with a 2" single-turn link at the buffer end.

On no account must twisted leads be used in the coupling arrangements as quite an appreciable amount of r.f. is lost—the wires must be paralleled. Belden cable tied together in a few places can be used, but should be connected in the correct way.

**5 AND 10- METRE 'PHONE AND C.W. TRANSMITTER**

**List Of Parts For Buffer And Final Amplifier Unit**

- 1—Chassis 16" x 9" x 2 1/2" built of 1/4" kauri, impregnated and ducoed.
- 1—Frosted aluminium tray 9" x 9" x 1/2".
- 4—Mounting rods for above (see photo).
- 2—Large 7-pin, 2- 4-pin isolantite sockets (Raymart).
- 4—1 1/2" stand-off insulators (Birnbach).
- 3—1" feed-through insulators (Birnbach).
- 2—1" cone type insulators (Birnbach).
- 3—1 1/2" deep jack type insulators (Birnbach).
- 2—Neutralising condensers (see text).
- 2—Knobs for above.
- 1—Split stator condenser gang, 70 mmfd. per section (Colville).
- 3—Dials, 2-3", 1-4" (Raymart).
- 4—70 mmfd. variable condensers (Raymart).
- 4—Single circuit jacks.
- 3—2.5 millihenry 100 mill. chokes (Raymart CHN).
- 1—2.5 millihenry 500 mill. choke (Raymart).

- 2—6-pin Amphenol sockets.
- 1—2-pin Dalton socket.
- 4—Flexible couplers.
- 1—8" length of extension rod.
- 4—Grid clips (2 large, 2 small).
- 1—Dozen midget grid clips.

**FIXED CONDENSERS:**

- 1—.004 mfd. mica condenser, 1000 volt working (Simplex T.C.C.).
- 3—.01 mfd. mica condenser, 1000 volt working (Simplex T.C.C.).
- 2—.05 mfd. tubular condensers (T.C.C.).

**FIXED RESISTORS:**

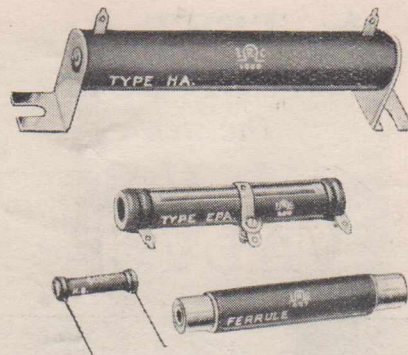
- 1— 3,000 ohm 20-watt (I.R.C.).
- 1—15,000 ohm 5-watt "
- 1—50,000 ohm 3-watt "

**VALVES:**

- 2—802's 2—809's (Radiotron).

**MISCELLANEOUS:**

Small quantity of 12-gauge and 10-gauge enamel wire (latter is for final amplifier), 12-gauge tinned bus-bar for earth line, solder tags, nuts and bolts, etc.



**Wire Wound Coated POWER RESISTORS**

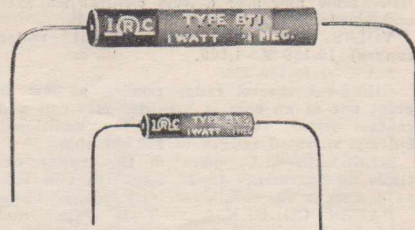
They are wound with highest grade alloys on ceramic formers, and coated with an infusible bonding material for protection against moisture and to ensure lower surface temperature. Complete with cadmium plated mounting feet.

**List Prices:**

- AA 3w., 1/3. AB 5w., 1/6.
- DG 20 w., 3/6.

**Net Prices:**

- DJ 30 w., 3/6. ESA 75 w. Voltage Divider (3 clips), 8/6.



**Insulated Metallized RESISTORS**

Ideal, reliable and constant, because of their balanced performance in every essential resistor characteristic.

**List Prices:**

- 1/2w., 9d. 1w., 1/-.
- 2w., 2/- 3w., 3/6.

**Birnbach Insulators**

Write for descriptive pamphlet illustrating full range

**Wm. J. McLellan & Co.**

55 York Street, Sydney.



# ★ TEST and CHECK the new 1.4 Volt VALVES



## The PALEC MODEL "VCT"

enables the radio mechanic to check and test every component in a radio chassis—valves included.

**VALVE TESTING** registers the condition of all types of standard valves on the "Good-Bad" scale and also detects element leakages and shorts.

**VOLTS, D.C.-A.C.** (also output meter ranges) 10-100-250-1,000.  
MA's.—1-10-100-250.

**OHMS**—A special range reading as low as point one of an ohm is provided (for coil and contact tests), together with two additional battery operated ranges to 200,000 ohms.

**MEGOHMS**—A.C. operated, this range extends measurements to 10 megohms and acts as a megger for breakdown and leakage tests.

**PAPER CONDENSERS**—Tests Paper and Mica Condensers for open circuit and leakage by the neon flash method.

**ELECTROLYTIC CONDENSERS**—The instrument supplies a working D.C. potential for both high and low voltage type electrolytics and reads the condition on a "Good-Bad" scale.

Price . . . . . £15/10/- plus tax.

## COUNTRY MODEL "VCT" AC-VIBRATOR (DUAL OPERATION)

Operates with equal efficiency from either the A.C. supply or from a 6-volt accumulator by the simple expedient of changing over the connection cable, giving servicemen in districts "off the line" the advantage of full A.C. specifications (as detailed) when connected to either source.

Trade price country VCT (A.C.-Vibrator), £17/17/- plus tax.

**NOTE**.—Earlier model "VCT" testers can be easily modified to permit of checking the latest 1.4 volt valves. Write for details.

## PATON ELECTRICAL PROPRIETARY LTD.

90 Victoria Street, Ashfield,  
Sydney. Phone: UA 1960.  
Distributors in all States.

The plug-in coils for 5 and 10 metres, which are simple to wind, are soldered to metal valve grid clips, making a sturdy and low resistance contact.

Inductive coupling is used between the buffer plates and final grids, a method that for simplicity and efficiency has no equal. The coils are adjusted on 56 m.c. for maximum transfer of energy, and these coils remain in position for 10 metres, for the increased output which one gets from the lower frequency enables the same input to be obtained, namely, 40 m.a. of grid current.

The condensers for the grid and plate of the buffer are mounted beneath the chassis, extension rods and couplers being used with them as shown in the under-chassis view.

It may be as well to mention here that grounds are not made from point to point, but to a common earth line which runs the length of the chassis.

The neutralising condensers are home-made and consist of two 12-

gauge nickelled brass discs, 3" in diameter, mounted on an Eddystone stand-off with the long stand-off made up from Catalin. Finally, the 809 plates project through the upper deck, which by the way is made up of 16-gauge aluminium. It is mounted up on four Dilecto ¼" bakelite rods and tapped 5/32 on the on the end, which makes quite a rigid job.

## Absorption Meter Desirable For Tuning

The tuning procedure does not differ from that used on the lower frequencies, except that an absorption meter should be part of the equipment as it is quite possible to work on the wrong harmonic.

If there are any problems associated with the building of this transmitter the writer will only be too pleased to advise readers concerning them. All correspondence should be addressed to VK2MQ, C/- "Radio World," 214 George St., Sydney.

# Stromberg-Carlson 1939 Dealers' Conference Managing Director L. P. R. Bean Predicts Boom Season

**O**VER fifty metropolitan and Newcastle radio dealers were present at the Stromberg-Carlson 1939 Dealers' Conference held at the Hotel Wentworth, Sydney, on Monday, March 6 last.

Mr. L. P. R. Bean, managing director of Stromberg-Carlson, presided over the gathering, while among the other executives of the company present were Messrs. G. Eglon (director), H. Murray Tyer (sales manager), A. Burgess (assistant sales manager), J. S. Bond (sales engineer), A. W. de Courcy Browne (Newcastle factory representative) and S. Gould (assistant secretary).

In his opening address Mr. Bean reviewed recent trends in the radio industry, and gave it as his opinion that the coming season would be a boom one for radio. In giving reasons for his confidence in prosperity for the trade, Mr. Bean mentioned the doubling of the present population within fifteen years as one vital reason why the future of the radio industry was assured.

In outlining the Company's merchandising policy, Mr. Bean stated that there were now over 1,000 Stromberg-Carlson dealers throughout the Commonwealth, extending in a network covering the continent from Cairns in the north to Perth in the west to South Tasmania. Dealer conferences were vital, and no less than seven had already been planned for New South Wales alone during the coming season.

In discussing lines other than radio that dealers could handle profitably, Mr. Bean mentioned the newly-released Stromberg-Carlson Home Laundry, planned by his company to supply the vast, almost untouched market that exists to-day in this field in Australia.

Finally, Mr. Bean briefly reviewed the 1939 range of Stromberg-Carlson receivers displayed before his audience, before handing over the microphone to sales manager Murray Tyler.

In reviewing each new model in detail, Mr. Tyler outlined the reason



for each release, and its place in the dealer's sales campaign for the coming year. A newly-perfected mechanical system of automatic tuning exclusive to Stromberg-Carlson, iron-cored coils and air trimmers were prominent among the technical refinements, and together with attractively-styled cabinets and substantially reduced prices provided sales ammunition that every dealer could appreciate.

Other speakers during the evening included Mr. S. Gould, assistant accountant of the company, who spoke on the finance side of set sales, and Mr. A. Burgess, metropolitan representative, who discussed his company's plans to assist dealers in their marketing of Stromberg-Carlson receivers.

Full advantage was then taken by those present of an invitation to examine more closely the wide range of 1939 models on display.

A highly successful conference concluded with a vote of thanks to the Company, proposed on behalf of the guests by Mr. Tree, being passed by acclamation.



The Stromberg-Carlson 1939 Dealers' Conference. The display in the background comprises the wide variety of Stromberg-Carlson receivers being released for the coming season.

**1939 Ultimate Receiver  
Catalogue**

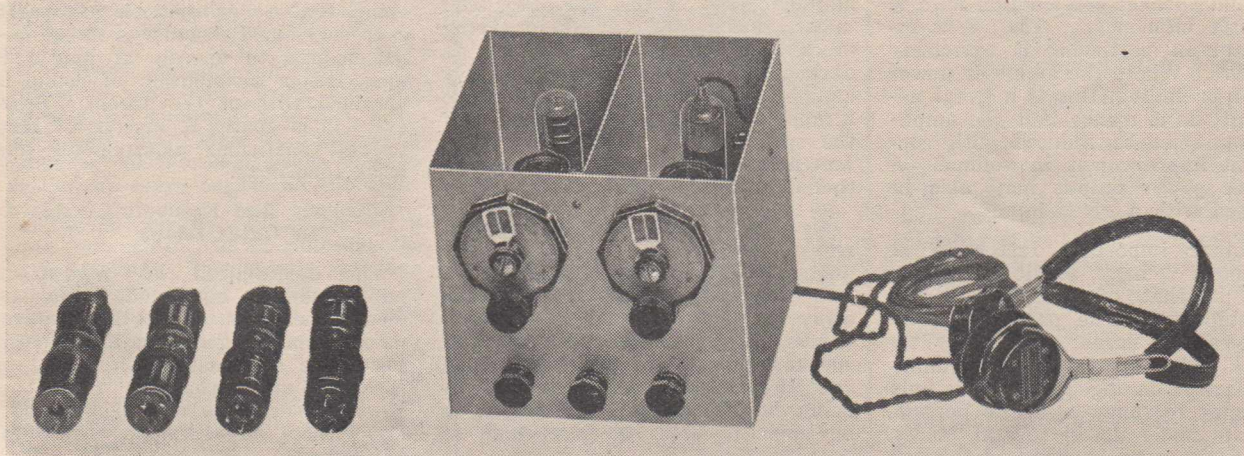
A review copy of their latest Ultimate receiver catalogue featuring the new 1939 all-world models, has just

been received from the sole Australian representatives, Messrs. George Brown & Co. Pty. Ltd., 267 Clarence St., Sydney.

Printed in two colours on heavy art paper, this catalogue contains illustrations, with full technical details, of

the entire range of Ultimate receivers, comprising a.c., battery, vibrator and portable models.

Copies of this catalogue will be sent post free to "Radio World" readers writing to the address given above.



**"Sky-Hawk All-Wave Three" Uses Latest 1-4 Volt Valves**

This photograph shows a general view (with lid removed) of the "Sky-Hawk All-Wave Three," to be featured in next month's "Radio World." Designed to use the new 1.4-volt valves, it is remarkably economical to operate, while its performance ranks it as one of the finest of battery three-valvers ever described.

On the left are shown four of the five pairs of coils used to give coverage of the shortwave and broadcast bands, while on the right is a pair of the newly-released S.T.C. headphones.  
WATCH NEXT MONTH'S ISSUE FOR FURTHER DETAILS



# Public Address Outfit Uses

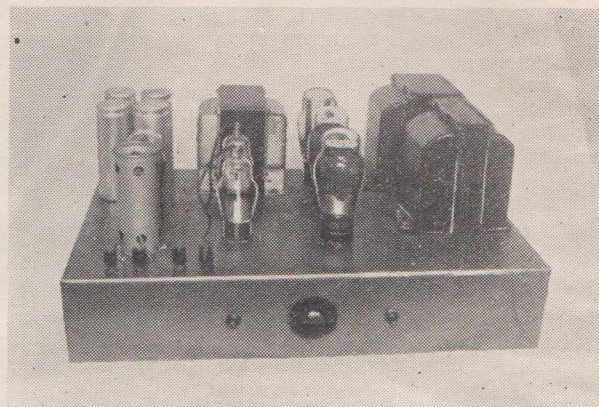
## New

This 32-watt amplifier is one of several used by the author for p.a. work.

## Projection

## Unit

### This Month's Front Cover



**T**HE public address equipment and utility truck shown on this month's cover utilises the special p.a. projection units released recently by Messrs. Geo. Brown and Co. Ltd., of Sydney. They are fitted with the well-known Rola model 8-42 per-magnetic speakers. The outfit belongs to Mr. W. J. Phelps, of 14 Watkin St., Canterbury, and is used by him in handling a wide variety of public address jobs. In the following, Mr. Phelps gives a brief outline of his experiences with the equipment shown.

#### Efficiency An Outstanding Feature

Undoubtedly the most outstanding feature of the particular projection unit and speaker combination used is its high efficiency. The 8-42 reproducer in particular is extremely sensitive. Where the amplifier power output is limited, this is a great advantage, as it means that the amplifier gain can be reduced with consequent improvement in volume. A greater power output may also be obtained with a given input.

Another important factor to be considered in public address work is that of possible damage to equipment. The parts for these speakers and flares are easily replaced. If a section of the aluminium flare is damaged, then it is only necessary to renew a single portion, as it is made up in several pieces. Should the cone be wrecked through careless use of a high-powered amplifier causing excessive overload, then it may be renewed at very reasonable cost without the necessity of replacing the entire speaker unit. Briefly, any part of the speaker or projector may be readily replaced.

It may be surmised that the ability of these speakers to handle very

small amplifier outputs effectively would result in their not being entirely suitable for larger outputs. In this regard the manufacturers claim that the 8-42 Rola unit will handle 14 watts with the correct air load as is provided by the Brown Projector. While the equipment illustrated in the photograph has never been operated at this level per speaker, their power-handling capabilities are not for a moment doubted.

#### Two Miles Range With Amplifier "Throttled Down"

As a practical example, one occasion can be quoted when two of these units were used on a 32-watt 6L6G amplifier (see photo), operating well under rating, the speakers being erected to a height of 60 feet. As darkness fell, speech was clearly audible in an adjacent suburb  $1\frac{3}{4}$  to 2 miles away. Due to the height of the speakers, the volume of sound was not at all objectionable even in their immediate vicinity.

A remark was made by a local resident to the effect that he could not understand why he could hear just as clearly a quarter of a mile away as he could directly underneath. As is the case with all horn speakers, they are highly directional, and when occasion necessitates their being worked at full volume, it is advisable to erect them as high as possible.

A further feature worthy of mention is, of course, their comparative cheapness. Until their introduction the price of horn projectors capable of handling anything over 10 watts was, to many prospective purchasers, rather prohibitive. No doubt these speakers will find favor with many country dealers and radio men, as, in

places where amplifier power is limited, the units take good care of small outputs, the essential requirement being correct matching of output valves to speaker input.

#### Operational Details

Technical specifications state that for musical reproduction the throat of the projector may be removed and the speaker unit attached directly to the main flare, thus giving a better low note response. For speech, better actual projection is obtained with the units assembled in the normal way, but quite satisfactory musical reproduction for outdoor work may be obtained without removing the throat. However, some users claim that for projection of speech **over very short distances**, where it is not desired to operate at loud volume, better distribution of sound is obtained without the throat. However, it is really a matter of trial to suit particular requirements and local conditions.

#### Efficiency And Economy Combined In Outfit Shown

The installation of high-grade public address equipment is by no means cheap, as present-day requirements demand good quality apparatus. The combination illustrated of speakers and projection units has, however, served to reduce initial outlay without any sacrifice in general performance.

The 32-watt amplifier shown in the accompanying photograph is identical with that described last year in "Radiotronics," this portion of the equipment being constructed by L. T. Martin (Precision Radio). It comprises but one of the amplifier units, other units for mobile operation being also available.



# “One-Four Portable Five” On Test

## Reports From Builders Claim Outstanding Performance ★ Inter-State Reception On Few Feet Of Aerial



IN describing field tests conducted on the “One-Four Portable Five,” Mr. L. T. Martin, of Strathfield, writes:—

“Following the description of the ‘One-Four Portable Five’ in the January and February issues of ‘Radio World,’ a series of tests was planned to determine the receiver’s capabilities.

“The set was taken out to picnics and down to the beach, and in every location there was not the slightest trouble in getting excellent reception at full volume from every local station. Also, in the evening many of the inter-state stations could be tuned in at good speaker strength.

“Country stations that can be received all day long, using only the lid antenna, comprise 2GZ, 2CA, 2NC, 2WL and 2KO, while at night using an indoor aerial there seems to be a station at every degree on the dial.

“The ‘B’ battery consumption is very low, being 7 to 7.5 milliamperes at full volume. Incidentally, the Rola midget permagnetic speaker used is remarkably sensitive, and gives surprising volume.

“One point that should be borne in mind by prospective builders is that due to the high-gain coils used, every care must be taken in the assembly and wiring of the set. All the leads around the coils must be very short and direct.

“Receivers using the 1.4 volt valves should prove a great boon to people many miles from anywhere, with perhaps a mail only once a month. Apart from its portability and its exceptionally fine performance, I should say that this alone would commend

the “One-Four Portable Five” to many.

“As a radio in a car and boat it cannot be excelled. A serious dis-

### “ONE-FOUR” STEPS OUT!

#### Interstate With Few Feet Of Aerial

I have just built the “One-Four Portable Five” as described in the January issue, and as the set has proved entirely satisfactory in every way, I thought I would write and express appreciation of the admirable manner in which the article was published and described.

With a few feet of aerial lying on the table it is possible to listen to daylight reception of 2KA, while at night time the dial is literally full of local and interstate stations, still using the same improvised aerial.

In my opinion, your journal is most enterprising in being to the fore with the very latest circuits and ideas.—B. Colwell, Gordon, N.S.W.

advantage the writer has found with vibrator-operated receivers in camp is the real danger of having a flat car battery when the time comes to go home. As well, the ‘One-Four Portable Five’ has a much greater range than any car radio yet tested by the writer.

“Mounted in a suitable cabinet it would make an excellent home receiver that would be remarkably economical to run, particularly if a couple of 45-volt Superdynes were used for ‘B’ supply, with one of the new Ever-Ready type X250 1.5 volt ‘A’ cells for the filaments.”

#### Special Kit For Portable Builders

Messrs. Martin de Launay Pty. Ltd., Cr. Druitt and Clarence Sts., Sydney, advise that they are making available a special kit of parts for the “One-Four Portable Five.” Enquiries are invited from prospective builders.

#### An Appreciation From Queensland

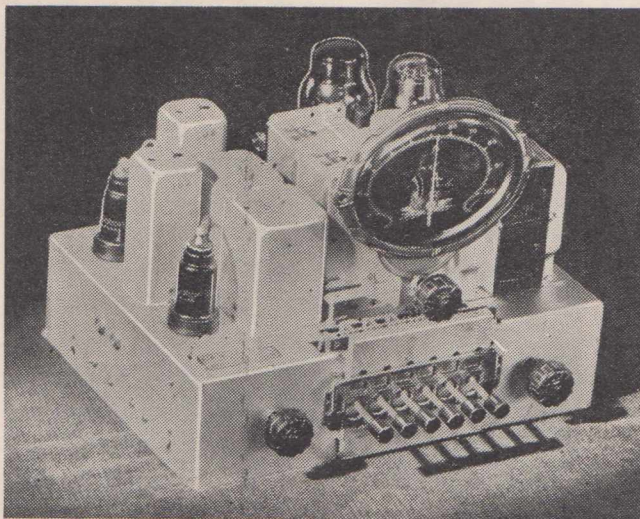
I should like to take this opportunity of complimenting you on your FB magazine, “Radio World.” I was first introduced to it by VK4CJ, a member of your DX club, and I must say it is a magazine specially suited to the Australian “ham” and SWL.—D. E. Runham (AW477DX), Morningside, Queensland.

★

#### Back From Four Months’ Trip

Mr. F. Tisbury, of the Ever-Ready Co. (Aust.) Pty. Ltd., has now returned to Sydney after a four months’ visit to New Zealand, during which time he took over the control of his company’s affairs following the sudden death of their late general manager, Mr. A. K. Jackson. Mr. R. D. Greenwood, of Wellington, has now been appointed general manager of the New Zealand branch.





The completed receiver, which is built on a sprayed steel chassis measuring 11 x 8½ x 3 inches.

# The . . . . Trans-Tasman All-Wave Push- Button Five

Features of this outstanding 4/5 superhet include all-wave coverage, automatic tuning, new high-gain output pentode, and latest "micro" iron-cored coils. To simplify construction, the receiver is supplied to builders partly assembled and wired.

THE "Trans Tasman All-Wave P.B. Five" is a 4/5 superhet. designed along orthodox lines, to give set-builders the maximum in short-wave and broadcast reception at the lowest cost. In line with the latest trend in receiver design, a push-button unit has been incorporated to give automatic selection of six stations.

The receiver was designed by Messrs. F. J. W. Fear & Co., of Wellington, N.Z., and this description is intended primarily for N.Z. set-builders. However, constructors in this country could easily adapt the circuit to use components available here. New "Micro" iron-cored coils have been employed throughout, while the push-button unit is the "Micromatic Touch Tuner" that incidentally is available separately for those who wish to convert their receivers to push-button tuning.

### Chassis Ready-Wired To Grid of 6K7

A feature of this kit that should appeal strongly to experimenters, particularly to those who would find the wiring of the push-button unit a little complicated, is that the kit is supplied with the condenser gang, aerial and oscillator coils, mixer valve socket, first i.f. transformer, and push-button unit already mounted and wired.

Actually, the wiring is complete to

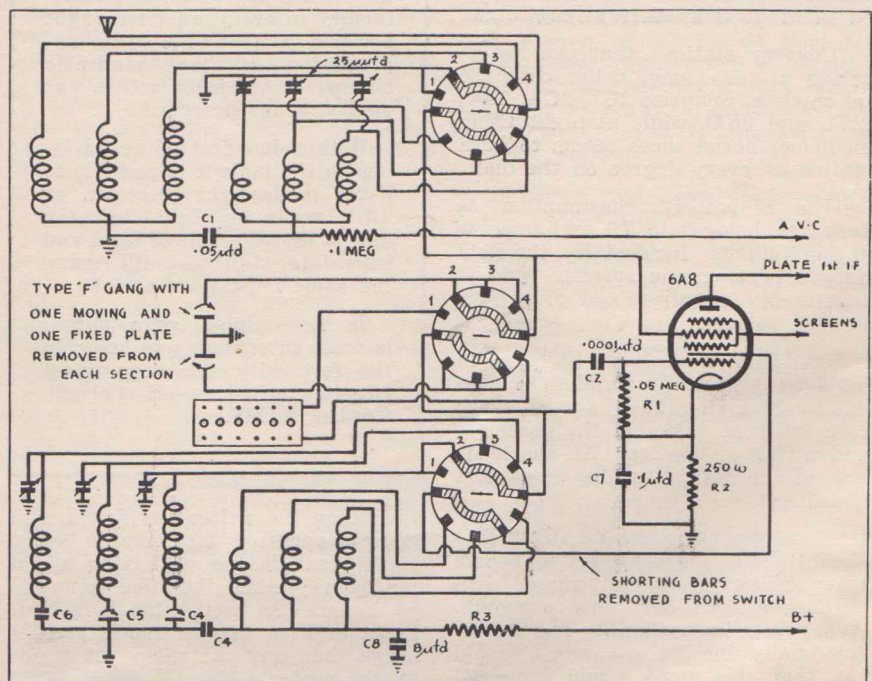
This circuit shows the mixer section of the "Trans-Tasman All-Wave Five" and indicates the coil switching system adopted for coverage of the three wave-bands, with a fourth position for automatic tuning. In kits supplied to builders this portion of the receiver is ready assembled, wired and tested,

the grid of the 6K7 i.f. amplifier valve. There are only three leads connecting to the ready-wired portion, "a.v.c.," "screen" and "B+." These are identified by labels, and it is a very simple matter to solder them to their correct destinations when the remainder of the receiver is being wired.

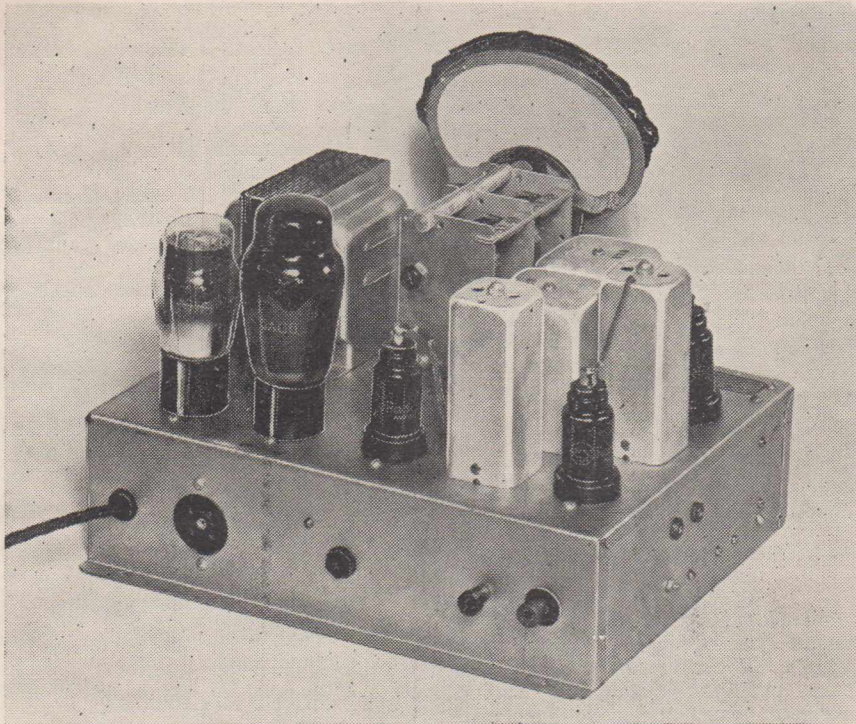
The i.f. amplifier is a 6K7, and is followed by a 6Q7 combined diode-second detector and triode first audio amplifier. A.V.C. is taken from the negative end of the diode load resistor, a method that is both simple and effective.

### High Slope Output Pentode Delivers Four Watts

The output pentode used is the new Brimar 6AG6-G indirectly-heated high slope pentode. This valve has an unusually high sensitivity, in that an input of only 2 volts r.m.s. will fully load it, to deliver over four watts of output. It is actually so sensitive that the intermediate audio stage could be dispensed with. However, as modern practice calls for fairly high level audio amplification, it has been retained, the combination giving a high-quality, high-gain audio amplification system.



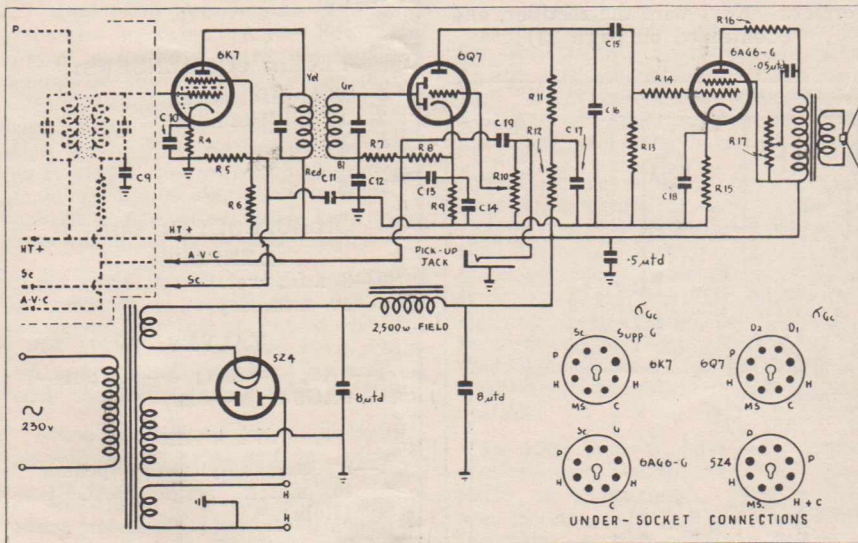




A rear view of the receiver showing the above chassis layout adopted. In the centre of the rear wall is the pick-up jack.

The rectifier used is a 5Z4 octal-based "G" type. The power pack is standard throughout, using a 2,500 ohm speaker field coil and two 8 mfd. electrolytic condensers as filter.

**Tone Control Optional**  
Minor circuit refinements comprise a tone control and pick-up jack. The



The "Trans-Tasman" is supplied to builders wired and tested as far as the grid of the 6K7 i.f. amplifier. The three leads running from the ready-wired section to the remainder of the set will be found labelled "HT+," "a.v.c." and "screen." These connect as shown in the above circuit and the wiring diagram. Resistor and condenser values are as follows:—R1=50,000 ohms, R2=250 ohms, R3=20,000 ohms, R4=350 ohms, R5=25,000 ohms, R6=20,000 ohms, R7=50,000 ohms, R8=.5 meg., R9=5,000 ohms, R10=.5 meg. pot., R11=250,000 ohms, R12=50,000 ohms, R13=.5 meg., R14=50,000 ohms, R15=150 ohms, R16=100 ohms, R17=25,000 ohm. pot., C1, C3, C9=.05 mfd., C2, C12, C13=.0001 mfd., C4 and C5, padders, C6=.004 mfd., C7, C10, C11, C17=.1 mfd., C8=8 mfd., C14, C18=10 mfd., C15, C19=.01 mfd.

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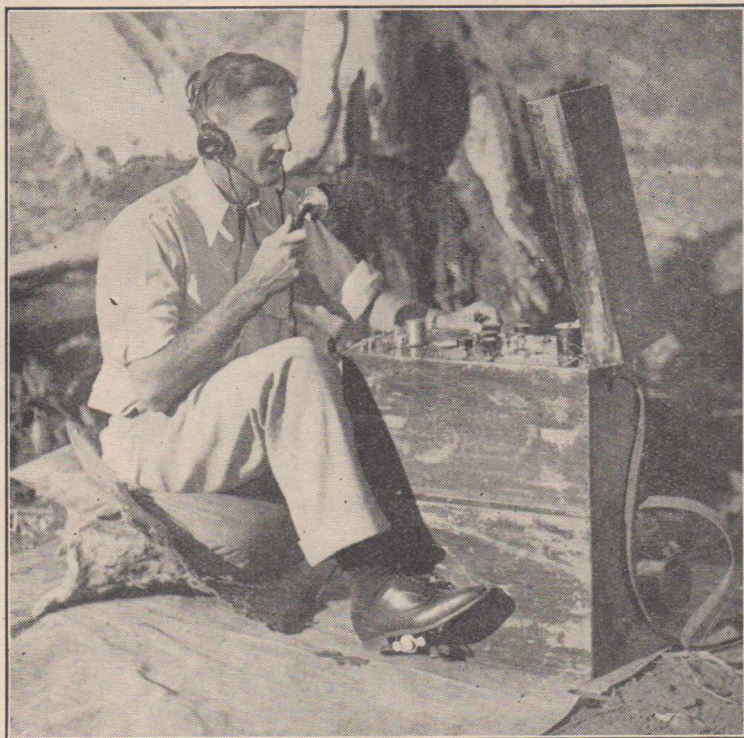
267 Clarence St., SYDNEY.

'Phone: M 2544.









In the heart of the lonely outback, a settler communicates with the nearest base by means of his portable pedal transceiver.

It has been said, that genius is 10% inspiration and 90% perspiration. Just what proportions have gone into the make-up of the Rev. John Flynn, or as he is more affectionately known in the outback, "Flynn of the Inland," it would be difficult to assess. The unique national organisation of the "Flying Doctor Services" as it stands to-day is a living monument to his genius, and to the inspiration and effort that have gone into the building of this service.

As early as 1917 the possibilities of wireless in conjunction with the aeroplane, for the benefit of the isolated inland settlements, were realised, and experiments were carried out with the limited gear then available.

Some years later an experimental patrol was undertaken from Adelaide to Alice Springs, in the very centre of Australia. The expedition was of great practical value; it demonstrated very conclusively the possibilities, as well as the problems still to be tackled.

For instance, although at that time—about 1925—a certain success was being obtained by telephony, it was necessary then for Morse telegraphy to be the mainstay for communication under the difficult conditions of very limited power and severe static.

#### Ingenious Device Sends Morse Automatically.

Morse telegraphy was no problem for the trained operator, but what of the outback settler and his family? To overcome this problem, Mr. Traeger, of Adelaide, developed the automatic Morse keyboard.

This device is made up from old typewriter-keyboards, and is so arranged that by pressing a letter on the keyboard, the corresponding Morse character is transmitted. Hence it is a simple matter for any person, or even a child, to tap out a message on the typewriter keyboard and then to listen to the telephonic reply from the higher-powered base station.

In 1928 such a base—or mother station—was established at Cloncurry, in Queensland. This position was chosen as being an ideal starting point, in that within a radius of four to five hundred miles a very large area of sparsely-populated territory could be covered—an area where little or no means of communication existed.

Even the roads or tracks which sometimes existed frequently became impassable. This may be due to too much rain in the wet seasons, or perhaps to an entire lack of water.

# Radio Aids The Outback

The vital part that is played by the Australian Aerial Medical Services in aiding the outback by means of radio and aeroplane is described in the article below.

By E. J. T. MOORE

Chief Engineer, Philips Radio Factory

It is in these conditions that radio communication comes into its own, for it constitutes the only link between these isolated settlements and the outside world.

#### Five Base Stations Now Established.

The success which accompanied the establishment of the Cloncurry base encouraged the creation of further centres. At the present time these bases include Wyndham in the far north-west of Australia, Port Hedland, directly west; Kalgoorlie, in the south-west, and now Broken Hill is in service.

It is proposed to erect another base at Alice Springs. When this has been done, the whole of the inland of Australia, over a million square miles of territory, will be covered by a veritable mantle of safety, by means of the six base stations, with their hospitals, doctors and aeroplanes, connecting with the numerous pedal transceiver outposts scattered throughout the whole of the inland.

The aerial ambulances are specially fitted to take stretcher cases, and the patient may be attended by the doctor throughout the flight.

In addition, the planes are fitted with radio so that landing instructions may be given and received, and instructions given by the doctor for the preparation and treatment of the patient.

It is, of course, not always necessary for the aerial ambulance or the doctor to make a flight. In the majority of cases, diagnosis and suggested treatment may be a matter of consultation between the doctor and





**BUT, LADY,  
I ONLY CAME  
TO FIX  
THE RADIO**

Some radio service men get themselves into some awkward predicaments. But there's one way to avoid valve trouble, and that's change to Brimar. By using a really dependable replacement you gain prestige as a radio man who really knows his valves.

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# BRIMAR

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the outpost, the necessary advice being given, and progress reported, by means of radio.

However, in the last seven months Dr. Alberry, of Cloncurry, has flown over 28,852 miles, calls being received from north, south, east and west—from Mornington Island up in the Gulf to Brisbane. The trip to Brisbane was undertaken at the request of the Queensland Government Health Department to transport two girls aged 7 years who were suffering with infantile paralysis.

Many lives have been saved during this period and, at the request of the Protector of Aborigines, examinations of aborigines have taken place at various centres.

### Million Words In Telegrams.

Although the main purpose of the Australian Aerial Medical Services is the spreading of this mantle of safety in swift medical attention to those in need, there are other aspects which are of immense value to these isolated communities.

All these pedal transceivers, which are equipped with Philips valves, are now registered as telegraph stations, and telegrams may be sent to and from them.

To give some idea of the extent to which this facility is used, we may take Cloncurry as an example; in a period of just over the last four years over a million words have been sent to and from the pedal transceivers in ordinary paid telegrams. This service is quite separate from, and does not include, the many medical and other daily calls between the base and the outposts.

It would be extremely difficult for anyone in the more populated areas to assess the feeling of deep security which is engendered by the installation of a pedal transceiver, and all that this means to the small community it serves.

Every day some service is rendered, from a neighbourly chat to the spectacular saving of a valuable life. To enumerate the cases would take far more time and space than is at present available; suffice it to say that in the Australian Aerial Medical Services we have an ideal and a service to our pioneer people unequalled anywhere else in the world.



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Let Vealls Sound Department give you sound advice . . . an expert solution to your problems.

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Write for a copy of Vealls new booklet on Sound Equipment, giving full details of all models speakers, microphones, gramo motors, etc. Rail and post free.

FOR DANCES, PARTIES, SOCIALS, BANDS, ETC.



## A COMPLETE 5-VALVE BATTERY SUPER KIT

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## FULL CONSTRUCTIONAL DETAILS . . . . . FREE

Write for free constructional folder giving full details, circuits, diagrams, photographs, etc. Learn how easily you can assemble this set . . . at low cost.



## METERS AND TEST EQUIPMENT

The complete range of Meters and Test Equipment handled by Vealls is particularly comprehensive and covers every possible type—a model for every purpose—from small pocket voltmeters up to test equipment giving laboratory precision. Multimeters, Oscillators, Valve Checkers, Analysers, etc., are all shown in our catalogue or if desired we will supply our 24-page booklet giving full operating instructions, prices, terms, etc. Price, 6d. per copy, post free.

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## VIBRATORS FOR TRANSMITTERS ETC.

Something the "ham" has been waiting for—Transceiver Vibrators giving high voltage output from either a 6- or 12-volt accumulator.

THE VAN RUYTEN TRANSCEIVER VIBRATOR for 6- or 12-volt accum. Output 350 volts 60 m.a. PRICE, £7/10/-. Large model, giving 350 volts 100 m.a., £9/9/-.

Other Van Ruyten Vibrators from 150V 25 m.a. types at £3/19/6 or with filter £4/19/6. Special types for 32-volt or 6- and 12-volt car radios.

# VEALLS

NOTE: N.Z. INQUIRIES NOT SOLICITED.  
LETTERS TO BOX 2135, G.P.O., MELBOURNE C1. See inside back cover for full list of Branches.



### Hurstville Radio Club Notes

(Affiliated with W.I.A.)

VK2MZ, Hurstville Amateur Radio Club, is once more on the air, with a heap of r.f. to spare. Since tests were carried out, we have had more than 50 different QSO's on 40-metre 'phone. Club members are very pleased with the improvement in speech, and depth of modulation. The line-up comprises 47 crystal oscillator, 46 doubler, 46 buffer into a 10 final r.f. amplifier, the speech equipment 57-57-56 driver into a pair of 42's wired as triodes.

VK2ALG gave members studying for the next exam, a Morse test from his own rig, and was copied 100% by them. Fellow amateurs will be interested to know that Joe Ackerman (VK2ALG) has just received his QSL card order of 5000. The design is quite an improvement on the ordinary cards, measuring 5" x 12."

The Hurstville Amateur Radio Club wish to convey to anyone interested in "ham" radio, no matter how meagre their knowledge, that they are always willing to help the newcomers in every way. This can be readily verified by the addition of

nine new members in the last three weeks.

Anyone interested should get in touch with the secretary, J. Ackerman, 34 Park Rd., Carlton, who will gladly furnish particulars or call at the station, 98 Tabrett St., where the meetings are held every Thursday night at 7.45 p.m.—G. J. Boyd.

★

### World-Wide DX With The "Atlas All-Waver"

I received my membership certificate and club badge, and report forms. The latter should certainly bring back QSL cards.

I built the "Atlas All-Waver" described in a recent issue of "Radio World," and using a temporary aerial about 25 ft. long and 18 ft. high have pulled in 2RO Rome, PCJ Holland, GSB London, DJN Berlin, and at night KZRM and KZIB Manila, VLR, VK2ME and VK3ME, also several New Zealand amateurs. There is no r.f. stage on the "Atlas" yet. I have only made the single-valve version with an output pentode stage added to it—making a total of two valves, giving three-valve performance.—W. Polglase (AW478DX), Maroubra, Sydney.

# Rola

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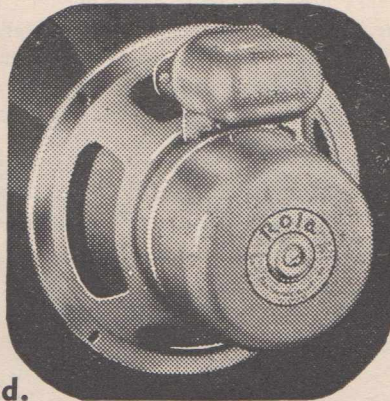
To set buyers and home constructors alike Rola's new and outstanding developments mean better radio. The new features are far in advance of current loudspeaker construction and introduce new standards in clearness and faithfulness of sound reproduction.

- Patented dustproofing and acoustic filter. Responsible for clearer reproduction and positive dustproofing.
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- New moulded corrugated spider. Voice coil cannot move out of centre. Bigger magnets of finer steel. Bring new standard of high efficiency to battery sets.
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### Five-Valve Battery Superhet Gives Excellent Results

After two years' experience, I still consider the "Radio World" to be the best journal for the radio enthusiast.

Using five valves on hand, I have turned my three-valve t.r.f. into a superhet. KF4, 1st detector with regeneration, and sup. injection; 30 h.f. oscillator; VPZ i.f. amplifier; BZ1 twin triode as 2nd detector, and b.f.o.; and PM22A pentode. Rather a miscellaneous collection of valves, but they work very nicely.

With the separate h.f. oscillator the mixer works efficiently to below 13 metres with low "B" voltage. The regeneration is obtained by a normal regeneration coil wound near the grid end of the first det. primary. By controlling regeneration with a shunt potentiometer, the effect of the usual variable screen voltage on the stage's gain, due to varying antenna loads, is avoided. Regeneration here almost eliminates images on 20m., increases gain and selectivity, and replaces a good r.f. stage.

Tuning is by a 2-gang .000385 mfd. used with .00025 mfd. mica condensers in series on the s.w. A 13-plate midget is used to accurately line up the regenerative 1st det. circuit, and incidentally this provides sufficient padding on the s.w. The 100 mmfd. grid

(Continued on page 47)



TEST EQUIPMENT . . . . .

(7)

# Building A Pocket Multi-meter

RANGES:—

- 0-10 volts D.C.
- 0-50 " "
- 0-250 " "
- 0-10 M.A.
- 0-50 " "
- 0-250 " "
- 0-500 " "
- (Low ohms)
- 0-100,000
- (High ohms)



**Compact, accurate, and flexible, this latest Delta Model D-735 multi-meter offers servicemen and experimenters a cheap and effective way of obtaining an instrument that takes care of all the tests generally made in servicing or checking over a receiver chassis.**

The finished instrument is housed in a black moulded bakelite case, and is provided with a panel attractively finished in red, black and silver. This illustration is approximately two-thirds actual size.

A complete laboratory test of a modern radio receiver requires an imposing and most comprehensive array of testing equipment well beyond the means of the average serviceman or amateur. For ordinary service or workshop practice, however, the simple multi-meter, or more correctly, the volt-ohm-milliammeter, still retains its popularity as an inexpensive and effective means of locating the more obvious faults encountered in everyday experience.

**High Degree Of Accuracy.**

As a measuring instrument it will, if properly designed and calibrated, indicate with a degree of accuracy equal to that of the larger and more expensive combination testers now so much in use, and which in many

cases are just complicated multi-meters with other functions added.

The instrument under discussion is a d.c. volt-ohm-milliammeter, engineer-designed and built to meet a demand for a compact and accurate instrument combining utility with rugged construction. It may be carried in the pocket or service kit or tucked unobtrusively away in the workshop. It is the smallest of its type and range using a 3in. meter yet produced in Australia. Its accuracy and appearance are equal to, if not better than, many of the larger and more expensive instruments.

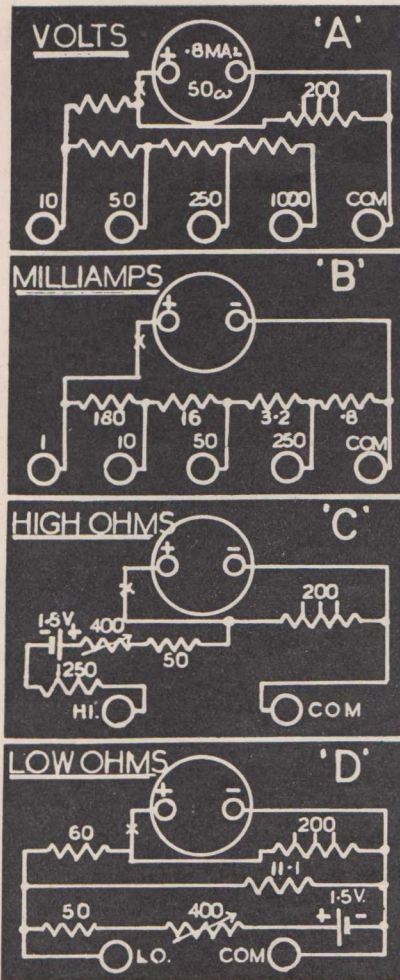
A study of the wiring diagram and constructional details shows a comparatively simple circuit, with one or two novel features. The only switching required is the change from High

Ohms to Low Ohms, all other functions being utilised through sockets without switching. Switching is handier in operation but more expensive and complicated in wiring, and has the disadvantage of requiring more space. Each function has been separately analysed in the circuit diagram as an aid to the thorough understanding of the circuit.

**Latest Square Triplett Meter Used.**

The instrument in this model is a 3in. square Triplett from which the flange has been removed. It is mounted on the panel by means of four screws in the base. It will be noted that the meter has a full deflection of .8 milliamperes and a resistance of 50 ohms. This need not "scare" prospective builders who possess ordinary 0-1 milliammeters, as the necessary change does not involve rewinding unless the meter has a resistance higher than 50 ohms. For home constructors who desire to depart





Left: The circuit of the Delta multi-meter, dissected into four sections to illustrate how the volts, milliamps, high ohms and low ohms ranges are provided for. There are several ingenious and exclusive features incorporated that are explained in detail in the text.

Right: This sketch gives full dimensions for preparing the panel, which in the Delta kit of parts is supplied ready drilled and stamped.

out and the carrying case. The circuit and component parts will be quite satisfactory as shown.

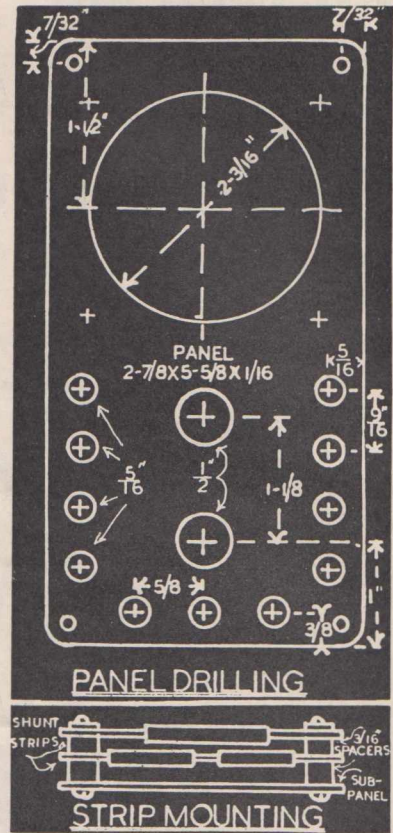
**The Circuit Explained.**

Fig. "A" shows a common arrangement of instrument and multipliers for the measurement of d.c. volts. With the exception of the 200-ohm resistor across the meter terminals, this requires no further comment. The resistor shunting the meter is a tapped shunt for the measurement of milliamperes, and it is shown in detail in fig. "B." It will be noted that the total value of the various sections of the shunt is 200 ohms, and that this is always in circuit across the meter.

This arrangement is necessary in order to obtain a deflection of 1 m.a. without recourse to additional switching, and the meter circuit thus becomes equivalent to that of a 1 m.a. meter with a resistance of 40 ohms., and a sensitivity of 1000 ohms per volt.

Fig. "C" depicts the conventional series ohms circuit for a range of 0-100,000 ohms, and needs no explanation.

Fig. "D" shows the less common "back-up" circuit for a range of



0-500 ohms. The novel feature of this instrument is the simplified method of so entirely changing the circuit with a D.P.D.T. switch. Not only are the battery and potentiometer placed across the meter in parallel, but a shunt is introduced to change the meter to 10 m.a. full de-

from the "Delta" design and use round type meters, the only additional changes will be in the panel lay-

**Make sure of maximum efficiency and longest life—**

**ADOPT AS YOUR STANDARD —**

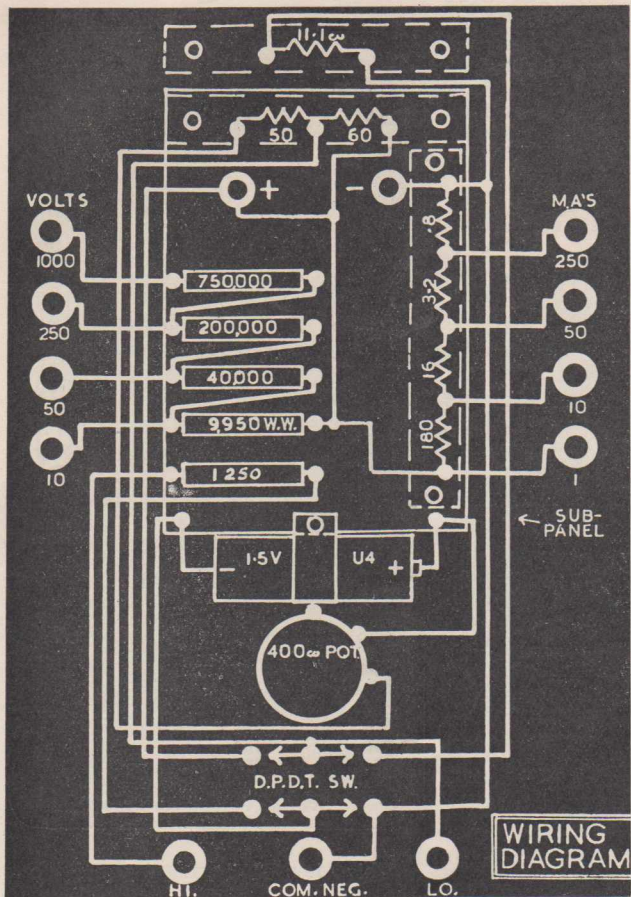
# Mullard

## M A S T E R

### RADIOVALVES

MULLARD (AUST.) PTY. LTD., 63-67 WILLIAM STREET, SYDNEY. 'PHONE: FL 5188 (3 lines)





The complete wiring of the Delta Model D-735 multi-meter is shown in this sketch.

flexion, while a resistor of 60 ohms is placed in series with the meter to register half-scale deflection at 10 ohms.

[NOTE.—The point "X" on the positive meter lead shows the correct position for the insertion of additional external meter resistance if necessary to raise same to 50 ohms. This resistance is mounted internally for model D-735].

The main wiring diagram gives mounting and connections within the instrument, and is easily followed. The sub-panel is  $\frac{1}{16}$ " sheet bakelite,  $2\frac{1}{8}$ " x  $3\frac{3}{4}$ ", and is mounted on the meter terminals. The position of the component parts can be clearly seen, together with the various connections.

**Some Assembly Hints**

The potentiometer and D.P.D.T. switch are mounted directly on the panel, and the spindle of the former must be insulated therefrom. In the D-735 the potentiometer has a diameter of  $1\frac{3}{4}$ "—this is the maximum permissible—and the switch is of H. & H. or Arrow Type.

A single 1.5-volt U4 Ever-Ready cell operates the Ohms Measurement Circuit, and is mounted as shown, being easily renewed.

The sockets are insulated from the panel by special erinoid washers. The method of mounting shunt strips is shown at the lower right side of the drawing.

The panel itself is of  $\frac{1}{16}$ " brass processed to give a

*Run* like mad to  
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**S**EE that apparition up top? We call it "BROKEN PROMISES." Last time it tried to creep into our business, we gave it such a hiding it hasn't shown its face here again. But we hear it is pretty busy elsewhere around town. If "BROKEN PROMISES" is frightening the growth out of YOUR business, call on MARTIN DE LAUNAY'S for help. Enormous stock . . . keen prices . . . good products . . . service as slick as greased lightning—you'll like doing business with this enterprising electrical and radio supplies organisation. You'll find PLEASURE as well as PROFIT in dealing with . . .

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### Delta Model D735 Multi-meter—List Of Parts

- 1—panel, 2 $\frac{7}{8}$ " x 5 $\frac{5}{8}$ " x  $\frac{1}{16}$ "
  - 1—Triplet 326 meter with flange removed and altered from 1 m.a. to .8 m.a., 50 ohms.
  - 1—bakelite box, 3" x 5 $\frac{3}{4}$ " x 2 $\frac{1}{16}$ " drilled and tapped
  - 11—sockets complete with insulating washers, nuts and solder lugs
  - 1—knob for potentiometer
  - 1—400 ohm potentiometer
  - 1—D.P./D.T. special toggle switch
  - 1—sub-panel 2 $\frac{1}{8}$ " x 3 $\frac{3}{4}$ " x  $\frac{1}{16}$ " drilled and lugged
  - 1—set multipliers (4 carbon—1 wirewound)
  - 1—tapped shunt—200 ohms
  - 1—11.1 ohm resistor
  - 1—50/60 ohm resistor strip W.W.
  - 1—U4 Ever-Ready battery 1.5 volt and mounting strip
  - 1—yard hook-up wire
  - 1—pair test leads and prods
- Panel and strip mounting screws

black background with silver lettering. The name and "Ohms Adj." escutcheon are picked out in red.

The box containing the instrument is of moulded bakelite suitably ribbed for strength, the panel being attached at the corners. The dimensions of

the finished instrument are 3" x 5 $\frac{3}{4}$ " x 2 $\frac{5}{8}$ " deep overall.

As already mentioned, the constructor may vary the size and layout to suit his own particular need and fancy, without affecting the efficiency of the circuit.

#### Operating Instructions.

The operation of the instrument presents no difficulties.

**To Measure Volts.**—Insert one test lead in the common negative terminal at the bottom of the panel and the other in the desired socket at the right of the instrument.

**To Measure Milliamps.**—Insert negative lead as before and the positive lead in the correct socket at the left of the panel.

[NOTE.—If not certain of the value of the voltage or current to be measured, start at the highest socket and work downwards until a suitable deflection is obtained.]

**To Measure High Ohms.**—See that toggle switch is on "Hi. Ohms" position. Insert leads in correct sockets and touch points together. This will cause the meter to deflect to the right hand side of the scale. Adjust to full deflection by means of "Ohms Adjust" knob. A resistance placed between leads may then be measured directly on the "Hi. Ohms" scale of the meter.

**To Measure Low Ohms.**—Place toggle switch on "Lo. Ohms." Insert leads in correct sockets. With leads open-circuited, meter will deflect. Adjust as before. Measurements of resistance between leads are then indicated on "Lo. Ohms" scale of meter.

In conclusion, the constructor is assured of good results if the diagrams are carefully followed, and the completed instrument will do all that is claimed, proving itself a useful and indispensable adjunct to his present equipment.



This view of the front panel shows the symmetrical layout used. This illustration is approximately two-thirds actual size.

### VK2ME, 3ME And 6ME — Schedules For March And April, 1939.

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

VK2ME (31.28 m., 9590 k.c.).

	Sydney Time.	G.M.T.
Sundays:	4-6 p.m.	0600-0800
	8 p.m.-midnight.	1000-1400
Mondays:	12.30-2.230 a.m.	1430-1630

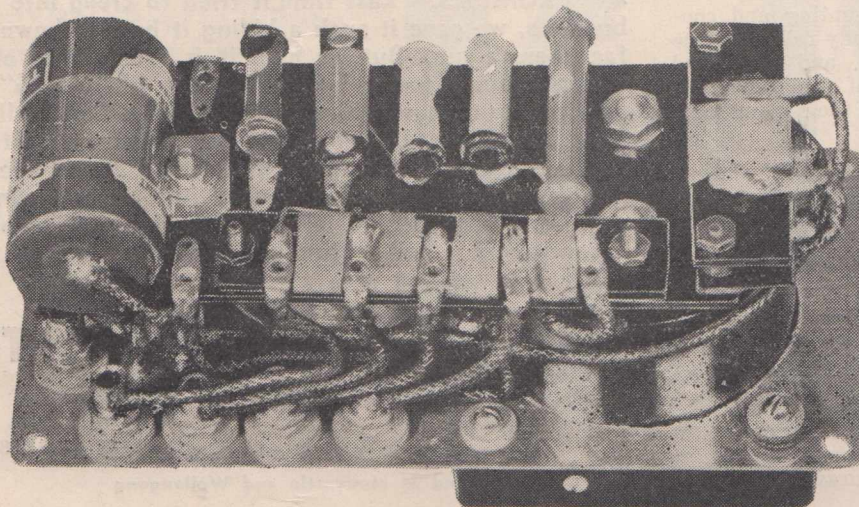
VK3ME (31.5 m., 9510 k.c.)

	Melbourne Time.	G.M.T.
Nightly		
Monday to	7 p.m.-10 p.m.	0900-1200
Saturday		
(inclusive)		

VK6ME, Perth (31.28 m., 9590 k.c.)

	Perth Time.	G.M.T.
Nightly		
Monday to	7 p.m.-9 p.m.	1100-1300
Saturday		
(inclusive)		

Details of the sub-panel assembly are clearly shown in this view.





Build this  
**DELTA**  
Multimeter



**Any serviceman can build this handy tester in half an hour . . . and save money too!**

A remarkably compact instrument of the most advanced design, the Delta Model D735 Multimeter is simple and inexpensive to build; in fact, it can be easily put together in one evening.

Employing a Triplet Model 326 D.C. Milliammeter 0/1; 1000 ohms per volt, it measures only 3 1/16" x 5 7/8" x 2 1/2" high, and is fitted in a handsome bakelite case with etched silver, black and red panel.

Ohms zero adjuster is provided, and the ranges are 1-10-50-250 M.A., 10-50-250-1000 Volts, low ohms 0.2-500 and high ohms 0-100,000.

The Delta Kit is absolutely complete to the smallest detail, ready for immediate delivery and instant assembly. Every component in it is guaranteed, and is exactly as described by the editor in this issue.

Price, complete kit . . . . . £3/19/8

Or fully assembled . . . . . £4/10/-

Write for illustrated literature giving full details of latest Delta, Triplet and Readrite Test Equipment.

**Complete list of parts to build the D 735 £3/19/8**

	PRICE
1 panel 2 3/4 x 5 3/4 x 1/8 . . . . .	0 7 9
1 Triplet 326 instrument with flange removed and altered from 1 m.a. to 0.8 m.a. 50 ohms . . . . .	1 15 0
1 bakelite box 3 x 5 3/4 x 2 1/2, drilled and tapped . . . . .	0 3 0
11 sockets, complete with insulating washers, nuts and solder lugs . . . . .	0 4 6
1 knob for potentiometer . . . . .	0 0 8
1 400 ohm potentiometer . . . . .	0 2 6
1 D.P. D.T. special toggle switch . . . . .	0 3 9
1 sub-panel 2 3/4 x 3 3/4 x 1/8, drilled and lugged . . . . .	0 1 6
1 set multipliers (4 carbon—1 wire wound) . . . . .	0 6 0
1 tapped shunt—200 ohms . . . . .	0 6 0
1 11.1 ohm resistor . . . . .	0 2 0
1 50/60 ohm resistor strip W.W. . . . .	0 3 0
1 U4 Ever-ready battery, 1.5v., and mounting strip . . . . .	0 0 4
1 yard hook-up wire . . . . .	0 0 4
Panel and strip mounting screws . . . . .	0 0 4
1 pair test leads and prods . . . . .	0 3 0

**£3/19/8**

Full details for the construction of the Delta D735 will be found on page 17 of this issue of the "Radio World."

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Building A . . . .

# Code Practice Oscillator

In response to requests from readers wishing to learn the morse code, this article, outlining and describing the construction of a simple code practice oscillator, has been re-printed from the February, 1937, issue of "Radio World".



Only a handful of parts, most of which will be found in the junk box, are needed to build this code practice oscillator.

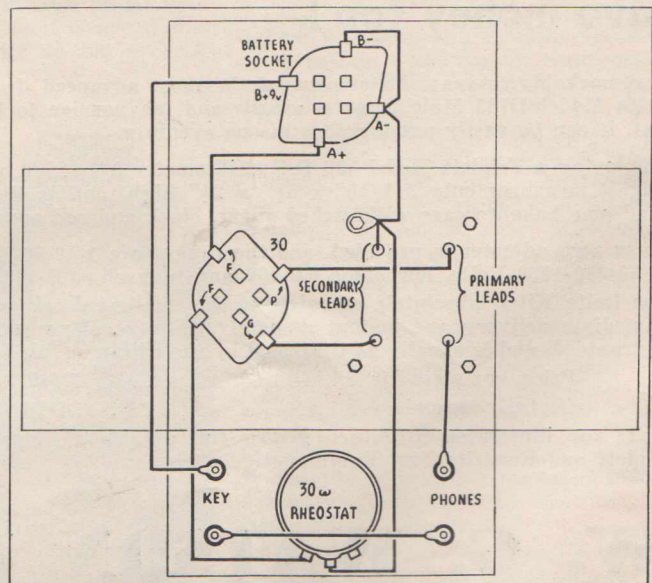
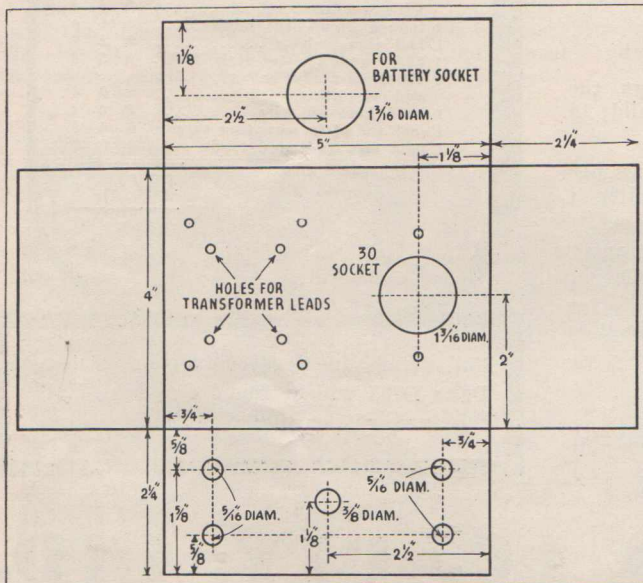
THE simplest way of learning the code is to use an audio oscillator (or buzzer), a key and a pair of phones. An oscillator such as that illustrated above can be built for next to nothing, as some, if not all, of the parts required will be found lying around the workshop. Apart from the valve, the audio transformer is the only other important part required. For this component, any old "tranny" will do—in fact, the older and cheaper it is the better, providing the windings are sound, because expensive makes rarely give as good a note as the cheaper types.

### The Batteries Required.

An "A" and "B" supply are needed to operate the oscillator. A suitable "B" supply is a 9-volt "C" battery, which will give months of service because the "B" drain is only a fraction of a mill.

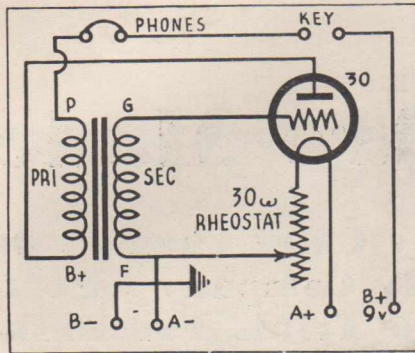
If a type 30 valve is used, the "A" drain is only .06 amp., which means that a couple of standard torch cells

could be used. Alternatively, of course, a 2-volt accumulator can be employed. The rheostat has been provided for two reasons—firstly, to reduce the filament voltage from 3 volts to 2 when dry cells are used, and secondly to adjust the note of the oscillator to the most suitable pitch. The note is generally best with a low voltage on the filament—in fact, the oscillator shown will work



Left: This sketch gives dimensions for preparing the 5in. x4in. x2¼in. chassis. Right: The under-chassis wiring.





The circuit of the code practice oscillator.

well from a single dry cell.

**Assembly Is Simple.**

When the parts listed elsewhere have been obtained, the valve and battery sockets can be mounted on the aluminium chassis, together with the audio transformer, rheostat, and terminals.

The wiring is very simple, and for those who cannot follow a circuit diagram, it is shown in detail in the wiring sketch. Finally the battery plug is wired, and the batteries connected up.

The leads from the 'phones and key are next hooked up, and the rheostat turned on until, with the key depressed, a loud clear note is heard

**Code Practice Oscillator  
List Of Parts.**

- 1—aluminium chassis, 4" x 5" x 2 1/4"
- 2—4-pin wafer sockets
- 1—audio transformer
- 1—30 ohm rheostat (Radiokes)
- 4—terminals, 2 red, 2 black
- 1—small knob
- 1—4-pin plug and 4-wire battery cable
- 1—type 30 valve
- 1—pair headphones (S.T.C.)
- 1—Morse key (Radiomac)
- Hook-up wire, nuts and bolts, solder tags
- 1—9v. "C" battery (Ever-Ready)
- 2—1 1/2 v. "A" cells (Ever Ready), or
- 1—2v. accumulator (Clyde).

in the 'phones. If nothing is heard, then try the effect of reversing the leads to either the primary OR secondary (not both) of the audio transformer.

With the oscillator operating correctly, the task of learning the code can be started, along the lines indicated in the article below. There is nothing in the least difficult about it, but regular daily practice is essential for success.

**LEARNING THE CODE**

**A Simple Method Outlined**

**T**HE Morse Code is a system of dots and dashes (known as dits and dahs) so arranged that communications can be transmitted in all European languages. The only method by which efficiency can be obtained in this most important branch of an amateur's knowledge is by constant study until the system becomes, like the written alphabet, second nature.

There are 26 letters in the English alphabet provided for, as well as seven further letters known as continental letters, for use only in such languages as German, French, Spanish, etc. They are not used in our language or in examinations by the P.M.G.'s Department for experimental licences, and may be disregarded by students for the time being.

**How To Group Letters.**

Definitely there is no short cut to acquiring a knowledge of code, but perhaps a few hints likely to be of help can be offered. Having learned the alphabet in signals, it will be

found advantageous to remember certain groups of letters, each of which have an affinity with the others in the group.

First we will take the letters E, I, S and H. These are denoted by dits only, and are respectively, - , - - , - - - , - - - - . Our next group of letters is A, W and J. These each commence with one dit and are followed by dahs, thus, - - , - - - , - - - - . These may be followed by R, F and L in that order, and again the dit is the commencing signal, but in this case their number varies whereas they each contain only one dah, thus, - - - , - - - - , - - - - - .

There are three letters that are represented only by dahs, and they are T(- - -), M(- - - -) and O(- - - - -), while N, D and B commence with and contain one dah only in this manner, - - - - , - - - - - , - - - - - - . The letters K, X, C and Y comprise a group of letters that commence with a single dah, but are followed by a varying number of dits, and they appear thus, - - - - , - - - - - , - - - - - - . Our next

	<p>A B C D E F G H I J K L M N O P Q R S T U V W X Y Z</p> <p>1 2 3 4 5 6 7 8 9 0</p> <p>PERIOD INTERROGATION BREAK (DOUBLE DASH) WAIT END OF MESSAGE END OF TRANSMISSION RECEIVED (O.K.) INVITATION TO TRANSMIT (GO AHEAD) EXCLAMATION BAR INDICATING FRACTION (OBLIQUE STROKE) COMMA COLON SEMICOLON QUOTES PARENTHESIS</p>
--	---

group contains the letters G, Z and Q, and these letters each commence with two dahs in this manner, - - - - , - - - - - , - - - - - - . Our remaining group of letters are P, U and V, and these commence with one, two and three dits respectively, - - - - , - - - - - , - - - - - - . The direct opposites are: A(- - -), N(- - - -); D(- - - - -), U(- - - - -); F(- - - - -), Q(- - - - -); L(- - - - -), Y(- - - - -).

These groups and opposites when mastered will be a great help to the student, and after a time will become as legible to the ear as the finest copper plate caligraphy is to the eye.

(Continued on page 37)

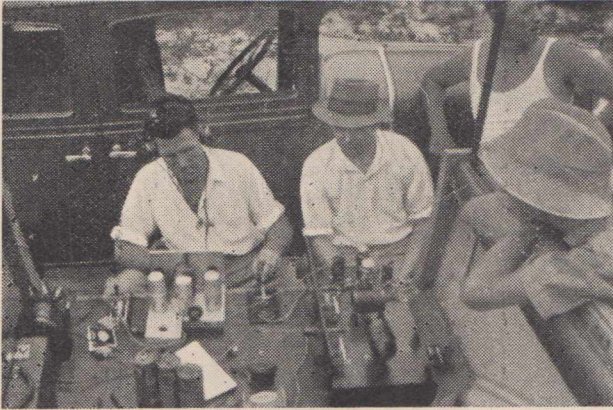


# How Dry Batteries

# Are Made

**Lecture By Chief Chemist Of Ever Ready Company ★ Portable Radio Trials For Bushwalkers' Club An Outstanding Success ★ Lakemba Radio Club Notes And News . . . .**

**by W.J.P.**



The base station, VK2LR, Operator 2VA, with H. Shanks and 2PX. Transmitter is a two-stage C.C. rig., powered by a genemotor.

**A**T the meeting of the Lakemba Radio Club on Tuesday, February 14, Mr. A. Luciano, of the Ever Ready Battery Co., delivered a most interesting lecture on the manufacture of dry batteries, in the presence of over 50 members and visitors—the largest attendance for year.

The lecturer briefly traced the history of batteries, referring to early types and their disadvantages as compared with the modern manufactured product. In the older types the shelf life was comparatively low, due to the low internal chemical action, while the present-day products were far superior due to higher-grade materials, resulting in their being permitted to stand for much greater periods and to be subjected to greater overloads with less detrimental results.

Being himself a chemist, Mr. Luciano stressed the care that was taken to ensure that the materials used were the best procurable. The various types of batteries manufactured for special operating conditions were explained, together with the necessity for special attention to the smallest details of manufacture to cope with actions and reactions within the cell under various conditions.

In the Ever Ready test room, the room temperature was maintained at a constant level throughout the year, resulting in the batteries on test being subject to standard conditions. Extensive laboratory tests were continually being conducted, all raw materials being kept until actual service reports were available.

The lecturer stated that in a few isolated cases batteries were returned as having failed to deliver the

specified service. In most cases evidence of the internal reaction of the cells revealed that they had been subject to excessive overload, either by error or through subjecting a battery with a low discharge rate to a current drain considerably in excess of its rating.

In battery-operated receivers where "A," "B" and "C" batteries were working together, each supplying different current values, the tendency was for each battery to have



VK2LR-X, inland station, Operator VK2ACS. Transmitter is single stage S.E. rig, operating off 60 volts of "B" battery.

a different life. This was a matter which was receiving constant attention in the chemical laboratory, resulting in the production of sets of batteries suitable for different types of receivers, the combination delivering a more even operating life.

Special reference was made to the batteries suitable for the new 1.4-volt valves, while the discharge rates and rated life of various types were discussed. Members displayed considerable interest at this stage in view of the fact that the following week-end tests were being conducted with the Bushwalkers' Club, operating portable radio equipment.

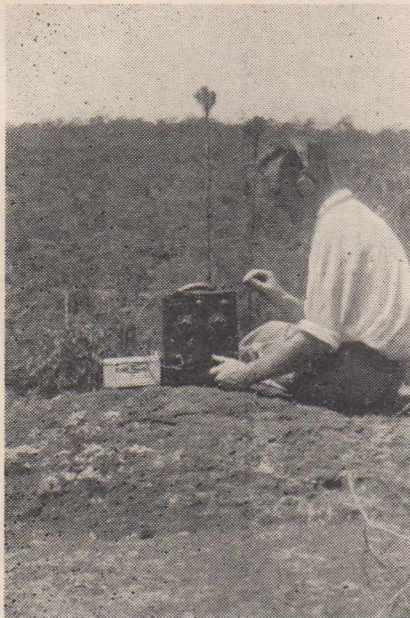
At the conclusion of the lecture, Mr. Luciano, on behalf of the Company, expressed their willingness to provide the necessary dry batteries for this field test. This offer was greatly appreciated, and a hearty vote of thanks was accorded. Mr. Luciano was also congratulated on his success in explaining in a simple way a subject which naturally is one of a rather complicated nature.

## Radio Tests With Bushwalkers' Club

In order to investigate the possibility of establishing satisfactory communication between inland search parties and outside civilisation, tests were conducted between members of the Bushwalkers' Club and the Lakemba Radio Club on Sunday, February 26, in the rugged country which extends between Minto and the South Coast. Slight alterations were made to the original plans, as it was decided that having conducted this test, a further one would be organised in the near future on a much larger scale extending over a three-day week-end.

The parties assembled at a point





VK2LR-Z, inland station, operator, 2EH. Transmitter is two-stage C.C. rig, operating off two 60-volt light duty batteries.

about five miles from Minto railway station on the Sunday morning, where

after erecting the base station and conducting preliminary tests, everything was ready for the start to be made. The stations were as follows: — VK2LR (base station), VK2LR-X (inland station), VK2LR-Y (mobile observation station), VK2LR-Z (inland station) and VK2HB (city station connected with telephone).

A departure was made by the two parties on foot, while the mobile station was driven to a point about five miles from the base on the eastern side of Campbelltown. Besides hearing 2LR and 2HB, both the inland stations were also audible. The latter stations had no difficulty in maintaining constant communication with the base, despite the extremely low power used. In fact, at one stage VK2LR-Z communicated direct with VK2HB.

The inland stations confined their operations to within five miles of the base station, and conducted various experiments from ridges and gullies. The operators of the mobile station, however, were rather disappointed as they failed to contact the base station, although they were heard by both the inland stations!

Towards the close of the day's work the following message was dis-

patched by VK2LR-Z through VK2LR, VK2HB and thence by telephone to Oatley:—

"To Mr. Myles J. Dunphy, Phone LU1088. Greetings from Harris Creek, near Minto. Tests are very satisfactory. Signed, Lakemba Radio Club and the Rescue Party of Federation of Bushwalkers."

In about half an hour the following reply was received by VK2LR-Z at Harris Creek:—

"I am glad to comment on this important matter of locating lost persons in our rugged bushland by the use of amateur radio. Hitherto, as everyone knows, contact by the usual means of lights by night, smoke signals, semaphore, heliograph and flag signalling by day, is attended with great disadvantages mainly because people do not become lost in easy country.

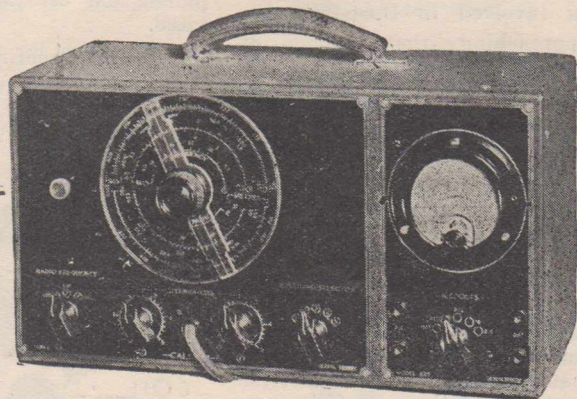
"Now, however, thanks to the expert efforts of the Lakemba Radio Club, a system of portable radio units capable of sending and receiving messages from a central control station, has been perfected.

"This radio system has tremendous advantages. The nearest broadcasting station or amateur radio station now will become a control

(Continued on page 27)

## A Really FIRST-CLASS OSCILLATOR for as low as £10-10-0

(Within the reach of every Experimenter, Set-builder or Serviceman)



IT'S a really high-grade job: all wording etched on non-ferrous metal; leather carrying handle, rubber feet. Pilot light and black instrument knobs on each model. Five inch dial reads direct in Kc/s, Mc/s (top half) and corresponding metres (bottom half): smooth planetary movement—adjustable for slip. Two attenuators on both models.

**SPECIFICATIONS:** Model 306, battery-operated, with minimised battery drain ("B" battery drain approximately 5 ma., at 67.5 V.; "A" battery 4.5 V., drain approx. 120 ma., including pilot).

Band spread 150 Kc/s to 16 Mc/s on fundamentals without breaks: above 16 Mc/s by using 2nd harmonics. R.F. signal modulated at will. High degree of stability and accuracy particularly over 175 and 465 Kc/s channels.

Model 307 A.C., mains operated. Feed back prevented by line filters, thus maintaining good attenuation. Bandsread 150 Kc/s to 25 Mc/s on fundamentals without breaks. Both models available with or without built-in output meter.

**OUTPUT METER:** 3" round type. Special Alnico magnet gives approx. 300% increase over old style. Ranges: 2, 5, 10, 50, 250. Provision for measuring A.C. volts. All necessary cards and instructions supplied.

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N.S.W.: Australian Radio College Ltd., Martin de Launay Ltd., Bloch & Gerber Ltd., United Radio Distributors, John Martin Ltd., Electric Service Co., Newcastle. QUEENSLAND: J. B. Chandler & Co. SOUTH AUSTRALIA: Radio Wholesalers Ltd., Adelaide. WEST AUSTRALIA: Carlyle & Co., Perth; Norman L. Burnell & Co., 13 Queen Street, Perth. VICTORIA: Australian General Electric Ltd., Melbourne; Arthur J. Veall Pty. Ltd.; Hartleys Ltd., Flinders Street, Melbourne. TASMANIA: Noyes Bros. (Melbourne) Ltd., Launceston. NEW ZEALAND: New Zealand Electrical Equipment Co. Stocks also available from Turnbull and Jones, all branches.

306 Battery Operated .....	£10 10 0
306a (illustrated) ditto with output meter .....	15 15 0
307 Mains Operated .....	10 17 6
307a ditto with output meter .....	16 2 6
Output Meter as used on both models .....	5 10 0

(All prices subject to sales tax)

Terms arranged Trade-ins accepted

**SLADE'S RADIO PTY. LTD.**

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# Acoustic Filter In Latest Rola Units

**New Method Of Dust-Proofing And Acoustic Filtration Improves Fidelity And Volume-Handling Capacity.**

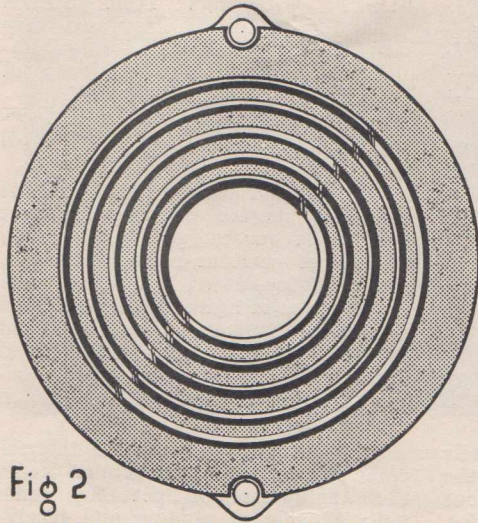


Fig 2  
CORRUGATED-PAPER SPIDER

A new and greatly-improved dust-proof and acoustic filter has been incorporated into several models of Rola sound reproducers. Of this new patented method of filtering is claimed that fidelity and volume-handling qualities are considerably improved. Following is an account of the general problems of dust-proofing leading up to a description of the latest patented method.

#### Problem Involved In Dust-Proofing.

In approaching the problem of dustproofing and acoustic filtration, one has to take into consideration a basic problem which may be described as follows:—

To produce sound waves, a vibrating cone or diaphragm is used to compress and rarify the air in front and behind itself. These sound waves depend upon the free excursions of the cone for volume, pitch and tone.

The diaphragm and suspension must be designed so that its effective mass and stiffness is limited to a degree that will not unduly restrict the free movement of the cone. The cone is caused to vibrate by force applied to it by the voice coil, which is suspended in the gap between the pole piece and the magnet. As this gap is minute, there is the barest clearance between the voice coil and the magnet on one side and pole piece on the other. The general design must be such that the voice coil is free to vibrate in a plane parallel to the magnet and pole piece, but is held rigidly against movement in any other direction.

The suspending medium must have sufficient stiffness to return the voice

coil and diaphragm to a position centrally between the pole pieces. It must not have any tendency to lose these qualities after it has been in use for a considerable period of time.

The strong electro-magnet or permanent magnet of the reproducer tends to attract metallic particles suspended in the air as dust. Unless some method is devised to exclude this dust from the gap, the efficiency of the speaker will be seriously impaired and constant service necessitated.

#### Dust-Proofing Methods.

There are two areas of the magnet to be protected, i.e., that part between the pole piece and the inside of the

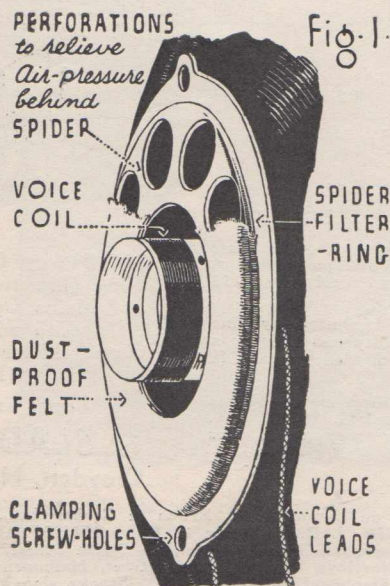


Fig. 1.

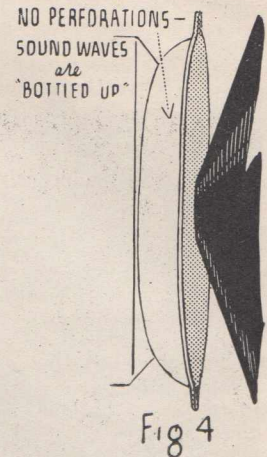


Fig 4

voice coil, known as the inner gap, and the outer portion of the other side of the voice coil. The inner gap can be protected by a suitable shield of dustproof material across the opening of the coil at the apex of the cone.

Covering the outer gap satisfactorily presents a more serious problem. Several methods have been adopted from time to time, and discarded for some reason or other.

The general difficulty is to shield this outer gap without restricting the free movement of the cone and yet provide free movement of air.

#### Full Circle Suspension Popular.

What is known generally as full circle suspension has become very popular. In this method the spider—the means of suspending the voice coil in the gap—is made of paper or similar material and is attached to the perimeter of the voice coil on the inside and a suitable support on the outside (figure 2).

The difficulty arises in the design of the outer support for the corrugated paper spider. The method used has been widely adopted. The spider is supported by a solid ring of metal which fits tightly to the front piece of the magnet. Thus dust cannot enter the inner gap.

Although this method provides excellent cone suspension and positive dust-proofing, there is one very big disadvantage. The spider is restricted in its excursions to and fro by the compression and rarification of the enclosed air, which becomes virtually an air cushion preventing the full migration of the spider and consequently of the voice coil. The ob-



vious results are loss of efficiency and deterioration of tonal quality.

**Patented Improvement Provides "Breathing Space."**

The most logical solution is to provide breathing spaces which, while allowing a free passage of air to the back of the spider, prevent the ingress of dust. By perforating the spider support, and covering these perforations by a felt washer coarse enough to allow air movement, yet fine enough to filter the air, effective dust-proofing has been achieved.

This method, which is fully covered by patents taken out by the Rola Company, is shown in figure 1. The photograph (figure 3) shows the new spider in position on the permanent magnet speaker 6-6. It has also been used with the new F5B which has recently been released, and can also be obtained in the popular 8in. electro-dynamic F8.

The effectiveness of this new method of dust-proofing and acoustic filtration becomes strikingly apparent during a listening test whereby speakers featuring the two methods can be contrasted.

**Superiority Of F5B Revealed In "Radio World" Test**

As a practical check on the claims made for the new Rola F5B, a direct

comparison test between this new model and its earlier prototype, the DP5B, was arranged. Both speakers were mounted on the one baffle board, the voice coil leads from both speakers being wired to a double-pole double-throw switch in such a way that either speaker could be connected at will to the secondary of the output transformer mounted on the F5B. The receiver used was a standard 4/5 dual-wave superhet., using a 6V6G with inverse feedback in the output.

Comparative listening tests were made both on records and radio, and even to inexperienced observers the superiority of the F5B was undoubted. Speech was clean and crisp, response to transients being exceptionally good for so low-priced a speaker. As well, the frequency range has definitely been extended upward without any undesirable effect on bass response, substantiating Rola's claim to "more even response."

**Bushwalkers' Club Tests**

(Continued from page 25)

base from which a search control officer will direct economical operations. He will have a sketch map over which is drawn a grid, similar to the grid used on Government mili-

tary maps. By means of numbered squares operations are directed. When signs of the lost party are picked up, the news and nature of the circumstances are conveyed to the base station and the control officer then issues his instructions.

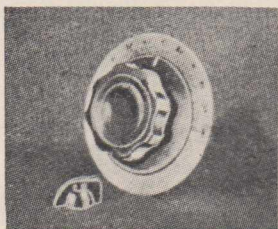
"I wish to congratulate the Lakemba Radio Club and the Search and Rescue Section of Bushwalking Clubs on the successful conclusion to their practical experiment.—Signed, Myles J. Dunphy." (Mr. Dunphy has for 25 years been the secretary of the Mountain Trails Club of N.S.W.).

A contributing factor to the success of the day was the generosity of two battery manufacturers who supplied the necessary battery power. The Battery Equipment Supply Co., of Allen St., Waterloo, provided a bank of six-volt accumulators to drive the genemotor. These batteries were subject to a drain of 10 amps. most of the day.

The Ever Ready Battery Co. supplied the necessary light duty "B" batteries besides the "A" battery supply. On two of the transmitters the small "B" batteries were subject to a much greater current drain than that specified, without any apparent detrimental results. Both companies have expressed their willingness to co-operate on occasions such as

(Continued on page 34)

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# The 2NO Amateur Band Superhet

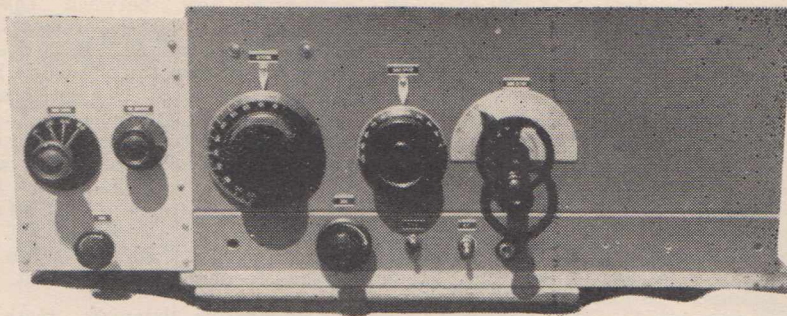


Fig. 1.—The receiver seen from the controls. These are, left to right: R.F. bandswitch, R.F. tuning, mixer tuning, bandspread tuning and band-setter. An old vernier dial movement is adapted for the last, with the band positions marked with Indian ink on an aluminium plate. Bottom controls are, left to right: R.F. regeneration, I.F. gain, on-off switch, B.F.O. switch, 'phone jack.

It is not essential to gang three tuned circuits, comprising R.F. amplifier, mixer and oscillator, in a receiver designed to cover the most-used amateur bands only. The limited frequency range needed for each band permits the use of separate controls, with signal tuning on the oscillator bandspread control. The receiver described here is used at the writer's experimental station with excellent results on 10, 20, 40 and 80 metres.

by DON B. KNOCK (VK2NO)

Radio Editor, "The Bulletin."

SOMETHING more suitable than the simple tuned r.f. receiver is essential if consistent communication is to be enjoyed on the congested 20- and 40-metre bands. No matter how perfectly shielded and well designed, the best t.r.f. receiver is practically useless in a district crowded with amateur stations. A good superhet is essential for efficient reception, and good design can easily be combined with simplicity and reasonable cost. The receiver described here was used originally without pre-selection, and gave a very good account of itself with mixer input alone. The regenerative r.f. stage was added later, as may be seen in the illustrations.

It was decided in this receiver to

use a 6L7 mixer with 6J5G oscillator, one stage of i.f. at 465 kc. using a 6K7, 6C5 plate detector with provision for headphone connection, 76-beat frequency oscillator and 6V6G beam tetrode output to the speaker. Tracking is so little a problem on the amateur bands that a manual control was arranged for the 50 mmfd. variable condenser tuning the mixer grid, with the usual band-setter and bandspread tuner on the oscillator. This worked so well in the final form of the receiver that there is complete lack of interlocking between these circuits, so that the mixer tuning becomes a very effective manual volume control. It is particularly useful to detune this circuit when trying to copy a distant c.w. station alongside

a powerful local signal.

Examination of the circuit diagram, Fig. 3, shows that, with the addition of the capacity-coupled regenerative r.f. amplifier, an unconventional mixer is used. When the receiver was under test before adding the r.f. stage, trouble developed with the only available 6L7 valve. No replacement being on hand, a compromise was sought with interesting results.

## Octode Mixer With Separate Oscillator.

The only 6.3-volt valve available of suitable type was a Philips EK2G octode. As the receiver had already been laid out for separate mixer and oscillator, it was decided to adopt a little-known method with this type of valve—using the EK2G with the oscillator plate connected to the pentode section screen grid, and the oscillator grid employed as the injector grid to the 6J5G oscillator. Coupling is in the usual manner for a 6L7, through a 50mmfd. mica ceramic condenser, with a 50,000-ohm resistor to earth to keep oscillator voltage from the injector grid. This gives remarkable conversion gain at the highest frequencies, and there is almost complete lack of interlocking.

When the receiver was finally completed with the r.f. stage in action it was found that other suitable valves in this scheme of connection are the recently-introduced types 6K8 and 6J8G. (It is noteworthy that in "Radio Handbook" for this year the latest amateur band superhets employ a 6J8G in this manner with separate os-

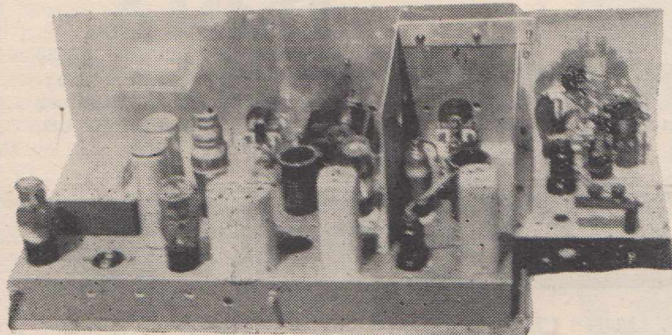


Fig. 2.—Rear view, showing the layout. The round screening can is the B.F.O. unit.



illator.) The EK2G, however, gives better results.

Instead of using the popular cathode tap arrangement to obtain regeneration in a mixer stage, a tip was taken from "QST" and plate feedback coils were used for both mixer and oscillator. Thus with the cathode earthed there is less possibility of hum modulating d.c. signals and making them r.a.c. Also, oscillator voltage is less likely to appear in the mixer grid circuit.

In the circuit diagram the EK2G mixer is shown with a plate feedback coil inductively coupled to the grid circuit. This is applicable only where regeneration is wanted on the mixer. If the receiver is built minus the r.f. stage then regeneration is a decided advantage on the mixer. In such case the usual 50,000-ohm potentiometer will be included in the screen grid circuit for variation of potential. If the receiver is made up as shown in the circuit diagram with regenerative r.f. stage, retention of regeneration on the mixer would complicate matters, and the plate coil should be omitted. Actually the circuit should be shown with plate of the EK2G connected directly to the primary of the first i.f.t. This point must be borne in mind if the receiver includes the r.f. stage.

**Switching Plus Plug-in Coils.**

With the receiver in its initial form, plug-in coils were used for simplicity and efficiency. They take a lot of beating in an amateur band receiver since leads in tuned circuits can be kept extremely short. It is no trouble, moreover, to change two coils for each band manually. With an r.f. stage, however, three coils become a nuisance. It was decided, therefore, to make up the regenerative r.f. stage with switching, employing a four-section two-pole switch for the four bands. Being separately tuned, plus regeneration, this stage calls for a fair degree of sharp tuning when lifting a weak signal out of the background, but on normal signals regeneration can be reduced and tuning is relatively broader.

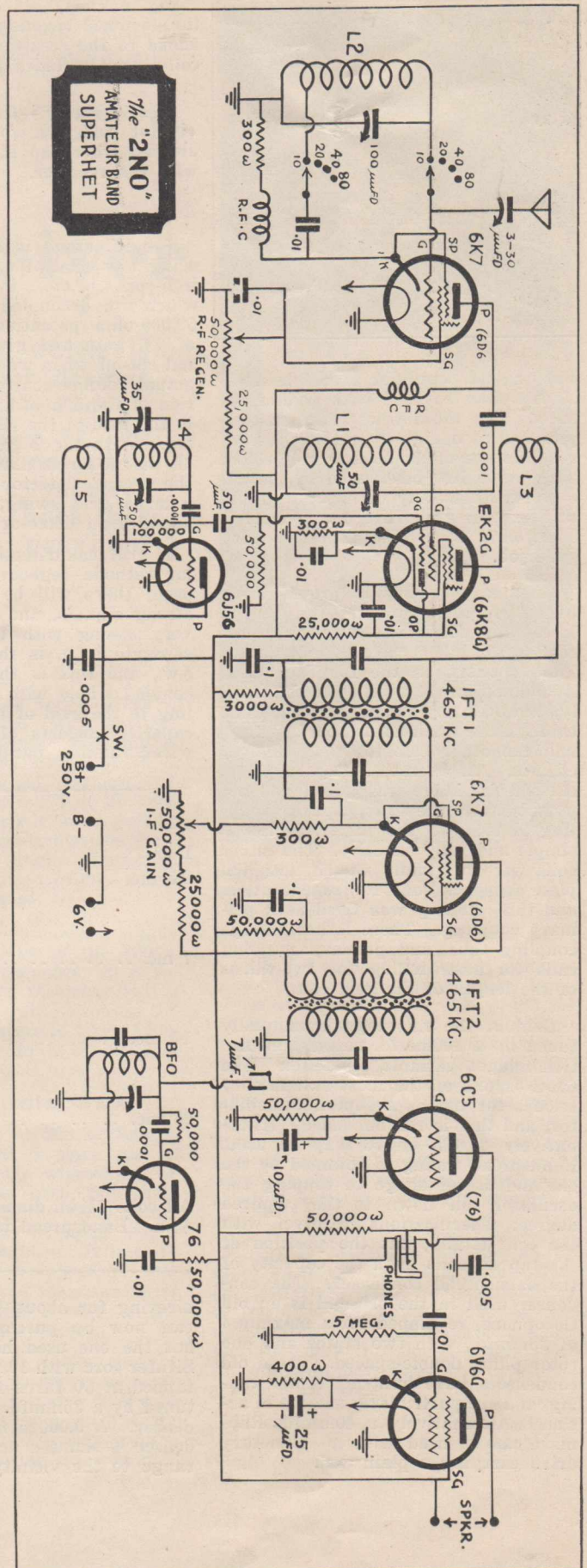
There is another advantage. As may be expected, image interference on 20 metres from the 19-metre broadcast stations is only very slight with the r.f. stage. On occasions the writer likes to listen to Daventry and other stations around 19 metres. Procedure is to tune to the weak image on 20 metres, then to tune the r.f. stage to the higher frequency. This brings the 19-metre stations up to full speaker volume without the necessity for altering the bandsetter control.

**Circuit Details.**

There are seven valves, not including a power supply, which is not shown.

This is quite conventional, consisting of the usual 385-volts power pack with double filter and 80 rectifier.

Fig. 3.—Circuit diagram, with all constants, of the 2N0 Amateur Band Superheterodyne Receiver. It uses a 6K7 in both the r.f. and i.f. valve sockets, and an EK2G Octode as mixer. A 6J5G Octode as mixer. A 6J5G acts as a separate oscillator, in an unconventional hook-up that gives excellent results at high frequencies.





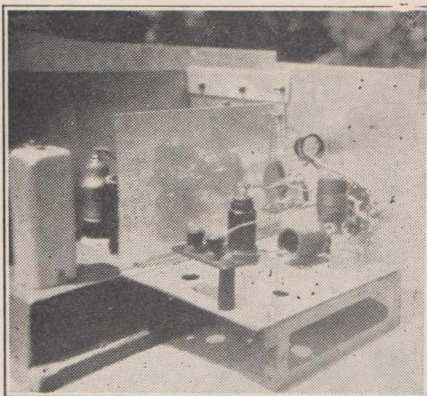


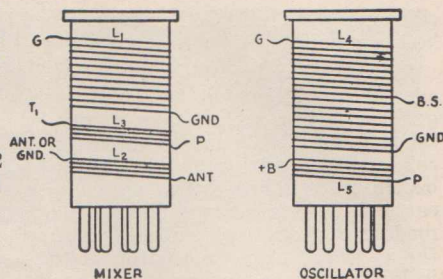
Fig. 4 (left).—A close-up view of the switched regenerative R.F. stage, added to the receiver. The 80-metre coil is not included in this view.

For the r.f. amplifier a 6K7 is used. A 6D6 may be used with similar results. For those who want r.f. amplification at a high degree on 10 metres, the use of an 1851 is suggested. This valve has been tried in the receiver without any circuit alteration, and gave a great lift on 10 metres. The 6K7, nevertheless, does a very good job.

A small capacity is provided for aerial coupling, connected as shown. If coupling for a doublet aerial is preferred, this means a switch with two more sections on the four positions. A doublet can be used quite effectively, however, by connecting one side through the small adjustable capacity, and the other side to the receiver chassis. All circuit values are given. As the r.f. stage was added and not planned from the start, capacity coupling is used to the mixer. This is simple and fully effective. The mixer coils were originally wound with the plate feedback coils for regeneration, and this winding was tried as a primary coupling. There is not enough coupling thus, and primary coupling calls for interwinding for two-thirds of the length of the grid coil.

Grid of the r.f. stage is manually tuned by a 100mmfd. ceramic insulation midget variable condenser. The 6J5G is one of the most satisfactory triodes for use as a superhet oscillator, and this is recommended. Alternatively a 6C5 or 76 may be used. Bandsread tuning is obtained by the old and useful dodge of tapping the oscillator coil down to the required degree. Specifications are given with the coil details; but the position of the tap depends upon the capacity of the bandsread condenser. The condenser, used in the original is an old Gecophone, revamped for a maximum of 35mmfd., with two stator and one rotor plate, double-spaced. These old condensers have built-in vernier tuning, and are particularly smooth in action. Alternatively a 40mmfd. Raymart can be used with a planetary drive carrying a plain dial.

Fig. 5 (right).—How mixer and-oscillator coils are wound. Ignore L2 and L3 where an R.F. stage is used with the receiver.



The i.f. stage is a 6K7 (or 6D6) using the small inexpensive 465 kc. iron-core i.f.t.'s., the primaries of which are decoupled as shown. A 50,000-ohm potentiometer takes care of i.f. gain and gives complete signal cut-off when wanted. This is only actual volume control, manual operation of the 50mmfd. tuning condenser in the grid of the EK2G being an extra. With the high conversion gain of the mixer-oscillator combination, the second detector needs to handle a large grid swing, and the 6C5 as anode bend detector does this.

If grid-leak detection with the popular cathode regeneration scheme is used, there will be overloading on strong signals, and most signals are very strong with this receiver. A separate b.f.o. is thus necessary for c.w., and this is the usual electron-coupled triode with very small coupling to the grid of the detector. The capacity consists of two insulated wires running parallel in insulating

unit is easily made up in an old i.f.t. can.

With the 6V6G output on a Rola permag. 12in. speaker, the volume is more than comfortable for average requirements. Not shown in the diagram is a switch in the plate feed to the b.f.o. to cut this valve out when not required. S.w. in the 250-volt plate supply to the receiver is the on-off switch to cut the receiver when on transmission.

Coils for the r.f. stage are: Ten metres, five turns 14 enamelled copper, 1in. diameter, self-supporting, and tapped half-turn from ground; 20 metres, 1in. diameter coil, 11 turns 22 enamelled copper, spaced 1/8in. and tapped half-turn from ground; 40 metres, 1in. diameter coil, 24 turns 26 d.s.c., spaced diameter of wire and tapped half-turn from ground; 80 metres, 1 1/2in. coil, 35 turns 26 d.s.c., close-wound and tapped one turn from ground.

MIXER AND OSCILLATOR COIL DATA.

Band.	Coil.	Size.	Turns.	Lengths.	Tap.
3.5 mc. . . . .	L1	22	35	close-wound	—
	L3	22	2.5	"	—
	L4	22	25	1in.	17
	L5	22	5	close-wound	—
	L3	22	2	close-wound	—
7 mc. . . . .	L1	18	20	1in.	—
	L3	22	2	close-wound	—
	L4	18	13	1in.	6
	L5	22	3	close-wound	—
	L3	22	2.5	close-wound	—
14 mc. . . . .	L1	18	11	1in.	—
	L3	22	2.5	close-wound	—
	L4	18	7	1in.	2.4
	L5	22	2	close-wound	—
	L3	22	2.5	close-wound	—
28 mc. . . . .	L1	18	5	1in.	—
	L3	22	2.5	close-wound	—
	L4	18	3.6	1in.	1.3
	L5	22	1.4	close-wound	—
	L3	22	2.5	close-wound	—

All coils 1 1/2in. diameter. Spacing between coils on same form approximately 1/8in. Bandsread taps are measured from bottom (ground) end of L4. All coils are wound with enamelled wire.

sleeving for about 1/2in. B.f.o. units can now be purchased ready-made, but the one used here consists of a Sirufer core with 102 turns of 36 d.s.c. tapped at 30 turns from ground, and tuned by a 35mmfd. compression condenser. A 0.00025 mica ceramic condenser is shunted across to bring the range to the vicinity of 465kc. The

L3 in these specifications refers in each range to a plate feedback coil if used with the mixer, where such a receiver may be constructed minus the r.f. stage.

Fig. 5 shows the method of winding coils for mixer and oscillator, the mixer coils being shown with the feed-  
(Continued on page 34)

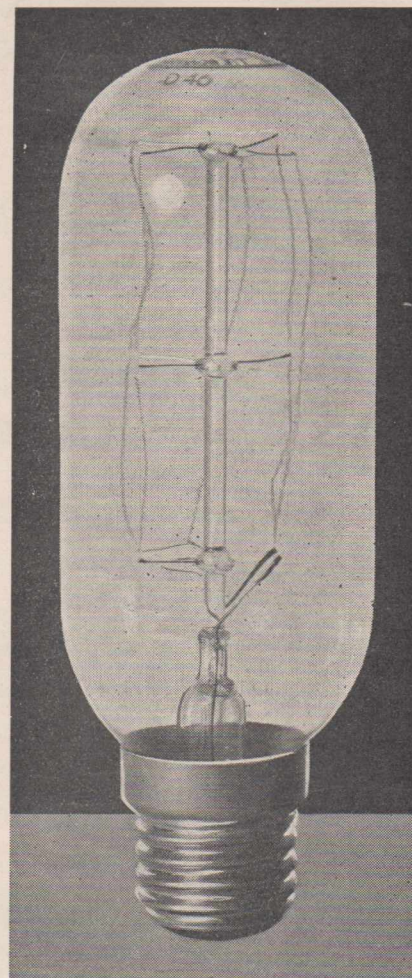


On the right is shown the Philips type 1941 barretter which comprises an iron resistance element enclosed in an atmosphere of hydrogen. It has a regulating range of from 77 to 200 volts at 300 m.a.

# The Universal Receiver

The universal or a.c. / d.c. receiver, which is widely popular in the States in midget designs suitable for transport, has also a market, though a restricted one, in Australia by virtue of the d.c. areas that still exist. This article describes the fundamental principles of a.c./d.c receiver design, and stresses the dangers from shock that exist unless adequate insulation is provided throughout . . . . .

by "ENGINEER"



In the early days of town lighting by electricity, d.c. was often chosen in preference to a.c., mainly because the advantages of a.c. were not then fully understood. Unfortunately, however, many areas served with d.c. are forced by economic circumstances to retain their supplies, while other territories around them have had a.c. supplies installed. This state of affairs has led to the development of the universal receiver, capable of operating either on a.c. or d.c.

There are, in general, two power supplies required for radio apparatus—filament (or heater) and plate, or "A" and "B." The two supplies may come from a common source, but even now the problems of cathode heating and plate supplies are distinct. On one hand there are (normally) several relatively low voltage, high current, loads, and on the other a much higher resistance load consuming, say, 50 milliamps., at anything up to 300 volts.

One important reason why heater voltages are kept relatively low is that high alternating voltages may set up intense fields under the chassis and introduce hum. Further, the manufacturer of valves feels happiest while dealing with thicker heaters.

At least one European valve maker has succeeded, more or less commercially, in producing valves with 200-volt heaters designed specifically for d.c. and universal operation, but they have their own application problems

and the present-day series array of heaters seems to be fairly satisfactory. The Continental and English standard of 200 milliamps. at 12 or 25 volts seems logical enough, although the American 6.3 or 25 volts at 300 milliamps., while more greedy, allows increased standardisation from the manufacturer's angle. Increased standardisation quite often infers stabilised performance.

In Europe the standard supply voltage appears to be of the 200 v. order, and in consequence, if a receiver has, say, five receiving valves and a rectifier, the voltage across the series string of heaters is  $12 + 12 + 12 + 12 + 25 + 25 = 98$  volts or more.

### How The Barretter Works

About 100 volts at 200 milliamps. has to be absorbed in some sort of resistance. Ordinary wirewound resistances have been used, but there is a limit to which the temperature of an open wire may be taken before it begins badly to oxidise. It is more economical, so far as space is concerned, to enclose the resistance wire in a bulb and provide it with an atmosphere devoid of oxygen.

Advantage may be taken then of the barretter principle, which depends simply upon the fact that a cold wire has less resistance than a hot one. By adjusting the pressure of, say, hydrogen, in a bulb housing an iron fila-

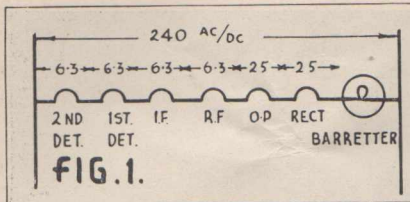
ment, it is possible to make the current practically independent of the voltage drop—a most valuable safeguard in universal receivers.

In U.S.A., where the supply voltage is normally about 110, the same type of receiver would have  $6.3 + 6.3 + 6.3 + 6.3 + 25 + 25 = 76$  volts (approx.) across its heaters, and there would be only 34 volts at 300 milliamps. wasted in the dropping resistance. Consequently, barretters have never been popular in the U.S.A., and the current practice appears to be that of winding some "ni-chrome" wire on asbestos string and incorporating it in the flexible cable from the mains.

Users of American 6.3 and 25 v. types of valves were, therefore, without barretters until the adaptability of the 6.3v. series was realised in Great Britain. English valve manufacturers then introduced a series of 300 milliamp. barretters, two of which are now procurable in Australia.

When connecting heaters in series, those nearest to the chassis potential should be those in the valves most



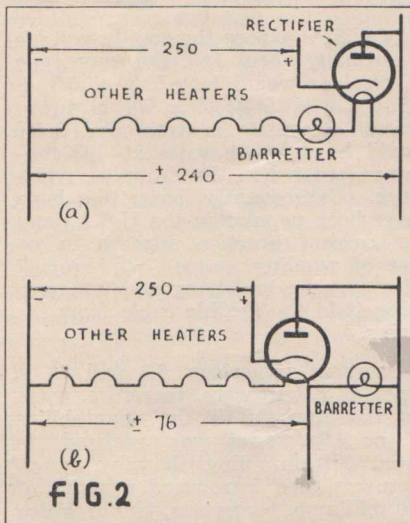


This sketch shows the normal connection for universal operation of valves with 6.3-volt heaters.

liable to hum injection—the first audio stage (second detector, in most cases) and the non-linear r.f. or i.f. stages—the converter or mixer and oscillator. After those come the other valves in order of cathode bias: the r.f. stage, the i.f. stage, the output stage, and the rectifier. The barretter is connected between the rectifier and the other main (fig. 1).

There was one school of radio workers who pressed at one time for connecting the rectifier filament between the barretter and the "hot" line, and while such a scheme behaved well on d.c., abnormally high voltages appeared at the cathode insulation on a.c. The effect may be seen from fig. 2.

To supply anode current from a.c. or d.c. without circuit change demands either half-wave rectification or a full-wave bridge (fig. 3), as these are the only rectification schemes providing a free d.c. path. The centre-tap full-wave scheme provides a short circuit for d.c. and the condensers of the voltage doubler circuit will not conduct (fig. 4). Moreover, the bridge circuit is not sufficiently superior to the half-wave scheme to warrant its

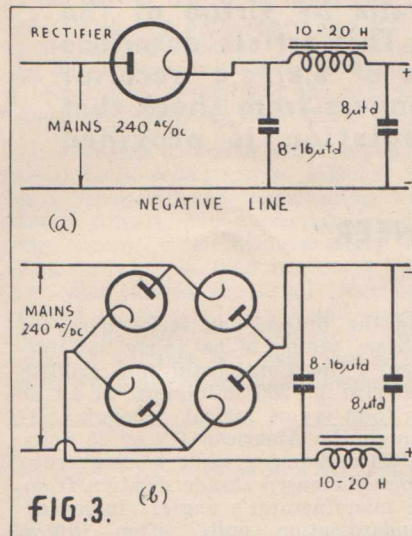


Rectifier heater connections. (b) is preferable as the peak heater cathode voltage does not exceed 350 volts. In (a) it is greater than 580 volts.

general adoption. While it renders the equipment independent of the way it is plugged in, the chassis or negative line can never be at earth potential because of the rectifiers always present in both leads.

The power output of any valve falls rapidly with reduced plate voltage, a 10 per cent. reduction causing a drop of 22 per cent. in power output. As the supply voltage is limited in universal equipment, it is necessary to use low resistance smoothing with fairly large condensers and a low resistance choke. The input condenser (fig. 5) tends to be charged up to the peak value of the supply, and to deliver its energy as required.

When the voltage across the rectifier is high, extremely high, momen-

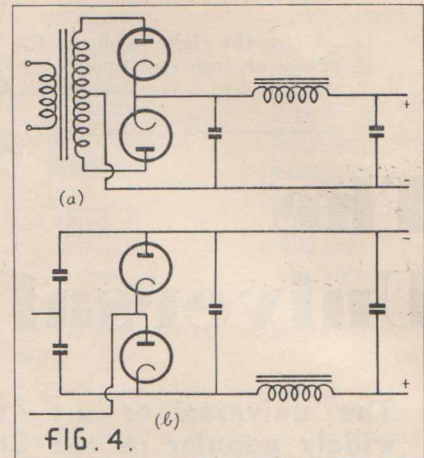


Half-wave power supplies as shown in (a) are generally used. Two double diode rectifying valves must be used for the bridge circuit shown in (b).

tary currents tend to flow, as the internal resistances of most indirectly-heated rectifiers are low, and to prevent damage to the cathode coating it is usual to include small resistors of about 50 ohms in series with each plate. They should be capable of carrying at least twice the normal rectifier current (fig. 5).

Apart from ordinary smoothing problems, there are many other means by which hum is introduced in a.c./d.c. receivers. There are stray fields everywhere, and if any voltages are induced between any grid and its corresponding cathode, hum may appear in the output. The first audio stage is the most vulnerable, and all heater wiring should be kept from its grid circuit.

The a.v.c. network is another source of trouble. Alternating voltage in-

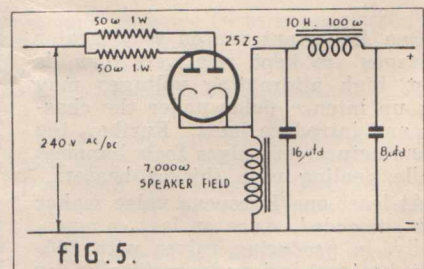


Two power supplies unsuited to universal operation—(a) centre tap, (b) voltage doubler.

duced there can result in hum which is only present when a station is in tune—modulation hum. Returning the individual by-pass condensers directly to their respective cathodes (fig. 6), sometimes helps in this regard, but it is important to keep all r.f. and i.f. coils away from the heater wiring.

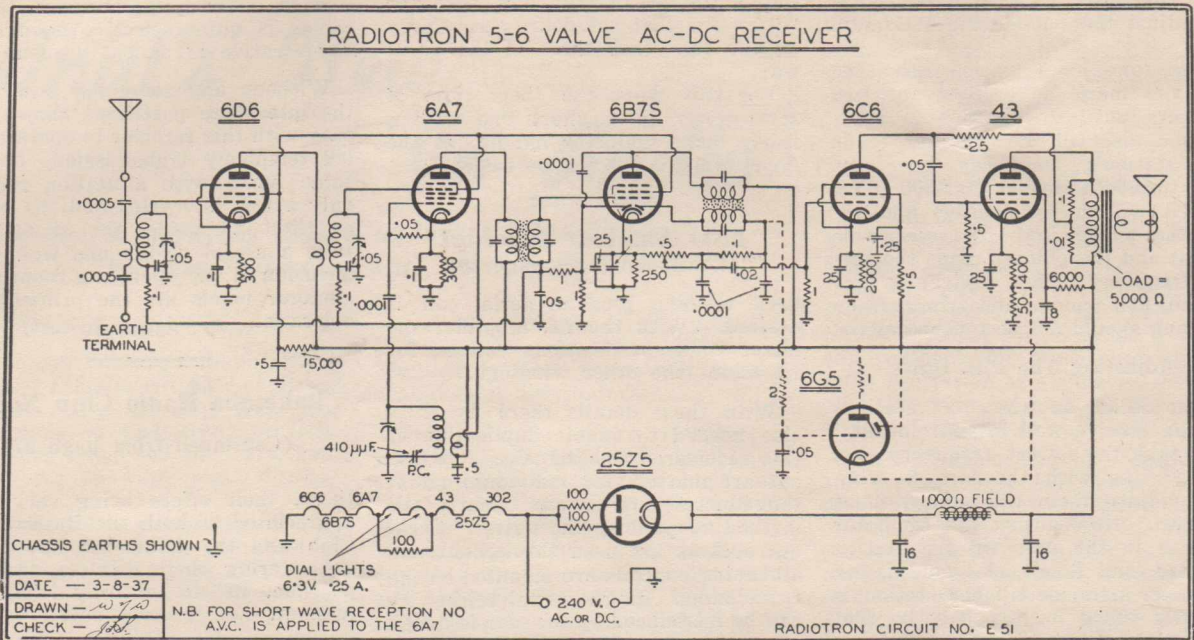
When an earth-line is used and by-passed to the chassis there is always the danger of the incidence of a loop in which voltages may be induced magnetically. For absence of background it will be found generally that the chassis return principle is the better.

With a chassis connected to one side of the mains, severe shocks may be experienced by those who touch chassis and ground simultaneously. Direct contact should be made impossible by the fitting of a ventilating (drilled or slatted) back to the cabinet. Care should be also taken to ensure that the dial escutcheon does not make contact with the chassis, and that all knobs are insulated and fitted with well-sunken grub screws. The aerial and earth connections should be isolated from the chassis with condensers having any value up to



A practical half-wave universal power supply.





This circuit of a typical 5/6 A.C./D.C. receiver was developed by A.W. Valve Co. Pty. Ltd. The valve heaters have been arranged in series, the arrangement of them adopted being to ensure minimum hum.

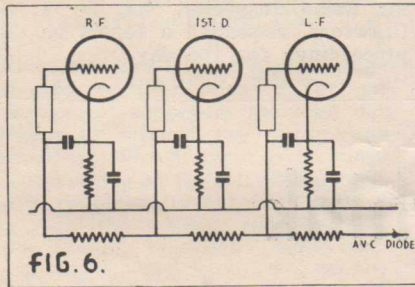


Fig. 6.—By by-passing coil returns directly to their respective cathodes, modulation hum may be minimised. Grid windings are shown here as rectangles.

.05 mfd. If this value is exceeded listeners may receive shocks while connecting up.

Pick-ups may be connected through isolating condensers, but their use is often capable of introducing hum. Hum-free isolation may be achieved by using a screened transformer (fig. 7).

A 7000-8000 ohm speaker field may be connected across the output side of the filter (fig. 8), where it improves smoothing by acting as a bleeder. Dial lights are usually of the 150 milliamp. class, shunted by resistances. If the lamp breaks down, the barretter takes up the extra voltage.

When it is all over the universal set still has severe limitations. It can be made as sensitive as any a.c.

receiver, but the background noise, even with a good r.f. line filter, makes it impossible to use all the sensitivity. It is difficult to service, as a break anywhere in the heater wiring means a total "black-out." Its output is limited by the supply voltage, and by reduced field excitation. It does not make an excellent phonoradio combination.

And all because a few town councils (and the city council in Sydney) cannot (or will not) afford to be in fashion. Very soon, we hope, we may see all problems of universal supply solved for us. But now we must face them.

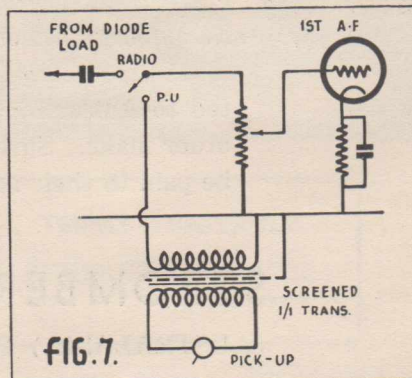


Fig. 7.—A 1:1 ratio audio transformer, well screened between the primary and secondary windings and well insulated, ensures effective isolation for a pick-up, thus reducing induction hum and increasing safety.

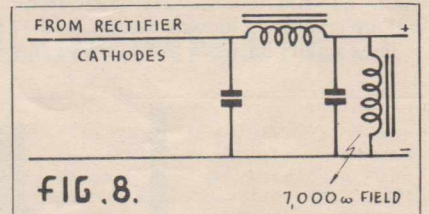


Fig. 8.—If the smoothing choke is large enough, hum may be reduced by connecting the speaker field across the output side of the filter.

**"Trans-Tasman All-Wave Five"**  
(Continued from page 12)

then the valve heaters. The speaker socket can also be wired.

Next, wire the 6K7 i.f. amplifier socket, then the second i.f. transformer, followed by the 6Q7 socket, while finally the 6AG6-G socket can be wired. The three labelled leads—"HT+," "a.v.c." and "screen," running from the ready-wired mixer section, can also be soldered in place.

When the wiring has been completed it should be thoroughly checked. Then the chassis can be inverted, the grid clips fitted and finally the dial can be mounted and the three control knobs fitted. The valves and speaker can now be plugged in, aerial and earth leads connected and the set switched on.

**Testing And Aligning**

Turn the wavechange switch to the "Manual Tuning" position. Assuming that the i.f.'s are lined up, turn the



gang condenser to around 600 k.c.'s and adjust the padder for maximum noise.

Then tune in a station near the 1400 k.c. mark and adjust the two trimmers until this station is loudest, and also till the pointer reads that station's frequency correctly. Next, tune in a station near 600 (2YA or 1YA will do excellently) and adjust the padder until the station is loudest and the pointer reads the correct frequency. The receiver is now aligned, and padder and trimmers on the gang should not be touched again.

#### Adjusting The P.B. Unit

First decide on which six stations you can receive well in your locality. Then take the lowest frequency one, and starting with the largest trimmers, adjust them till loudest noise is heard. Now adjust the oscillator trimmer in the unit till the station is heard, and finish off by adjusting the mixer trimmer till the station is correctly tuned in. It may be that the initial setting of these two trimmers is too far off for the station to be heard by adjustment of the trimmer on the oscillator alone. If so, adjust each in turn a little and peak them as you go. Start with them full in and work downwards.

Then take the next station and use

the second set of trimmers, with the button for that set depressed. Carry on for the other three in the same way.

For this work the best type of screwdriver is a short one with a fairly large diameter handle, as the finer adjustments will be easier.

#### 2NO Amateur Superhet (Continued from page 30)

back winding plus an aerial coil if desired. With the r.f. amplifier the mixer coils specifications will be for L1 minus the other windings.

With these details there is little else needed to enable duplication of this receiver. Chassis size and layout are matters for individual taste; the illustrations show clearly the method adopted by the writer. Ceramic sockets are used throughout and all tuning controls are mounted on the front panel. Single signal selectivity can be introduced by the simple dodge of making the i.f. stage regenerative. This is done by connecting a flex wire from the grid of the i.f. valve and pushing as much as is needed into a hole in the second i.f.t. Advancing the gain control will produce oscillation. The edge of this condition will sharpen things materially on c.w. re-

ception. Normally, however, the receiver is quite selective enough and regenerative i.f. is not needed.

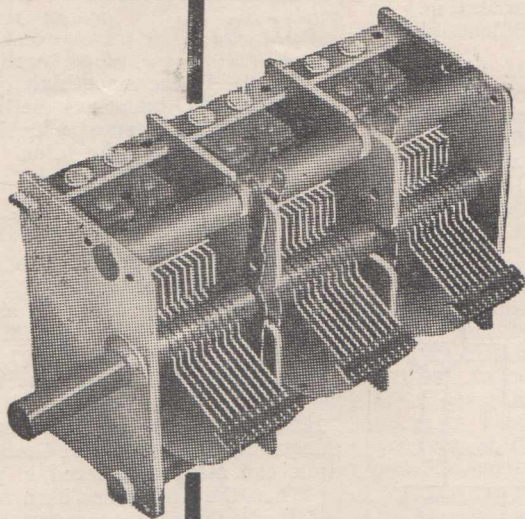
Without any screening other than the interstage partitions shown, it is easy with this receiver to operate duplex telephony transmission on the same band, with a station removed only a few kilocycles and the receiver right alongside the transmitter. It is a useful design and well worth inclusion in any operating room where amateur bands are the primary consideration.

#### Lakemba Radio Club Notes

(Continued from page 27)

these, their offers being very much appreciated as both the Bushwalkers' Club and the Lakemba Radio Club are offering their services whenever possible, in an entirely voluntary manner.

Considerable interest has been expressed by many persons outside the Lakemba Club in this experiment, and in willingly granting permission to conduct the tests, the Senior Radio Inspector, Mr. W. T. S. Crawford, requested a report on the proceedings for the day.



## They think the same as we do—

Other leading radio manufacturers apparently think the same as we do about the Stromberg-Carlson gang condenser, because more Stromberg-Carlson condensers are fitted to Australian radio receivers than any other make. Surely no finer compliment can be paid to their accuracy and reliability.

**STROMBERG-CARLSON**  
(AUSTRALASIA) PROPRIETARY LIMITED

124 BOURKE RD., ALEXANDRIA, N.S.W.



# What's New In Radio

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

## In "Radiotronics" No. 95.

The latest issue of "Radiotronics" (Technical Bulletin No. 95), published by A. W. Valve Co. Pty. Ltd., features details on Radiotron transmitting triodes types 809 and 1623, both designed for 25 watts plate dissipation.

Also included is a four-page R.C.A. application note on the operation of the new single-ended type 6SA7 pentagrid converter, which differs from other converter valves in two important respects. Firstly, all electrodes including the signal grid, terminate in base pins, and secondly, there is no electrode which functions only as an oscillator anode.

Other valve types about which details are published include the following:—

**Radiotron 2V3-G** is a high voltage half-wave rectifier intended for use in equipment supplying the high d.c. voltages to cathode ray tubes and kinescopes. The filament is of tungsten, operating at 2.5 volts 5 amperes. The peak plate current is 12 m.a. max., and the average plate current is 2 m.a. max. The peak inverse voltage is 16,500 volts max. The 2V3-G is fitted with a medium metal cap and a small shell octal 8-pin base. Further information is available on request. Small quantities are expected to be available in March.

**Radiotron 1803-P4** is a 12" kinescope with electromagnetic deflection and producing a black and white picture.

**Radiotron 1804-P4** is a 9" kinescope with electromagnetic deflection and producing a black and white picture.

A kinescope is a cathode ray tube suitable for use in television reception. Both these kinescopes may also be used for oscillographic purposes if so desired. These types are not normally available from stock. Additional technical information is available on request.



## New Service To Set Manufacturers

Mr. R. K. Stokes, managing director of Radio Suppliers Pty. Ltd., sole agent for Radiokes products, advises that his company has completed ar-

rangements enabling set manufacturers to get immediate delivery of components stock from their regular dealers and distributors.

This valuable service is filling a long-felt need of the radio trade, as a set manufacturer must be able to obtain his parts at once in order to supply his own customers immediately. The usual procedure is to order parts and then wait for them to be made, and consequently a time lag occurs which sometimes ends in orders being cancelled. This can now be overcome

by large supplies of regular standard stocks being available.

As well, special lines can be made up and held in stock for clients and delivered when required.

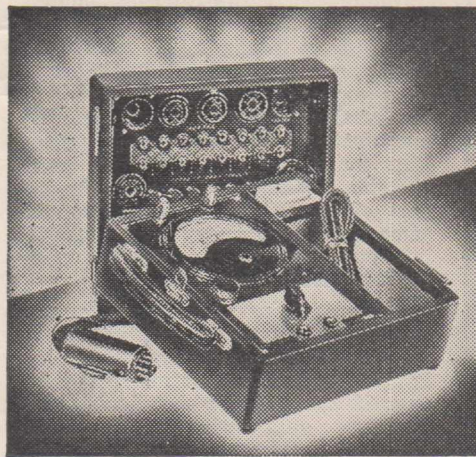


## "The Radio Manual."

A copy of the latest (third) edition of "The Radio Manual," by George E. Sterling, was received last month from the publishers in London. A 1120-page manual, it has been specially prepared to serve as a guide and textbook for those entering the radio profession as engineers, inspectors, operators, as well as for those already engaged in such activity.

For the transport pilot, sportsman, and student flyer this edition supplies information on the principles of operation and the practical use of radio aids to air navigation, including problems in orientation, homing, instrument flying and blind landing systems. In addition, some elementary radio-telephone (broadcast) en-

## PALEC Model "M5" VOLT-OHM-MILLIAMMETER



"The Palec" Model M5 is a reliable and accurate multi-range instrument equipped with our large 5 in. type meter. RANGES:—D.C. volts, 10-100-500-1000 (at 1000 ohms per volt).

Ma's, 1-10-50-100.

Ohms, 0-2,000-20,000-200,000-2,000,000.

The latter range is obtained by connecting an external 45 volt battery to the terminals provided. The instrument is supplied in a well fitted leatherette case complete with test prods.

MODEL M5, Trade price, £5/17/6, plus tax.

MODEL MA5, has four additional ranges of A.C. and Output volts. Trade price, £7/19/6, plus tax.

### TERMS AVAILABLE

Manufacturers of Cathode Ray Equipment, Meters and full range of testing equipment.

## ANALYSER SELECTOR

A special Analyser Selector which is easily fitted into the removable lid of Model M5 (see illustration) can be supplied. This unit enables voltage and current readings to be readily taken at all points of American or Octal type valves, without removing the chassis from the cabinet. Price, £2/15/-, extra.

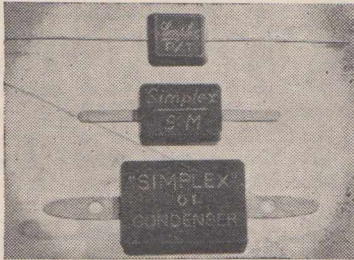
## PATON ELECTRICAL PTY. LTD.

90 VICTORIA STREET, ASHFIELD, SYDNEY. 'PHONE UA 1960.

Leading Distributors in all States.



# COMPACT EFFICIENCY



**T**O obtain ideal performance and to provide compactness without sacrificing efficiency, Simplex have made a detailed study of mica condenser requirements. To date, Simplex types S/M and P/T fulfil every possible radio need for mica condensers. Over two million of them are now in use, proof positive that they are superior in design and in actual operation. Notable features include:—

- High resistance to moisture.
- 1000 volt A.C. & D.C. test.
- Triple-strength contacts
- High accuracy of calibration.

Type S/M, available in capacities from .000005 microfarads to .01 microfarads.

Type P/T (Pigtails) measuring only  $\frac{3}{8}$ " x  $\frac{5}{8}$ "—capacity range .000005 microfarads to .001 microfarads.

(All Simplex condensers are subjected to a test of at least 1000 volts A.C. and D.C.)

## SIMPLEX Condensers

"FAVORED BY FAMOUS  
FACTORIES"

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

'Phone LM 5615.

AGENTS IN ALL STATES.

gineering has been included, as have radio frequency measurements and monitors and instantaneous recordings.

Representative commercial apparatus is described in detail in the chapters devoted to broadcast, ship, aircraft and police station transmitters, receivers and associated apparatus.

★

### Ghirardi's "Radio Trouble-Shooter's Handbook"

An advance review copy has just come to hand from the Radio & Technical Publishing Company, New York, of Alfred A. Ghirardi's latest radio servicing book, "Radio Trouble-Shooter's Handbook." Described as a "monumental new compilation of compact reference material to aid servicemen in speeding up their trouble-shooting and repair work," the book comprises 518 pages with 134 illustrations, and is provided with a strong, gold-lettered black binding. Of standard manual size ( $8\frac{1}{2}$ " x 11"), it duplicates no other radio manuals in the material contained. The book provides the serviceman with a wide range of new data of various kinds, selected for practical "bench value," and tabulated and indexed for handy and immediate use. All data has been factory-checked and double-checked for accuracy.

One of the features of this publication is its collection of "Case Histories," comprising a 274-page compilation of the common trouble symptoms and remedies for 3313 models of the receivers made by 177 different manufacturers. While this section loses much of its value in this country, due to the restriction on the import of American receivers, at the same time it contains much practical information that can easily be applied to receivers in general.

Auto-radio installation and servicing receives special attention in a number of different tabulations . . . ignition-system interference data for over 80 car models; electrical wiring diagrams; gear ratios and dial directions of all auto-radio control heads; table of battery polarities, breaker-point gaps, spark-plug gaps, antenna data for all cars, etc.

Other features of the book include two new original and ingenious trouble-shooting charts; data for servicing sound-recorders and inter-communicator systems; comprehensive trade directories; and over 25 charts and tables on tubes, ballast resistors; dial lamps, magnet wire, grid-bias resistors, transformers, drills and taps, all RMA Colour Codes, and many other subjects.

"Radio Trouble-Shooting Handbook" takes the place of Ghirardi's

former and smaller data book, "Radio Field Service Data," and is a companion volume to his "Modern Radio Servicing."

★

### Calstan Battery-Operated Test Oscillators

Two new test equipment releases by Slade's Radio Pty. Ltd., of Croydon, N.S.W., comprise a battery-operated modulated test oscillator and a combination instrument consisting of this oscillator together with an output meter. These two instruments will also very shortly be available for a.c. operation.

Complete details will be published in next month's "Radio World," but in the meantime readers interested in these new instruments can obtain full information free on request direct from the manufacturers—Slade's Radio Pty. Ltd., Lang Street, Croydon, N.S.W.

★

### Pamphlet On Rola Speakers

A pamphlet has just been released by the Rola Company in Melbourne illustrating and listing the latest range of Rola speakers.

Complete information on all models is included, such as dimensions, voice coil impedance, normal field excitation, price, etc. As well, a price list for repairs to Rola speakers is included.

This pamphlet is available free on request from any of the Rola distributors listed below, or direct from the Rola Company (Aust.) Pty. Ltd., The Boulevard and Park Av., Richmond, E.1, Victoria, or 116 Clarence St., Sydney, N.S.W.

#### Rola Inter-State Distributors

The Rola Company has now completed its distribution in all States. The following firms represent Rola's resale interests in their respective States:—Mr. A. E. Harrold, Queensland; George Brown & Co. Pty. Ltd., Sydney; John Martin Pty. Ltd., Sydney; Homecrafts Pty. Ltd., Melbourne; A. G. Healing Ltd., Melbourne and Adelaide; Messrs. D. Harris & Co., Adelaide; Atkins (W.A.) Limited, Perth; W. & G. Genders Pty. Ltd., Tasmania (Launceston, Hobart, Burnie).

Retailers of radio goods should contact these distributors for supplies of Rola reproducers. Manufacturers are invited to contact Rola direct at their head office in Melbourne or at Sydney Service Depot (Rola Company (Aust.) Pty. Ltd., The Boulevard and Park Avenue, Richmond, E.1, Phone J5351; and 116 Clarence Street, Sydney, Phone B5867).





# The All-Wave All-World

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

# DX News



### QSL Exchange Bureau

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

- M. N. Wicks (AW425DX), "Elmsdale," Balhannah, South Australia;
- W. A. McColl (AW215DX), 5 Coromandel Street, Wellington, New Zealand;
- Wm. Bantow (AW353DX), 237 Point Nepean Road, Eidthvale, S.14, Victoria;
- Jock Ashley (AW401DX), C/- E.S. & A. Bank, Ulmarra, N.S.W.;
- John Cooke (AW343DX), 111 Archer Street, Chatswood, N.S.W.

### Learning The Code

(Continued from page 23)

One other suggestion which may prove of assistance is to cultivate the habit of substituting the code symbols for A, B, C and so on, when reading street signs or even the morning paper.

#### Oscillator Or Buzzer Necessary.

For the purpose of practice, it is advisable that students work together in pairs or more. A good key (not a cheap or ill-made instrument) with either an oscillator or buzzer is a necessity.

Practice should commence at a speed of not less than four words per minute, a word to consist of five letters. It is better to arrange groups of five letters containing opposites, as this system demands strict concentration, whereas by sending ordinary reading matter a fair chance of filling in lost letters presents itself, which is not helpful.

During the initial stages the key points should be allowed a reasonably wide clearance, which can be reduced as speed is attained. There is no cut and dried length for a dit (dot), but whatever length or period occupied by a dot, the dah (dash) is twice its length. Between letters a period equal to a dah is allowed, and at the end of a word, twice that period.

#### How To Hold The Key.

The manner in which the key is grasped is to place the index and

middle fingers on the top of the knob, with the thumb and third finger on either side of it. The grip must be very light, and the necessary movement must come from the wrist only—not the hand. For this reason the key should be placed so that no part of the arm is touching the table or bench upon which the key rests during operation. For a while this position will be uncomfortable and cause a distinct ache, but this will soon disappear as the limb becomes accustomed to it.

Do not attempt to speed up your sending too soon, as this is the chief cause of bad formation. Make your first objective good formation of letters, ensured by care in making them and by observing correct periods as between letters and words. One of

the worst features of the self-taught operator is due to a desire to attain speed too quickly, whereas by making correctness the first consideration it will be found that when the necessary speed is attained, formation does not suffer.

#### Slow Morse Sessions.

A simple shortwave receiver or a dual-wave superhet that embodies a beat oscillator for the purpose of listening to morse transmissions by amateurs, will be found of great assistance, as there is usually slow morse on the air for the benefit of beginners. An application to the Hon. Secretary of the State branch of the Wireless Institute of Australia can

(Continued on page 46)

## ALL-WAVE ALL-WORLD DX CLUB Application for Membership

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

Dear Sir,

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

Name.....

Address.....

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

My set is a.....

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

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

(Signed).....

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





# Short-wave Review

CONDUCTED BY  
**ALAN H. GRAHAM**

## Review Of Conditions ★ Latest Overseas News ★ Reports From Observers ★ Hourly Tuning Guide

### Summary of Present Conditions

During the past month further indications of a gradual changeover to autumn and winter conditions have been noted, and have been confirmed by reports from official observers.

Already indications are that 40 metres will provide some interesting DX later in the year. At the present time reception on this band is quite good during the mornings and late evenings, when any number of transmitters are to be heard when the noise level falls to reasonable proportions. The main interest here is the new Albanian station, "Radio Tirana," now testing on 49.4 m. in the early mornings. Also watch out for the following on the higher wavelengths:—FK8AA, Noumea, 49.02 m.; CFRX, Toronto, 49.42 m.; CHNX, Halifax, 48.94 m.; TGWB, Guatemala City, 46.2 m.; TGQA, Quezaltenango, 46.56 m.; XETW, Tampico, 49.6 m.; CS2WD, Lisbon, 50.15 m.; and ZNB, Mafeking, 50.84 m.

Good reception is now being provided, both morning and evening, on 31 metres; and daylight reception on this band should improve steadily during the coming months. "Radio Tirana," Albania, has also been testing on 30 metres, 9970 k.c., usually around 6 p.m. A stranger on 31.49 m. is believed to be "Radio Warsaw." TGWA, LRX, CXA-8 and OZF are interesting stations to be heard at present.

On 25 metres night reception should soon become poor, but early morning and daylight reception will improve. The Americans are still the best morning stations on this band. Unusual loggings this month include HVJ, Vatican City; HIN; and CB-1190.

Just below the regular 25-metre band XMHA, Shanghai; and HCJB, Quito, on 24.5 and 24.08 metres, respectively, are attracting a good deal of attention.

Although 19 metres continues to provide some really extraordinary reception, it is apparent that early evening reception is steadily declining, as the peak for reception on this band moves towards midnight. ZG0X, Chungking; TGWA and HAS-3 are reported. The last mentioned station is very strong at Sunday midnight.

Both the 13 and 16 metre bands are becoming very erratic, with ever-increasing periods of almost total "black-out."

★

### Ultra-High-Frequency Notes

Conditions on 11 metres (now the outstanding UHF attraction) continue to be reasonably satisfactory. From 10 a.m. till 1 p.m. is the period of best reception, with a peak usually around 11.30 a.m. W9XUP is the steadiest signal; with W6XKG and W9XA also strong.

The 9.49-metre band seems to have suffered a temporary (we hope) eclipse. On most occasions there was no trace of even the regulars.

The 10-metre amateur band is improving as far as reception from North America is concerned. Very strong signals are to be heard around 11 a.m. Conditions on this band were very good on March 1 when a number of strong R9 signals were logged. W6MOU, W9WTW, W4FJB and W6PDB were about the best—the last mentioned being particularly strong. A few Europeans are still to be heard around 9 p.m.

### 11-Metre Stations.

In addition to the stations listed in the special article by Mr. Ferrell, which appeared in the last issue of the "Radio World," the following transmitters have been allocated frequencies on 11 metres.

W3XAU, 25720 k.c., 11.7 m., Philadelphia.

W9XTB, 26550 k.c., 11.3 m., Des Moines.

★

### Latest News of Overseas Stations

#### Austria.

DJG, Vienna, is a new station reported on 17815 k.c., 16.84 m. It is believed to be on the air irregularly, broadcasting to South Africa around 2-4 p.m.

#### Chile.

The Chilean station, CB-970, is using the slogan "La Voz de Chile para toda la America." They relay CB-76 on 9735 k.c., 30.82 m., from 2 a.m. to 2 p.m. daily (occasionally till 4 p.m.). Reports should be sent to: La Cooperativa Vitalicia, Lira 543, Valparaiso.

Also new is CB-960, Santiago, on 31.2 m. They announce as "Radio La Americana, Compania de Seguros de Vida." Schedule is 11.30 a.m. till 2.30 p.m.

#### China.

Another new Chinese station, operated by the Chinese Government, and located in Kwei-yang, Kwei-chow, is transmitting on 42 m., 7010 k.c. Call sign is stated to be XPSA; schedule from 9.10 p.m. till 1.10 a.m. daily, with news service in English at 12 midnight.

#### Colombian Republic.

Yet another list of Colombian alterations.

HJ6FAH, Armenia, on 4870 k.c., 61.6 m. Was formerly HJ6ABH.

HJ5EAD, Cali, on 4825 k.c., 62.3 m. Was formerly HJ5ABD.



**Canada.**

CJRO, 6150 k.c., 48.78 m., and CJRX, 11720 k.c., 25.6 m., two of the pioneer SW stations have gradually reduced their hours of transmission until they now are on the air only from 1 p.m. to 6 p.m. on Sundays.

**Cuba.**

The Cuban stations continue their practice of altering frequencies with rather bewildering rapidity. COCQ are the worst offenders; listed on 9740 k.c., 30.8 m., they have appeared on no less than SIX other frequencies within the last few months. These channels have been 8550, 8565, 8700, 8715, 8815 and 8835 k.c., or 35.1, 35.0, 34.46, 35.5, 33.6 and 33.5 m., respectively. COBC have been on 9970 and 9980 k.c., 30.08 and 30.05 m., in addition to their listed frequency of 9995 k.c., 30.02 m. COBZ have been on 9020 and 9030 k.c., 33.36 and 33.32 m. COCD on 6140 and 6150 k.c., 48.83 and 48.75 m. And COCH on 9450 and 9437 k.c., 31.75 and 31.8 m.

Senor Rubio (our West Indies representative) informs us that the Havana civic authorities have changed the street numbers in that city. The addresses of the stations affected are:—

- COCO, San Miguel 314, Habana.
- COCQ, Monte 103, Habana.
- COBZ, San Rafael 108, Habana.
- COBC, Monte 467, Habana.
- COCW, Prado 553 Altos, Habana.
- COCM, Calle 25 No. 1113, Vedado, Habana.
- COBX, San Miquel, 570, Habana.
- COCA, Galiano 464, Habana.
- COCD, Calles 25 y G, Vedado, Habana.
- COCH, Prado 63 Altos, Habana.
- COCX, Reina 314 Altos, Habana.

**Italy.**

The new Italian on 9667 k.c., 31.03 m., relaying 2RO-3/IRF programmes, puts in a strong signal. News in Italian at 8 and 9 a.m. will help to identify this station. It is understood that it uses a power of 100kw.

**Japan.**

Several new transmitters are being used on the regular Japanese transmissions. In addition to JLG, 7285 k.c., 41.18 m., JLT-2, 9645 k.c., 31.1 m., is believed to be on the air regularly, although there is no mention of this in the latest bulletins to hand from Tokyo.

**Nicaragua.**

The station located in Managua, which operates on 9740 k.c., 30.8 m., uses the call YNRS. On the air from 9 a.m. to 3 p.m., YNRS includes an English news session in the last part of its programme. Their slogan is "Radio Pilot"; closing number is the Nazi anthem. It is owned and oper-

ated by Rodolfo Sangelman, Managua, to whom reports should be forwarded.

**Panama.**

A new and powerful station, located in Panama City, will soon be operating on 10680 k.c., 28.1 m. Call will be HOA.

**Peru.**

Lima, "Radio Nacional del Peru," transmits on 15290 k.c., 19.62 m. Special programmes are sent to the United States.

**Metres/K.C. Chart Free To Readers.**

A supply of wavelength frequency conversion charts has been received from Messrs. Philips' Lamps (Asia) Ltd. for free distribution among "Radio World" readers. This chart enables wavelength in metres to be instantly converted to frequency in kilocycles, and conversely. Commencing at 100 k.c. the table progresses in single k.c.'s to 999 k.c. (3000 to 300.3 metres). However, unknowns applying to quantities that are multiples or sub-multiples of those listed can easily be ascertained, and so the chart can be employed to cover the entire range of frequencies used in radio transmission. For example, 500 metres is equal to 600 k.c. The corresponding frequency for five metres (one-hundredth of 500) is obtained by multiplying the frequency quoted by 100; thus it becomes 60,000 k.c., or 60 m.c.

Readers can obtain their copies of this chart by writing "Radio World," 214 George Street, Sydney, enclosing a 1d. stamp to cover postage.

**Roumania.**

An experimental station in Bucharest, announcing as "Radio Bucures-ti," is now on regular schedule on 8572 k.c., 34.9 m. Hours of transmission are 7 to 10 a.m., and 11.15 p.m. to 1.30 a.m.

**Uruguay.**

CXA-2, Montevideo, relays LS-2 (Radio Prieto, Buenos Aires) on 6000 k.c., 50 m., from 1 a.m. till 1 p.m.

**U.S.A.**

An interesting session from W1XAL, 11790 k.c., 25.45 m., is the Modern Radio course, heard from 8 to 9 a.m.

W8XK, Pittsburgh, relaying KDKA, now observes the following

schedule: 21540 k.c., 13.93 m.—9.45 p.m. till 12 midnight; 15210 k.c., 19.72 m.—12 midnight till 5 a.m.; 11870 k.c., 25.26 m.—5 a.m. till 2 p.m.; 6140 k.c., 48.83 m.—2 till 4 p.m.

**U.S.S.R.**

The new Russian station on 6830 k.c., 43.9 m., is located in Khabarovsk, Siberia; and its call is RFN. It is on the air from 5.30 till 10 p.m. RV-15, same locality, is still on 4250 k.c., 70.4 m., from 5 p.m. till 12 midnight. On occasions both stations carry the same programme. It is also reported that RV-15 are on 6040 k.c., 49.65 m., but as yet there is no confirmation available.



**Reports From Observers**

(N.B. All Times Mentioned Are Aust. E.S.T.)

Mr. G. O. La Roche (South Perth, West Australia):

On the S.W. broadcast bands reception from midnight till 4 a.m. is good, with all the regular stations at good strength. Generally conditions improve as the night goes on, peaking around 4 a.m. Daylight reception has been very largely interfered with by heavy QRN.

Best broadcast station loggings include the following:—

- 13 metres: W8XK, W2XE.
- 16 metres: W3XL.
- 19 metres: 2RO-5, XGOX, HVJ, RW96.
- 24 metres: XMHA.
- 25 metres: CR7BH, SBP, Saigon, COCX, XTJ, YDB.
- 26-30 metres: CSW-2 (27.17), ORK, COBC, JDY, COCM, Saigon (30.72), ZHP.
- 31 metres: JFO, W3XAL, CS2AW, ZRK, VUD-2, KZIB, KZRM.
- 32-45 metres: COCD (32.08), COCA, COCQ (33), JVP, PMH.
- 48-49 metres: ZEB, VPB, CR6AA, ZGE, VQ7LO, COCO, XYO (Rangoon), 9MI.
- 50-100 metres: PMY, VUD-2, VUC-2, VUM-2, VUB-2, and several NIROM stations on wavelengths from 61 to 98 metres.

As for the amateur bands, well, results on 20 metres have proved a trifle disappointing, conditions having been very erratic. TG9BA, Guatemala, was the best logging, putting in a very strong signal; this station is on 10 metres on Sundays at 11 a.m. On 40 metres two South Africans were heard at 6 a.m. on February 8—it is interesting to recall that ZU5AC was heard at the same time almost a year ago, namely, at 6 a.m. on January 28, 1938.



Loggings:—20 metres: VS7, VU, XU, VS6, J, XZ, VS2, ZS6, ON, F, G, CO, TG, PK, ZL, KA, K6. 40 metres: ZS6AB and ZS6CM.

**Mr. W. H. Pepin (Maylands, West Australia):—**

DX conditions continue much the same as in previous months.

13 metres: GSJ (13.92) are not quite as strong as formerly. W2XE (13.94) are heard only occasionally.

16 metres: Rome (16.83) put in a strong signal around 11.30 p.m., transmitting to Asia and the Far East. GSG (16.86) are definitely stronger since their power has been increased to 50kw. DJE (16.89) are also good. W3XL (16.87) fair.

19 metres: The Russian RW-96 (19.76) was heard on February 6 giving a commentary from an exhibition with workmen on the spot doing their various jobs, such as constructing aeroplanes, assembling motor cars and tractors, etc. Broadcast was in English. All the regulars on this band are still very good; the best period being from 8 p.m. till 12 midnight.

20 metres: HBJ (20.6) was heard on one occasion with a musical programme at 1 a.m. KQH (20.1), "Hawaii Calls," is good on Sundays.

27-30 metres: The NIROM station on 27 and 29 m. still put in strong signals every night. JDY (30.2) and IRF (30.5) are regulars. The American 'phone WOM (30.3) was heard for a few minutes on plain speech.

31 metres: This band is crowded at nights—VUB (31.41) are good. On February 10 KZRM (31.35) were radiating a basketball commentary. HS6PJ (31.55) still comes in well, but the 15.77 m. transmissions of this station are not as good as previously. It was announced that these stations would operate nightly in the fairly near future. W3XAL have been very good on several occasions on their new 31.03 m. channel, usually at 11 a.m.

Above 31 metres: RW-59 were logged on February 21 on 50 m. at rather good strength. Above 50 m. there is plenty of heavy QRM, but occasionally it is possible to hear PMY (58), VUB-3, RV-15 and YDA (98).  
Amateur Bands:—

20 metres: Best loggings included TG9BA, FNIC (French India), LAIF and SP1QE. Also logged K6, VU, XZ, VS7, ZL, KA, VS6, PK, J, F and XU.

10 metres: A number of Americans have been putting through good signals, W6POZ and W9DRQ being very good. K6BNR, PK1VM and VE5AEZ were other loggings. VK's heard were VK6MW, VK3BQ and VK3IW.

**Mr. A. R. Payten (Coffs Harbour, New South Wales):**

DX generally has been fair. I have spent most time between 9 and 11 metres, with reasonable success. The 10 metre amateur band has been quite good, and a formidable list of W's has been noted during the past few weeks, many of them putting through very strong signals.

W6XKG, on 11 metres, has been heard on quite a number of occasions, usually rather weakly, but once or

### DX Club Requirements.

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

**REPORT FORMS.**—Save time and make sure of supplying all the information required by using these official forms, which identify you with an established DX organisation.

Price . . . 1/6 for 50, post free.

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

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

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

twice signals came up to R6-7, with 100% copy.

The 20 metre amateur, KA1PI, has been very active lately. This is the station at the Radio Exposition at Manila. All QSO's are put through amplifiers for the visitors.

The Jap. on 41.18 m.—JLG—is strong around 5.45 a.m., with news in English. A little later Paris is heard very well on 41.21 m. (7280 k.c.), also with a news bulletin in English. This transmission is simultaneous with TPA-3, 25.24 m. They request reports on the 41 m. station.

On February 19 TAP, 31.7 m., were heard with a post-bag session at 6.25 a.m. Greetings were sent to listeners all over the world. Amongst those to whom greetings were sent were

Mr. Moses, of the A.B.C., and Mr. Ray Simpson, the well-known DX-er.

Loggings on 20 metres include: W, KA, K6, PK, ZL, VK9, VU, XU, J, CO, VP4, F, CE, and TG.

**Mr. J. Ferrier (Coleraine, Victoria):**

Since my last report I have built a small portable, using two of the new 1.4-volt tubes. Complete with batteries, it is housed in an aluminium box 5" x 6" x 6". The antenna used at present is a 15" vertical. Really astonishing results have been obtained, and I am more than pleased. While carrying it around outside W's, XU's, PK's and K6's have been heard on 20-metre phone; and O11BA on CW.

General DX has been poor, and nothing of exceptional interest has been logged. The 10-metre amateur band is improving as far as North Americans are concerned, but the Europeans continue to fall away. Best loggings from Europe, all between 9 and 9.30 p.m., are G, PA and SU.

It is pleasing to note that there are definite signs of activity on the 9-meter police bands. It was during March and April of last year that they were best, so it seems that we have something to look forward to during the next month or so.

**Mr. H. I. Johns (Nelson, New Zealand):**

The remarkable feature of summer reception has been the fact that on both 19 and 25 metres, stations have been heard practically all day at good strength. As I write, at 10 a.m., there are five strong signals on 19 metres.

The last few weeks have been very good for DX. No fewer than 33 stations in 23 countries have been logged and reports forwarded to them.

During the American hour from Rome, 2RO-4, from 10.30 till midday, IQA, on 20.37 m., are now being used in addition to IRF for relay purposes.

On 19 metres, as mentioned above, conditions have been excellent. W2XAD and W8XK are good in the mornings, 8 a.m. Berlin and London are very strong, as is the Jap., JZK. VUD-3 is heard quite well after 1 p.m. with native music; this is followed by a news session in English, before closing at 2 p.m. RW-96 is heard at about the same time.

Just before midday HCJB is heard with a strong signal (very good for this time of the year) on 24 m.

During the afternoons the usual stations are W8XK (25.26) with news at 2.30 p.m.; W3XAL (31), XEWW (31), and TGWA (30.9) heard as late as 4 p.m. After 4.30 p.m. VK2ME is heard on Sundays.

Other loggings include:—

DJX (31.01), fair signals around 6.30 a.m.



KEI (31.68), heard just before 3 p.m.

HBJ (20.64), very strong signals at 6 p.m.

Three Indian stations (Calcutta, Bombay and Madras) on 60 metres at 11 p.m. Difficult to copy on account of QRN.

DZH (20.75) is on irregularly afternoons. Signals usually weak.

CSW-2 (27.17) at 5 a.m. One of the most consistent stations.

TGWA (19.7) on Monday mornings around 7 a.m. Musical programme.

XGOX (19.7) at 9.30 p.m. Lady announcer.

JZH (49.2) is irregular. Heard recently at 9.45 p.m.

CR7BH and SBP are evening stations on 25 metres, best between 7 and 8 p.m.

The Cubans, COBC, COCQ, COCM, are all good. COCH is heard around 3 p.m.

CB-1190 (25.2) is heard from 1.30 p.m. till it closes at 2 p.m.

W2XAF (31.4) closes at 3 p.m.

HVJ has been heard on 49 metres around 6 a.m.

TGWB (46.01) at 4 p.m. Also heard with a special programme for the Archbold expedition in New Guinea.

FK8AA, New Caledonia (49.02), is on the air from 5.30 till 6.45 p.m. Uses only 50 watts. All announcements are in French.

CXA-8 (31.3) is heard on Sundays at 4 p.m. with announcements in English before signing at 4.10 p.m.

LRX (31.06) heard at 4.15 p.m.

XMHA (24.5) opening at 7 p.m. Announcements in English.

XGOY (32.09) heard at 9 p.m. with talks and native music. Call given frequently in English. (This station at Cheng-tu, previously thought to be XOY).

Best amateur loggings for the month are HK3CO, PY2JC, OA4AW and several KA's.

Senor Richard F. Rubio (Habana, Cuba, West Indies):

Senor Rubio forwards a very interesting budget of news, most of which has been incorporated in the section dealing with overseas stations.

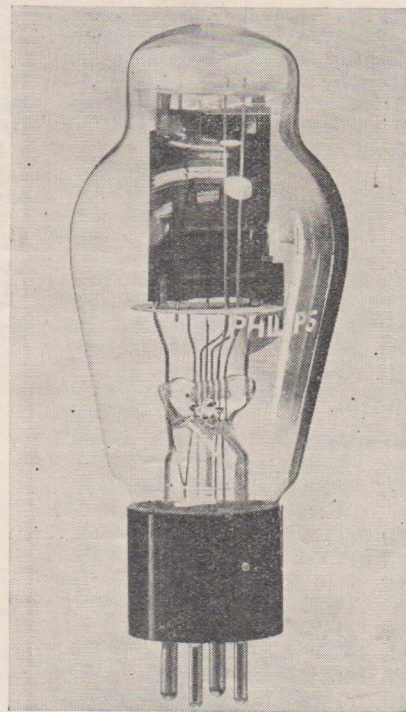
He writes that the 20-metre amateur band still continues to provide the best DX, although conditions are good on all the broadcast bands. His best amateur loggings include:—VS<sup>9</sup>, ZS, VQ2, CR7, FB8, VR2, KA, VU, PK, XZ, XU, VS2, CT, ON, G, VP3, YV, HK, LU, HC, XE and VK.

During the month he added some very fine veries to his collection. Included were cards or letters from EAQ, CR7AA, Radio Lee (Belgian Congo) and Addis Ababa; and the amateurs, ZT1AE, ZS1AL, VK5FM, VK4TH, YV5ABY, YV5ACE, VK3BM,

## Shipwrecked Valve Still Works !

Shown alongside is a Philips type 50 valve which was found washed up on Maroubra Beach on January 17—the day after the wooden coaster Belbowrie was wrecked. It has been established that Philips type 50 valves were part of the "Udisco" transmitting equipment installed on the vessel. Water had penetrated inside the base, rendering the valve useless, but Philips experts drained and dried the base and put the valve on test.

It was found to perform normally, thus providing proof that radio valves, in spite of their thin glass bulbs and delicate inner parts, can "take it" to a degree far beyond expectation. It is amazing that this fragile valve should have escaped being smashed to pieces on



the rocks during its journey through heavy surf.

ZS6AJ CM2AR, VU2JL, ZL2BE, VK2HV, VR6AY, VK5ZL, VK5TR and J2MI.

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

DX this month has shown some improvement, mainly on the 10 metre band and between 60 and 80 metres, where the QRN is easing off somewhat.

I have been concentrating on 10 metres for some time past. At present the band opens up as early as 6.30 a.m., and signals are audible till about 1 p.m. New stations heard recently include KG6NVJ, Jarvis Island; and KF6ODC and CO2WM. Other 10 metre loggings include W's (mostly W9's and W4's), ZL's and PK's.

On 20 metres FN1C, French India, is the month's best logging. And on the whole the band has been fairly good. KA1PI at the Manila Radio Exposition is on every night. Special QSL cards are being sent out to commemorate the occasion—QRA is Box 849, Manila.

On the broadcast bands several interesting stations have been logged. These include "Radio Tirana," Albania, testing on 30.9 m.; they announce that transmissions are on Thursdays, Fridays and Saturdays. HCJB, on 24 m., is to be heard rather

faintly around 10.30 p.m. XMHA, also on 24 m., are very loud, but badly QRM'd by a code station. XGOX, on 19.7 m., are also strong—with a news service in English at 10 p.m.

Recent verifications to hand include HC2HP, TI2LR (10 m.) W6-KTJ (10 m.), HA1P and CN1AF.

Mr. C. J. Anderson (Dumbleyung, West Australia).

This month's reception has been very patchy. At times conditions have been very good, and this keeps the interest alive during the dull periods.

As usual the 20 metre amateur band provided the best DX. FN1C, French India; TG9BA, Guatemala; and SP1QE, Poland, were about the best stations for the month. On February 21 at 6 a.m. (Perth time) a number of Europeans were logged, but on subsequent mornings at the same time the band was quite dead.

With more or less wintery conditions earlier in February I expected some good DX, but none was forthcoming. The following Cubans are good: COCX (25), COBC, COCH, COBZ, COBX, COCA, COCQ and COCW. A weak signal on 46 m. around 11 p.m. (E.S.T.) is thought to be TGWB. Another Guatemalan, TGWA, was heard on 19.7 m. at 4



p.m., broadcasting a special programme to PK6XX. This was on February 18. Also on 19 m. is W3-XAU, 19.65 m., heard in the mornings. Saigon was heard on 48 m. on one occasion at 11.30 p.m.—signals were strong but noisy. The 24 m. Chinese station, XMHA, is spoilt by QRM from a code station.

★

### Latest Schedules

Below are set out the latest information available regarding the transmitters and schedules of the "regular" overseas shortwave stations.

#### England:—

##### Transmitters:—

GSA, 6050 k.c., 49.59 m.  
 GSB, 9510 k.c., 31.55 m.  
 GSC, 9580 k.c., 31.32 m.  
 GSD, 11750 k.c., 25.53 m.  
 GSE, 11860 k.c., 25.29 m.  
 GSF, 5140 k.c., 19.82 m.  
 GSG, 17790 k.c., 16.86 m.  
 GSH, 21470 k.c., 13.97 m.  
 GSI, 15260 k.c., 19.66 m.  
 GSJ, 21530 k.c., 13.93 m.  
 GSO, 15180 k.c., 19.76 m.  
 GSP, 15310 k.c., 19.62 m.  
 GSV, 17810 k.c., 16.84 m.

##### Operating Schedules:—

Transmission 1: 4.30 to 6.45 p.m., GSI, GSO, GSF, GSE and GSD.

Transmission 2: 8.45 p.m. to 12 midnight, GSJ, GSH, GSV, GSG, GSF and GSE.

Transmission 3: Midnight to 3 a.m., GSH, GSG, GSF, GSD and GSE.

Transmission 4: 3.20 a.m. to 7 a.m., GSG, GSP, SA, SD, GSB, GSI, GSE and GSV... 7.15 to 9 a.m., GSO, GSC, GSD, GSB and GSA.

Transmission 5: 9.20 to 11.30 a.m., GSO, GSD, GSC and GSB.

Transmission 6: 12.20 to 2.20 p.m., GSC, GSB and GSD.

##### News Broadcasts:—

Sundays: 2 a.m., 10.40 a.m., 1.30 p.m., 7.40 p.m., 11.25 p.m.

Mondays: 2 a.m., 7 a.m., 10.35 a.m., 1.30 p.m., 7.50 p.m., 11.30 p.m.

Other days: 2 a.m., 7.15 a.m., 10.40 a.m., 1.30 p.m., 7.50 p.m., 11.30 p.m.

#### Germany:—

##### Transmitters:—

DJA, 9560 k.c., 31.38 m.  
 DJB, 15200 k.c., 19.74 m.  
 DJC, 6020 k.c., 49.83 m.  
 DJD, 11770 k.c., 25.49 m.  
 DJE, 17760 k.c., 16.89 m.  
 DJH, 17845 k.c., 16.81 m.  
 DJL, 15110 k.c., 19.85 m.  
 DJN, 9540 k.c., 31.45 m.  
 DJQ, 15280 k.c., 19.63 m.  
 DJR, 15340 k.c., 19.56 m.  
 DJS, 21450 k.c., 13.99 m.  
 DJX, 9675 k.c., 31.01 m.

DJZ, 11801 k.c., 25.42 m.

##### Operating Schedules:—

Transmissions for Australia and Asia; 12.15 to 2 a.m., DJH; 3.05 to 8.50 p.m., DJE; 3.05 to 10.50 p.m., DJS and DJH; 3.05 p.m. to 2 a.m., DJB, DJN and DJQ; 11 p.m. to 2 a.m., DJE.

News broadcasts in English: Sundays, 5 p.m. and 12 midnight. Other days, 5 p.m., 10 p.m. and 12 midnight.

Transmissions for Africa: 1.40 to 7.25 a.m., DJL and DJX; 2.30 to 7.25 a.m., DJD and DJC; 3.05 to 5 p.m., DJL.

Transmissions for South America: 7.50 a.m. to 12 noon, DJE, DJQ; 7.50

JZJ, 11800 k.c., 25.42 m.

##### OPERATING SCHEDULES

Transmissions for Europe: 5.30 to 7 a.m., JLG, JZJ.

Transmissions for South America: 7.30 to 8.30 a.m., JZI, JZJ.

Transmissions for North America (eastern districts): 11 to 11.30 a.m., JZJ; 10 to 10.30 p.m., JZJ.

Transmissions for North America (Pacific Coast), Canada and Hawaii: 3.30 to 4.30 p.m., JZJ.

Transmissions for China and South Seas: 11 p.m. to 12.30 a.m., JVP, JZJ.

News broadcasts in English: Daily at 5.35 and 11.05 a.m., and 3.35 and 11.25 p.m.

#### Italy:—

##### Transmitters:—

2RO-3, 9635 k.c., 31.13 m.  
 2RO-4, 11810 k.c., 25.4 m.  
 2RO-6, 15300 k.c., 19.61 m.  
 2RO-8, 17820 k.c., 16.83 m.  
 2RO-9, 9670 k.c., 31.02 m.  
 IRF, 9835 k.c., 30.52 m.  
 IQY, 11673 k.c., 25.7 m.  
 IQA, 14795 k.c., 20.28 m.

##### Operating Schedules:—

2RO-3, 4 to 5.55 a.m., 7 a.m. to 12 noon.

2RO-4, 9 a.m. to 12 noon, 7 p.m. to 5.30 a.m.

2RO-6, 1 to 3.05 a.m., 4 to 8.30 a.m., 9 a.m. to 12 noon.

2RO-8, 7.30 to 11.45 p.m.

2RO-9, 3 to 4 a.m., 4.35 to 6.35 a.m.

IQA, 7.30 to 8 p.m.

IQY, 6 to 6.35 a.m., 8 to 8.15 p.m.

IRF, 3 to 4 a.m., 4.35 to 6.35 a.m., 9 a.m. to 12 noon.

News broadcasts in English: Daily at 2.05, 4.19, 9.00 and 10.30 a.m., and 9 p.m.

#### Czecho-Slovakia:—

##### Transmitters:—

OLR2A, 6010 k.c., 49.92 m.  
 OLR3A, 9550 k.c., 31.41 m.  
 OLR4A, 11840 k.c., 25.34 m.  
 OLR4B, 11760 k.c., 25.51 m.  
 OLR5A, 15230 k.c., 19.7 m.  
 OLR5B, 15320 k.c., 19.58 m.  
 OK1MPT, 5145 k.c., 58.31 m.

##### Operating Schedules:—

OLR4A-4B or OLR5A-5B, 10.55 a.m. to 1.55 p.m. daily, except Sundays and Mondays, 8.55 to 11.55 a.m.

OLR4A-4B, 4.55 to 8.10 a.m.

OLR5A, 9 to 11.10 p.m.

OLR4B, 11.25 p.m. to 1.25 a.m.

N.B. At 7.40 a.m. a frequency change is announced, the new transmitter coming on at 7.45 a.m. OLR3A is used on Tuesdays; OLR5A on Wednesdays; OLR2A on Thursdays and Fridays; and OK1MPT on Saturdays.

News broadcasts in English: Daily at 12.50 a.m., 7.30 a.m. and 9 p.m.

#### France:—

##### Transmitters:—

TPA-2, 15243 k.c., 19.68 m.

#### OFFICIAL S.W. OBSERVERS.

N.S.W.: V. D. Kemmis (AW301DX), "Brampton Hall," 49 Kurraba Road, Neutral Bay, Sydney; A. R. Payten (AW352-DX), High Street, Coff's Harbour.

SOUTH AUSTRALIA: J. C. Linehan (AW323DX), 181 South Terrace, Adelaide; A. E. Bruce (AW171DX), C/- 54 Currie Street, Adelaide; R. S. Coggins, 8 Glen Rowan Road, Woodville.

QUEENSLAND: J. K. Sorensen (AW316DX), "Fairholme," Station Road, Gympie; E. Neill (AW64DX), 26 Canning Street, Nth Ipswich.

WEST AUSTRALIA: G. O. La Roche (AW155DX), 62 Gladstone Avenue, South Perth; W. H. Pepin (AW402DX), Seventh Avenue, Maylands; C. J. Anderson (AW417DX), Dumbleyung.

TASMANIA: H. A. Callander (AW304DX), 1 Franklin Street, West Hobart.

VICTORIA: J. Ferrier (AW129DX), "Winninburn," Coleraine.

NEW ZEALAND: H. I. Johns (AW407DX), Mount Pleasant Avenue, Nelson, N.Z.

a.m. to 1.50 p.m., DJN; 12 noon to 1.50 p.m., DJQ; 9 to 10.50 p.m., DJE; 2.10 to 3.25 a.m. (Mondays only), DJE.

Transmissions for North America: 7.50 a.m. to 1.50 p.m., DJB, DJD and DJZ; 11 p.m. to 12 midnight, DJL; 2.10 to 3.25 a.m. (Mondays only), DJB.

Transmissions for Central America: 7.50 a.m. to 1.50 p.m., DJR; 9.30 a.m. to 1.50 p.m., DJA; 11 p.m. to 12 midnight, DJH.

#### Japan:—

##### Transmitters:—

JLG, 7285 k.c., 41.18 m.  
 JVP, 7510 k.c., 39.95 m.  
 JZI, 9535 k.c., 31.46 m.



TPA-3, 11885 k.c., 25.24 m.  
 TPA-4, 11718 k.c., 25.6 m.  
 TPB-3, 17810 k.c., 16.84 m.  
 TPB-6, 15130 k.c., 19.83 m.  
 TPB-7, 11885 k.c., 25.24 m.  
 7280 k.c., 41.21 m.  
 TPB-11, 9550 k.c., 31.41 m.

Operating Schedules:—

12.30 to 2 a.m., TPB-3; 2.15 to 9 a.m., TPA-3; 10 a.m. to 12.15 p.m., TPA-4; 12.30 to 3 p.m., TPB-7 and TPA-4; 5 to 8 p.m., TPB-6 and TPA-3; 9 p.m. to 2 a.m., TPA-2; 2.15 to 9 a.m., TPB-11.

News broadcasts in English: Daily at 6 a.m., and 2, 7.15 and 10 p.m.

Holland:—

Transmitters:—

PHI-2, 17770 k.c., 16.88 m.  
 PCJ, 9590 k.c., 31.28 m.  
 PCJ-2, 15220 k.c., 19.71 m.

Operating Schedules:—

PHI-2, 10.40 p.m. to 12.10 a.m., except Mondays (9.25 to 11.45 p.m.).  
 PCJ-2, 6 to 7.30 p.m., Wednesdays; 12.30 to 2.30 a.m. Fridays.  
 PCJ, 11 a.m. to noon Sundays; 4.20 to 4.35, 5 to 6, 10.15 to 11.15 a.m., 11.25 a.m. to 12.25 p.m. and 12.35 to 12.50 p.m. Tuesdays; 4.45 to 6.30, 10.15 to 11.45 a.m., and noon to 1.30 p.m. Thursdays; 10.15 to 11.15 and 11.25 to 11.40 a.m. Fridays.

News broadcasts in English: Daily at 10.45 p.m.

Philippines:—

Transmitters:—

KZRM, 9570 k.c., 31.35 m.  
 KZIB, 9503 k.c., 31.57 m.

Operating Schedules:—

KZIB, 10 p.m. to 12.05 a.m.  
 KZRM, 7.30 to 10 a.m., 2.15 and 3.15 p.m., and 7 p.m. to 1 a.m. (except Sundays); Sundays, 6 p.m. to 1 a.m.

News in English: Daily at 10.50 p.m.; also at 8.30 p.m. on Saturdays.



10 Metres Improving

Daylight reception on 10 metres is showing signs of definite improvement, with very strong signals coming through from North America during the morning hours, from 8 a.m. till noon, providing an almost continuous period of good reception. Evening conditions are not as good as in previous months, only a few Europeans being heard around 9 p.m.

20 Metres

The 20 metre band continues to be the DX-ers stand-by, for good results seem always obtainable here, even when the other bands are not so good. Interesting stations are reported this month from the various observers—such as FN8C, French In-

dia; VP4TH, Trinidad; VS9AC, Maldive Is. (in the Arabian Sea); TG-9BA, Guatemala; VQ4MSR, Kenya; and CR7BT (Mozambique).

Latest "K" Prefixes

The newly allotted "K" prefixes are as follow:—

K4—Puerto Rico.  
 KB4—Virgin Is.  
 K5—Canal Zone.  
 K6—Hawaii.  
 KB6—Guam.  
 KC6—Wake Is.  
 KD6—Midway Is.  
 KE6—Johnstone Is.  
 KF6—Baker Is., Howland Is. and American Phoenix group.  
 KG6—Jarvis Is., Palmyra group.  
 K7—Alaska and Pribilof Is.



Calls Heard

20 Metres—

EUROPE

Norway: LA1F (Pepin).  
 Poland: SP1QE (Pepin).  
 France: F8YX (Pepin), F8XT (La Roche, Payten), F8VP (Graham).  
 Belgium: ON4DZ (La Roche), ON-4MZ, ON4NW (Rubio).  
 England: G6ML (La Roche), G5HS, G2AL, G3DO (Rubio), G8CL (Graham).  
 Portugal: CT1QG (Rubio).

AFRICA

South Africa: ZS6EB, ZS6CM (La Roche), ZS4H, ZS2AV, ZS6EF, ZS-

5PL (Rubio), ZS6SA, ZS6AJ (Graham).

Madagascar: FB8AH (Rubio).  
 Mozambique: CR7BT (Rubio).  
 Kenya: VQ4MSR (Graham).

Northern Rhodesia: VQ2FJ, VQ-2PL (Rubio).

ASIA

China: XU8NR (Pepin), XU8NR, XU8HB (La Roche), XU8RB (Payten), XU6TL (Rubio), XU8ET (Graham).

Maldive Is.: VS9AC (Rubio).

Japan: J2MI, J2NG, J3FK (Pepin), J2MI, J2NF (La Roche), J2MI (Payten), J8CG (Rubio).

D.E.I.: PK1EG, PK4DG, PK1RI, PK1VM, PK2LZ (Pepin), PK1RI, PK3WI, PK4AY, PK4JD (Payten), PK1VM, PK1RL, PK1CV, PK1ME, PK1EG, PK2AY, PK4KS, PK4AU, PK4JD (La Roche).

Malaya: VS2AB, VS2AS, VS2AF (La Roche), VS2AL (Rubio).

French India: FN8C (Pepin).

Hong Kong: VS6AG (Pepin), VS-6AK (La Roche).

Ceylon: VS7RF (Pepin), VS7GJ (La Roche).

Burma: XZ2DX, XZ2DY, XZ2PV, XZ2JB (Pepin), XZ2JB (La Roche, Payten), XZ2DX (Rubio).

India: VU7FY, VU2LL, VU2CA (Pepin), VU2CQ, VU2FU, VU2FA (La Roche), VU2FU (Payten), VU-2BT, VU2FU (Rubio).

Hawaii: K6ILW, K6NZQ (Pepin), K6BNR (La Roche), K6CMC, K6KKP (Payten).

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

THE AUSTRALASIAN RADIO WORLD.  
 214 George Street, Sydney,  
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Philippines: KA1JP, KA1LB, KA-1PI (Johns), KA1AX, KA2OV, KA-1JM, KA1ME, KA1CW, KA1FH, KA-1AF, KA1PI (Pepin), KA1CS, KA-1BH, KA1ER, KA1CW, KA-1AP, KA1JM, KA1FH, KA1CF, KA-1ME, KA1JC, KA1AX, KA1LB, KA-1KP, KA2OV, KA7EF (La Roche), KA1JM, KA1LB, KA7EF, KA1CX, KA1ME, KA1AF, KA1PI (Payten).

#### AMERICA (North, South, Central) AND WEST INDIES

Venezuela: YV5ACE, YV5ABA (Rubio), YV5ABF (Graham).  
Mexico: XE1CQ (Rubio).  
Chile: CE1AH (Payten).  
Cuba: CO2AM, CO2UA, CO2RD, CO2JJ (La Roche), CO2WM (Payten).  
Guatemala: TG9BA (Pepin, La Roche, Payten).  
Peru: OA4AW (Johns).  
Brazil: PY2BC (Johns).  
Trinidad: VP4TH (Payten).  
Argentine: LU8AB, LU5AN (Rubio), LU4OA (Graham).  
Dominican Republic: HI5X (Graham).  
Canada: VE2MW (Graham).  
Ecuador: KH3CO (Johns), HK1EF, HC1JW (Rubio).  
British Guiana: VP3AA (Rubio).

#### PACIFIC

Canton Is.: KF6DHW (Graham).  
New Guinea: PK6XX (La Roche, Payten, Rubio), VK9CL, VK9WL (Payten).  
Fiji Is.: VR2FF (Rubio).  
New Zealand: ZL2BE (Pepin), ZL4GM (La Roche), ZL2BE, ZL4AL KL1KJ (Payten).  
10 Metres:—

#### EUROPE

England: G2IS, G6DH, G6WX (Ferrier).  
Holland: PAOFB, PAOAZ (Ferrier).

#### AFRICA

Egypt: SU1MW (Ferrier).

#### ASIA

Hawaii: K6BNR (Pepin), K6NBC K6MBD, K6BNR (Payten).  
D.E.I.: PK1VM (Pepin).

#### AUSTRALIA

VK6MW, VK3BQ, VK3IW (Pepin).

#### AMERICA

Canada: VE5AEZ (Pepin).  
United States: W6POZ, W6BCF, W6PDB, W9DRQ (Pepin), W1WR, W2KAX, W3CDT, W3DUK, W4EKQ, W4FRJ, W4GBW, W4FIJ, W4FUM, W5FUA, W6ATU, W6PDB, W6POZ, W6CQS, W6OEC, W6AGQ, W6LIT, W6AGJ, W6MLA, W6NKF, W6HUM, W6JUW, W6MWD, W6BTF, W6MDX, W6NMA, W6TMB, W6ELW, W6NGJ, W7ACD, W8AHC, W9CXU, W9TOZ,

W9QKR, W9AIF, W9GIR (Payten), W6MOU, W6PDB, W4FJB, W9WTW, W9ROQ, W9DEA, W9ZIX (Graham).



#### SWL Card Exchangers' Section

The following overseas SWL's will appreciate hearing from any readers interested in "swapping" cards. They guarantee 100% QSL—but don't blame us if some of them slip you up.

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Edwin Hill, 38 Butler St., Birmingham 10, England.  
Edward H. Urban, 3389 Silsby Rd., Cleveland Heights, Ohio, U.S.A.  
Allen J. Schwartz, P.O. Box 695, Albany, N.Y., U.S.A.  
Kenneth J. Schlicher, 703 Tenth Av., Bethlehem, Penna., U.S.A.  
Joseph Zajchowski, 29 Jenks Av., Central Falls, R.I., U.S.A.  
Spencer E. Lawton, 15 Hillside Av., Westerly, R.I., U.S.A.  
Bruce H. Stribling, North Clemson Av., Clemson, S.C., U.S.A.  
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Leonard Woodall, Route 2, Plano, Texas, U.S.A.  
Ray J. Stockdale, Riverside Drive, Route 6, Zanesville, Ohio, U.S.A.



#### Last-Minute News

Additions to Amateur "Calls Heard" Section

10 Metres:—

#### PACIFIC

KG6NVJ, KF6ODC (Linehan).

#### AMERICA

Cuba: CO2WM (Linehan).

20 Metres:—

#### EUROPE

England: G2MF, G3BM, G5BJ, G6MU, G8IT, G8LH (Anderson); G5OV (Linehan).  
Belgium: ON4DI, ON4PA (Anderson).  
Roumania: YR5PB (Linehan).  
Hungary: HA1P (Linehan).

#### AFRICA

South Africa: ZS6O (Linehan).  
Mozambique: CR7AU (Linehan).  
Tangiers International Zone: CN-1AF (Linehan).

#### AMERICA AND WEST INDIES

Canada: VE2AA (Anderson), VE-1EI (Linehan).  
Bermuda: VP9R (Anderson).  
Bahamas: VP7NS (Anderson).  
Cuba: CO2GY (Linehan), CO2RR, CO7CX, CO8BC (Anderson).  
Costa Rica: TI2AV (Anderson).  
Mexico: XE1GE (Linehan).  
Brazil: PY2JC (Linehan).

#### ASIA

Singapore: VS1AD (Anderson).  
India: VU2BG, VU2LJ, VU2FU (Anderson), VU7KL (Linehan).  
French India: FN1C (Anderson, Linehan).  
Ceylon: VS7RA, VS7RP (Anderson).  
Malaya: VS2AP, VS2AJ (Anderson).  
Hong Kong: VS6AD (Anderson).  
China: XU8MC, XU7HV (Anderson).  
Hawaii: K6IQN, K6OTH (Anderson).  
Philippines: KA7HB (Linehan).

#### PACIFIC

Canton Is.: KF6DHW (Linehan).

#### Latest Shortwave Schedules

Though I am unable to do much DX, I have received some information that may be of interest. Firstly, a card from COCQ confirms the report that this erratic station is now on 33m., 8830 k.c. Secondly, a comprehensive time-table of Soviet broadcasts in English is reproduced below. All times mentioned are G.M.T.

**Sunday:** 8 a.m., 19.76 m.; 11 a.m., 25 m.; 3 p.m., 50 m.; 9 p.m., 1774 and 50 m.; midnight, 31.25, 19.89 and 49.75 metres.

**Monday:** 8 a.m., 19.76 m.; 9 p.m., 1744, 50 m.; midnight, 31.25, 19.89, 49.75 m.

**Tuesday:** 8 a.m., 19.76; midnight, 31.25, 19.89, 49.75 metres.

**Wednesday:** 8 a.m., 19.76 m.; 11.30 a.m., 25 m.; midnight, 31.25, 19.89, 49.75 metres.

**Thursday:** 8 a.m., 19.76 m.; 10 p.m., 1210, 50 metres; midnight, 31.25, 19.89, 49.75 m.

**Friday:** 8 a.m., 19.76 m.; 9 p.m., 1744, 50 m.; midnight, 31.25, 19.89, 49.75 metres.

**Saturday:** 8 a.m., 19.76 m.; 10 p.m., 31.51, 49.75, 50 metres; midnight, 31.25, 19.89, 49.75 metres.

On the 7th, 13th, 19th, 25th and 31st, RV96 (19.76) starts at 8.15 a.m. instead of 8.

The following is the time-table of Radio Vaticano, English broadcasts, time H.E.C.

**Tuesday:** 14.30, 25.55 m., news, etc.;



16.30, 19.84 m., news; 20.00, 48.47 or 49.75 m., news.

Thursday: 20.00, 48.47 or 49.75 m., Catholicism.

Friday: 20.00, 48.47 or 49.75 m., diverse subjects.

Sunday: 19.00, 19.84 m., news, etc. Perhaps club members may be in-

terested in the methods of identifying Radio Vaticano:—(1) The ticking of the studio clock for 5 minutes before transmissions begin; (2) the clock of St. Peters striking the hour; (3) "Laudetue Jesus Christus" always precedes and follows any transmission.—B. R. Ferris (AW439DX), Proston, Q'land.

19.66	GSI	25.00	RNE
19.72	W8XK	25.24	TPA-3
19.85	DJL	25.34	OLR4A
22.0	SPW (T, Th, Sat)	25.42	(S, M) DJZ
25.0	RNE	25.42	JZJ
25.24	TPA-3	25.45	W1XAL
25.34	OLR4A	25.49	DJD
25.42	JZJ	25.53	GSD
25.49	DJD	25.60	TPA-4
25.53	GSD	28.93	EAJ43
25.57	IQY	30.04	COBC
27.17	CSW	30.31	CSW
30.4	EAQ	30.43	EAQ
30.52	IRF	30.51	COCM
31.01	DJX	31.02	W3XAL
31.13	2RO-3	31.06	LRX
31.28	PCJ (W)	31.09	CS2WA
31.28	W3XAU	31.13	2RO-3
31.35	W1XK	31.28	W3XAU
31.48	W2XAF	31.32	GSC
31.55	GSB	31.33	KZRM
31.7	TAP	31.35	W1XK
41.18	JLG	31.45	DJN
43.1	ZL2GB	31.46	JZI
47.2	ICC	31.48	W2XAF
49.59	GSA	31.49	LKJ-1
49.83	DJC	31.55	GSB
		31.55	KZIB
		31.58	XEWW
		31.8	COCH
		49.59	GSA

# HOURLY TUNING GUIDE

## When and Where To Search

Compiled by ALAN H. GRAHAM.

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

All times are given in Australian Eastern Standard Time.

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

Midnight-1 a.m.	31.8	COCH	
13.97	GSH	32.59	COBX
16.81	DJH	32.95	COCA
16.84	TPB-3	33.32	COBZ
16.86	GSG	39.95	JVP
16.88	PHI (S)	48.7	VPB
16.89	DJE	49.59	GSA
19.35	W2XAD	49.9	COCO
19.63	DJQ	49.98	Rangoon
19.68	TPA-2	58.3	PMY
19.7	OLR5A	60.06	VUD
	(ex. M, S)	60.61	VUM
19.71	PCJ (Th)	61.16	VUC
19.74	DJB	70.2	RV-15
19.8	YDC	98.6	YDA
19.82	GSF		
25.34	OLR4A	1-2 a.m.	
	(ex. M, S)	13.97	GSH
25.4	2RO-4	16.81	DJH
25.42	JZJ	16.84	TPB-3
25.53	GSD	16.86	GSG
27.27	PLP	16.89	DJE
28.48	JIB	19.35	W2XAD
29.24	PMN	19.63	DJQ
30.96	ZHP	19.68	TPA-2
31.28	VK2ME	19.7	OLR5A
	(M)		(ex. S, M)
31.28	VUD	19.71	PCJ (Th)
31.38	DJA	19.74	DJB
31.45	DJN	19.8	YDC
31.49	ZBW-3	19.82	GSF
31.55	GSB	19.84	HVJ
31.55	HS8PJ	25.00	RNE
	(F)	25.24	TPA-3
31.58	XEWW	25.34	OLR4A

(ex. S, M)	49.59	GSA	
25.42	RO-4	49.83	DJC
25.53	GSD	60.06	VUD
27.27	PLP	60.61	VUM
28.48	JIB	61.16	VUC
29.24	PMN		
31.28	VUD	4-5 a.m.	
31.35	TPB-11	16.86	GSG
31.45	DJN	19.62	GSP
31.55	GSB	19.65	W2XE
48.7	VPB	19.66	GSI
49.59	GSA	19.85	DJL
49.9	COCO	24.52	TFJ
58.3	PMY	25.24	TPA-3
60.06	VUD	25.49	DJD
60.61	VUM	25.53	GSD
61.16	VUC	25.57	IQY
70.2	RV-15	31.01	DJX
		31.13	2RO-3
		31.28	PCJ (M)
		31.28	VUD
		31.55	GSB
		49.31	VQ7LO
		49.59	GSA
		49.83	DJC
		5-6 a.m.	
		16.86	GSG
		19.62	GSP
		19.65	W2XE
		19.66	GSI
		19.72	W8XK
		19.85	DJL
		22.0	SPW
			(T, Th, Sat)
		24.52	TFJ
		25.24	TPA-3
		25.34	OLR4A
		25.42	JZJ
		25.49	DJD
		25.53	GSD
		25.57	IQY
		27.17	CSW
		28.93	EAJ43
		31.01	DJX
		31.13	2RO-3
		31.28	PCJ
			(M, W)
		31.55	GSB
		41.18	JLG
		49.59	GSA
		49.83	DJC
		6-7 a.m.	
		16.86	GSG
		19.62	GSP
		19.65	W2XE

7-8 a.m.	19.65	W2XAD
	19.72	W8XK
	19.72	OLR5A
		(W)
	19.76	GSO
	19.85	DJL
	25.00	RNE
	25.24	TPA-3
	25.34	OLR4A
	25.42	JZJ
	25.45	W1XAL
	25.49	DJD
	25.53	GSD
	27.17	CSW
	30.40	EAQ
	31.01	DJX
	31.09	CS2WA
	31.13	2RO-3
	31.28	W3XAU
	31.32	GSC
	31.33	KZRM
	31.35	W1XK
	31.41	OLR3A
		(T)
	31.46	JZI
	31.48	W2XAF
	31.55	KZIB
	31.55	GSB
	31.7	TAP
	43.1	ZL2GB
	49.59	GSA
	49.83	DJC
	49.92	OLR2A
		(Th, F)
	58.31	OK1MPT
		8-9 a.m.
	16.87	W3XL
	16.89	DJE
	19.56	DJR
	19.63	DJQ
	19.65	W2XE
	19.71	OLR5A
		(S, M)
	19.72	W8XK
	19.74	DJB
	19.76	GSO
		9-10 a.m.
	16.87	W3XL
	16.89	DJE
	19.56	W2XAD
	19.56	DJR
	19.63	DJQ
	19.71	OLR5A
	19.72	W8XK
	19.74	DJB
	19.76	GSO
	19.8	YDC
	22.0	SPW
	25.27	PHI
		(ex. S, M)
	25.34	OLR4A
	25.36	W2XE
	25.42	JZJ
	25.42	DJZ
	25.45	W1XAL
	25.49	DJD
	25.51	OLR4B
	25.53	GSD
	25.57	IQY
	30.31	CSW
	30.52	IRF
	31.02	W3XAL
	31.06	LRX
	31.09	CS2WA
	31.13	2RO-3
	31.32	GSC
	31.35	W1XK
	31.38	DJA
	31.45	DJN
	31.48	W2XAF
	31.49	LKJ-1
	31.55	GSB
	49.1	GSL
		10-11 a.m.
	9.49	W9XPD
	9.49	W9XUY
	11.33	W9XA
	11.49	W9XJL
	11.51	W9XTC



11.56	W6XKG	19.74	DJB	26.31	HBO (M,	31.45	VPD-2	27.27	PLP	19.74	DJB
11.56	W9XUP	25.24	TPB-7		F).	31.49	ZBW-3	28.14	JVN	19.79	JZK
16.87	W3XL	25.26	W8XK	31.28	VK2ME	31.50	VK3ME	29.24	PMN	19.8	YDC
16.89	DJE	25.42	DJZ		(S)		(ex. S).	30.23	JDY	19.82	GSF
19.56	DJR	25.49	DJD	31.41	TPB-11	31.55	KZIB	30.96	ZHP	19.85	DJL
19.63	DJQ	31.02	W3XAL	31.38	DJA	43.1	ZL2GB	31.28	VK6ME	24.26	XMHA
19.71	OLR5A	31.28	PCJ (W)	31.45	DJN	44.64	PMH		(ex. S).	25.29	GSE
19.74	DJB	31.32	GSC			70.2	RV-15	31.28	VK2ME	25.4	2RO-4
19.76	GSO	31.38	DJA						(S).	25.42	JZJ
19.8	YDC	31.41	W2XAD		6-7 p.m.			31.28	VUD	25.57	IQY
25.26	W8XK	31.45	DJN	13.99	DJS		9-10 p.m.	31.33	KZRM	27.27	PLP
25.27	PHI (S)	31.48	W2XAF	16.81	DJH	13.97	GSJ	31.35	WIXK	29.24	PMN
25.34	OLR4A	31.55	GSB	16.89	DJE	13.99	DJS	31.45	DJN	30.52	IRF
25.36	W2XE	49.1	GSL	19.63	DJQ	16.81	DJH	31.48	W2XAF	30.96	ZHP
25.42	DJZ			19.66	GSI	16.86	GSG	31.49	ZBW-3	31.28	VK2ME
25.49	DJD		1-2 p.m.	19.71	PCJ (T)	16.88	PHI (S)	31.55	KZIB		(S).
25.53	GSD	19.56	DJR	19.74	DJB	16.89	DJE	31.8	COCH	31.28	VUD
25.57	IQY	19.63	DJQ	19.76	GSO	16.89	DJE	32.59	COBX	31.33	KZRM
25.61	TPA-4	19.74	DJB	19.82	GSF	19.58	OLR5B	33.32	COBZ	31.35	WIXK
29.15	DZC	25.24	TPB-7	19.83	TPB-6	19.63	DJQ	44.64	PMH	31.45	DJN
30.52	IRF	25.42	DJZ	20.64	HBJ (M)	19.68	TPA-2	46.8	TIPG	31.48	W2XAF
31.02	W3XAL	25.49	DJD	25.23	TPA 3	19.71	OLR5A	48.4	TG-2 (S)	31.49	ZBW-3
31.13	2RO-3	31.28	PCJ (W)	25.29	GSE	19.74	DJB	48.7	VPB	31.51	HS8PJ
31.25	RAN	31.32	GSC	25.53	GSD	19.8	YDC	49.5	W8XAL		(Th).
31.28	PCJ	31.38	DJA	28.14	JVN	19.82	GSF	49.96	HP5K	31.55	KZIB
	(M, W,	31.45	DJN	31.28	VK2ME	25.00	RNE	49.98	Rangoon	31.8	COCH
	Th)	31.48	W2XAF		(S).	25.4	2RO-4		XYO	32.59	COBX
31.32	GSC	31.55	GSB	31.41	TPB-11	25.29	GSE	58.3	PMY	33.32	COBZ
31.38	DJA	49.1	GSL	31.45	DJN	25.57	Saigon	60.06	VUD	39.95	JVP
31.41	W2XAD					27.27	PLP	60.6	VUM	44.64	PMH
31.45	DJN		2-3 p.m.		7-8 p.m.	28.14	JVN	61.16	VUC	48.4	TG-2 (S)
31.48	W2XAF	25.24	TPB-7	13.99	DJS	29.24	PMN	70.2	RV-15	48.7	VPB
31.49	LKJ-1	31.32	GSC	16.81	DJH	30.23	JDY			49.5	W8XAL
31.55	GSB	31.41	TPB-11	16.89	DJE	30.96	ZHP		11 p.m.-midnight.	49.6	XETW
49.1	GSL	31.48	W2XAF	19.56	DJR	31.28	VK2ME			13.93	GSJ
		31.55	GSB	19.63	DJQ		(S).			13.97	GSH
		49.1	GSL	19.66	GSI		VK6ME			16.81	DJH
11 a.m.-noon.				19.74	DJB		(ex. S).			16.86	GSG
9.49	W9XPD		3-4 p.m.	19.76	GSO	31.33	KZRM			16.88	PHI
9.49	W9XUY	13.99	DJS	19.82	GSF	31.45	DJN			16.89	DJE
11.33	W9XA	16.81	DJH	25.24	TPA-3	31.45	VPD-2			19.35	W2XAD
11.49	W9XJL	16.88	DJE	25.29	GSE	31.48	W2XAF			19.63	DJQ
11.51	W9XTC	19.63	DJQ	25.53	GSD	31.49	ZBW-3			19.68	TPA-2
11.56	W6XKG	19.74	DJB	25.57	Saigon	31.50	VK3ME				(ex. S).
11.56	W9XUP	19.85	DJL	28.14	JVN					31.55	KZIB
16.87	W3XL	25.42	JZJ	31.33	KZRM					43.1	ZL2GB
16.89	DJE	31.28	VK2ME	31.41	TPB-11					44.64	PMH
19.56	DJR		(S).	31.45	DJN					48.7	VPB
19.63	DJQ			31.49	ZBW-3					49.5	W8XAL
19.71	OLR5A	31.41	TPB-11	31.50	VK3ME					58.3	PMY
19.74	DJB	31.45	DJN		(ex. S).					70.2	RV-15
19.76	GSO	32.15	OAX4J								
25.26	W8XK	49.02	W2XE								
25.34	OLR4A	49.5	W8XAL	31.55	KZIB						
25.42	DJZ				8-9 p.m.						
25.42	JZJ		4-5 p.m.	13.93	GSJ		10-11 p.m.				
25.49	DJD	13.99	DJS	13.97	GSH		13.93	GSJ			
25.53	GSD	16.81	DJH	13.99	DJS		13.97	GSH			
25.61	TPA-4	16.89	DJE	16.81	DJH		13.99	DJS			
31.02	W3XAL	19.63	DJQ	16.86	GSG		16.81	DJH			
31.13	2RO-3	19.74	DJB	16.89	DJE		16.86	GSG			
31.25	RAN	19.85	DJL	19.63	DJQ		16.88	PHI			
31.28	PCJ (M,	25.42	JZJ	19.74	DJB		16.89	DJE			
	W, Th	31.28	VK2ME	19.8	YDC		19.58	OLR5B			
	Sat).		(S)	19.82	GSF		19.63	DJQ			
31.32	GSC	31.41	TPB-11	24.26	XMHA		19.68	TPA-2			
31.38	DJA	31.45	DJN	25.29	GSE		19.74	DJB			
31.41	W2XAD	49.5	W8XAL	25.4	2RO-4		19.71	OLR5A			
31.45	DJN			25.57	Saigon		19.76	GSO			
31.48	W2XAF		5-6 p.m.	27.27	PLP		19.8	YDC			
31.55	GSB	13.99	DJS	28.14	JVN		19.82	GSF			
49.1	GSL	16.81	DJH	29.24	PMN		24.1	HCJB			
		16.89	DJE	30.96	ZHP		24.26	XMHA			
		19.63	DJQ	31.28	VK2ME		25.29	GSE			
		19.71	PCJ (T)		(S).		25.4	2RO-4			
		19.74	DJB				25.42	JZJ			
		19.83	TPB-6				25.57	Saigon			
		25.23	TPA-3				25.65	HP5A			
16.87	W3XL			31.33	KZRM						
19.56	DJR			31.41	TPB-11						
19.63	DJQ			31.45	DJN						
19.71	PCJ (W)										

### A Handy Scriber.

Recently caught without a scriber and with a new aluminium panel to mark out, I cast my eye about for a substitute. A mechanical pencil of the chain store variety came to light. A gramophone needle was fitted in place of the lead and not only did it do the job on hand, but it proved so handy around the shack that I invested in a new pencil.—F. A. Burke (Waverley).

### Learning The Code.

(Continued from page 23)

be made for the purpose of obtaining particulars of these transmissions in the various States of the Commonwealth.

There is nothing at all terrifying or difficult about learning the morse code. Devote a few minutes regularly each day to the subject, and with reasonable application and concentration a speed of the required 12 words per minute should easily be attained.







# Boost your Signals from R4 to R9+

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

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

No one else would ever dare make such a claim —no other aerial of ANY TYPE can give you such incredible performance, because "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  
Box 3868 T, G.P.O., Sydney.

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

NAME .....

ADDRESS .....

A.R.W. 7/38.

## DX ALPHABET-PHONETIC PRONUNCIATIONS.

(Contributed By CARL BROEL—AW116DX)

English.	German.	French.	Italian.	Por'guese.	Spanish.	Dutch.
a . . . . .	ah	ah	ah	ah	ah	ah
b . . . . .	bay	bay	bay	beh	beh	bay
c . . . . .	tsay	say	chay	seh	seh	say
d . . . . .	day	day	dee	deh	deh	day
e . . . . .	ay	ay	ay	eh	eh	ay
f . . . . .	eff	ef	effa	effeh	effeh	eff
g . . . . .	gay	khay	ge	zhay	heh	ghay
h . . . . .	hah	ash	ahk-kah	er-gah	acha	hah
i . . . . .	ee	ee	ee	ee	ee	ee
j . . . . .	yah	zee	—	zhota	hota	yay
k . . . . .	kah	kah	kappa	kah	kah	kah
l . . . . .	ell	el	ella	elleh	elleh	el
m . . . . .	em	em	emma	emneh	emneh	em
n . . . . .	en	en	enna	enneh	enneh	en
o . . . . .	oh	oh	oh	or	oh	oah
p . . . . .	pay	pay	pay	peh	peh	pay
q . . . . .	koo	keeu	koo	keh	koo	keeu
r . . . . .	err	aer	erra	airr	erreh	err
s . . . . .	ess	ess	essa	esseh	esseh	es
t . . . . .	tay	tay	tay	teh	teh	tay
u . . . . .	oo	eeu	oo	oo	oo	eeu
v . . . . .	fow	vay	vay	veh	veh	vay
w . . . . .	vay	dooble-vay	doppio-vay	vahdbrado	dobleh-veh	way
x . . . . .	iks	eeks	iks	sheeze ipsilon or	ekis	iks
y . . . . .	ippsilon	ee-grec	e-greco	e-gray-goo	ee-gre-eh-ga	aai
z . . . . .	tset	zett	dzay-ta	zeh	theta	zett
1 . . . . .	ein	uhn	uno	un	uno	ayn
2 . . . . .	zwy	der	duay	dous	dos	tway
3 . . . . .	feer	trwah	tray	trez	trace	dree
4 . . . . .	feer	katr	quatro	quatro	cuatro	veer
5 . . . . .	feeuuf	sank	ching-que	sinko	sinko	vaif
6 . . . . .	zex	seess	set	seis	seis	zes
7 . . . . .	zeeben	sett	setteh	sete	seiteh	zaven
8 . . . . .	ancht	weet	ohtto	oito	ocho	ahcht
9 . . . . .	noin	nerf	novoh	novoh	nueveh	nayghen
10 . . . . .	tsayn	dees	diechi	dez	deeis	tien

### B.C. Band Jottings.

We have heard a great deal of the prowess of s.w. DX-ers through the columns of "R.W.," but b.c. band DX-ers can show just as interesting loggings. For example, Mr. G. W. F. Rouse, of Sydney, has verified more than 30 countries on b.c., while, as a comparative novice, I have verified b.c. band stations in India, Siam, China, Japan, Germany, France, New Zealand and U.S.A., as well as many low-powered Australian transmitters. 120 odd b.c. band veries speak volumes for the fun that even novices can get from this branch of DX-ing.

I suppose my best cards really are ones from Breslau, Nice-Corse, XGOA, JBCK, KNX, VUD, HS7PJ, JOHK, JOCK, JOFK, IZB and KZRM, whilst most of the other cards are from high, or rather I should say super-powered, Australian, Asiatic and New Zealand stations.

A few recent loggings are KSL (1130 k.c.), JODK (970) JOIK (810), XMHC (700), KGU (750), KGMB (1320) and KEHE (780), plus several

new low-powered Australian transmitters. Of the loggings I have just mentioned, the easiest are KSL (from midnight onwards), XMHC (12.30 a.m. onwards), KEHE (from midnight), KGV and KGMB (3.30 a.m. onwards). Here alone in these five stations there are five countries.

Well, now that I have thrown down the gauntlet to s.w. DX-ers, I hope that fellow b.c. DX-ers will stand behind me 100% in an endeavour to establish a b.c. band page in "R.W."—K. A. Crowley (AW368DX), Melbourne, Victoria.

### New Slade Distributor

Slade's Pty. Ltd., of Lang Street, Croydon, N.S.W., manufacturers of Calstan precision test equipment and radio receivers, announce that Melbourne distributing facilities have recently been increased by the addition of Hartley's Pty. Ltd., Flinders Street, to their list of Victorian distributors.



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200/250 volt, output 385/385 v., 80 M.A., 5v. 3 amp., 2.5 v. 6 amp., 2.5 v. 3 amp. List Price 18/-.

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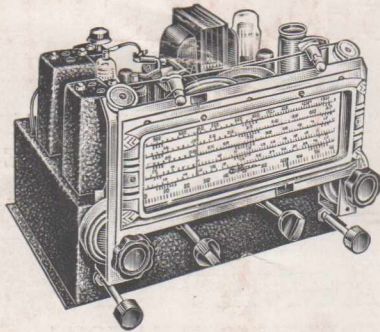
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# Meissner "TRAFFIC SCOUT" Solves All Receiver Problems!



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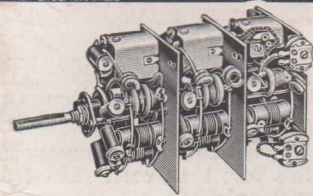
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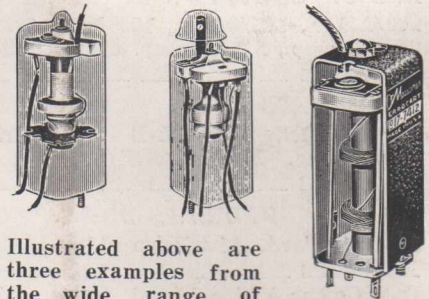
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Illustrated above are three examples from the wide range of Meissner coil units. Left: This Meissner crystal filter i.f. transformer is ideal for communications receivers. Are sold in matched pairs. Centre: This Meissner b.f.o. transformer is equipped with a tuning knob to vary pitch of beat-note, and is factory-peaked and tested. Right: Electrically-variable band-width is a feature of this Meissner Ferrocart band-expanding i.f. transformer. Complete instructions are supplied with each unit.

MEISSNER CAN FILL ALL YOUR COIL REQUIREMENTS. WRITE NOW FOR FURTHER DETAILS.