

**THE  
AUSTRALASIAN**

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by post as a periodical.

# Radio & Home World

**VOL. 6 . . . . . NO. 8**

**JANUARY 15 . . . . . 1942**

Harmonising the hard facts of science with the requirements of acoustic design in the new studios of 2GB. (See page 25.)

**BATTERY CIRCUIT  
CONTEST RESULTS**

**DIRECT COUPLED  
PHASE CHANGERS**

**SIGNAL TRACER  
FOR BATTERIES**

**HOW TO POLISH  
RADIO CABINETS**



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51 Murray Street  
Pyrmont



# THE AUSTRALASIAN RADIO WORLD

*Devoted entirely to Technical Radio*

and incorporating  
**ALL-WAVE ALL-WORLD DX NEWS**

Vol. 6

JANUARY, 1942

No. 8

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Laboratory Service, 2/6 per set

## EDITORIAL

The arrival of a recent mail has again emphasised the amazing way in which the English "can take it."

Notwithstanding the difficult conditions which must prevail on account of the incessant bombings, the radio press is still performing its work of national importance by disseminating technical information.

In London the good old "Wireless World" carries on in grand style, strongly supported by the leading advertisers. In their latest issue we notice nearly all the famous brand names amongst the twenty-two pages of advertising.

Fortunately, our position in Australia is infinitely safer than in Britain, although our radio business has its trading difficulties.

It is encouraging to notice that these difficulties are being faced in true Digger spirit and with a long-range outlook to the wide span of years which lies beyond our immediate task of dealing with the present disturbers of the peace.

In the meantime, we radio men will need to show the keenest initiative to keep our million and a half radio receivers in good operating condition.

# SOLVE YOUR PROBLEMS before they START!...



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- DA-8 Same as DA-7, but ready assembled ..... 13/6

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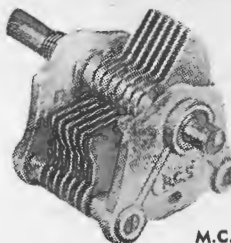
- AIR CORE "H" GANG**
- E342 Aerial 6/6
  - E343 R.F. .... 6/6
  - E344 Osc. .... 6/6
- PERM. TUNED "H" GANG**
- E345 Aerial 8/6
  - E346 R.F. .... 8/6
  - E347 Osc. .... 8/6

### T.R.F. TYPE-AIR CORE

- T88 Aerial ..... 6/6
- T89 R.F. .... 6/6
- T87 R.F. with reaction ..... 6/6
- T81 Reinartz ..... 6/6

R.C.S. radio components are a by-word for true efficiency and dependability. "The Coil People" originated and developed to the highest peak of efficiency the use of trolitul in radio coils. That is why you find unfailing standards of high "Q" in every R.C.S. Coil and Coil Unit.

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M.C. Type

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35	4	5	CV37	4/9	CV44	9/-
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100	6	14	CV40	6/5	CV47	11/3

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- When three I.F.'s are used:
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  - IF164 2nd .. 13/9
  - IF163 3rd .. 13/9

- Air Core I.F.'s
- Air Core 465 K.C. IF107 1st .. 7/6
  - IF108 2nd .. 7/6
- Air Core 175 K.C.
- IE68 1st .... 7/6
  - IE69 2nd .... 7/6

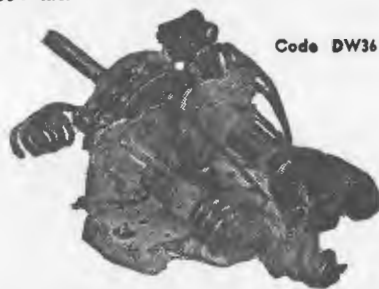
permeability-tuned I.F.'s special Trolitul formers inserted the adjustable



IF162

## R.C.S. D.W. UNIT

Type DW36, as illustrated, consists of Aerial and Oscillator Coils, Wave Change Switch, the necessary B.C. and S.W. Trimmers and Padder mounted together, wired up ready to assemble into a set utilising 465 k.c., the bands being S.W. 13.7 to 40 metres, and B.C. 1600 to 550 k.c.



Code DW36

- Code DW36 ..... £1/7/6
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SYDNEY, N.S.W.



## PHASE-CHANGERS

(Continued)

produced. Algebraically —  

$$Rl = \frac{dEa}{dIa}$$

(For those who are not well versed in mathematic,  $Rl =$  Load Resistance,  $d =$  "Small Change in";  $Ea =$  Anode Voltage;  $Ia =$  Anode Current in Amperes.)

Now, in this direct-coupled phase changer, the phase changer shares part of its anode load (approx. half) with the driver.

The anode load on the driver is made up of a .3 meg. resistor and a .1 meg. resistor, but its effective load

BELOW: An American circuit for a phase-changer with slightly higher gain but considerably more complication.

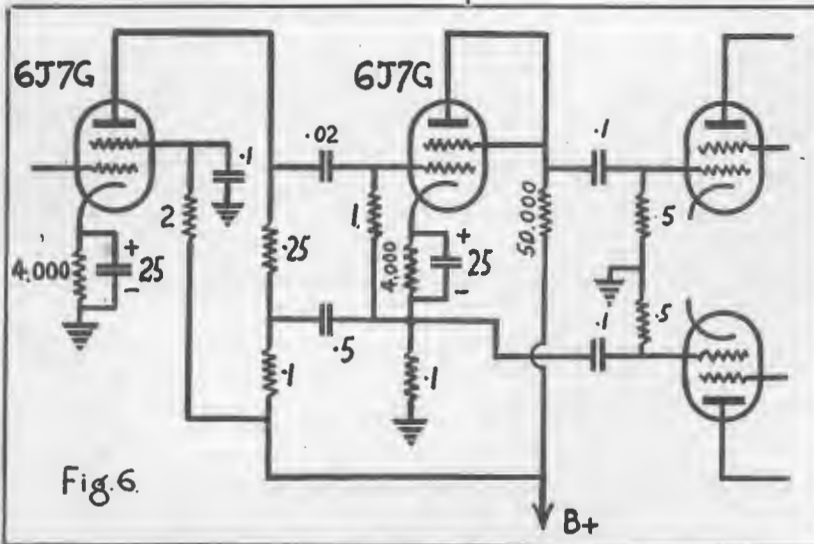


Fig. 6.

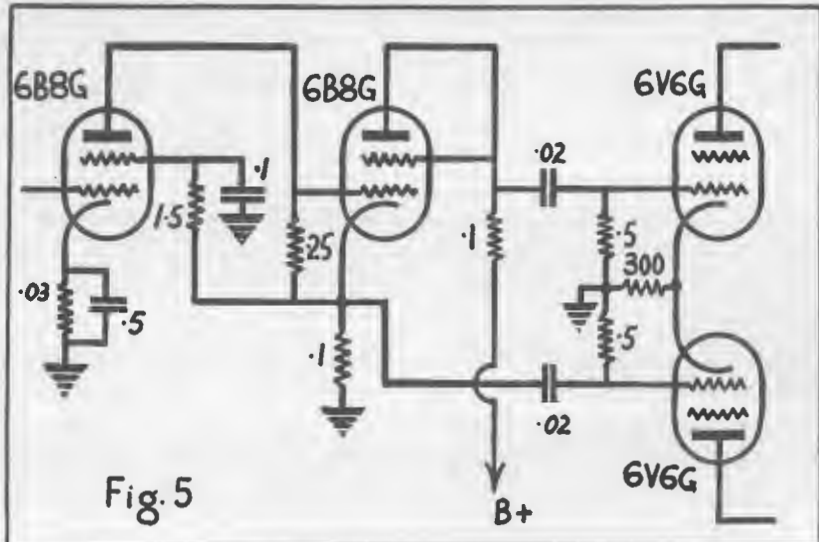


Fig. 5

ABOVE: Circuit for a direct-coupled phase-changer with pentode driver.

is much greater than .4 meg.! Actually it is equal to: .3 meg. + .15 meg.  $\times$  Total Amplification of Driver.

Let us see how this comes about. Suppose that a signal is applied to  $V_1$ , such that each of the output grids receives a peak signal of  $x$  volts, and that the total amplification of  $V_2$  is  $M$  (i.e., that the grid-to-grid output signal is  $M$  times the signal between the grid and cathode of  $V_2$ ). Then the signal applied to  $V_2$  across the .3 meg. resistor is — volts. The signal output

$\frac{M}{2x}$   
 voltage of  $V_1$  then is equal to the sum  
 $\frac{2x}{M}$   
 of — volts across the .3 meg. and  
 $\frac{M}{x}$   
 $x$  volts across the .1 meg. resistor.

NEWLY  
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# AMPLION 8P30

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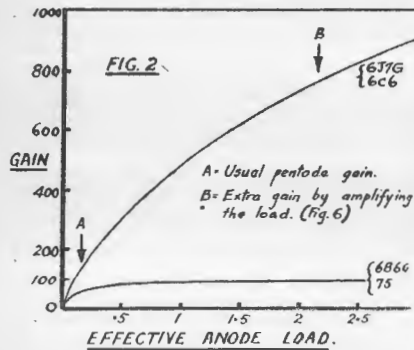
382 KENT STREET, SYDNEY



If it's not electrically welded  
 it's not an  
 Amplion

Amplion's **DIPHONIC** Reproduction is a revelation in sound! True high fidelity, with a range greater than 10,000 cycles is given, without distortion. Write for "Diphonic Data," free and post free.

Now for a  $\frac{2x}{M}$  voltage change across the .3 meg. resistor (the peak signal is the change in voltage, not the voltage itself), the current change must be  $\frac{2x}{M} \times \frac{1}{300,000}$  amperes. This current is the anode current of the driver,



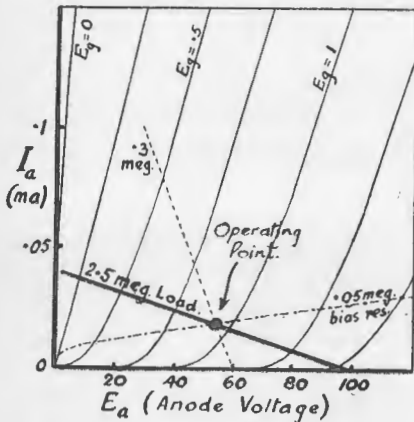
so that  $dI_a$  is equal to  $\frac{2x}{M} \times \frac{1}{300,000}$  and the effective load resistance is  $\frac{DE_a}{dI_a}$

$$R_1 = \frac{dI_a}{2x} + x \div \frac{2x}{M} \times \frac{1}{300,000}$$

$$= 300,000 \times (1 + \frac{1}{2}M) \text{ ohms}$$

$$= 300,000 + 150,000 \times M \text{ ohms}$$

For a 6J7G connected as a triode, the total gain is approximately 14, so

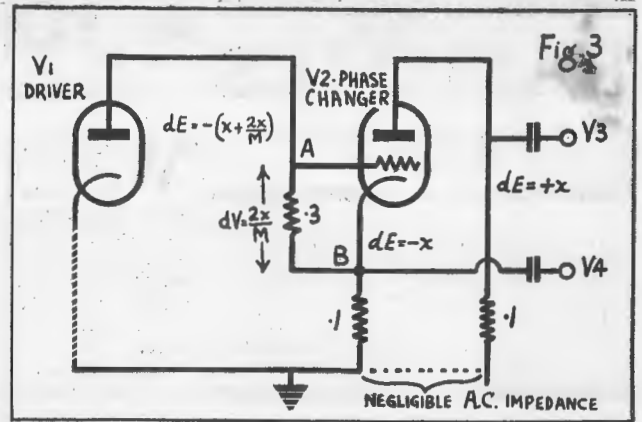


that the effective load on  $V_1$  is 2.4 megohms. The increase in gain is now obvious, especially with a pentode.

Because of the high gain the input to  $V_1$ , the driver is very small and curvature of the  $V_g - I_a$  characteristic due to the large bias is not important. Besides, the high load value gives a very flat dynamic  $V_g - I_a$  curve. For those who prefer the

(Continued on page 19)

Diagram of the elements of the direct-coupled phase-changer, which illustrates the reason for the excellent performance of this type of circuit.



## SPECIALISATION

For 19 years, the entire I.R.C. organisation has focused its research work, its ability and its energy exclusively upon the design and manufacture of fixed and variable resistors. From this specialisation have resulted products of tested quality, a world-wide reputation for engineering achievement and a thorough knowledge of resistance problems.

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- Insulated Wire Wound Resistors ( $\frac{1}{2}$  and 1 watt)
- High Voltage Metallized Resistors
- Metallized Suppressors
- Precision Wire Wound Resistors
- Fixed and Variable Power Wire Wound Resistors



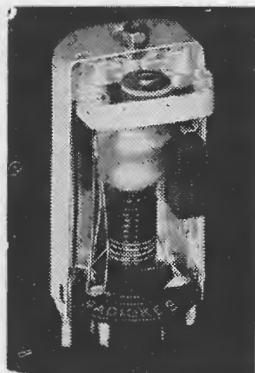
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Precision manufactured to ensure the highest standard of efficiency. The Radiokes Dual-wave Coil incorporates trolitul wherever possible. Litz wire windings; lugs already tinned. Short-wave range: 16-50 metres; B.C. range: 1,500 to 550 k.c.

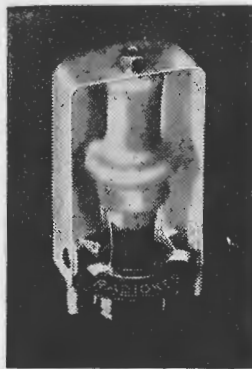
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Type DWU-1 ..... Price £17/6

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BROADWAY - - - SYDNEY

# A PORTABLE BATTERY SET

Another Essay in Our Battery Circuit Contest

WE isolated country dwellers do feel that insufficient importance is attached to the problems of country radio. But this contest should bring to light many interesting tricks and subterfuges to which the country enthusiast is compelled to resort in the interests of convenience, economy and performance.

The enclosed circuit has been built up as a portable receiver.

In my opinion, its advantages are:—

1. Employment of 2-volt valves instead of 1.4-volt.
2. Runs entirely from dry batteries.
3. Extremely low "A" current drain (60 M/a's from 2 volts). (This latter point makes it very suitable for camp use. It can be connected to the 6-volt car battery without any fear of running it down even after prolonged and continuous use.)
4. Low "B" current — something like less than 5 M/a's.
5. Provides ample loud-speaker volume from stations up to 100 miles distant in daytime, with 20 feet of

coils used cost about 1/3 five years ago, so their quality can be imagined. The audio frequency transformer is a Ferranti, salvaged three years ago from an ancient t.r.f. which had been thrown out. It is at least 12 years old, but still does a fine job. A 7-plate

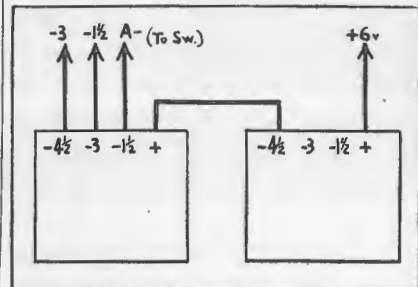


Diagram showing how two "C" batteries are connected to give filament current as well as bias.

midget is wired across the R.F. section of the 2-gang in order to keep the two tuned circuits in step.

The condenser control of regeneration as shown in the circuit was found to give much better results than potentiometer control of the plate voltage of the detector valve. The writer's experience has been that the former method is always more stable and trouble-free than the latter.

Although, at present, the set is working as a straight broadcast, I have operated it as a switched-coil short-waver. On short-waves it was quite satisfactory, bringing in all the well-known stations.

(Continued on page 31)

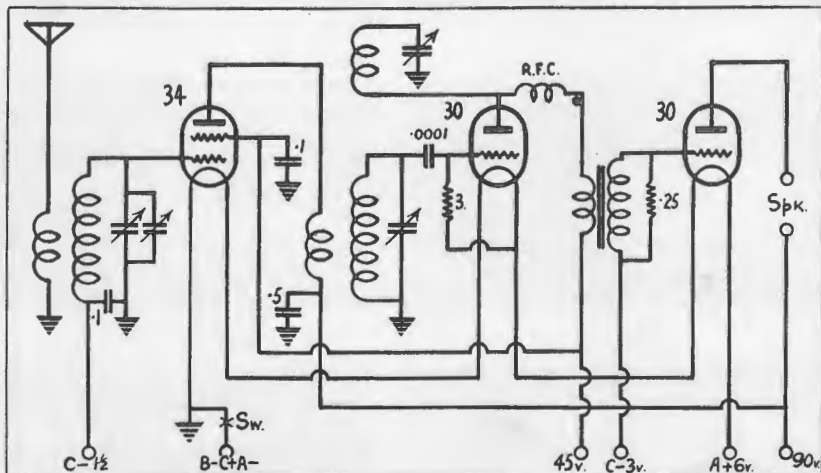
By —

**N. R. NAY**

Woolner's Arm, Casino, N.S.W.

aerial tossed over a branch, and State-wide reception after dark.

The set is built round a 34 R.F., a 30 detector, to which regeneration is applied, and a 30 audio amplifier. The



Circuit of the simple battery set which is suitable for portable use. Although only a low-powered output valve is used it will give satisfactory results with a loudspeaker, according to the designer.



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Mr. McCutcheon, using a 2A3 amplifier  
to drive a Rola G12PM in an infinite  
baffle of his own design, was awarded  
the blue ribbon against all comers.

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# RENOVATING AND POLISHING CABINETS

Some practical hints for the handyman or radio serviceman

**T**HERE is no reason why a scratched or dull cabinet should be tolerated, for, after all, a radio set is an article of furniture as well as a musical instrument. The majority of marks that make a cabinet look shabby are scratches, chips and finger marks, and such cabinets can easily be rejuvenated by the following method, which should be followed for both french polished and sprayed cabinets.

The materials required are: A small bottle of french polish, a "water" stain in powder form to match the

colour of the cabinet and a fine paint brush.

## For Scratched Surfaces

To touch up scratches of chips, proceed as follows: Place a little polish in a saucer and add just enough of the powder stain to colour the mixture, mix well and gradually add more powder until the approximate colour required is obtained. It is as well to be a little on the light side, as the colour can always be darkened when adding a second coat.

Thoroughly clean the scratch with

a cloth dipped in methylated spirits and carefully "paint" the scratch with the mixture of stain and polish, taking very great care not to get any on the polished surface of the cabinet, or the surface will be spoilt. Should the mixture get on the cabinet, wipe it away as quickly as possible.

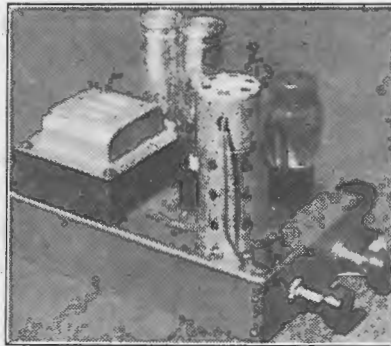
When the first coat has dried thoroughly, a second may be applied,



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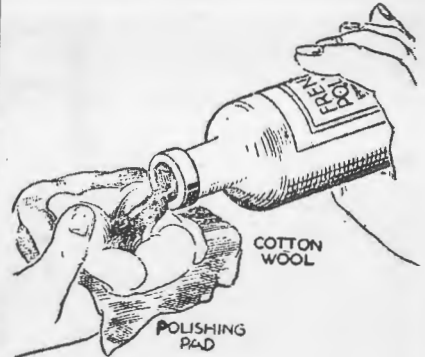
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and if the scratch has been coloured to match the rest of the cabinet by the first application of the mixture, the second "dose" should be of polish only. Otherwise, continue the treatment as outlined above with another coating of the mixture. When tackled in this way, the scratch will soon be filled and will scarcely be discernible.

## Using Plastic Wood

Some scratches, or chips, are too deep to be removed by this method, and plastic wood should be used. This



is obtainable from most ironmongers and, since it will not take a stain, the coloured variety should be used and a little pressed firmly into the scratch with the blade of a penknife. Here, again, take care not to allow any of the plastic wood to creep on to the rest of the cabinet, as it contains a powerful solvent which will quickly attack the polish and give it a matt surface. Smooth off the surface of the wood as soon as it is applied, and leave to dry for at least an hour. Plastic wood contracts as it dries, so the surface when applied should be

(Continued on page 33)

# BATTERY CIRCUIT CONTEST

A large number of entries was received in our Battery Circuit Contest, and your Editor has spent a lot of time reading through the essays with a view to allotting the prizes.

After due consideration it was decided to award first prize to the essay which came from Mr. R. Brown, of Taree. This essay, which happened to be the first to come to hand in the contest, was published in full in our issue of November, 1941. It dealt with the design of a powerful dual-waver to operate from a vibrator unit, and also contained many hints and tips of general interest.

So here are the official results:—

**WINNER of £5 cash, first prize:**

**Mr. R. BROWN**  
82 Victoria Street, Taree

Free annual subscriptions (or extensions of present subscriptions) have been arranged as consolation prizes for the following:—

Mr. J. G. Du Faur, C/o Standards Association of Aust., Melbourne, Vic.

Mr. E. C. Jamieson, Forrester, South Australia.

Mr. R. Pendlebury, Spring Gully, via Bendigo, Victoria.

Mr. Bob Eady, Keelogues, Unanderra, N.S.W.

Mr. D. Dove, Ullamalla, via Hill End, N.S.W.

Mr. N. R. Nay, Woolner's Arm, Casino, N.S.W.

Mr. R. M. Lyon, 120 French Street, Hamilton, Victoria.

The Editor would also like to take this opportunity of thanking the other competitors for their efforts.

Several prize-winning essays are published in this issue and a couple of other excellent ones have been held over for future issues.

In the case of two of the circuits submitted it has been decided to carry out some practical work in our laboratory, and if these tests prove successful the sets will be described in detail, with full photographs and wiring diagrams.

**A. G. HULL**



The job of the stern-looking cove at the left is to make sure that each order to MARTIN DE LAUNAY'S leaves the place with the slickness of greased lightning. For the purpose of this illustration the staff wear anxious looks, although, really, they need not.

Martin de Launay's stock is so comprehensive that the filling of any order is only a matter of minutes. Even more important to you is the keenness of the pricing and the high quality of the products. These are features which only a big, highly-efficient organisation, such as MARTIN DE LAUNAY PTY. LTD., can offer you.

SYDNEY—corner Druitt and Clarence Streets—M 2691 (5 lines)  
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# MARTIN DE LAUNAY'S

FOR EVERYTHING ELECTRICAL



# SIGNAL TRACER FOR BATTERY OPERATION

Certain to be of great interest to our country readers is the following letter, which deals with the construction of an effective five-valve signal tracer to operate from batteries. Here is the letter:—

Dear Sir,—I am a country reader of your 'Australasian Radio World' and I am pleased to say it has often helped me with my work, but I (as well as many others) am often very jealous of the many A.C. sets you have described in your publication.

I was especially envious of the

Designed and described by

**R. Pendlebury**

of Spring Gully, via Bendigo, Victoria

signal tracer published in your September issue, which was similar to jobs published in American magazines; but, after a while, I got an inspiration to design a similar, but battery job. I have enclosed a cir-

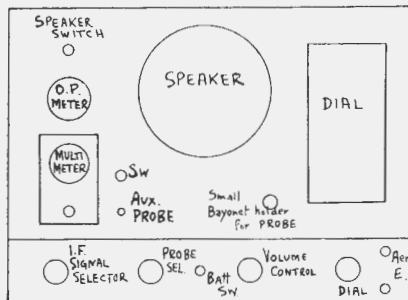
cuit diagram and some details, so that if you wish you may publish same, as it would interest many country servicemen and others. I have used this signal tracer for over a month and I can claim sterling results from it.

I have used a "series parallel" filament network with by-pass condensers, as I have found a six volt battery the best proposition, but it may be changed to a two-volt system provided a suitable bias battery is incorporated for the 1L5G and 1K7G valves. The six-volt network gives a 4-volt bias for the 1L5G, a two-volt bias for the 1K7G and the first I.F. valve, with iron core I.F. transformers; the valve need not work "flat out."

The first two valves make an ordinary "broadcast" tuner and I.F. amplifier to supply an I.F. signal to the set under test when required—switch speaker cone out on signal tracer when this is used. The following stages are resistance-coupled as shown.

## Construction

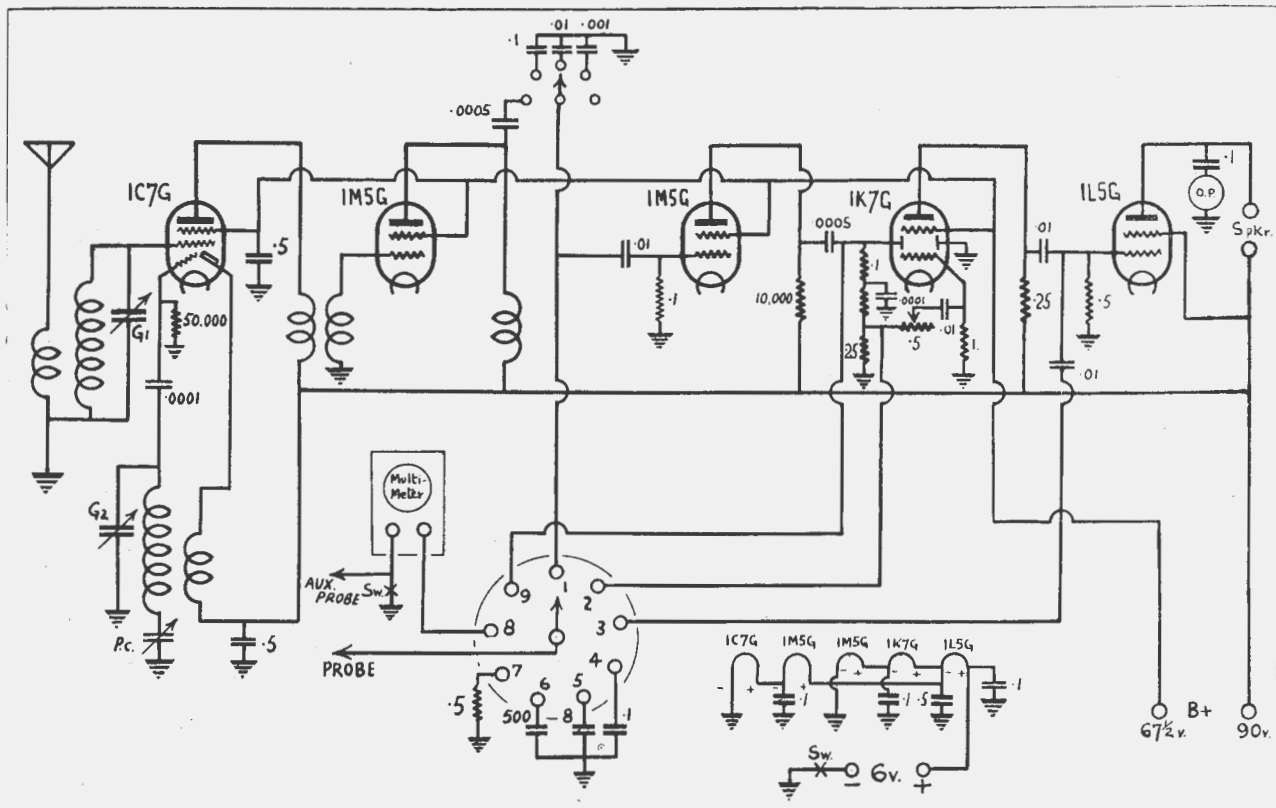
I constructed the signal tracer on a



A suggested layout for the front panel of the signal tracer.

chassis already drilled for a 5-valve set and bolted an insulated panel on the front. I connected the filament circuit first and then the rest in the same order as a receiver.

For best operation, I used a busbar to connect all earths. This was a piece of 0.064 (16 gauge) wire, with its V.I.R. cover stripped. (I got it from an electrician in town). The bypass condensers in the filament circuit are for extra stability. Only 90 volts of high tension need be used with 67½



The schematic circuit of the battery-operated signal tracer, which has been ingeniously adapted from the original a.c.-operated signal tracer which was described in our September issue.

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## **SIGNAL TRACER**

(Continued)

volts for the screen. I tried 135 volts, with no better results, except louder output.

### **Operation**

Contact No. 1 connects the probe so that R.F. and I.F. sections may be checked; or to feed an I.F. signal into the set to be tested.

Contact No. 2 connects detector sections from probe to the tracer.

Contact No. 3 can be used to check driver and audio sections.

Contact No. 4 can be used to check by-pass condensers and may show where such condensers could be used with advantage.

Contact No. 5 can be used to check 8 mfd. de-coupling condensers.

Contact No. 6 can be used to check vibrator 500 mfd. filter condensers.

Contact No. 7 can be used to check grid resistors.

Contact No. 8 connects various parts of a set to the multimeter on panel.

Contact No. 9 connects I.F. amplifiers to the second detector.

### **Conclusion**

Thus it will be seen that every section of the set can be checked and any faults immediately traced. Also, in conjunction with a modulated oscillator, the signal tracer may be advantageously used to align various sections of the set. Peaking of I.F. and R.F. sections can be seen on the output meter.

I hope that this tracer may be of use to many.—Yours, etc.,

**R. PENDLEBURY.**

# FUNDAMENTALS OF THE C.R.O.

## The Second Article of Our New Series on the Oscilloscope

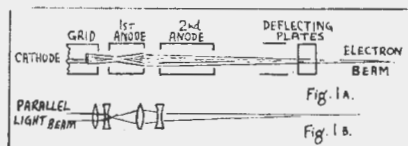
THE technician who has become a little surer that using a C.R.O. might be advantageous will no doubt wonder what is the best way to get to know the fundamentals which will be most useful.

Probably the best method is to take the construction of a typical C.R.O. by steps, discussing in necessary detail those technical points which must be understood before their practical value can be assessed.

### The Electron Lens

It is assumed that the general principles of the operation of a cathode ray tube are fairly well known.

We may conveniently start from the electron stream formed within the tube. The block schematic of Fig. 1 shows the physical layout in a typical tube. The anodes serve the purpose of accelerating the electrons and at the same time forming the stream



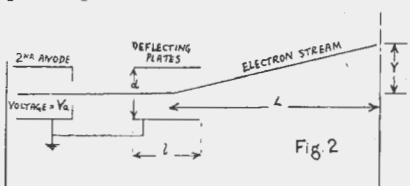
into a pencil-like beam. For any two such electrodes having different potentials have a field of force existing between them, which field will, of course, act on the negatively charged electrons. The space between electrodes therefore acts on the beam in the same way as a lens does on a beam of light and in fact forms an "electron lens." The equivalent optical figure is shown in Fig. 1A. Since the force field will vary with the potential difference between electrodes, varying the voltage on these alters the focal length of the equivalent lens and so allows focusing to be done. The intensity will be controlled by the number of electrons which of course means altering the potential between grid and cathode as in a normal radio valve.

### Beam Potential

The electrons receive their final accelerating from the second anode and will have a velocity proportional to the potential of this. The potential of the electron stream is really a measure of the velocity with which they are travelling so that the potential of the stream is equal to that of the second anode.

Now it is known the usual method of deflection is by means of plates set at right angles, through which the stream passes. To deflect the stream

we must obviously apply to these plates potentials which vary with res-



pect to the potential of the electron stream.

Therefore, for unbalanced operation it is usual to connect one of each set of plates to the last anode, and the varying potential between the two plates. To facilitate operation we earth the second anode and the observed signal can now be placed across the other plate and earthed. In many tubes the second anode and one of each set of plates is joined within the valve.

### Sensitivity

We are now able to consider the voltage necessary to give a certain deflection on the screen. In Fig. 2 a diagrammatic view of a single set of plates is shown.

It may be shown that for the nomenclature shown the deflection is given by —

$$Y = \frac{L^2 V_d}{2 V_a d}$$

where  $V_a$  is the second anode voltage, and  $V_d$  the voltage on the deflecting

plates. When magnetic deflection is used, however, the formula becomes —

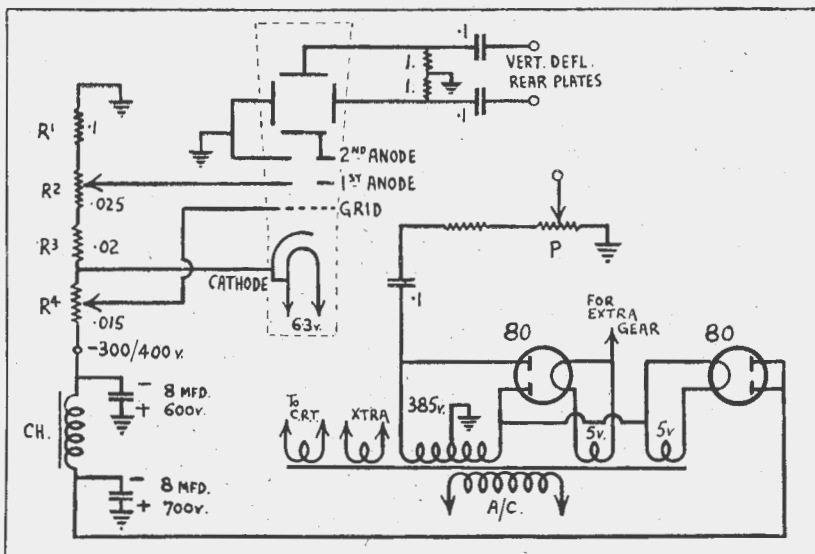
$$Y = H \sqrt{\frac{e}{m}} \frac{L^2}{\sqrt{2} \sqrt{V_a}}$$

The main difference to note is that in this case the sensitivity is inversely proportional to  $\sqrt{V_a}$ , and in the first case to  $V_a$ .


### Effect of Stray Fields

It means, too, that for electrostatic deflection (in which we are primarily concerned) the sensitivity drops off as the anode voltage is raised. But if stray magnetic fields are around, affecting the beam, raising this voltage decreases the sensitivity to a lesser degree for these fields. As a result the best ratio occurs at a low anode voltage, but greater freedom from extraneous effects at large anode voltages. In regard to stray fields a word to the good might be given here. Von Ardenne, the great television experimenter, once stated that the power supply for a cathode ray system should be at least three feet from the tube. For best results it will be found that the power supply should be as far away as practical. It is very difficult to shield the tube magnetically and stray fields will cause most annoying distortions. Simple electrostatic shielding is easy and often advisable, but with the later graphite-coated tubes does not seem a neces-

(Continued on page 17)



The fundamental circuit of the oscilloscope and the unusual type of negative power supply which it requires.



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sity for the ordinary experimenter.

### Graphite Coating

The graphite coating around the end of the tube serves a more important purpose, however. When the beam strikes the screen secondary emission takes place, and electrons from this emission as well as the primary beam tend to wander all over the place, depending on the various potentials within the tube. Since the deflecting plates are at a slightly higher potential than the beam when it hits the screen, electrons tend to be attracted to these as well as back to the second anode. Obviously these stray electrons pile up on the plates and cause the mean centre of the beam to wander unless comparatively

### NOTE

The article on the beat frequency oscillator, promised for this issue, must be held over indefinitely on account of suitable coils being unavailable at present.

small resistors are placed across the plates, allowing this accumulated charge to leak rapidly away—while the plates nearest the screen will suffer most. The graphite coating, however, serves as a low resistance path for all these electrons back to the anode and so helps to keep the plates free from stray electrons. By capturing some of the secondary emission, too, a certain amount of blurring of the spot is overcome.

### Deflection Sensitivity Practical Formula

We are able now to come to the first point from which all designs must eventually be made. That is, the deflection sensitivity.

## TABLE OF DEFLECTION SENSITIVITIES

VALVE	FRONT PLATES		REAR PLATES	
	R.M.S. Volts/In	D.C. Volts/In	R.M.S. Volts/In	D.C. Volts/In
913	65,000	182,000	46,000	128,000
	Van	Van	Van	Van
902	28,500	80,000	24,700	69,000
	Van	Van	Van	Van
906	27,400	76,500	26,000	73,000
	Van	Van	Van	Van

### Van — ANODE VOLTAGE APPLIED

VALVE	FRONT PLATES		REAR PLATES		VAN
	R.M.S. Volts/In	D.C. Volts/In	R.M.S. Volts/In	D.C. Volts/In	
913	162 V. R.M.S.	455 V D.C.	115 V R.M.S.	320 V D.C.	400
902	71.2 V	200 V	61.7 V	172	400
906	68.5 V	191	65 V	182	1,000

### ACTUAL SENSITIVITIES FOR VALUE OF VAN SHOWN FOR 1" DEFLECTION

It is usual to refer to this in terms of millimetres per volt. However, this is about as useful as a jack rabbit. From this we want to obtain the R.M.S. A.C. voltage necessary for a certain size of picture on the screen. The MM/volt scale is useful, of course, for making spot shifting controls because for this we only need D.C.

Firstly, as we have seen, the sensitivity is proportional to  $1/V_a$ . So if we have the sensitivity at an anode voltage  $V_a$ , the sensitivity at another voltage is  $\frac{V_a}{\text{Van}}$

If we have the deflection as X.MM. per volt, this is  $\frac{1}{X}$  volts per MM.

$$= \frac{25.4}{X} \text{ volts per inch.}$$

$$\text{i.e.} = \frac{25.4}{X} \times \frac{V_a}{\text{Van}}$$

The screen, of course, shows us a complete sine wave if we are observing such i.e., both the positive and negative side. The peak value is  $\sqrt{2}$  R.M.S. value, and so the peak-to-peak value is  $2\sqrt{2}$  R.M.S. value.

We now get a sensitivity of —

$$\frac{25.4}{X} \times 2\sqrt{2}$$

volts per inch for a certain anode voltage. Our complete formula is then

$$\frac{25.4}{X} \times 2\sqrt{2} \times \frac{V_a}{\text{Van}}$$

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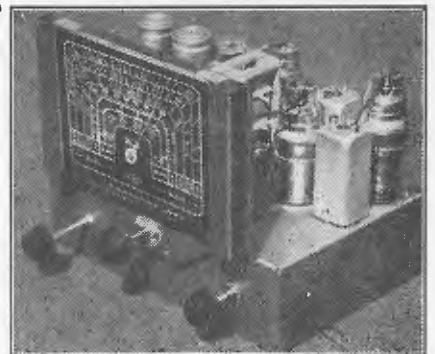
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## C.R.O. (Continued)

This then enables us to determine the R.M.S. voltage for a given size of picture, from which we may obtain if necessary the characteristics of an amplifier for the tube.

Referring to the original formula shows that the sensitivity is also proportional to the length  $L$ , which explains why the set nearer the screen has lower sensitivity.

Because of this and the fact that these plates are more likely to suffer from stray emission effects as mentioned, it is usual to use these plates for the horizontal deflection.

Deflection sensitivities for each of

the three popular tubes, 906, 902 and 913, have been worked out and are on the accompanying table.

We can now fairly rapidly complete the necessary data for our simple C.R.O. Because the actual drain is low, it is possible to put all the various focussing controls on a single dividing network across the supply. For reasons already given it is preferable to earth the + side of this supply. The values of the parts for this divider may be done by a simple proportional formula and so will not be gone into here. Although it is usually stated that little filtering is required, it is much better to use a small choke condenser system. This gives a perfectly steady picture at low frequencies and also helps to prevent the

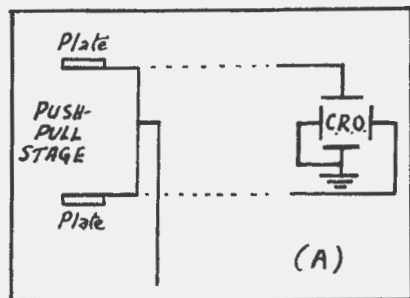
spotwandering when the focussing is varied. Fig. 3 then becomes our complete simple C.R.O., about which we have enough data to form the basis for a much more versatile and useful instrument.

In order to increase its application a small amount of A.C. has been tapped off by the potentiometer  $P$ , for application to the horizontal plates. The amount of voltage tapped can be decided on from a reference to the table given.

Despite its apparent simplicity there are quite a number of applications for this C.R.O. The phase and amplitude relations of a push-pull amplifier may be checked by connecting up as in Fig. 4a. If portion of

## C.R.O. (Continued)

the A.C. supply is used to modulate an oscillator, the overall waveform can be observed by using the horizon-



tal plates on to P and the vertical on the observed output (Fig. 4B). Distortion at other frequencies can be observed by the presence of darker horizontal lines in a solid pattern.

## PHASE CHANGERS

(Continued from page 7)

"plate characteristic" valve curves, a 2A6 (similar to 6B6G) valve curve is shown, together with the effective load.

The amplification of the driver load does not depend on the direct coupling but upon the sharing of load by the two valves. A few years ago, the Jones Radio Handbook gave a circuit of a modulator for a transmitter in which the phase changer amplified the load on a 6L7. The explanation given, however, was faulty, but the circuit is quite a useful one and an adapted version is given.

The direct-coupled job can be used with a pentode. The screen grid dropping resistor is tied to the junction of the .3 and .1 meg. resistors, the slight un-balance being of negligible importance. If a pentode is used, a 6B8G will probably function better as a phase changer — the greater bias permissible allows a larger anode current for  $V_s$ .

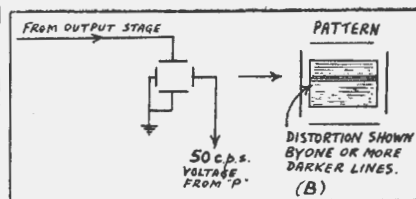
The writer has used two 6B8's, followed by a pair of 6L6G's, with splendid results.

The Jones circuit uses more components but gives slightly greater gain. Advantages of a pentode driver include the use of a medium gain crystal microphone without a pre-amplifier, spare gain for high and low-note compensation circuits of the "loss" type, and spare gain if a large amount of inverse feedback is required. On account of the high gain, the percentage of voice coil voltage that should be applied to the driver cathode is very small — about one per cent.

## Behaviour Important

However, it is not our purpose to try and discuss all the uses of the instrument at the moment. As has been pointed out, the understanding of the instrument can only be done after proper study of a large number of points. It is not possible to say, "Show me how to use the C.R.O.," and expect to have it mastered in three easy lessons!

The experimenter who builds the simple unit described is advised to learn as much as possible about its operation from practical consideration of the foregoing points. The effect of stray fields, poor filtering and so on, will be more easily observed than discussed and will certainly develop the basic understanding necessary for de-



tailed application. At this stage the behaviour of the tube under various conditions is probably more important than trying to guess the phase shift in some complicated set-up that doesn't matter anyway.

Further articles on the application of the cathode ray oscilloscope are due to appear in the next three or four issues.



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# SOME BATTERY SET CONSIDERATIONS

I HAVE purposely refrained from giving elaborate technical details of a radio receiver, because to those not so acquainted with the inner secrets of radio, an essay is of much more interest if it can be understood by them, yet, at the same time, be interesting enough to those more technically minded.

## Costs

There are two main drawbacks to be found in the building or purchase of any battery receivers, the first and foremost being the battery consumption and operational costs, and secondly the building costs. A glance at the commercial price lists for radio sets will show that the prices quoted are very high indeed; a five-valve dual-wave battery receiver is priced at approximately £35 and the vibrator-operated receiver dearer by several pounds. Regarding the operational costs, these have been reduced to a great extent by the advent of the new 1.4-volt battery valves. At present, however, it would appear impracticable to employ these types, as only a limited number and types are available due to war conditions and import restrictions. However, even if these valves were available in unlimited quantities, they have a number of disadvantages, firstly, that they must be mounted in a strictly vertical position, otherwise any sag in the internal elements of the valves will cause a short circuit and not only ruin the valve concerned but all the others in the circuit, and secondly, as good as the valves may appear to be, they are not equal in performance to the well-known makes of 2-volt valves. Also, the 2-volt valves are extremely economical; for instance, the type 30 valve draws a filament current of 0.06 m.a. and a plate current of 3.0 m.a. at 135 volts. The charging of the small 2-volt accumulator is very cheap, and, in addition, this battery is much easier to transport for charging than the 6-volt batteries used in conjunction with 6-volt valves.

## Type of Receiver

Naturally the type and design of the radio receiver is the first consideration, and again one sees the usual undecided mind—superheterodyne or tuned radio frequency type. Now, the use of radio frequency amplification in a set enhances the receiver's sensitivity and selectivity to a great degree, but there is a limit beyond which it is not practicable to employ radio frequency amplification without running into trouble due to oscillation and kindred unstable

## Another Essay in Our Battery

### Circuit Contest

by

E. C. Jamieson

of Forreston, South Australia

operating conditions. However, a way out of this difficulty is the employment of the superheterodyne principle.

## The Superhet Principle

This principle involved the reception of the incoming signal at its fundamental high frequency and with the voice tones with which it is modulated; the mixing of this incoming high frequency signal with a locally-generated signal which is unmodulated and of fixed amplitude or intensity. The "beat frequency" so formed is the arithmetical sum of the difference between the two frequencies, e.g., if the incoming signal has a fundamental frequency of 1,000,000 cycles and the locally generated signal a frequency of 500,000 cycles, the resultant beat frequency will be either 1,500,000 or 500,000 cycles. However, a frequency which is lower than the frequency of the incoming signal, is selected. The beat frequency together with the modulation frequencies which have not been disturbed by this beating, are fed through an amplifier tuned to a fixed frequency corresponding to the difference between the incoming and the local frequencies. This is known as an "intermediate frequency (I.F.) amplifier" and consists of a radio frequency amplifier system operating at a comparatively low radio frequency. From this amplifier the beat frequency signal is fed to what is known as the second detector or a demodulator, where it undergoes the same sequence of changes as take place with a signal received directly by the detector valve. Thence the signal passes to the audio frequency amplifier and to the loud speaker.

## Tuned Radio Frequency

The above gives some idea of the working of the superheterodyne; the other system, that of the tuned radio frequency receiver, however, has a number of advantages over even the best of superheterodynes, and they are, firstly, and the most important of all factors where short-wave reception is concerned, the noise level. A

tuned radio frequency (t.r.f.) receiver need only to be operated alongside a superheterodyne and the t.r.f. will win hands down in this respect. Secondly, the high state of sensitivity of the t.r.f. Although the superhet will provide an excellent output from any input signal of reasonable intensity, its high noise level and relative lack of sensitivity of the first detector will render impossible the reception of very weak signals. Besides this being a well known fact, I have myself carried out many tests with all makes of receivers, and stations which the superhet would not touch were received clearly, though not loudly, on the t.r.f. This is due to the high state of sensitivity to which the t.r.f.'s detector can be brought by judicious use of the regeneration control.

From the foregoing, it can be seen that those who are content to listen on short-waves from the entertainment point of view, and to only the strong stations, the superhet will suffice, but to those true DX fans who probe after every signal there is, whether strong or weak, the t.r.f. is to their advantage.

There are other types of receivers which will work satisfactorily, such as the "Rheinartz." However, this type and the others are quite obsolete now.

## Coils and Coil Changes

Coils are probably the most important and certainly the heart of any good receiver, whether it be superhet, t.r.f. or others. Once again, another argument arises: Will they be plug-in or switched coils? Whilst admitting that switches are of high quality nowadays, I still think they are not as efficient as the plug-in coils for short-wave reception. At the same time, as the switches have been improved, so too have the coil formers and coil sockets. Certainly the switched coils are an asset insofar as a labour-saving device is concerned, and this type of change is quite satisfactory in a receiver for the whole family, but to the DXer with an experience, plug-in coils are far superior. Again, the DXer usually likes to cover all wavelengths of interest, such as 9 to 550 metres, 13 to 200 metres and so on, and this would necessitate about five or so different sets of coils, but to have a five-bank wave-change switch in a receiver of normal proportions is well nigh impossible, and even if it were possible it would necessitate long leads from the coils to other parts of the receiver, with the introduction of oscillation and other

troubles. With the plug-in type of coils, any number of formers may be employed, any of which can be very easily changed. Also, in receivers using switched coils, the manufacturer (most coils used in a switching arrangement are commercially wound) usually tries to cover as much wavelength range as possible, thereby stretching the coil from about 16 to 50 metres, with a consequent dropping off in sensitivity and selectivity at the 50-metre end of the dial, whereas the DXer, using plug-in coils, would wisely cover, say, 16 to 31 metres with one coil and 31 to 60 or so with the second, thereby avoiding having any of the principle bands at the top end of the dial.

The mass produced coils are usually divided into two sets, namely, air-cored and iron-cored. The former consist of a large number of primary turns mounted so that small inductive coupling exists between the primary and secondary. The coupling is provided by means of a capacity. In some types of coil the capacity effect is obtained by running a link of wire from the "hot" end of the primary coil and winding this closely around the "hot" end of the secondary winding; this link, however, does not usually make a complete turn around the secondary winding, but is terminated about three-quarters of the way around, with no actual connections being made.

In the other type, a small condenser of variable capacity from some 2 to 30 mmfd., is connected between the "hot" ends of primary and secondary windings. The capacity of this condenser to a large extent governs the operation characteristics of the coil, and is used in conjunction with the primary winding to control the amplification of the coil throughout the tuning range. The high impedance primary winding is so constituted as to resonate at a low frequency outside the highest wavelength to which the coil tunes. This resonance point is usually set at about 540 k.c. The effect then is to bring the primary more and more into tune with the secondary as the receiver is tuned from 1,500 to 545 k.c., so that at the high wavelength end of the dial the sensitivity of the receiver is boosted.

Since the capacity of the coupling condenser is small, the value as a coupling medium is very small at the low frequencies, but is quite useful at the high frequencies, consequently, it is the coil whose coupling characteristics can be made quite even over the whole frequency range.

### Bandsread

An excellent addition to any receiver is that of electrical bandsread. This is a system by which any band or part of the dial on the short-wave

bands can be spread over a large area. It is usually accomplished by placing a small 2 or 3 plate midget variable condenser, connected to a vernier dial, across the tuning condensers of the receiver, fixed plates to fixed plates, etc. The main dial is used to set the receiver at the desired band or wavelength, for instance, 19 metres, and when set all future tuning is carried out on the bandsread dial. As an example, 19 metres can be spread over

**Watch for further articles  
on battery circuit design in  
next month's issue.**

approximately 85 degrees of dial readings, whereas, on the main tuning dial it occupies about 2 or less degrees. From this it can be seen how much easier it is to tune in weak stations and to separate them from nearby powerful stations. Short-wave listening is made very simple by this addition.

### Amplification

The type of amplification is another consideration. The majority of radio receivers use Class A amplification. The chief characteristics of Class A are those of low distortion, low power output for a given tube size, and a high power amplification. The other design, that of Class B, is one in which the output current is proportioned to the amplitude of the exciting grid voltage. The distinguishing operating conditions of Class B service are that the grid bias is set so that the plate current is very nearly zero to cut off when no signal is applied. For Class B audio amplification two valves must be used, the second valve working alternatively with the first, and must be included in the amplifier circuit. The following diagram (Fig. 1) will illustrate.

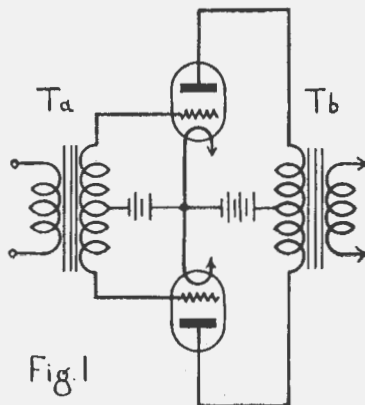
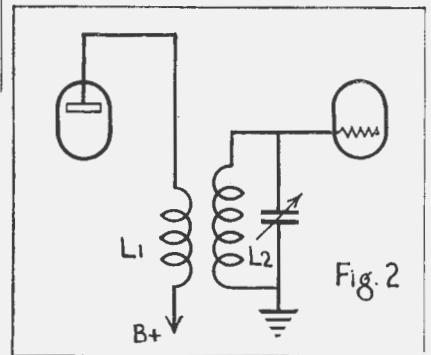


Fig. 1

The signal is fed to the transformer Ta, whose secondary is divided into two equal parts, with the tube grids connected to the outer terminals and the grid bias fed in at the centre. A transformer Tb, with a similarly divided primary, is connected to the plates of the tubes the plate voltage being fed in at the centre tap. When the signal swing in the upper half of Tb is positive, Tube No. 1 draws plate current, while Ta is idle; when the lower half of Ta becomes positive, Tube No. 2 draws plate current while Tube No. 1 is idle. This type of amplifier is capable of delivering much more power output for a given tube size than is obtainable from a Class A amplifier.

There are other types of amplification, such as Class C, Class AB, Class BC, but too much valuable space will be taken to deal with these individually. They are only used rarely.

The other type of amplification, al-



Conventional type of r.f. coupling, with tuned grid circuit.

though used at the beginning of the receiver and not at the end, as with audio amplification, is that of radio frequency amplification, which is another link in the successful operation of the radio receiver. If a signal is too weak to actuate the detector valve, no matter how powerful the audio amplifier, no signal will be heard, and it is for this reason that radio frequency amplifiers are used. These type of amplifiers increase the strength of the signals before they are detected or rectified; they also add to the selectivity of the receiver by reason of the tuned circuits they employ. They also reduce the noise level by providing a more powerful signal for the detector to handle.

Kindred troubles are found when an R.F. amplifier is used. The grid and plate leads to any of the valves must be kept entirely separate. There are four systems of coupling a radio frequency amplifier, each of which is detailed in Figs. 2 to 5 below.

To detail each of these would be

(Continued on next page)

# BATTERY SET DESIGN

(Continued)

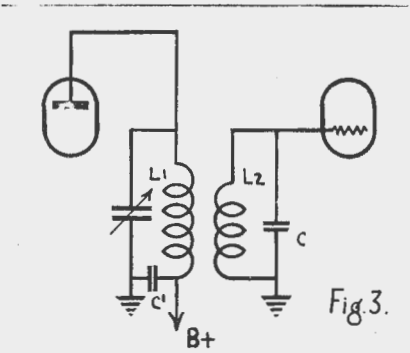
too lengthy, but a fair idea of their operation can be gained from the diagrams.

## Bias

With modern amplifying valves the application of a negative bias to their grids is essential if long valve life and good performance is to be expected. This bias is usually derived from a small dry cell capable of delivering potentials ranging from 1½ up to as high as 22½ volts, depending upon the various types of valves used. This type of bias supply is unsurpassed when the "B" batteries are new, but when they begin to decline in efficiency the "C" battery, from which no current is drawn, lasts for a much longer period than the "B" batteries. It can be appreciated that if a given valve requires 6 volts negative bias at 90 volts plate potential, it needs only 4½ volts bias at 67½ volts plate, yet the "C" battery continues to deliver 6 volts when the "B" batteries have fallen to 67½ volts. Naturally, there would be a noticeable deterioration in the set's performance when the plate voltage had been reduced twenty-five per cent., even if the "C" battery was correspondingly reduced.

## Automatic Bias

However, the general trend to-day is to use what is known as automatic bias, so called because it is obtained by means of the drop across a resistance connected in the negative side of the "B" supply system. This resistance is so proportioned that the correct bias will be obtained when the valves are new and the "B" batteries are delivering their rated voltage, so the plate current drawn by the valves is reduced as the "B" batteries fail, and so also is the bias correspondingly reduced as it is governed by the current flowing through it, and the balance between the "B" and "B" voltages maintained.



Circuit for tuned-plate coupling.

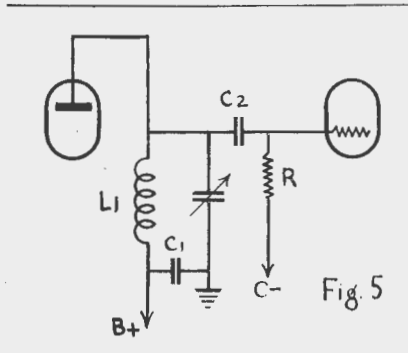
However, battery bias is the only practical system when Class "B" audio amplification is included in the receiver.

## Shielding

Although not generally appreciated, shielding plays a large part in the successful operation of the radio receiver. All coils, intermediate frequency transformers, valves, etc., should be shielded in any receiver, especially one employing an R.F. stage. This shielding is for the purpose of absorbing stray electromagnetic fields which may emanate from any of these components and would cause instability or kindred trouble in the receiver.

## Matching Speaker to Output Valve

It is essential to match the speaker to the output valve if good quality and volume is to be gained. It is pitiful to see people with a new receiver

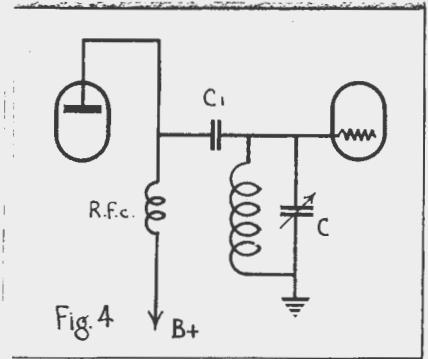


Another version of tuned plate coupling.

using an old speaker because the speaker still works. Modern radio receivers are designed to operate with the speakers supplied with them. Generally, an 8" permanent magnet speaker for battery sets will be found ideal for all-round reception. If I may be allowed to mention one make, the Rola PM 8/20 is a perfect example of this. I have never yet come across a speaker of such quality as the 8/20. Many people have purchased a 6" speaker because (1) it was cheaper by a few shillings, and (2) they could not see how the extra 2" to make an 8" speaker could possibly make any difference. They need only to try the two speakers alongside one another to see which is the better.

## Aerial and Earth

Finally, a good aerial is essential. An aerial of overall length of 80 to 100 feet and 30 to 40 feet high, erected clear of all trees and other obstructions, will be found to be quite satisfactory, for both short-wave and broadcast signals. Complicated and



Tuned-grid coupling, with choke-feed for the r.f. valve.

inefficient (from point of view) aerials such as the doublet or inverted V should be avoided. The first-named is only satisfactory where outside interference is encountered; as for the second, I myself cannot see anything so startling about it. I have used them both and also the common L type of aerial and, every time, the latter was far superior to the other two, particularly with short-wave reception. The four aerials being used by myself at the moment are all L types, and point in different directions, providing excellent signals at any time of the day or night. Also, this type of aerial will tune over any wavelength, whereas the others have to be cut to a certain length and then only tune from perhaps 16 to 22 metres or so.

## The Earth

Earth wires are just as essential as an aerial. The best type is that of either driving a pipe about three feet into the earth, and filling with water, keeping the surrounding ground damp, or of burying a copper plate at a depth of about 2 feet, keeping the nearby ground moist with water and ashes. Many radio receiver owners, because their radio works satisfactorily without an earth, do not use one. The earth not only provides an outlet for interference, but also improves the overall performance of the receiver, particularly on the short waves.

## Conclusion

In conclusion, from this essay I trust some information can be gained and that it will be of some help to someone. I will then feel that all my effort has not been wasted. I have described any particular receiver, but have given a general operating description of most of the important parts of the receiver. Such items as the operating characteristics of loudspeakers and valves have been omitted owing to lack of space.

Radio is fascinating, isn't it?

— E. C. JAMIESON.

Forreston, S.A.

# AN IMPROVED COUNTRYMAN'S CIRCUIT

Designed and described by Donald Dove, "Ullamalla," via Hill End, N.S.W.

**I**N THE country beyond all reach of electric light mains, it is not so easy to get good radio reception, while keeping running costs within reasonable limits. There must be plenty of sensitivity, also selectivity, as it is not much use having a powerful set, capable of bringing in every station in Australia, if, when it does so, two or three will be heard together. Noise level is another big factor, for in distant daylight reception noise level must be kept low. This is also necessary in short-wave reception.

## Years of Experimenting

Bearing all these essentials in mind, I have been experimenting for many years trying to find a perfect set for country use, attempting to combine sensitivity, selectivity, good tonal quality and economy in the one set, and have done this by building a seven-valve dual-waver, having a stage of radio frequency, pentagrid converter, two stages of intermediate frequency at 465 k.c., with Class B output.

## Tremendous Sensitivity

This set has tremendous sensitivity, owing to the two stages of intermediate frequency, low noise level because of the R.F. stage and two watts of power output. It is essential when building the set to get matched coils and intermediates, and nothing but the very best is good enough. The whole performance of the set depends on the quality of the coils and intermediates being of the best. In the

**A most practical radio man is the author of this essay, which deals with the design of a powerful dual-wave battery set. Mr. Dove is well known to our readers, being the author of the article on the original "Countryman's Six" receiver, which was described in detail in our issue for January, 1941.**

output section I have used a Ferranti Class B transformer and either a Rola P.M. 12-42 or Amplion 12P65. (I have tried them and both are excellent performers). As a result the tonal quality and output is very good. I have also used good Australian-made Class B transformers with equally good results.

## Good Coil Boxes

Good coil boxes can be secured, which simplifies the wiring, although personally I prefer to buy the D.W. coils and switch and wire them up. Instability may be encountered, but if care is taken in the layout to keep all leads as short as possible, and put the by-pass condensers right at the valve or coil, no trouble should be encountered. I am afraid there is nothing unusual in the circuit, any improvements in receivers during the

last few years having been mainly in the coils and intermediates. Battery valves have not improved at all in the last five years. The makers have given them different names and also made them with the octal base, but the characteristics are the same. I have also tried two pentodes (1D4's) in push-pull in the output stage, but had to abandon the idea because of the excessive "B" consumption. The output was then under one watt, whereas, using Class B, almost two watts were obtained, with considerably less current used. The battery consumption of this set is: "A" battery, .90 amps; "B" battery, 13 to 17 milliamps, and slightly higher if very high volume is used.

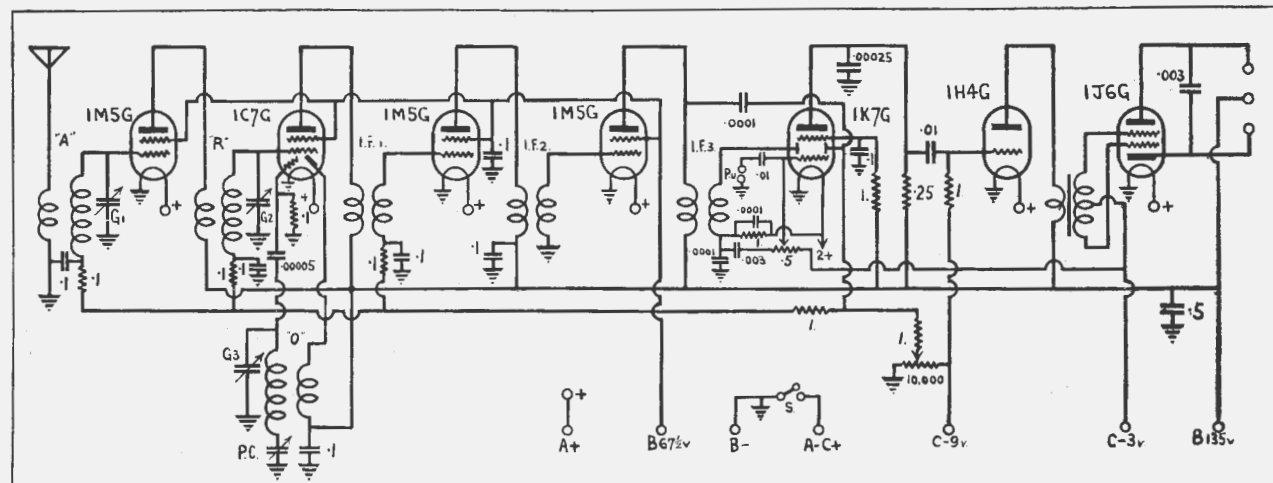
## One I.F. Not Enough

For absolutely best results on the broadcast band where short-wave reception is not required, I use the same circuit, but replace the two stages of I.F. with one stage of I.F. at 175 k.c.

The usual set, of one stage of I.F. at 465 k.c., is no use whatever in country districts. The sensitivity is inadequate and at night it is impossible to separate the smaller stations with any satisfaction.

## Good Aerial Helpful

Another essential for good long-distance reception is to have a good aerial of at least 100 feet and an efficient earthing system. This keeps the noise level low, and the set I have described is sufficiently selective to separate all the stations on the biggest of aerials.



Circuit for a powerful dual-waver to use seven valves, as suggested by Mr. Dove. The circuit is in some ways similar to the original "Countryman's Six," which was detailed in our issue of January, 1941.

# Shortwave Review

CONDUCTED BY

L. J. KEAST

## NOTES FROM MY DIARY

On account of the introduction of daylight saving time in Australia, one hour must be added to all times mentioned hereunder.

There has certainly been some big news since our last issue went to press. I think I can be excused if any of my schedules have gone haywire but what has struck me most forcibly is the surprising strength of the American stations just when they are wanted. And what a news service they can be relied upon to present! Programmes are interrupted at any time to let us have the latest news flash and "further news momentarily" is keenly awaited and an excellent programme keeps one tuned in.

Talking of schedules, doubtless many of our readers have found that WGEA, Schenectady, on 31.41m, is heard from 7.15 a.m. till 9.45 p.m., that is, of course, allowing for the "blackout" period between, say, 8.30 a.m. and 1.30 p.m. At 8.30 p.m. they put in a great signal, and the sister

station, WGEO, on 31.48m, which gives a fine signal in the mornings, can be heard at night but the very strong Jap, JZI, on 31.46m, makes listening difficult.

The General Electric Co.'s other international station, WGEI, situated in Frisco, seems to have improved or at any rate in the earlier part of the evening, say, round about 8.30, they are splendid on 31.02m. Opening at 4 p.m., they go right through till 2 a.m. News is given at 4, 5, 9.30 and 10.30 p.m. WRUW, Boston, on 19.54m, are good with the news at 6.30 a.m., and a new frequency for them is 9.70mc. On 30.93m, from 6.50 a.m. to 8.30 a.m., with news at 8.15, they are putting in a great signal. The same programme is on WRUL on 25.45m.

We have become accustomed to finding short-wave stations have left the air through enemy occupation, many of them not being heard since; others are back on the air but with a different outlook, forced of course, but that was in Europe and it seemed a long way away. Who ever dreamed we would find it happening near us? But

there is all too much evidence it is. Hardly had we ceased rejoicing that a British-owned station in Shanghai, XGDN, had made its appearance than it goes silent.

I am sure we all miss XMHA, the American-owned station in the same city, and it seems almost unbelievable that ZBW-3, Hongkong, has not been heard for a week or so.

I have often referred to the feeling of security we have by hearing Big Ben. To-day, I guess most of us are tuning to ZHP-1, Singapore, for the assurance that all is well.

With careful tuning, another Russian transmitter can be found on 15,090kc, 19.88m. Opening with news at 9 p.m., they can be held till closing at about 11 p.m., following the second news bulletin in English. Care is required, because they are sandwiched in between DJL, on 19.85m, and the Italian on 19.91m. Actually the Russian is the weakest of the three. Russia is heard from 9 a.m. for a little over an hour on 19.69m and in the evening on 24.88m from 6.40 till 6.55. News in English is given during this brief period, and welcome news, too.

Radio Saigon now gives the first News in English, at 8.15 p.m., the second at 9.15 p.m.

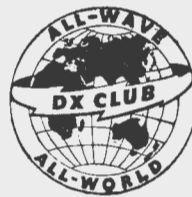
WBOS, Boston, 15.213kc, 19.72m, would have a great signal at midnight if the noise was not so high. WRCA, on 16.87 at the same, hour is fair.

Listeners will find WGEA, 31.41, very interesting at 8.30 a.m. on Sundays, when "The March of Time" is put over. Actually the station is worth tuning in at 8 a.m. as a very good news service is heard till 8.30.

One of the most popular of the B.B.C. sessions is "Hi Gang," judging by the time it has been running. Given in the Eastern Service on Tuesdays at 10.15 p.m., on hears Bebe Daniels, Ben Lyon and Vic Oliver. An opportunity may be had soon to see them, as a film has been made with the same title. Had it not been for the war, Ben Lyon and his wife, Bebe Daniel, would have been here in person many months ago.

## ALL-WAVE ALL-WORLD DX CLUB

### Application for Membership



The Secretary,  
All-Wave All-World DX Club,  
117 Reservoir Street, Sydney, N.S.W.  
Dear Sir,

I am very interested in dxing, and am keen to join your Club.

Name .....

Address .....

(Please print both plainly)

My set is a .....

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) .....

(Readers who do not want to mutilate their copies can write out the details required.)



Running over the bands one Sunday afternoon recently, I found the best of the London transmitters was GRS, 42.49m. By the way, London has either in operation or available 34 transmitters, surely very convincing evidence of the importance they attach to short-waves.

On the same Sabbath, WCBX, 6170kc, 48.62m, were very good at 6.20 p.m.

Radio Saigon now gives first News in English at 8.15 p.m., at the conclusion of which it is announced that the next News in English will be heard at 9.15 p.m. Following the first news there are several strokes on a gong, then the "Marseillaise," an announcement by a man in French, a bugle is sounded, more announcements, more bugles, then a woman gives "News" in French.

The two recent additions to the 16-metre band, GRQ, London, 16.64m, and GRP, 16.79m, are both very good at 9 p.m.

Am very glad to welcome back to the list of reporters, Roy Taylor, of Mosman. Roy goes after the unusual and is a "tiger" for 100 to 200-metre loggings. He has just purchased a new set, and I figure petrol rationing will not worry him—he will be too much concerned with midnight oil.

Delighted to receive some notes from Phil Byard, of Launceston, who has been "off the air" during building operations, but with the proposed aerial array I guess readers of this magazine will have some hunting to do with the signals he will discover.

Reporter W. H. Pepin, while out of camp in W.A. for a brief spell, managed to do some short-wave listening and sends some fine notes.

Another West Australian and one new to us is Mr. L. Walker, of Applecross. He forwards some interesting loggings. That is what we like—reports from all over the Commonwealth.

## FOR SALE

1—Pre-selector Booster Unit, using two "Acorn" valves, complete with own power supply, in aluminium cabinet, with wave-change switch, covering from 18 to 80 metres; originally cost £16 wholesale.

1—Rola permagnetic speaker, 12," 7,000-ohm load, with baffle board.

1—Rola 5" permagnetic speaker.

1—Morse code key and buzzer, mounted.

Price, £7/10/- the lot

L. J. KEAST

96 Frenchman's Road, Randwick  
FX 6168

## NEW STATIONS

**Emissora Nacional**, Ponta Delgada, 7305kc, 41.07m: This station is heard opening at 6 a.m. and appears to be on the air for an hour. Signal is splendid at opening but weakens towards 7 a.m. Ponta Delgada is a town on San Miguel and is the largest town in the Azores. This Portuguese group in mid-Atlantic is 1,500 miles S.W. of Ireland and 1,700 E. of Nova Scotia; area, 922 sq. miles, and a population of 254,000. The capital is Angra, on Terceira Is.

Readers of these pages will remember that Mr. Roy Taylor, of Mosman, was mentioned in May issue as hearing **CT2AJ**, Ponta Delgada, on 4002kc, 75.00m, at 11 p.m. and also at 8 a.m. All the American magazines by the last mail refer to Ponta Delgada being heard on 14,400kc, 20.83m, and some give 14,580kc, 20.58m. Times are 6 to 7 a.m. This is the hour at which the new Portuguese station is being heard

here. It is easy to log, as a clock strikes six at 6 o'clock our time. We are twelve hours ahead of the Azores. Dr. Gaden was the first to log this station.

**S.S. Lurline**, at sea, 8820kc, 34.01m: Dr. Gaden reports hearing this maritime station talking to **KRO**, Kahuku (Hawaii). He did not hear Hawaii, but chances are they were using 5845kc, 51.32m.

**WRUW**, Boston, 9700kc, 30.93m: This new outlet of the World Radio University is heard at 6.50 a.m. in same programme as **WRUL**, 25.45m. Very good signal. News at 8.15. Closes at 8.30.

**YSR**, San Salvador, 6515kc, 46.04m: This is a new station reported by Mr. Ray Dissinger, of Kansas, U.S.A., as being heard at good strength from 10 a.m. to 1 p.m. Some American magazines give frequency as 6530kc, 45.94m. I do not remember this having been reported in Australia.

Keep a sharp lookout for the new transmitter to be erected at San Francisco. "Permission has been granted Wesley Dumm, owner of long-wave station, KSFO, to construct a new 100,000-watt station to operate on 6.06mc, 9.57mc, 11.87mc, 15.35mc and 17.61mc. Broadcasts will be made twenty hours a day in English, French, Dutch, Spanish, Portuguese, Japanese and possibly Chinese, Thai, Russian and Korean." (I.S.W., East Liverpool, Ohio).

## I.R.E. EXAMS.

The Institution of Radio Engineers (Australia) will be holding its half-yearly examination for admission to the Graduate and Associate Member grades, and the Radio Service Technicians examination for the Service Division of the Institution on Saturday, February 7, 1942. Intending candidates are invited to apply to the General Secretary, The Institution of Radio Engineers (Australia), Box 3120, G.P.O., Sydney.

Radio station **WOR** in the United States wanted a rooster to crow at dawn when it inaugurated all-night broadcasting. Sound effects men collected several, just in case, but none of them did anything.

They called up Dr. Harry Nimphius, Director of the Central Park Zoo, to find out why. Dr. Nimphius told them: "One of the reasons roosters crow is to challenge other roosters. Unless there is a hen in the vicinity there is no reason for them to make a challenge."

The sound effects men dug up a hen. Poochie, a Japanese Long Tail Rooster, looked at the other roosters, took a deep breath and crowed most effectively.

Apropos of Dr. Gaden hearing S.S. "Lurline," the N.B.C. have been heard using **WNBM** aboard the S.S. "Argentina" on 9.135mc, 32.83m.

## STOP PRESS

And herewith some items received too late for classification or checking:—

Mr. Hugh Perkins reports:

**VLG-10**, Melbourne, 9493kc, 31.60m: Used in Dept. of Inf. programme to North America at 10.30 p.m.

**VLG-7**, Melbourne, 15,160kc, 19.79m: Testing at 9.45 a.m.

He also heard announcement from London re **GRE** in the 19-metre band, but did not hear frequency or time. He thinks it is to be used with **GSG** in foreign broadcasts.

Mr. Roy Hallett, Enfield, advises having heard (all times Australia Eastern Daylight Saving Time):—

**WCRC**, New York, 6.17mc, 48.6m: From 6 p.m. to 9.15 p.m., with a good R8 signal. (This is one of the new C.B.S. twin 50 k.w. transmitters, **WCBX**, **WCRC**, situated at Brentwood, Long Island. The following frequencies have been assigned: 21.57, 21.52, 17.83, 15.27, 11.83, 9.65, 6.17 and 6.12 m.c.—Ed.).

—, Bangkok (Thai), 6.04kc, 49.66m: From 10 p.m. to 1 a.m. Good signal.

—, Costa Rica, 11,900kc, 25.2m: Heard at 12.15 a.m. (Dr. Gaden also reports this, and thinks call sign is either **TIEG** or **TICG**. Has heard them as early as 10.30 p.m., also on Sunday afternoons.—Ed.)

**XGAP**, Peking, 6100kc, 49.18m: English programme between midnight and 1 a.m.

# The MONTH'S LOGGINGS

ALL TIMES ARE AUSTRALIAN EASTERN STANDARD

## AUSTRALIA

- VLG-6**, Melbourne ..... 15,230kc, 19.69m  
Schedule: 6.30 a.m. to 2.45 p.m.; 5 p.m. to 6.45 p.m.
- VLR-3**, Melbourne ..... 11,880kc, 25.25m  
Schedule: Noon to 6.15 p.m. Relays national programme.
- VLG-5**, Melbourne ..... 11,880kc, 25.25m  
7 p.m. to 10 p.m.
- VLG-2**, Melbourne ..... 11,870kc, 25.27m  
10.25 p.m. to 11.10 p.m.; 11.15 p.m. to 1 a.m.
- VLW-3**, Perth ..... 11,830kc, 25.36m  
Schedule: Daily, 8.30 a.m. to 11.45 a.m.; 1.30 p.m. to 8.45 p.m.; Relays W.A. national programmes. Sundays, 9 a.m. to 8.45 p.m.
- VLR-8**, Melbourne ..... 11,760kc, 25.51m  
Schedule: 6.30 a.m. to 10.15 a.m.: Relays national programme.
- VLR**, Melbourne ..... 9580kc, 31.32m  
Schedule: 6.30 p.m. to 11.30 p.m. Relays national programme.
- VLW-2**, Perth ..... 9560kc, 31.38m  
Schedule: 9 p.m. to 1.30 a.m.: Relays W.A. national programme. To South-east Asia. Sundays: 9 p.m. to 1 a.m.

## Department of Information Broadcasts Add one hour to times shown

- VLG-6**, Melbourne ..... 15,230kc, 19.69m  
Trans. F.1: To A.I.F. in Middle East, 3 p.m. to 3.30 p.m. Trans. F.2: To A.I.F. in Malaya, 6.15 p.m. to 6.45 p.m. Trans. F.3: To A.I.F. in Middle East: 2.25 a.m. to 2.55 a.m.
- VLQ-2**, Sydney ..... 11,870kc, 25.27m  
Trans. VI.: To North America (West), 3.55 p.m. to 4.40 p.m. (Also on **VLG-3**, 25.62m). Trans. II.: In English to North-east Asia, 8.40 p.m. to 9.15 p.m.
- VLG-3**, Melbourne ..... 11,710kc, 25.62m  
To North America (West), 3.55 p.m. to 4.40 p.m. (Also on **VLQ-9**). Excellent at 4 p.m., but no sign of VLQ-9 (Cushen).
- VLW-2**, Perth ..... 9650kc, 31.09m  
Trans. IV.: In Dutch, French and English to South-east Asia, 11.15 p.m. to 1 a.m. (also on **VLG-2**).
- VLQ**, Sydney ..... 9615kc, 31.2m  
Trans. I.: In French to New Caledonia and French Oceania, 6.25 p.m. to 7.25 p.m.
- VLG**, Melbourne ..... 9580kc, 31.32m  
Trans. V.: In English to North America (West Coast), 1.25 a.m. to 2.10 a.m. Heard testing in the afternoons for transmission to British Isles (Jamieson).
- VLG-2**, Melbourne ..... 9540kc, 31.45m  
Trans. III.: To North America (East Coast), 10.25 p.m. to 11.10 p.m. (Also on **VLQ-9**). Trans. IV.: To South-east Asia, in Dutch, French and English, from 11.15 p.m. to 1 a.m. (Also on 31.09.)
- VLQ-9**, Sydney ..... 7250kc, 41.38m  
Trans. III.: To North America (East Coast), 10.25 p.m. to 11.10 p.m. (Also on **VLG-2**). Trans. VI.: To North America (West Coast), 3.55 p.m. to 4.45 p.m. (Also on **VLG-3**). Excellent at 10.25 p.m. (Cushen). Not heard at 4 p.m. (Cushen).

## OCEANIA

- Fiji:**  
**VPD-2**, Suva ..... 15,160kc, 19.79m

Schedule: 7.30 a.m. to 8.30 a.m. (News 8.15 a.m.); 12.30 p.m. to 1.30 p.m.  
Heard them at 7.45 a.m. (Nelson). Heard in French session, closing at 3.30 p.m.—Ed.

**VPD-2**, Suva ..... 11,895kc, 25.22m  
Not heard for several nights.

**VPD-2**, Suva ..... 9535kc, 31.46m  
Think have also left the air.

## New Caledonia:

**FK8AA**, Noumea ..... 6130kc, 48.94m  
Schedule: 5.30 to 6.25 p.m., except Sundays. On opening and closing plays "Morseillaise," "God Save the King" and "The Star-Spangled Banner." Also uses " - - -" when opening.  
R6 at 6.15 p.m. (Tolyar).

## Papua:

**VIG**, Port Moresby ..... 15,770kc, 19.02m  
Reported heard around 10.30a.m.

## Tahiti:

**FO8AA**, Papeete ..... 7100kc, 42.25m  
Wednesdays and Saturdays, 2 p.m. to 3.15 p.m. Good signal (Cushen).

## AFRICA

### Algeria:

**TPZ**, Algiers ..... 12,120kc, 24.76m  
Schedule: 7 a.m. to 8 a.m.

**TPZ-2**, Aigiers ..... 8960kc, 33.48m  
Schedule: 7 a.m. to 8 a.m.

### Belgian Congo:

**OPM**, Leopoldville ..... 10,140kc, 29.59m  
Schedule: 4.55 a.m. to 5.45 a.m.  
Received verification in French (Cushen).  
R5 at 4.55 a.m.

### Egypt:

**SUV**, Cairo ..... 10,055kc, 29.84m  
Some mornings, round about 5.30. Fair signal.

**SUX**, Cairo ..... 7865kc, 38.15m  
Schedule: 4.30 a.m. to 6.30 a.m.

**SUP-2**, Coira ..... 6,320kc, 47.47m  
Schedule unknown, but heard from 2.30 to 3 a.m.

Splendid on opening at 2.30 a.m., fades out by 3 a.m. (Cushen, Walker).

### French Equatorial Africa:

**FZI**, Brazzaville ..... 11,965kc, 25.06m  
Despite static, signal is R7 at 4 p.m. Also heard some days between 5 and 7 a.m. Much weaker than last month, but audible with News at 5.45 a.m. (Nelson).

### Gold Coast:

#### British West Africa:

**ZOY**, Accra ..... 6000kc, 50.00m  
Relays B.B.C. at 4 a.m.  
Fair at 4.15 a.m. (Cushen).

### Kenya:

**VQ7LO**, Nairobi ..... 6060kc, 49.5m  
Schedule: 2.15 to 5.15 a.m. (News, 2.30 and 4 a.m.).  
Fair signal at 4 a.m. (Nelson, Walker).

### South Africa:

#### Rhodesia:

**The Post Office Station**, Salisbury, 7317kc, 41m  
Schedule: 2 a.m. to 6 a.m. Relays Daventry at 4 a.m. Closes with "God Save the King." Fair signal just before closing. Received letter from Secretary, Broadcasting Advisory Board, Broadcasting Studio, P.O. Box 1300, Salisbury (Cushen).

### Portuguese East Africa:

#### Mozambique:

**CR7BD**, Lourenco Marques ..... 15,250kc, 19.66m

English by a woman, Portuguese by man, between 3 and 4 p.m. Chimes are given between various items.

**CR7BE**, Lourenco Marques ..... 9840kc, 30.48m  
Schedule: 5 to 7 a.m. except Mondays. News 5.55.  
(Generally a very fine signal at 6.—Ed.)

### Senegal:

**FGR**, Dakar ..... 9400kc, 31.90m  
Becoming audible at 7 a.m. and should improve from now on (Nelson). (It is significant that Mr. Nelson should report this, as I believe he was the first to notice this station away back in 1940.—Ed.)

**CR7AA**, Lourenco Marques ..... 6175kc, 48.58m

### Transvaal:

**ZRH**, Johannesburg ..... 6007kc, 49.95m  
Schedule: 1.30 a.m. to 7 a.m. News 6.45 a.m.  
South African Press News in English at 6.5 a.m. B.B.C. News at 6.45 a.m.

## AMERICA

### Central:

**T14RH**, Heredia ..... 9740kc, 30.80m  
Closes just before 3 p.m. on Sunday, Wednesday and Friday.  
Still good till 3 p.m. (Cushen).

### Costa Rica:

**TIPG**, San Jose ..... 9620kc, 31.19m  
Schedule: 10 p.m. to midnight.  
Loudest of the Central Americans and sometimes heard around 2 p.m.  
R6 at 10 p.m. (Byard, Nelson). Closes at 2.30 p.m. with English and good signal (Cushen).

**TIEP**, San Jose ..... 6696kc, 44.81m  
Weak, but can be heard about 10.30 p.m. (Rodgers).

**TILS**, San Jose ..... 6165kc, 48.66m  
Opens at 10 p.m. with "Stars and Stripes."

**TIGPH**, San Jose ..... 5910kc, 50.76m  
Good around 10.15 p.m. (Goden).

### El Salvador:

**YSM**, San Salvador ..... 11,720kc, 25.62m  
Schedule: 4-5 a.m. and occasionally 11 a.m. to 1.30 p.m.

**YSD**, San Salvador ..... 7894kc, 37.99m  
"Radio Difusora Nacional Alma Cuscatleca." Schedule: 10 a.m.-2 p.m.

**YSR**, San Salvador ..... 6515kc, 46.04m  
This is a new station, heard with good signal from about 10 a.m. to near 1 p.m. (Dissinger, U.S.A.). (Some U.S.A. magazines give frequency as 6530kc, 45.94m.—Ed.)

### Guatemala:

**TGWA**, Guatemala ..... 15,170kc, 19.78m  
5 a.m. to 10 a.m. on Mondays, R6 at 8 a.m. R5 Mondays at 8 a.m. (Nelson).

**TGWA**, Guatemala ..... 9685kc, 30.98m  
Schedule: 2 p.m. to 3 p.m.  
Has been on till after 3 p.m. with Guatemala National Fair (Cushen).

**TGWB**, Guatemala ..... 6470kc, 46.37m  
Opens at 11 p.m. with physical jerks.  
Weak at 11 p.m. occasionally (Nelson).

### Nicaragua:

**YNRS**, Managua ..... 8585kc, 34.95m  
"Radio Nicaraguense," relays **YNPH**, "Radio Philips." Schedule: 11 p.m. to midnight, and 9.40 a.m. to 1.40 p.m.  
R4-5 when opening at 11 p.m.

### Panama:

**HPSA**, Panama City ..... 11,700kc, 25.64m  
Schedule: 2 p.m. to 3 p.m.; 9.40 p.m. to midnight.

Weak signal 2.45 p.m. and 10 p.m. (Nelson, Gandy).  
Better than **WLWO** at 3 p.m., although interference from **CB-1170** and, till 2 p.m., from **CBFY** (Cushen).

**HPSJ**, Panama City ..... 9607kc, 31.22m  
Schedule: 10 p.m. till midnight.  
R4 at 10 p.m. (Byard).

**HPSB**, Panama City ..... 6030kc, 49.75m  
"Radio Estacion Miramar."

**HP5K**, Colon ..... 6005kc, 49.96m  
 Heard occasionally from 10 p.m. English  
 announcements.

**North:**

Now that U.S.A. is at war, the American sta-  
 tions can be expected to interrupt programmes  
 and give "Further News Flashes Momentarily."

**WRCA**, New York ..... 17,780kc, 16.87m  
 Best American at 11.15 p.m. (Gaden). R8  
 at 12.30 a.m. (Byard). Just audible at  
 11 p.m. in Perth (Walker).

**WRUL**, Boston ..... 17,750kc, 16.9m.  
 Opens up at 12.30 a.m. and on favourable  
 nights (mornings) can be heard till closing  
 at 3 a.m. Full schedule in November issue.

**WRUW**, Boston ..... 15,350kc, 19.54m  
 Schedule: 4 a.m. to 6.45 a.m. News at  
 6.30 is preceded by talk in French.  
 Splendid signal; much better on 25.45.

**KGEI**, Frisco ..... 15,330kc, 19.56m  
 Schedule: 9.05 to 3.45 p.m. News at 10  
 a.m., noon, 2 p.m. and 3.30 p.m.

**WGEA**, Schenectady ..... 15,330kc, 19.56m  
 6.45 a.m. to 9 a.m., very weak.

**WCBX**, New York ..... 15,270kc, 19.65m  
 Opens at 11 p.m.

**WLWO**, Cincinnati ..... 15,250kc, 19.67m  
 Schedule: 1 a.m. to 9.15 a.m.  
 Good (Gaden).

**WBOS**, Boston ..... 15,213kc, 19.72m  
 Schedule: 11 p.m. to 3.45 a.m. (News, mid-  
 night and 1 a.m.).  
 (Fair signal at midnight.—Ed.)

**WNBI**, Baundbrook ..... 15,145kc, 19.81m  
 Slight interference from **YDC**, but great at  
 11 p.m. with News (Cushen). Good at  
 7 a.m. (Gaden). Short English announce-  
 ment when closing at 9.45 a.m. (Walker).

**KKQ**, Bolinas ..... 11,950kc, 25.11m  
 Sunday afternoons (Nelson, Fitzgerald).

**WNBI**, Boundbrook ..... 11,890kc, 25.23m  
 Schedule: 10 a.m. to 11.45 a.m.  
 Good signal at 6 a.m. (Cushen).

**WBOS**, Boston ..... 11,870kc, 25.26m  
 Schedule: 4 a.m. to 6 p.m. News, 6 a.m.  
 and 9 a.m.  
 Much weaker at 6 a.m. and spoilt by **VLQ-2**  
 in afternoon (Cushen).

**WCBX**, New York ..... 11,830kc, 25.36m  
 Schedule: 5 a.m. to 9 a.m. News at 6.30  
 a.m.  
 R6 at 7.45 a.m. (Byard).

**WRUL**, Boston ..... 11,790kc, 25.45m  
 Schedule: 4 a.m. to 8.30 a.m. News 6.30  
 a.m. and 8.15 a.m.)  
 Excellent signal at 6.30 a.m. (Gaden,  
 Byard).

**WRUW**, Boston ..... 11,730kc, 25.58m  
 Schedule: 8.56 to 1.30 p.m. News 9.15 a.m.

**WLWO**, Cincinnati ..... 11,710kc, 25.62m  
 Schedule: 11 a.m. to 3 p.m. (News at 1  
 p.m.).  
 I can hear this chap at 9.30 a.m. (Gaden).

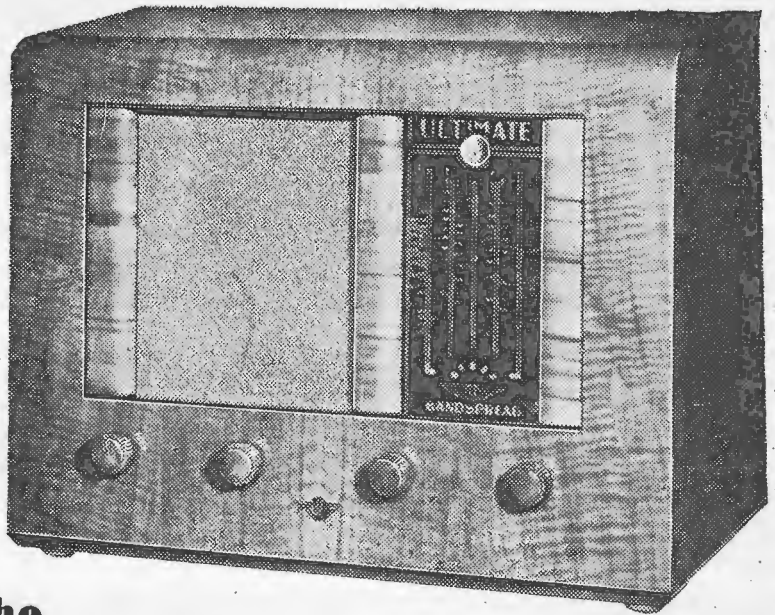
**WRUW**, Boston ..... 9700kc, 30.93m  
 Schedule: 6.50 a.m. to 8.30 a.m. News 8.15.  
 (Excellent signal at 7.30). Same programme  
 as **WRUL**, 25.45m.—Ed.) Heard **WRUL** an-  
 nounce also on this frequency (Gellasch).

**KGEI**, Frisco ..... 9670kc, 31.02m  
 Schedule: Since hostilities commenced has  
 extended schedule, which now is: 4 p.m. to  
 2 a.m. News at 4 p.m. and nearly every  
 hour till closing. Flashes may come at  
 any time.

**WRCA**, Boundbrook ..... 9670kc, 31.02m  
 Schedule: 9 a.m. to 4 p.m.  
 Very good (Cushen).

**WLWO**, Cincinnati ..... 9590kc, 31.28m  
 Schedule: 11 a.m. to 3 p.m.

**WGEA**, Schenectady ..... 9550kc, 31.41m  
 Schedule: 7.15 a.m. to 9.45 p.m. Splendid  
 signal day and night. At 8.45 p.m. much  
 louder than **WGeo**. News at 8 a.m. and  
 4.15 p.m. Talks are frequent.



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## LOGGINGS (Continued)

**WGEO**, Schenectady ..... 9530kc, 31.48m  
Schedule: Same as **WGEA**.  
Very patchy signal (Gaden). (Radio Vichy seems to overpower it, but **WGEA** is good.—Ed.)

**KEI**, Bolinas ..... 9490kc, 31.61m  
Good on Sunday afternoons, but not as loud as **KKQ**.

**WCBX**, New York ..... 6170kc, 48.62m

**WCAB**, Philadelphia ..... 6060kc, 49.5m  
Good till closing at 4 p.m. (Cushen). Heard again at 10 p.m., mixed with **KZIB** (Cushen).

**Mexico:**  
**XEBR**, Hermosillo ..... 11,820kc, 25.38m  
"Radio Difusora de Sonora."  
Generally good till 3 p.m. (Rogers).

**XEQQ**, Mexico City ..... 9680kc, 30.99m  
Heard between 2 and 4 p.m.

**XEYU**, Mexico City ..... 9605kc, 31.24m  
QRM'd by **GRY**, but O.K. when **GRY** not on air.

**XEWW**, Mexico City ..... 9503kc, 31.57m  
3 p.m. to 4 p.m.

**XEXA**, Mexico City ..... 6170kc, 48.62m  
Physical exercises at 11.30 p.m.

**XEUZ**, Vera Cruz ..... 6120kc, 49.02m  
Fair at 3 p.m. on favourable days.

**XEUW**, Vera Cruz ..... 6023kc, 49.78m  
Opens at 10 p.m. Very weak signal. Listen for four chimes.

**XEBT**, Mexico City ..... 6005kc, 49.96m  
Closes at 3.30 p.m.

**South:**  
**Argentine:**  
**LSX**, Buenos Aires ..... 10,350kc, 28.98m  
Appears to be only audible on Sunday mornings.

**LRX**, Buenos Aires ..... 9660kc, 31.06m

Weak signal 8.30 p.m. to 9 p.m. English announcements (Nelson).

**Bolivia:**  
**CP38**, La Paz ..... 9480kc, 31.63m  
Heard weakly between 9 a.m. and 12.30 p.m. Were formerly QRM'd by **XEWW** (Dissinger, U.S.A.).

**CP-5**, La Paz ..... 6200kc, 48.39m

**CP-2**, La Paz ..... 6110kc, 49.10m  
Reported fair at 2.30 p.m.

**Brazil:**  
**PRA-8**, Pernambuco ..... 6010kc, 49.92m  
Heard around 6.30 a.m. at fair strength.

**PSF**, Rio de Janeiro ..... 14,690kc, 20.42m  
Heard in same programme as **PSH** between 9 and 10 a.m.

**PSH**, Rio de Janeiro ..... 10,220kc, 29.35m  
8.30 a.m. to 8.45 a.m., 8.55 a.m. to 10 a.m., except Sunday, and on Mondays from 11.30 a.m. to noon in English to North America. Monday broadcast known as Brazilian Hour (Dissinger, U.S.A.).

**British Guiana:**  
**VP3BG**, Georgetown ..... 6130kc, 48.94m

**Chile:**  
**CB-1180**, Santiago ..... 11,975kc, 25.05m  
R7-8 opening at 9.30 p.m. R5 at 6 a.m. and R8 at 2 p.m. (Cushen). Gone off at lunch-time; would give it R7 at night (Gaden).

**CB-1174**, Santiago ..... 11,740kc, 25.55m  
Slogan: Radio Huckle. Schedule: 9.30 a.m. to 3 p.m. Very, very weak.

**CB-1170**, Santiago ..... 11,700kc, 25.64m

**CB-970**, Valparaiso ..... 9730kc, 30.83m  
Radio la Cooperativa Vitalicia. Slogan is: "La Vuz de Chile para toda America." Opens at 9.30 p.m.

**CB960**, Santiago ..... 9600kc, 31.25m  
Reported heard at 3 p.m. and again at 10 p.m.

**Colombia:**  
**HJCT**, Bogota ..... 9655kc, 31.09m  
"Radio Nacional de Colombia in Bogota" relays **HJCR**. Schedule: 2-6 a.m., 8.15 a.m. to 2.30 p.m. (Dissinger, U.S.A.). (Note change in frequency, to avoid interference from **2RO-3**.—Ed.)

**HJXC**, Bogota ..... 6018kc, 49.85m  
Excellent at 4 p.m. Specialises in dance items Sunday afternoons.

**Dutch Guiana:**  
**PZH**, Paramaribo, Surinam, 11,515kc, 26.05m  
Schedule believed to be: Tuesdays and Fridays, 9.30 to 10.30 a.m.

**Ecuador:**  
**HCJB**, Quito ..... 12,460kc, 24.08m  
R7 at noon (Cushen). English every night at 11 o'clock, except Mondays. Offering a souvenir in commemoration of their ten years of broadcasting (Nelson).

**HCQRX**, Quito ..... 5975kc, 50.21m  
"Radio Quito" opens at 9.45 p.m. with march.

**Paraguay:**  
**Peru:**  
**OAX3A**, Huanuco ..... 6205kc, 48.35m  
**OAX4J**, Lima ..... 9340kc, 32.12m

**Uruguay:**  
**CXA-8**, Colonia ..... 9640kc, 31.12m  
"Radio Real de San Carlos" relays **LR1**, Radio Belgrand, Buenos Aires, from 11 a.m. to 1 p.m. and on Sunday to 5 p.m. This is **CXA-8** and is located in Uruguay and is not **LR1**, located in Buenos Aires, as is thought by some. Have verified by letter. Gives Uruguayan call at sign-off (Dissinger, U.S.A.).

**CXA-8**, Montevideo ..... 9620kc, 31.19m  
"Radio Electrica," heard daily from 1.30 a.m. to 3.30 a.m. and 6.30 o.m. to 12.15 p.m., relaying **CX6**. Classical music is presented, depicting the culture of Uruguay (Dissinger, U.S.A.).

## THE EAST

**Borneo:**  
**VQF**, Kuching (Sarawak) ..... 6985kc, 42.96m  
Saturdays at 9.40 a.m.  
This little-known station is of particular interest at present time, Sarawak having been reported attacked by Japanese. It will be remembered the White Rajah of Sarawak was holidaying in Sydney when the news broke. He returned post haste. Current reports suggest that this island may soon be in enemy hands.

**Burma:**  
**XYZ**, Rangoon ..... 6007kc, 49.94m  
Schedule: 9.45 p.m. to 1 a.m. News at 12.30 a.m.  
Always reliable (Cushen). (And for many moons, I trust.—Ed.)

**XZZ**, Rangoon ..... 3488kc, 86.00m

**China:**  
**FFZ**, Shanghai ..... 12,068kc, 24.86m  
Schedule: 7 p.m. to 1.05 a.m. (News 11 p.m.).  
Good signal, but oh! that mouse (Cushen).

**XGRS**, Shanghai ..... 12,029kc, 24.94m  
Schedule: 6 p.m. to 2 a.m. "The Voice of Europe." News 9.45 p.m., 10.30 p.m. and 12.15 a.m. News in Russian at 10.45 p.m.  
Don't forget this station is owned by a German club.

**XIRS**, Shanghai ..... 11,980kc, 25.02m  
Schedule: 8 p.m. to 11.30 p.m.  
News in English at 9.15 p.m.  
This is an Italian-owned station.

**XGDN**, Shanghai ..... 11,920kc, 25.16m  
Schedule: 6.30 p.m. to 2 a.m. News 11 p.m. and 1 a.m.  
Has been missing since Battle of Pacific began.

**XGOY**, Chungking ..... 11,900kc, 25.21m  
Schedule: 8 to 10.15 p.m. (News, 8.15 and 9.30).

**XMHA**, Shanghai ..... 11,853kc, 25.31m  
Schedule: 6.30 p.m. to 1 a.m. News, 9 p.m. and 11.15 p.m.  
Not heard since America entered the war.

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### LOGGINGS (Continued)

**XGOY**, Chungking .... 11,790kc, 25.44m  
Heard at 7.30 a.m. with News for Europe.

**XGOK**, Canton .... 11,650kc, 25.75m  
Schedule: 8 p.m.-midnight (News at 10.30).

**XGAP**, Pekin .... 10,250kc, 29.23m  
Excellent strength on this newcomer (Walker).

**XOZS**, Peiping .... 10,050kc, 29.85m

**XGOA**, Chungking .... 9720kc, 30.85m  
(Generally a fair signal. News at midnight.—Ed.)

**XGOY**, Chungking .... 9620kc, 31.17m  
Schedule: Midnight to 2 a.m. News at midnight and 1 a.m.

**XGOY**, Chungking .... 9635kc, 31.5m

**XGOY**, Chungking .... 9472kc, 31.67m  
12.55 a.m. to 1.30 a.m. News at 1 a.m. (This new transmitter is meant for America.—Ed.)

**XLMA**, ———— 9370kc, 32.02m  
Heard from 10 p.m. till closing at 11 p.m. when call letters are given.

**XPSA**, Kweiyang .... 8484kc, 35.36m  
Schedule: 9 p.m. to 1 a.m.  
English at midnight (Hallett).  
R6 at 9.45 p.m. and 6.45 a.m. (Perkins).

**XGOY**, Chungking .... 5950kc, 50.42m  
Schedule: 6-7 a.m.; 10.20 p.m. to 12.55 a.m.

p.m. News at 10.30, 11.30 p.m., midnight and 12.30.

**Dutch East Indies:**

**PMA**, Bandoeng .... 19,380kc, 15.48m  
10.15 p.m. to 11.15 p.m. News 10.45 p.m. Good, reliable station from opening. News at 10.45 is given by female announcer in perfect English.—Ed.

**PLG-8**, Bandoeng .... 15,950kc, 18.81m

**YDB** .... 15,315kc, 19.59m

**YDC**, Bandoeng .... 15,150kc, 19.81m  
Schedule: 8.30 a.m. to 10.30 a.m.; 1.30 p.m. to 5 p.m.; 7.30 p.m. to 1.30 a.m.  
Gives call-sign at 7.30 a.m. and plays records for uninterrupted hour.

**PLJ**, Bandoeng .... 14,630kc, 20.51m  
Good night station.  
Heard from 7.30 p.m. to 3 a.m. in Malay programme. R6 at 8.10 p.m. (Taylor).

**PLP**, Bandoeng .... 11,000kc, 27.27m  
See **YDC** for schedule. O.K. at night (Cushen).

**PLS**, Bandoeng .... 10,365kc, 28.94m  
7.30 p.m. to 1.30 a.m.

**YDB**, Bandoeng .... 9550kc, 31.41m  
R5 at 10.30 p.m. (Byard).

**YDX**, Medan (Sumatra) .... 7210kc, 41.55m  
Schedule: 8 p.m. to 3 a.m.

**PMH**, Bandoeng .... 6720kc, 44.64m

**PMY**, Bandoeng .... 5145kc, 58.31m  
7.30 p.m. to 1.30 a.m.  
Good at 8.30 p.m. (Taylor).

**YDA** .... 4900kc, 61.22m  
R8 at 9.15 p.m.

**YDE-2**, Solo .... 4810kc, 62.37m  
R7 at 9.30 p.m.

**YDE**, Temerang .... 4470kc, 67.11m  
Good signal, but native (Cushen).

**YDA**, Bandoeng .... 3040kc, 98.68m  
7.30 p.m. to 1.30 a.m.  
R6 at 9.10 p.m. (Taylor).

**French Indo-China:**

**Radio Saigon**, Saigon .... 11,780kc, 25.47m  
Schedule: 8.30 p.m. to 2 a.m. News, 8.15 p.m., 9.15 p.m. and 1.45 a.m.

**Radio Saigon**, Saigon .... 6180kc, 48.54m  
Schedule: 8.15 p.m. to 2 a.m. News at 9.15 p.m. and 1.45 a.m.

**Hong Kong:**

**ZBW-3** .... 9525kc, 31.49m  
Not heard since December 11.

**India:**

**VUD-3**, Delhi .... 15,290kc, 19.62m  
R-Max at 5 p.m. in News and music (Gaden).

**VUD-4**, Delhi .... 11,830kc, 25.36m  
Schedule: 9 p.m. to 11 p.m. News, 10.30 p.m.

**VUD-2**, Delhi .... 9590kc, 31.28m  
Schedule: 9 to 2 a.m. News, 10.30 p.m., 1.50 a.m.  
Very good station.

# LOGGINGS (Continued)

**VUD-2**, Delhi ..... 7290kc, 41.15m  
Schedule: 9.30 p.m. to 1 a.m. News 10.30.

**VUB-2**, Bombay ..... 7240kc, 41.44m  
Opens at 9.30 p.m. Closes at 1.15 a.m.

**VUC-2**, Calcutta ..... 7210kc, 41.61m

**VUD-2**, Delhi ..... 6130kc, 48.94m  
Heard from 11.15 p.m. News 1.50 a.m.

**VUD-8**, Delhi ..... 4920kc, 60.98m  
Schedule: 10.30 p.m. to 2 a.m.  
R7 at 10.30 p.m. News in English (Nelson, Gandy).

**VUB-2**, Bombay ..... 4880kc, 61.48m  
R7 at 10.30 p.m. News in English (Nelson).

**Japan:**  
(Tokyo considered source of supply unless otherwise mentioned)

Pressure on space does not permit of full schedules.

**JLQ** ..... 18,500kc, 16.21m  
News in English at 8 a.m. (Nelson). See "New Stations."

**JLU-4** ..... 17,795kc, 16.86m  
R9 at 11.30 p.m. (Byard).

**MTCY**, Hsinking ..... 15,320kc, 19.58m

**JVW-4**, Tokyo ..... 15,235kc, 19.69m

**JZK**, Tokyo ..... 15,160kc, 19.79m

**JLG-4**, ..... 15,105kc, 19.86m  
9 a.m. to 12.30 p.m. News 9 a.m.

**JZV** ..... 12,390kc, 24.21m  
News in English at 8 a.m. (Nelson). See "New Stations."

**JVZ-2** ..... 11,825kc, 25.37m

**JZJ** ..... 11,800kc, 25.42m  
Schedule: 7 p.m. to 12.30 a.m. News, 10 p.m. and 11.30 p.m.; 1 a.m. to 4.30 a.m. News 1.30 and 4 a.m.

**MTCY**, Hsinking ..... 11,780kc, 25.49m  
Schedule: 11 p.m. to 12.30 a.m. News at 11.15 p.m.

..... 11,740kc, 25.55m  
Schedule: 4.30 p.m. to 5.30 p.m. News, 4.30.

**JVW-3** ..... 11,720kc, 25.6m  
Schedule: 6.45 a.m. to 8.30 a.m. (Exercises 7.7 a.m.). 6.45 p.m. to 12.30 a.m.

..... 10,274kc, 29.20m  
Opens with Japanese national anthem at 9 p.m.

**JIE-2**, Formosa ..... 9690kc, 30.95m  
R5 at night. News at 12.15 a.m. (Nelson).

**MTCY**, Hsinking ..... 9545kc, 31.43m  
Schedule: 6.50 a.m. to 8 a.m. (News at 7.3 a.m.).

**JZJ** ..... 9530kc, 31.46m  
4.30 p.m. to 6 p.m. (News 4.30 p.m.); 7 p.m. to 12.30 a.m. (News 7 p.m. and 10 p.m.); 1 a.m. to 4.30 a.m. (News 1.30 a.m. and 4 a.m.).

**JVW** ..... 7257kc, 41.38m  
Schedule: 5 a.m. to 8.30 a.m. (News 5 a.m.).

**JVS** ..... 6990kc, 42.92m  
An old-timer being heard again at midnight.

**JLT** ..... 6190kc, 48.47m  
Schedule: 5 a.m. to 8.30 a.m.

**MTCY**, Hsinking ..... 6125kc, 48.98m  
Strong signal nightly (Nelson).

**MTCY**, Hsinking ..... 5990kc, 50.08m  
Heard from 11 p.m. to midnight.

**Malaya:**

**ZHN-3**, Singapore ..... 11,940kc, 25.13m  
Schedule: 7.30 p.m. to 1.15 a.m. Relays B.B.C. at 11 p.m.  
Signal only fair. **ZHP-3** much stronger (Nelson). (Note still further change in frequency.—Ed.)

**ZHP-1**, Singapore ..... 9700kc, 30.92m  
Schedule: 7.30 p.m. to 1.15 a.m. B.B.C. News at 9 p.m. and 12.30 a.m.  
R4 at 9 p.m. (Gandy). Relays commentary from **KGEI** at 12.45 a.m. (Cushen).

**ZHP-3**, Singapore ..... 7250kc, 41.38m  
R8 at 9.30 p.m. (Gandy).

**ZHP-2**, Singapore ..... 6175kc, 48.58m  
Schedule: 7.30 to 1.15 a.m. (B.B.C. News at 9 and 11 p.m.).  
R7 at 9.10 p.m. (Taylor).

**ZHJ**, Penang ..... 6095kc, 49.23m  
Am afraid any signal from here now is from the enemy.

## Philippines:

As can be expected, schedules are almost impossible to compile and listeners are advised to tune frequently to **KZND**, 8790kc, 34.13m, the Department of Publicity and Propaganda. Most of the Manila stations relay the News from here. It was from **KZND** on Boxing Day at 9.45 p.m. I heard the proclamation that Manila was an open city. On the same night I could find no trace of **KZRH**, 31.12m, but **KZRF**, 48.86m, was never better.

**KZRB**, Manila ..... 11,840kc, 25.34m  
Heard on two occasions at 9 p.m. (Nelson).

**KZRH**, Manila ..... 9640kc, 31.12m  
Schedule: 7.30 a.m. to 9.30 a.m. (News 8.15 a.m.); 6 p.m. to 2 a.m. (News 7 p.m., 7.45 p.m. and 10.45 p.m.).  
(Heard News at 8 p.m.—Ed.)

**KZRM**, Manila ..... 9570kc, 31.35m  
Schedule: 6.45 p.m. to 1.30 a.m. News, 8.35, 10.45 and 11.45 p.m., also 12.45 a.m.

**KZIB**, Manila ..... 9520kc, 31.58m  
6 p.m. to midnight.  
Often spoilt by noise.

**KZND**, Manila ..... 8790kc, 34.13m  
Schedule: 6 p.m. to midnight (News 7 p.m. and 10.45 p.m.). News flashes likely at any moment. Open at 8 a.m.

**KZRF**, Manila ..... 6140kc, 48.86m  
Schedule: 7 p.m. to 2 a.m.  
Strongest of the Philippines, but not the best (Nelson).

**KZRC**, Cebu ..... 6100kc, 49.18m  
Very weak.

**KZIB**, Manila ..... 6058kc, 49.51m  
Has been noticed at 9 p.m., and at 10 p.m. is mixed with **WCAB** (Cushen).

## Portuguese China:

**CR8AA**, Macao ..... 6080kc, 49.3m  
11 p.m. to 11.15 p.m. English announcement when closing.

## Thai:

**HSP-5**, Bangkok ..... 11,715kc, 25.61m  
Schedule: 9 p.m. to midnight (News 10 p.m. and 11.15 p.m.).  
Much improved at midnight (Cushen).

**HS8PJ**, Bangkok ..... 9510kc, 31.55m  
Here is another old-timer reported being heard again at 11.30 p.m. and using English. (**HS8PJ** was replaced in February, 1940, by **HSP-6**, 7968kc, 37.56m.—Ed.)

## GREAT BRITAIN

### "This Is London Calling"

**GST** ..... 21,550kc, 13.92m

**GSJ** ..... 21,530kc, 13.93m

**GSH** ..... 21,470kc, 13.97m  
8.57 p.m. to 1.15 a.m.  
(Only audible on favourable nights.—Ed.)

**GRQ** ..... 18,030kc, 16.64m  
Heard at 10.15 (Gaden).

**GRP** ..... 17,890kc, 16.77m  
8.57 p.m. to 1.15 a.m.  
No good yet (Gaden). R4-5 at 9 p.m. (Perkins).

**GSV** ..... 17,810kc, 16.84m  
6 p.m. to 7.57 p.m.; 8.57 p.m. to 1.15 a.m.

**GSG** ..... 17,790kc, 16.86m  
Session for China at 8.30 p.m.

**GSP** ..... 15,310kc, 19.66m  
5.30 p.m. to 7.57 p.m.; 5.30 a.m. to 7 a.m.; Turkish at 8.30 p.m.  
French at 9 p.m.

**GSI** ..... 15,260kc, 19.66m  
5 p.m. to 7.57 p.m.

**GSO** ..... 15,180kc, 19.76m  
10.15 to 10.45 p.m., Portuguese; 10.45 to 11.15 p.m., Spanish.  
(Can be heard now Moscow is not using frequency till 11.30.—Ed.)

**GSF** ..... 15,140kc, 19.82m  
6 p.m. to 7.57 p.m.; 8.57 p.m. to 1.15 a.m.; 1.30 a.m. to 5.15 a.m.; 6.35 a.m. to 7 a.m.

**GRV** ..... 12,040kc, 24.92m  
Eur., 2.55 a.m. to 4.15 a.m. (News at 4 a.m.).  
Heard in French at 7 a.m. Spanish at 7.30 a.m. R4 around 7 a.m. (Perkins).  
Portuguese at 10.15 p.m. Spanish at 11 p.m.

**GSE** ..... 11,860kc, 25.29m  
3.55 p.m. to 7.30 p.m. (News 6 p.m.).

**GSN** ..... 11,820kc, 25.38m  
European Service, 9 p.m. to 1.30 a.m. (News 11.30 p.m.).  
8.30 a.m. to 12.45 p.m. (Spanish and Portuguese).  
Intended for Latin America.

**GSD** ..... 11,750kc, 25.53m  
4.10 p.m. to 7.57 p.m.; 8.57 p.m. to 1.15 a.m.; 1.30 a.m. to 7 a.m.; 7.15 a.m. to 2.45 p.m.

**GRG** ..... 11,680kc, 25.68m  
Used in African Service.  
Fair signal at 6 a.m.

**GRH** ..... 9825kc, 30.53m  
Used in North American Service. 7.15 a.m. to 2.45 p.m.  
Fair at 7.15 a.m. for short period (Gaden).  
Excellent in Invercargill at 1 p.m. (Cushen).

**GRX** ..... 9690kc, 30.96m  
3.55 p.m. to 8 p.m. (News at 6 p.m.); 1.55 a.m. to 8 a.m.; 8.30 a.m. to 12.45 p.m. (Spanish and Portuguese).

**GRY** ..... 9600kc, 31.25m  
4.30 a.m. to 7 a.m.; 7.15 a.m. to 8.45 a.m.  
Also in Pacific Service, 4.10 to 6.15 p.m.

**GSC** ..... 9580kc, 31.32m  
7.15 a.m. to 2.45 p.m. North American Service.

**GSB** ..... 9510kc, 31.55m  
4.10 p.m. to 7.57 p.m.;

**GRU** ..... 9450kc, 31.75m  
11.30 p.m. to 1.15 a.m.  
Excellent signal.

**GRI** ..... 9415kc, 31.86m  
Used in Eastern Service. 8.57 p.m. to 10.30 p.m. and African Service from 1.30 a.m. to 2.45 a.m.  
Has improved in Eastern Service (Gaden).  
(Still a poor signal at Randwick.—Ed.)

**GRJ** ..... 7320kc, 41m  
European Service, 5 p.m. to 7 p.m. (News at 6 p.m.).  
R4-5 at 6.15 p.m. (Perkins).

**GSW** ..... 7230kc, 41.49m  
3.55 p.m. to 8 p.m. News 6 p.m. (European Service).

**GRS** ..... 7065kc, 42.49m  
Now used in Pacific Service from 4.10 p.m. to 6.15 p.m.  
Delightful signal at Invercargill (Cushen).

**GRN** ..... 6194kc, 48.43m  
6 a.m. to 7 a.m. African Service.  
Excellent at 6 a.m. (Nelson).

**GRO** ..... 6180kc, 48.54m  
Also used in African Service between 1.30 a.m. to 7 a.m.

**GRW** ..... 6145kc, 48.82m  
Home service, 3.30 p.m. to 5.15 p.m. News 5 p.m. 2 a.m. to 8 a.m. News 3 and 6 a.m. R6 at 6.15 a.m. (Perkins).

**GSL** ..... 6110kc, 49.10m  
4.10 p.m. to 5.45 p.m.

**GRR** ..... 6075kc, 49.38m  
3.30 p.m. to 7.30 p.m. News 5 p.m. 2 a.m. to 8 a.m. News 3 a.m., 6 a.m. R5 at 6.30 a.m. (Perkins).

**GSA** ..... 6050kc, 49.59m  
Eur., 3.55 p.m. to 8 p.m., 1.55 a.m. to 8 a.m. News 6 p.m.

News: 4.15 p.m., 6 p.m., 9 p.m., 11 p.m., 2 a.m., 4 a.m., 6.45 a.m., 8.45 a.m., 11 a.m., noon, 2.30 p.m.

**Radio Newsreel:** 1.30 p.m., 7.30 p.m.  
All London transmitters are good excepting 8 a.m. to 1.30 p.m.

**EUROPE**

**Czecho-Slovakia:**  
**"Radio Bratislava,"** Bratislava 9525kc, 31.49m  
 Can just hear after 9 a.m. (Gaden).

**France:**  
 (Of course, Nazi controlled)  
**Radio Vichy, Vichy** ..... 17,850kc, 16.8m  
 "La Voix de la France." Schedule, as far as can be learnt, is: 8.30 p.m. to 9.20 p.m. News in French at 9.10 p.m.  
 R8 at 9 p.m. (Nelson).

**Paris Mondial** ..... 15,240kc, 19.68m  
 Between 3 p.m. and midnight. Sometimes till nearly 2 a.m.  
 Have not heard day or night of late (Gaden).

**Radio Vichy, Vichy** ..... 11,840kc, 25.33m  
 Heard between 2.15 p.m. and 5.15 p.m. Also sometimes between 1 a.m. and 3.30 a.m.  
 Very good lately in afternoons (Jamieson).

**Radio Vichy, Vichy** ..... 9520kc, 31.51m  
 Schedule: 4 a.m. to 7.30 a.m.  
 Excellent signal at 6 a.m.

**"Y"** ..... 9520kc, 31.51m  
 Schedule: 7.50 a.m. to 2 p.m. (News 1.30 p.m.).

**Germany:**  
 "Station Ananias," Berlin  
 Most Berlin transmitters put in very loud signals for most part of the day, but from early evening are subject to interference of a swirling sound nature.

**DJH** ..... 17,840kc, 16.81m  
 5.30 p.m. to 2 a.m. News 7.30 p.m. and 10 p.m.

**DJE** ..... 17,760kc, 16.89m  
 4.30 p.m. to 9.30 p.m. News 5 p.m. and 7.30 p.m.

**DZG** ..... 15,360kc, 19.53m  
 Reported being heard in late afternoons.

**DJR** ..... 15,340kc, 19.56m  
 Schedule: 3 p.m. to 2 a.m. News 5 p.m. and 10 p.m.  
 On December 18 best signal I have ever heard from any short-wave station (Jamieson). Truly a wonderful signal here nightly. —Ed.)

**DJQ** ..... 15,280kc, 19.63m  
 3 p.m. to 2 a.m. News 5 p.m., 10 p.m. and midnight.

**DJB** ..... 15,200kc, 19.74m  
 7.50 a.m. to 2.05 p.m. 9.30 p.m. to 11.45 p.m. News 9.30 p.m. and 11.30 p.m.

**DJL** ..... 15,100kc, 19.85m  
 1.40 a.m. to 3.15 a.m. News at 2.15 a.m. 9.30 p.m. to 11.45 p.m. "Lord Haw-Haw" at 10.30 p.m. News 9.30 and 11.30 p.m.

**DZH** ..... 14,460kc, 20.75m  
 Russian News at 2 p.m., 5.15 p.m., 1.15 a.m., 6.30 a.m., 7 a.m. and 8.15 a.m.  
 Delivers powerful signal lately (Pepin).

**DZE** ..... 12,130kc, 24.73m  
 Very loud at 12.30 a.m. in Front-line News. (French session closed at 11.30 p.m., then Spanish followed. Very loud.—Ed.)

**DJP** ..... 11,855kc, 25.31m  
 8 p.m. to 2 a.m. News at 10 p.m.

**DJD** ..... 11,770kc, 25.49m  
 Schedule: 1.40 to 7.25 a.m. News, 2.15, 5.15 and 7.15 a.m. Talk at 3.30 a.m. 7.50 a.m. to 2.05 p.m. News 1.30 p.m.

**DXC-2** ..... 11,740kc, 25.55m  
 Schedule: 3.40 a.m. to 7.25 a.m. News 6.15 and 7.15 a.m.

**DZD** ..... 10,530kc, 28.45m  
 7.50 a.m. to 2 p.m. News 8.30 a.m. and 1.30 p.m. 5 a.m. to 7 a.m. News 5 a.m., 6.45 p.m. News for Ireland at 6.45 a.m. (Also on 31.35m).

**DZC** ..... 10,290kc, 29.25m  
 Very loud before mid-day.

**DJX** ..... 9670kc, 31.01m  
 1.40 a.m. to 7.25 a.m. News 2.15 a.m. and 7.15 a.m.  
 (Good signal when closing.—Ed.)

**DJW** ..... 9650kc, 31.09m  
 3 p.m. to 2 a.m. News at 5 p.m., 10 p.m. and midnight.  
 Excellent signal at 10.30 (Gaden, Perkins).

**DXB** ..... 9610kc, 31.22m  
 Heard opening at 3.15 p.m. (Gaden).

**DXZ** ..... 9570kc, 31.35m  
 1.40 a.m. to 7.25 a.m. News 2.15 and 7.15 a.m. 7.50 a.m. to 4 p.m. News 1.30 and 3 p.m. News for Ireland at 6.45 a.m. (also on 28.45m).  
 (This station is supposed to be in Warsaw, Poland, but carries Berlin programme.—Ed.)

**DJA** ..... 9560kc, 31.38m  
 Schedule: 3.30 a.m. to 6 a.m. News 3.30 and 4.30 a.m., and 5.30 "Lord Haw-Haw."

**DXM** ..... 7270kc, 41.27m  
 Schedule: 4 to 8 a.m. "Lord Haw-Haw" 6.30 and 7.30 a.m. News 4.30 and 5.30.

**DJC** ..... 6020kc, 49.83m  
 3.40 a.m. to 7.25 a.m. News at 6.15 and 7.15.

**Holland:**  
**PCV, Kootwijk** ..... 18,070kc, 16.6m  
 R5 at 11.30 p.m. (Byard).

**PCJ-2, Huizen** ..... 15,220kc, 19.71m  
 Heard nightly, but swirling noise makes listening unpleasant. R4 at 11.30 p.m. (Byard).

**Hungary:**  
**HAT-4, Budapest** ..... 9123kc, 32.88m  
 Still heard at good strength at 11 a.m. (Cushen).

**Italy:**  
 "This is Radio Roma"  
**IRW** ..... 19,590kc, 15.31m  
 9 p.m. to 11.30 p.m. (News 11.20 p.m.).  
 Excellent signal.

**ZRO-8** ..... 17,820kc, 16.83m  
 Heard in Arabic at 8.30 p.m. French at 11.30 p.m.

**ZRO-6** ..... 15,300kc, 19.61m  
 12.30 a.m. to 8.55 a.m.; 11 a.m. to 2.20 p.m.; 2.30 p.m. to 3.30 p.m.; 5 p.m. to 5.30 p.m.; 6.15 p.m. to 6.30 p.m.; 9 p.m. to 11.30 p.m. (News, 5 a.m., 7.12 a.m., 8.20 a.m., 1.30 p.m., 3 p.m., 5.20 p.m., 6.15 p.m., 11.20 p.m.)  
 R9 at 11.30 p.m. (Byard).

**ZRO-4** ..... 11,810kc, 25.4m  
 12.30 a.m. to 8.55 a.m., 11 a.m. to 2.20 p.m., 2.30 p.m. to 3.30 p.m., 6.15 p.m. to 6.30 p.m. News at 1.40 a.m., 7.12 a.m., 8.20 a.m., 1.30 p.m., 3 p.m., 6.10 p.m.

**ZRO-7** ..... 15,230kc, 19.70m  
 At times can hear Rome using this frequency of a night (Gaden).

**ZRO-?** ..... 15,070kc, 19.91m  
 (Heard at 10.45 p.m. Listen for canaries. —Ed.) Gives time signal at 9 p.m. (Gaden).

**ZRO-15** ..... 11,760kc, 25.51m  
 2.30 a.m. to 8.55 a.m.  
 (Heard at 11 p.m. in Italian.—Ed.)  
 ..... 11,695kc, 25.65m  
 No call-sign is given, but at 5.15 p.m. announces in Russian: "Here is Italian short-wave station." Heard again at 1 a.m.

**ZRO-18** ..... 9765kc, 30.74m  
 11 a.m. to 2.20 p.m. News at 1.30 p.m.

**ZRO-9** ..... 9670kc, 31.03m  
 2.30 a.m. to 8.55 a.m. News at 5 a.m., 7.12 a.m.

**ZRO-3** ..... 9630kc, 31.15m  
 12.30 a.m. to 8.55 a.m.; 2.30 p.m. to 3.30 p.m.; 5 p.m. to 5.30 p.m. News, 1.40 a.m., 5 a.m., 7.12 a.m., 3 p.m. and 5.20 p.m.

**ZRO-11** ..... 7220kc, 41.55m  
 2.30 a.m. to 8.55 a.m. News, 5 a.m., 7.12 a.m. and 8.20 a.m.

**HVJ, Vatican City** ..... 15,120kc, 19.84m  
 Talk on Wednesdays 1 a.m. to 1.15 a.m. Also heard on Sundays at 7.30 p.m.

**HVJ, Vatican City** ..... 11,740kc, 25.55m  
 Heard between 4 and 6 p.m. Wednesdays and Fridays, giving names of prisoners of war.  
 Good signal (Cushen).

**HVJ, Vatican City** ..... 9660kc, 31.06m  
 Reported heard daily at 1.30 a.m. and on Sundays at 7.30 p.m.

**HVJ, Vatican City** ..... 6190kc, 48.47m  
 5.15 a.m. to 5.30 a.m. Talks.  
 Much weaker, but English still at 5.15 a.m. (Cushen).

**Portugal:**  
**CSW-6, Lisbon** ..... 11,040kc, 27.17m  
 Schedule: 3 a.m. to 7.30 a.m., except Sundays.

**CSW-7, Lisbon** ..... 9740kc, 30.8m  
 Schedule: 7.40 to 9 a.m. Talks: On Wednesday, Friday and Sunday from 7.50 to 8 a.m.

**CSZWD, Portugal** ..... 6200kc, 48.38m  
 Schedule: 6 to 9 a.m.  
 Very faint and fades out by 6 o'clock.

**Rumania:**  
**Radio Bucharesti, Bucharest** 9255kc, 32.41m  
 5 a.m. to 8 a.m. News 6.50 a.m.

(Continued on next page)

**PORTABLE SET**

(Continued from page 8)

This brings me to what I consider the principal advantage of this set—the "A" and "C" supply. The filaments of the three valves are linked in series, allowing them to be supplied from wet or dry batteries. When dry batteries are used two 4½-volt bias batteries are necessary, connected in series. Six volts of the nine thus secured are utilised for the filament supply, leaving a -1½ and -3 volt tapping (-3 and -4½ on the battery, respectively) for bias for the 34 and 30 audio valve. I cannot say how long these bias batteries would last, as I do not know their capacity, but from experience I should say quite some time, and in any case their replacement costs little. When one is operating the portable in a tent, the car battery can be used.

In my case, I run a 6-volt lamp from the car battery for lighting. This

hangs on the centre pole. The lamp socket is fitted into a small board, which also carries a switch and a second socket for the radio. I place the portable on a chair or box at the foot of the centre pole and plug in.

The aerial comes down with the jump rope and, above the tent, is thrown over a convenient limb. While under canvas, lighting and radio very often depend upon the car battery. This means the rationing of both. But with the set described here there need be no rationing of the radio.

The drain on the car battery is negligible, so, even if the rain won't lift, the radio can continue to do its utmost to dispel the gloom and pessimism.

Furthermore, a drain of, at most, 5 M/a's for the "B" supply means long life for the two PR 45-volts.

Fitted with up-to-date parts, this little set will give complete satisfaction to the prospective picnicker or camper.

## LOGGINGS (Continued)

### Russia:

The war-time capital of Russia is Kuibyshev, and it is quite likely that it is from here that transmissions are made.

It is very difficult to keep track of Russian transmitters, but here is a list of those actually heard during December and several of which were still operating as we go to press.

..... 15,230kc, 19.69m  
9 a.m. to 10.55 a.m. News 9.30 a.m.  
Hear giving News. R5 (Perkins).

**RW-96** ..... 15,180kc, 19.76m  
Was heard opening at 11 p.m. for fifteen minutes and from midnight to 3.30 a.m. News at 1.10 a.m.

..... 15,090kc, 19.88m  
Opens at 9 p.m. with News in English and gives News again at 10.45 p.m., closing at 11 p.m.

..... 12,090kc, 24.81m  
2.30 p.m., talk in English; 2.45 p.m., News in English; 6.20 p.m., Italian; 6.30 p.m., Dutch; 6.40 p.m., English; 10 p.m., Italian; 10.15 p.m., Dutch; 10.30 p.m., English.

..... 12,060kc, 24.88m  
3.30 p.m., Russian; 5 p.m., Italian; 6 p.m. to 7 p.m., English, with News at 6.40.

..... 11,790kc, 25.45m

**RKF** ..... 11,740kc, 25.55m  
News in English at 6.40 p.m. News in Russian at 12.30 a.m.

..... 10,135kc, 29.60m  
10.30 p.m. to 11.30 p.m. News 11 p.m.

..... 10,040kc, 29.88m  
N.B.C. News Reporters, 11 p.m. to 11.15 p.m. Italian, 11.15 p.m. to 11.30 p.m. English, 11.30 p.m.  
(Gives wave-length before and after English News.—Ed.)

**RW-96** ..... 8050kc, 37.27m  
News at 6 a.m.

**RW-96** ..... 7520kc, 39.89m  
News in English at 4.30 a.m.

..... 5493kc, 54.61m  
News in English at 3.30, 4.30 and 5.30 a.m.

### Siberia:

**RW-15**, Khabarovsk ..... 9566kc, 31.36m  
Schedule: 5 p.m. to midnight; 5.50 a.m. to 8 a.m.

**RW-15**, Khabarovsk ..... 6050kc, 49.59m  
5 p.m. to midnight.

....., Leningrad ..... 4983kc, 60.20m  
Heard the other night. Signal quite fair (Jamieson).

**RW-15**, Khabarovsk ..... 4273kc, 70.2m  
(Old schedule was 5 p.m. to midnight. Have not heard lately.—Ed.)

### Spain:

**Radio Malaga**, Malaga ..... 7210kc, 41.61m  
Fairly good strength at 6.30 a.m. (News at 6.15 a.m. Weak.—Ed.)

**EAJ22**, Oviedo ..... 7140kc, 42.02m  
Being heard again in the mornings, opening at 6. Fair signal at 7 (Nelson).

"Radio Mediterranee" (Spain?)  
..... 7130kc, 42.07m

....., Malaga ..... 6993kc, 42.9m  
Think I heard this very weakly at 7 a.m. (Goden, Nelson).  
Weak at 6.30 a.m. (Nelson).

### Switzerland:

**HBH**, Geneva ..... 18,480kc, 16.23m  
Schedule: 11.45 p.m. Fridays to 1.10 a.m. Saturdays. Mostly English, little French. News 11.45 p.m. Mondays to 1.10 a.m.

**HBJ**, Geneva ..... 14,535kc, 20.65m  
First Sunday in the month. 3.45 p.m. to 5.10 p.m.

**HER-5**, Schwarzenburg ..... 11,865kc, 25.30m  
(Being heard between 11 and 11.30 p.m. at fair strength, but right alongside DJP, which is terrific nightly.—Ed.)

**HBO**, Geneva ..... 11,420kc, 26.31m  
Same remarks as HBJ.

**HER-4**, Schwarzenburg ..... 9535kc, 31.47m  
Heard at noon with programme in English for North America. Reports are solicited (Dissinger, U.S.A.). (I think the call-sign of this station was once HEC.—Ed.)

**HER-3**, Schwarzenburg ..... 6165kc, 48.66m  
Schedule: 3.30 to 7.30 a.m.  
Only Swiss and French heard.  
On Sundays can be heard from 5.45 p.m. to 6.30 p.m.

**Yugo-Slavia** (now Nazi controlled):

**YUC**, Belgrade ..... 9505kc, 31.56m  
Broadcast in Russian at 2.25 p.m., 1.15 and 2.15 a.m.  
(Reported heard from 4.15 p.m. to 4.30 p.m. daily.—Ed.)

**YUB**, Belgrade ..... 6100kc, 49.18m  
Heard almost every morning at 6.

## SCANDINAVIA

### Denmark:

**Radio Denmark**, Copenhagen ..... 9710kc, 30.9m  
Very good strength at 3.30 p.m. (Cushen).

### Finland:

**OIE**, Lahti ..... 15,190kc, 19.75m  
12.30 a.m. to 8 a.m. News at 4.30 a.m. Female announcer heard at 7.

**OFE**, Lahti ..... 11,780kc, 25.47m  
Schedule: 12.30 a.m. to 8 a.m. News 4.30 a.m. 4 p.m. to 7.30 p.m.  
Excellent at 4.15 p.m. News in English (Cushen).

**OFD**, Lahti ..... 9500kc, 31.58m  
Schedule: 12.30 a.m. to 8 a.m. News, 4.30 a.m.

### Norway:

**LKQ**, Oslo ..... 11,735kc, 25.57m  
Schedule: 3.05 to 6 p.m.; 12.30 to 7.30 a.m. Exercises at 3.10 p.m.

### Sweden:

**SBT**, Stockholm ..... 15,150kc, 19.8m  
Schedule: 6 p.m. Sundays to 7 a.m. Mondays. Daily: 3.56 a.m. to 7.15 a.m.

**SBP**, Stockholm ..... 11,710kc, 25.63m  
Schedule: 3.56 a.m. to 7.15 a.m. Opens again at 11 a.m. with News for U.S.A. 4.40 p.m. to 7 p.m. (Sundays 6 p.m. to 7 a.m. Mondays).

**SBU**, Stockholm ..... 9535kc, 31.47m  
Same programme as SBO, but weak.

**SBO**, Stockholm ..... 6060kc, 49.46m  
Schedule: 7.18 a.m. to 8 a.m. News, 7.20 a.m.

## MISCELLANEOUS

### Arabia:

**ZNR**, Aden ..... 12,110kc, 24.76m  
English call at 3 a.m., followed by News in French; 3.15 a.m., English call, News in Italian; 3.30 a.m., call in English, News in Somali; 3.45 a.m., call and sign off.  
Coming back to the old mid-summer strength. R4 now (Cushen).

### Canada:

**CBFY**, Montreal ..... 11,705kc, 25.63m  
Heard from 9.30 p.m. to 1 a.m. News 10 p.m. and midnight. Improving at 2 p.m. (Cushen).

**CJRO**, Winnipeg ..... 6150kc, 48.78m  
Heard till 3.30 p.m. on occasions (Cushen).

**CKFX** ..... 6080kc, 49.34m  
**CBFW**, Quebec ..... 6160kc, 48.70m  
Heard opening in same programme as **CBFY** at 9.30 p.m. Good at 9.30 p.m. (Cushen).

**CFRX**, Toronto ..... 6070kc, 49.42m  
Opens at good strength at 8.45 p.m. (Cushen).

### Eire:

**Radio Eire**, Athlone ..... 9590kc, 31.27m  
Can be heard on favourable days about 7.15 a.m., but they must be favourable.

**Radio Eire**, Athlone ..... 15,120kc, 19.83m  
Heard sometimes at 7 a.m., but very seldom.

### Iran:

**EQC**, Teheran ..... 9680kc, 30.98m  
Schedule: 11.45 p.m. to 3.30 a.m. News 4.50 a.m.

**EQB**, Teheran ..... 6155kc, 48.74m  
Schedule: 4 a.m. to 6 a.m. (News 4.50 a.m.).

Man and woman announcers. Woman generally gives News. The Persian stations are of great interest now.—Ed. Very good with News at 4.50 a.m. (Cushen).

### Turkey:

**TAQ**, Ankara ..... 15,195kc, 19.74m  
Schedule: 8.30 p.m. to 10.30 p.m.  
Listen for flute notes just before opening. Great signal now (Gaden).

**TAP**, Ankara ..... 9465kc, 31.70m  
Schedule is: 1.15 a.m. to 7 a.m. News at 5.15, and on Sundays English at 5.50. Excellent signals. Splendid dance records. News at 5.15 a.m., great strength (Cushen).

### Location Unknown:

**Christian Peace Movement** ..... 9430kc, 31.84m  
Heard singing hymns around 5.45 a.m. Sessions at 4.45 a.m. and 5.45 a.m., the former the best. Signs on the hour. Opens with "Jesus, Lover of My Soul" (Cushen).

**European Revolutionary Station** ..... 9640kc, 31.12m  
Heard from 7 to 7.20 a.m. and from 3 to 3.14 p.m.

# BACK NUMBERS

## SPECIAL CHRISTMAS OFFER DEFINITELY CLOSING JANUARY 31st

We have a limited number of sets of the 12 issues dated from August, 1940, to July, 1941, inclusive. These issues contain a wealth of technical data and will provide hours of interesting reading matter.

Price 5/- the dozen

Post free to any part of Australasia

Address orders—

Australasian Radio World, 117 Reservoir Street, Sydney.



**Radio Antoiné** ..... 9750kc, 30.77m  
(This station, which appears to be the same as **Unconno**, is heard from 4 to 4.15 p.m., at good strength.—Ed.)

**Azores:**  
**Emisora Nacional, Ponta Delgada**  
7305kc, 41.07m  
Opens at 6 a.m. with clock striking six. Closes at 7 with clock striking seven (Gaden). (See "New Stations." Reported in America to be also on 14,400kc, 20.83m and/or 14,580kc, 20.58m. Opens with clock striking six, followed by national anthem. Says "Ici Portugal En Ponta Delgada."—Ed.)

### WEST INDIES

#### Cuba:

Havana unless otherwise mentioned  
**COGF, Matanzas** ..... 11,805kc, 25.41m  
"Radio-Emisoras **CMGF** and **COGF**."  
Schedule: Midnight to 2 p.m. occasionally. One you have to fish for (Dissinger, U.S.A.).

**COCY** ..... 11,745kc, 25.54m  
Closes at 4.15 with English. Also heard at R6 at 11 p.m. (Cushen). Couple of times very fine 4 p.m. (Gaden).

**COK** ..... 11,620kc, 25.82m  
Ministerio de Educacion, Direccion General Nacional de Deportes (National Sports Director). Schedule: 4 a.m. to 4 p.m. Best about 2 p.m. Also quite good at 6.30 a.m.

**COCM, Cadena Sauritos** ..... 9810kc, 30.58m  
9.30 to midnight and early morning.

**COCH** ..... 9435kc, 31.82m  
Signal strength both afternoon and night has dropped.

**COBC** ..... 9360kc, 32.05m  
Weak in mornings and night.

**COCX** ..... 9270kc, 32.36m  
Weak both morning (7 a.m.) and night (10 p.m.). Listen for religious service in English at 8 a.m. Mondays (Nelson).

**COBZ** ..... 9030kc, 33.32m  
Opens at 10.45 p.m.

**COKG, Santiago** ..... 8920kc, 33.50m  
Weak and only seldom heard at night.—Ed.

**COCQ** ..... 8850kc, 33.9m  
9.30 p.m. to midnight.  
R7 at 10 p.m. (Byard).

**COCO** ..... 8700kc, 34.48m  
Being heard again. R5 in English at 10 p.m. (Byard).

**COHI, Santa Clara** ..... 6455kc, 46.48m  
Opens at 8.30 and is heard till 11.30 p.m. Ed.  
Heard weakly some nights (Nelson).

**COCQ** ..... 6375kc, 47.06m  
Schedule: 2 p.m. to 3.15 p.m.; 9.30 p.m. to midnight.  
Heard weakly some nights (Nelson).

**COCW** ..... 6320kc, 47.47m  
Very poor signal at night.

#### Dominican Republic:

**HI1N, Trujillo** ..... 12,480kc, 24.03m

**HI2G** ..... 9295kc, 32.28m  
Schedule is 10.30 p.m. to 1.30 p.m.

**HI1N, Ciudad Trujillo** ..... 6245kc, 48.08m  
Schedule: 10.40 to 11.40 p.m.; 2.40 a.m. to 4.40 a.m.; 10.10 a.m. to 1.10 p.m. All Spanish.

Have verified with one of the most beautiful cards ever received (Dissinger U.S.A.).

**HI1J, San Pedro Macoris**, 6025kc, 49.79m

**HIG** ..... 6280kc

**HI3C, Larumana** ..... 6145kc, 84.82m  
Fair from just after 10 p.m.

#### Haiti:

**HH3W, Port-au-Prince** ..... 10,130kc, 29.62m  
This station, affiliated with C.B.S. of New York, has a very good signal. Heard morning and afternoon till near 1.30 p.m. with musical programme (Dissinger, U.S.A.).

**HHBM, Port-au-Prince** ..... 9660kc, 31.06m  
Schedule: 10 p.m. to 11.30 p.m.; 3.30 a.m. to 5.30 a.m.; 6.30 a.m. to 12.30 p.m.

R4 at 10 p.m. Excellent musical programmes (Nelson). Signs off in Spanish and English: "Ladies and gentlemen, this is short-wave station **HHBM**, in Port-au-Prince, signing off" (Dissinger, U.S.A.).

#### Martinique:

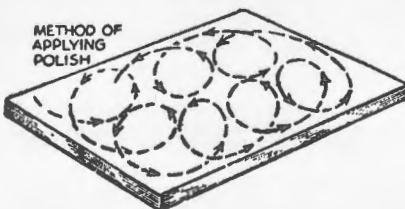
**Radio Martinique, Forte-de-France**  
9705kc, 30.92m  
Schedule: 8.30 a.m. to 11.30 a.m.

## RENOVATING

(Continued from page 10)

just slightly above the level of the cabinet. When hard, it should be carefully levelled down with a very fine sandpaper. The mixture of stain and polish may then be applied as before, and any irregularities in the surface of the plastic wood will be levelled up by this application. This method is so effective that the position of a scratch may be practically hidden.

When a cabinet is merely dull, the application of a little "oil" or "liquid glass" coupled with plenty of "elbow grease" should be tried. It is surprising what a few minutes of such treatment will do, but if no improvement is obtained, "Duro" may be tried. In fact, any of the many commercial car polishes (cellulose type) are extremely good, not only for removing finger marks and generally cleaning up the cabinet, but also in giving an extremely high polish and removing fine scratches from most of the finishes used in cabinet manufacture. Such treatment is of no avail when the



cabinet has been hand french polished.

Perhaps the worst kind of cabinet to tackle is one on which the actual polish surface has worn off due to continual use and polishing. Too many people make a habit of regularly polishing their cabinet with polish, with the result that they do more harm than good, and gradually remove the surface. Rub it over occasionally by all means, but use only a soft, clean duster with no polish.

In such a case, the only way to make a good job of the cabinet is to "strip" it, that is, to remove all that remains of the existing polished surface by well rubbing the cabinet with fine sandpaper. Always sandpaper the way of the grain, never across the grain, and make a perfectly smooth and uniform surface before attempting any re-polishing. After sandpapering, clean the cabinet with a duster and then with a rag moistened with methylated spirits to remove all grease.

This time, however, the polish cannot be applied with a brush, or a very uneven surface, showing all brush marks, would result. The following method should be followed, and although it may seem a little tedious, it will render results equal to a new

cabinet, and is well worth the time and patience.

### Polishing Hints

Place a small amount of cotton wool in the centre of a square of linen or fine rag as in Fig. 1, and pour sufficient of the staining polish (which should be made up as described above), on to the wool so as to damp it right through. Screw the rag round the wool so as to make it a tight pad, as in Fig. 2, with a smooth polishing surface. Slight pressure of the fingers on the sides of the pad should cause some of the polish to ooze through the linen.

Apply the polish in circular motions, as indicated in Fig. 3, with a gentle but firm pressure, taking care to cover every portion of the surface with a layer of polish. If more polish is required, never pour it on to the rag, but undo the pad and add polish to the surface being polished, apply a spot of linseed oil to the actual polishing surface of the pad. On no account add more than one spot unless the surface is extremely large. This will prevent the pad sticking as the polish hardens.

When the first application has dried thoroughly, rub it over very lightly with extra-fine sandpaper, working the way of the grain as before, and then apply another layer of polish, but using this time a slightly drier pad, and working in very small circles. Work up and down the surface in these small circles and, at the end of each line, draw the pad very lightly across the newly-polished surface in the direction of the grain.

If it is found that the surface is patchy when dry, i.e., polished in some places, but with dull patches here and there, the surface must be lightly sandpapered once more and the above procedure repeated again, until, finally, a highly polished surface is obtained. Practice, of course, makes a great deal of difference to the ease with which a cabinet may be completely repolished.

Finally, there are one or two hints that may save time and patience, viz., never attempt polishing except in a dry atmosphere; always see that the pad is clean and smooth, and, above all, never go over a polished surface until it has become quite hard. It is not the amount of polish, nor the pressure, that produces a good surface, simply the continued rubbing. Speed does not matter, but rather an even, steady circular movement with even pressure.

If the pad is stopped on the work, a mark will be made which can only be removed by sandpapering off the entire surface.

—From "Radiogram" (N.Z.).

# SPEEDY QUERY SERVICE

Conducted under the personal supervision of A. G. HULL

**G.R.A. (Rose Bay) enquires about a circuit of an amplifier which appeared in our June and July issues of 1939.**

A.—This circuit was perfectly O.K. in every way, and reports on it have been excellent. We can readily understand why it was recommended to you so strongly. It was one of the first to be published with this simple method of effective inverse feedback. The high tension feed is taken right back to the rectifier side of the filter in order to get the higher applied voltage. This was intended and is not a mistake. The hum difficulty is taken care of by the decoupling resistor and condenser. In every way you need have no hesitation in going right ahead with this amplifier exactly as described. Power output is a full seven watts and for an amplifier of this size and quality the cost of a kit of parts is exceptionally moderate.

**T.P. (Mosman) has built up a mantel model which will not line up properly on the padder, and the oscillator section seems wrong, as even with the condenser right out it will not tune low enough. He mentions that he has shielded all leads to the gang.**

A.—The first step will be to remove the shielding from the wires. Under no circumstances should any shielding be fitted to wires which are associated with tuned circuits. The distributed capacity caused by the shielding is sure to upset the tuning. In fact, we would go so far as to say that the less shielding used in any set, the better. Under certain circumstances you may be forced to use shielding to avoid hum or instability, but we suggest that you get the set operating first, resorting to shielding only if all other methods fail to get you satisfactory results.

**M.P. (Wellington) is worried about the battery position.**

A.—So far as we can ascertain there is little likelihood of the battery position easing. The war requirements are to be met first, and then there will be a demand for thousands of torch batteries for N.E.S. men, etc. We do not know of any definite statement issued by the battery makers, but we understand that there is no particular shortage of zinc, carbon or chemicals, and the problem is simply to produce sufficient batteries to meet essential needs and those which are considered to be more important than ordinary radio requirements. It might be quite a good plan to put aside your exhausted batteries in future, instead of throwing them away, as at some time or other somebody might suggest a way to use the old carbons and brass caps in

the re-building of the batteries. A type PR45 "B" battery consists of thirty cells of similar size to the three cells which go to make up a "1,000" type torch battery. If you could get ample supplies of torch batteries you could use these for "B" batteries by connecting them up in series.

**G.K. (Strathfield) is in search of good quality gramophone reproduction and is interested in infinite baffle boxes.**

A.—The actual construction is simple enough to a handy man accustomed to using hammer and saw. The cutting of the plywood, which needs to be heavy—for preference at least three-quarters of an inch thick, calls for a strong arm. All joints should be screwed as well as glued, calling for a strong hand and a lot of energy. Whether it is too much work or not would be a personal matter, depend-

## NOTICE

On account of shortage of space, only queries of general interest will be answered in these columns in future. If you want a reply by return mail, enclose stamps or postal note to the value of 1/- and we will do what we can to help you without delay.

ing on just what you are accustomed to doing. It is customary to fit a trapdoor to overcome the difficulty of changing speakers and making the speaker accessible. The trap door should be a good fit and firmly held in place. The whole job needs to be air-proof in order to provide correct loading, even to the extent of running the speaker leads through a tightly bushed hole.

**F.G. (Randwick) is having trouble in getting special bases made to order.**

A.—Yes, we understand that in future the Arcadian people will only make special bases once a month, collecting templates up till the first Tuesday in each month and then putting them all through in one batch, to be ready for delivery within a day or two. This may cause considerable inconvenience, but these sort of problems have to be faced in times like these.

**C.L. (Orange) enquires whether vibrator units can be bought.**

A.—We doubt if you will be able to buy a complete eliminator unit, but the actual

vibrators are available and also the necessary transformer, chokes, etc., so that you could work from Brown's article on the November issue to build one for yourself. If your usual supplier does not have the vibrators in stock we can tell you where to get them.

**D.S.L. (Maroubra) is finding difficulty in getting an "H" type gang.**

A.—You can use the F or G type gangs without affecting results, apart from the matter of station markings on the dial. For dual-wave work the "H" gang is to be preferred on account of the wider capacity range, but as your set is to cover broadcast only you should have no difficulty in this direction. We had a full article on the history of gang condensers, the difference between the various types and details of their capacities in our issue of May, 1940. We still have a fair stock of this issue on hand, 6d. post free.

**B.R. (Clovelly) is using a magnetic pick-up with one of our amplifiers and finds that the tone is pitched too high for his liking.**

A.—Your trouble is almost certain to be due to mis-matching of the load for the pick-up. Most of our circuits are drawn to show a half-meg. volume control across the input. This is correct only for crystal pick-ups and those which are designed to feed into a fairly high impedance load. For a magnetic pick-up the volume control should be according to the maker's recommendation, usually something between 10,000 and 100,000 ohms. The higher the value the better the high note response, with 25,000 or 50,000 ohms the happy medium.

**V.L.H. (Camden) enquires about crystal sets.**

A.—We do not have any plan for another crystal set article at the moment, but we can readily supply you with three or four back numbers containing crystal circuits which we can recommend. These are available at 6d. each, post free.

**C.E. (Picton) has a two-valve battery-operated set which will not operate and does not give any indication of oscillating or any trace of static or signal.**

A.—We feel rather helpless about giving you any concrete advice in such circumstances. In the first place, since all your components are secondhand, almost any one of them might be faulty. First check is to make sure you get a good click in the phones when the batteries are connected. It might be a good plan to put the headphones in the plate circuit of the first valve, in effect making the set a single-valver. If it then works but doesn't work when the audio stage is added you will at least be a little further towards finding the trouble.

## NEW ZEALANDERS

In order to subscribe direct to "Australasian Radio World" it is necessary to make application for a sanction for the necessary money order.

This matter is easily fixed up by obtaining an application form at any money order office, filling it in, and handing back at that office.

Usually within a week the necessary sanction is granted and the money order for the 10/6 is then issued in the ordinary way.

Subscribers should note that, although we have to pay extra postage, we do NOT make any extra charge to New Zealand subscribers.



**Yes, there's a bridge --**  
*but he won't use it*

His progress is impeded by a river over which he can easily cross by the bridge. He doesn't know that it's there. And there are hundreds like him. Hundreds of radio dealers whose Philips valve sales are limited because they do not realise that **RADIOSERVICE** is the bridge to permanent, profitable radio business.

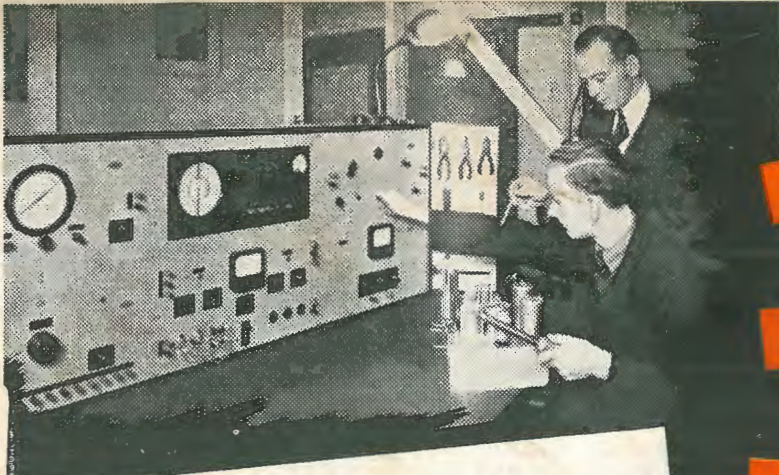
Established **RADIOSERVICE** is a bridge to more sources of profit than one: labour profits, spare parts profits — and new Philips valve profits. **RADIOSERVICE** leads to new set sales. Throughout Australia there are thousands and thousands of sets in need of repair, and the retailer who is prepared to go out after this business and handle it in an **ORGANISED** way **CANNOT FAIL** to make big money.

Philips will help you put your service section on the map. Write your nearest Philips office to-day for details of the **RADIOSERVICE** campaign.



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**SKILLED MEN NEEDED**

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WAY TO HELP  
YOUR COUNTRY  
& YOURSELF**



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**L. B. GRAHAM,**  
Principal.

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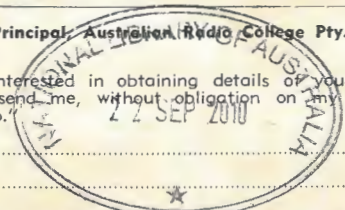
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To Mr. L. B. Graham, Principal, Australian Radio College Pty. Ltd., Broadway, Sydney.

Dear Sir,—I am interested in obtaining details of your special Radio training plan. Please send me, without obligation on my part, the free book, "Careers in Radio."

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