

**THE
AUSTRALASIAN**

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Radio World

VOL. 4 NO. 10

MARCH, 1940

NEW EDITOR—A. G. HULL

● **WONDER ONE 1-VALVE
5-BAND SET**

● **DANDY THREE
A.C. SUPERHET**

● **WORLD STANDARD
POWERFUL DUAL-WAVER**

● **GROUP TRAINER
FOR MORSE CODE**



OUR NEW EDITOR (Photo by Norton-Trevaire)

BRIMAR

VALVES

.... ARE STRONGLY
RECOMMENDED BY
THE TECHNICAL
EDITOR FOR ALL
RADIO WORLD
RECEIVERS

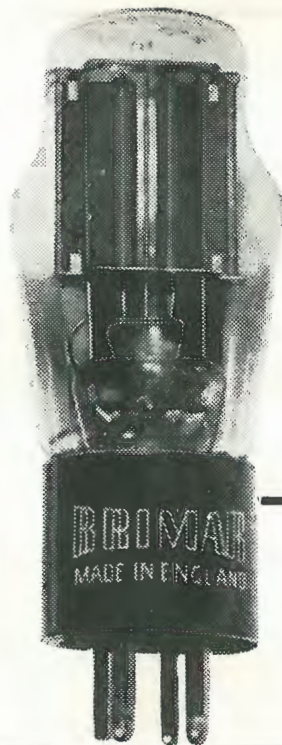
In the design of radio receivers, the make of valves chosen is of vital importance in order to ensure highest possible gain with minimum noise level. That is why for all "Radio World" receivers, the Technical Editor regularly specifies BRIMAR valves

MAKE THEM YOUR CHOICE, TOO.



EVERY BRIMAR VALVE IS TEN TIMES TESTED

Manufactured in one of the largest and most up-to-date valve factories in the world, BRIMAR valves are made with hair-line precision to rigid standards under which every valve not 100 per cent. perfect is automatically rejected. During manufacture, every Brimar valve is **TEN TIMES TESTED**, giving users the world over a gilt-edged guarantee of perfection. That is why leading radio engineers the world over use and recommend BRIMAR why BRIMAR valves were specially chosen for the huge marine radio installations on the world-famous liners, "Queen Mary" and "Queen Elizabeth," and for dozens of other services where maintenance of communications is of vital importance.



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VALVES

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EVERY BRIMAR VALVE IS TEN TIMES TESTED

The Australasian
RADIO WORLD

Incorporating the
ALL-WAVE ALL-WORLD DX NEWS

Vol. 4. MARCH, 1940. No. 10.

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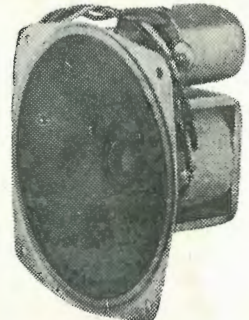
THESE

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Newly designed, the 1940 range of Amplion Speakers incorporates every feature that assures high fidelity reproduction. Completely dustproofed, sealed transformers, larger-cone areas, **ELECTRICALLY WELDED**. Extended frequency range, greater output—these speakers mark 1940's greatest advance in speaker production.

New BIG 7-inch



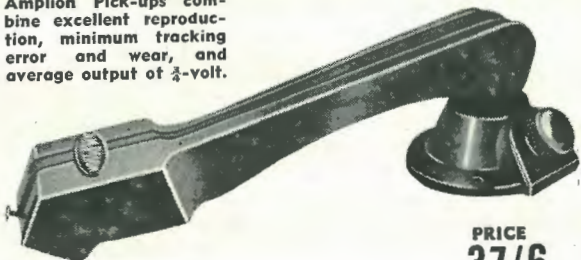
New BIG 5-inch



Specify the New BIG 5-inch for the "1940 World Standard."
 Type 5E7, Electro 28/6
 For the "Wonder One,"
 Type 5P8, Permagn., 31/6
 For the "1940 World Standard."
 12E12, Standard .. 43/-
 12E22, De Luxe .. 56/-
 12E22
 7E12, "BIG 7" .. 31/-

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Amplion Pick-ups combine excellent reproduction, minimum tracking error and wear, and average output of 3-volt.



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 Complete

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- Brilliant Middle Register
- Full Bass
- Free from Resonance
- True Tangent Angle Head
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 Complete with Arm,
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A PERSONAL MESSAGE

*With due apology for the too abundant
use of the word "I".*

I cannot express how happy I am at the prospect of again devoting all my energy to technical radio matters.

During the past two years I have had to deal with the prosaic matters of business, of broadcasting programmes, publicity and the like.

Now I am right back in the thick of the technicalities which I love.

From now on my days and nights will be spent fiddling around with novel circuits, new valves, powerful amplifiers and the rest of the things which mean so much to me.

What is more to the point there will be less restriction for my only thoughts need be to please those whose heart beats as mine. No need to consider the masses, no fear that I will have to please people to whom a circuit is like Chinese.

Before I go further I feel that I should express the satisfaction I feel in carrying on a technical policy of which anyone might well be proud.

In the past the Australasian Radio World has held my esteem for the soundness of its articles, the accuracy of its circuits and the general way in which the magazine has been conducted.

I feel that only a few minor details need attention to make the paper worthy to maintain its rightful place as Australia's only one hundred per cent. technical radio journal.

Among these changes I might mention the addition of a Junior Technical section, to be conducted by Alf. Barnes, whose articles have been a feature of "Wireless Weekly" for the past couple of years.

Another feature to be strengthened is the query service.

Readers should be assured of prompt and effective handling of their letters, with replies either free of charge in the columns of our pages, or by mail on payment of a small fee.

Several other minor improvements should be noted during the next couple of months and I am sure that they will be duly appreciated.

No startling changes in style are contemplated, and the services of Earl Read, who has made the paper what it is to-day are being retained as Associate Editor.

A. G. Hull

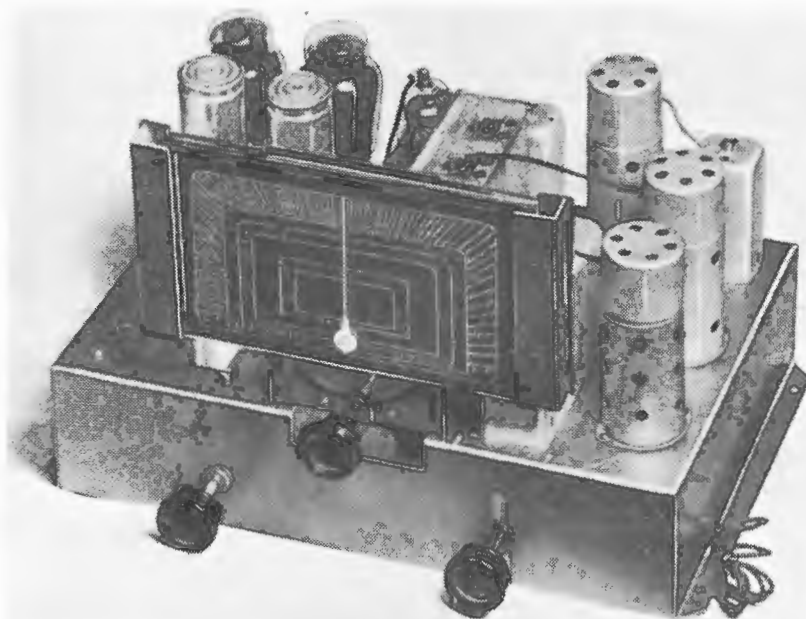


World Standard for 1940

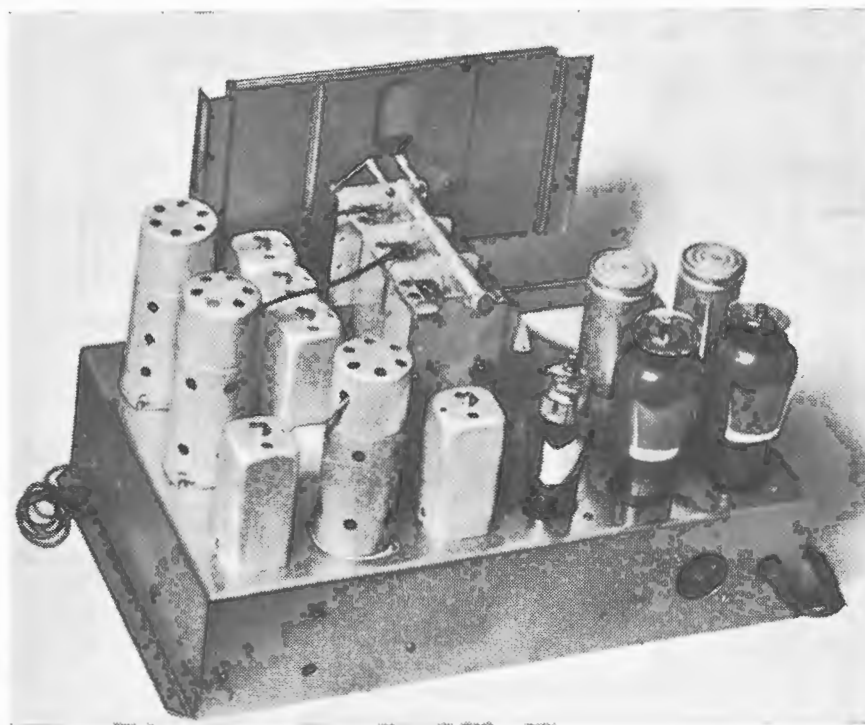
By modernising the original "1933 Standard" circuit we provide a powerful dual-waver having unsurpassed fidelity, yet costing little more to build than a conventional receiver.

THE most successful circuit ever described in an Australian radio journal was the 1933 Standard superhet. Thousands of kits of parts for this job were sold and it was so popular that it was a bad influence on technical journalism. This is hard to believe, but is a fact, as thousands of people felt that when they had finished their Standard they had achieved the ultimate. They took no further interest in circuits for months and even years after. To give some idea of the popularity of the original Standard we might mention that one manufacturer of steel bases for this particular chassis reported that he sold over ten thousand in the first five weeks. But all that was away back, nearly seven years ago.

As time went by, the Standard circuit dwindled into obscurity, mainly because it presented a couple of minor difficulties. Chief of these was the difficulty of obtaining automatic volume control. The circuit used a novel phase-changer to obtain true push-pull with resistance coupling, but the cathode of the diode detector valve had to be kept at a high potential in respect to earth, and so it was not



A front view of the chassis.



Rear view of the chassis.

possible to use this valve to supply the necessary control voltages for automatic volume control. With the dual-wave sets which became popular in later years, the automatic volume control was considered essential, and so the Standard circuit was put away. Now it is here again.

Re-designed and revised, the circuit now uses the latest types of valves. A completely effective method of automatic volume control has been applied, making up a dual-wave receiver possessed of unsurpassed fidelity, terrific range and power, yet using only a couple of extra components and costing only a few shillings more to build than a conventional receiver.

The Circuit.

The circuit, so far as the tuner end of the receiver is concerned, follows conventional arrangements with a dual-wave tuner having one r.f. stage and one i.f. stage. One of the type 6G6G double-diode-pentodes is used for the intermediate amplifier, the diode plates being used to obtain the desired a.v.c. voltages.

The audio end follows the same fundamental principle as the original Standard of 1933. A valve is used with split loads, half the load in the plate circuit and half the load in the cathode circuit, so that the normal

audio amplification of the valve is obtained, together with a perfectly balanced splitting of phase, so that the two valves in the output stage work in push-pull, cancelling the second harmonic distortion which is found if these valves are used singly, as in ordinary sets.

Another progressive step has been the biasing of the phase-changer valve with a self-biasing resistor in the cathode circuit. This resistor is not by-passed, so that inverse feedback is introduced, which reduces still further the amount of distortion in the output.

Comparatively low audio amplification is used, the phase-changer being the pentode portion of another 6G8G, but with the plate and screen of the pentode tied together to form a low-gain triode. In this condition the valve gives ample gain to allow full

power output from the usual type of crystal pick-up when the set is used as a gramophone amplifier, yet not sufficient to cause hum trouble.

It is simple enough to make the set absolutely hum proof, and the original receiver was so completely free from hum that it was quite impossible to tell whether it was switched on or not, unless tuned to a station.

Layout.

It is simply a matter of getting a suitable base and the set can be built as a single unit, but the original chassis shown in the photographs was built up in two units. The practice has much to recommend it, the power transformer and rectifier being built on to a separate base to be fitted in the bottom of the cabinet, with a flexible plug and cable to connect the two units together. Such an arrangement

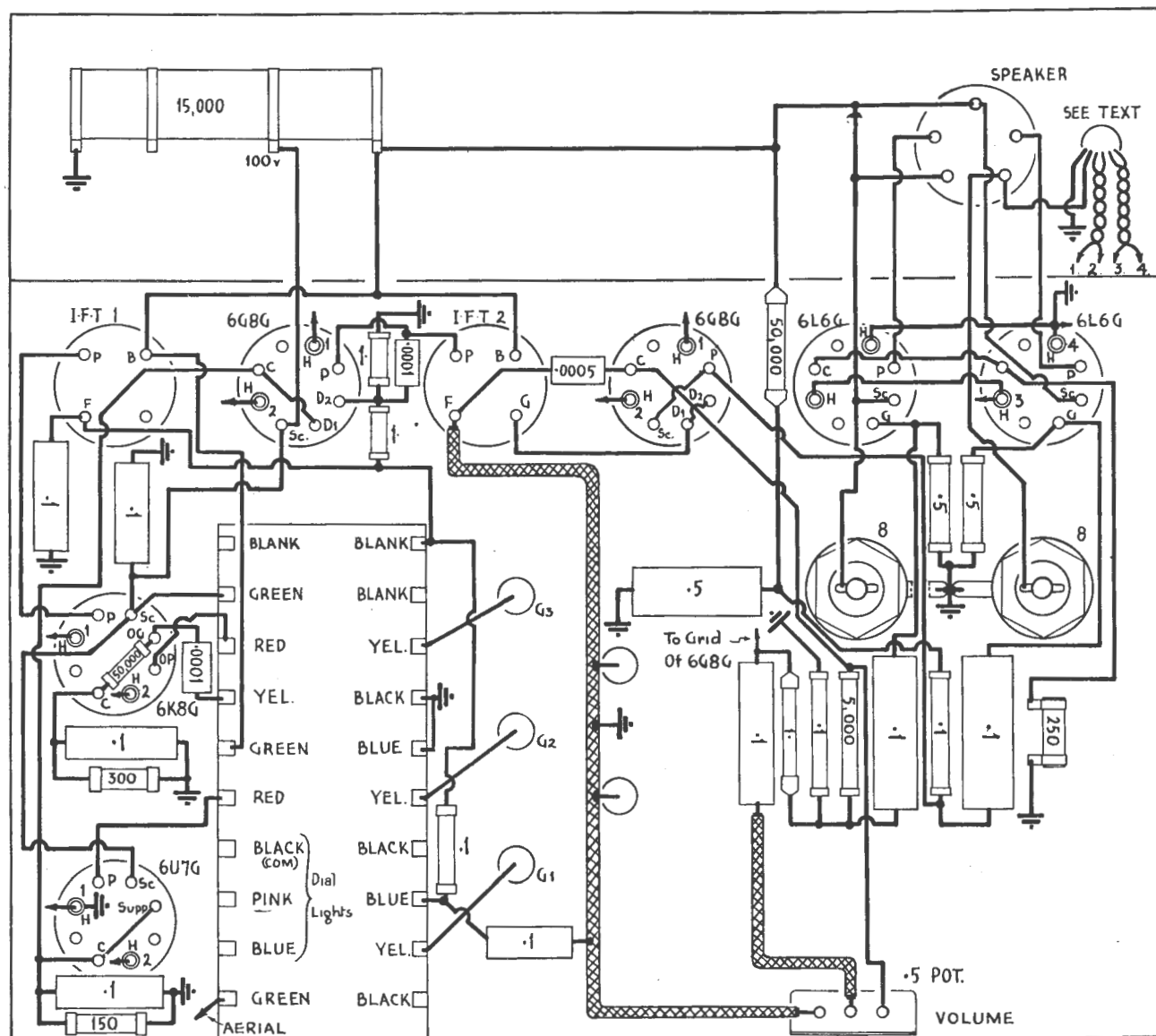
is to be preferred, as it keeps the hum and heat localised, makes construction simpler, and costs only a few pence extra.

The plan, in fact, which we recommend to those who are taking to radio as a hobby is to build the set in two units and make the power unit a universal affair with adjustable voltage tapings, separate filament transformer unit and so on, so that it can be used with a multiplicity of different types and styles of receivers and amplifiers. A full description of such a power supply unit will be given in next month's issue.

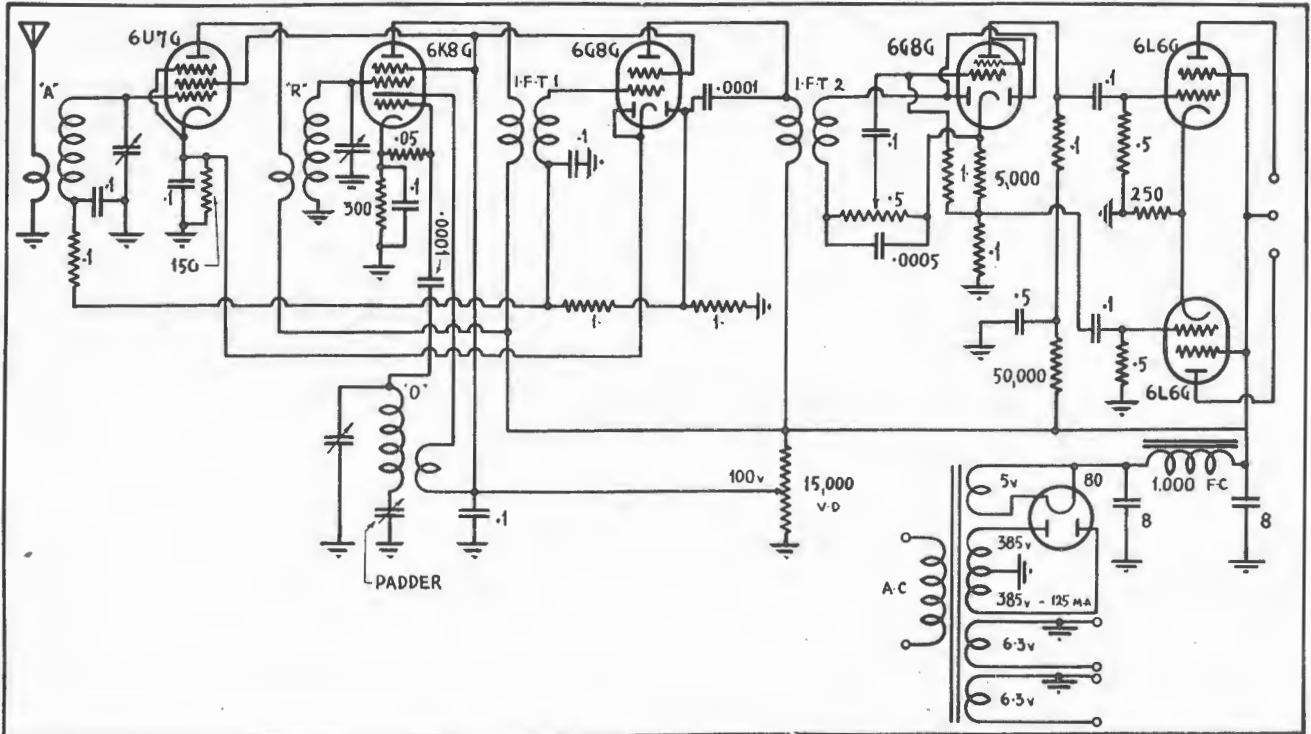
In the meantime, however, this point need not deter those who want to go right ahead and build one of these phenomenal sets.

The Speaker.

It is easy enough to get a good set to sound right with an expensive high-



Picture diagram of the wiring.



Schematic diagram of the circuit.

**THE "1940 WORLD STANDARD"
List Of Parts.**

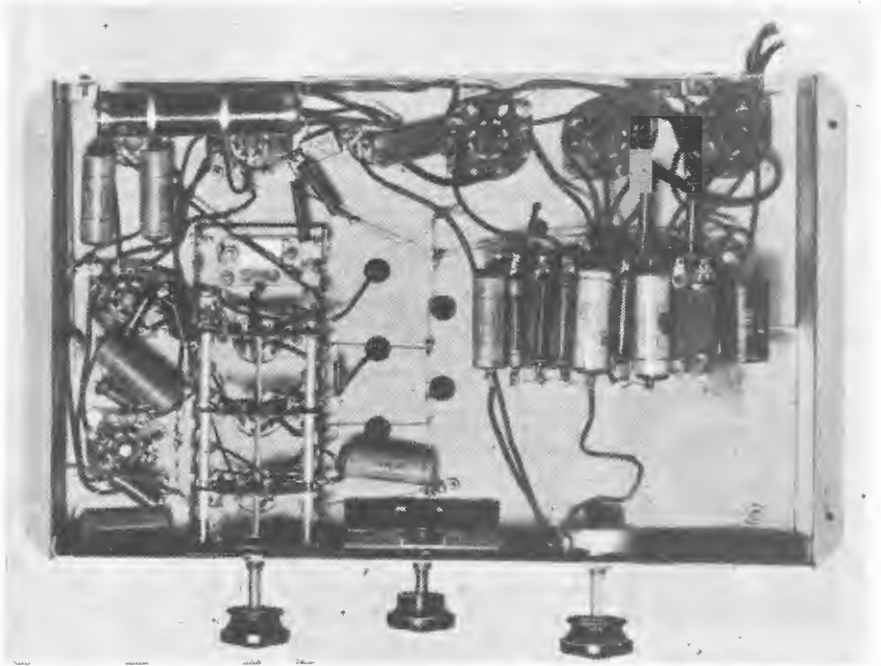
- 1 Suitable base (Acorn)
- 1 Dual-wave kit with intermediates and gang (R.C.S., Radiokes)
- 1 Dial to suit (Efco)
- 1 Power transformer, 150 m.a. (Henderson)
- 2 Electrolytic filter condensers 8 mtds. (Solar, T.C.C., Ducon).
- 1 15,000 ohm voltage divider (R.C.S., Radiokes)
- 8 .1 mfd. tubular by-pass condensers (Solar, Ducon, T.C.C.)
- 1 .5 mfd. tubular by-pass condenser (Solar, Ducon, T.C.C.)
- 3 1 megohm resistors 1-watt (I.R.C.)
- 2 .5 meg. resistors 1-watt (I.R.C.)
- 3 .1 meg. resistors 1-watt (I.R.C.)
- 2 50,000 ohm resistors 1-watt (I.R.C.)
- 1 5,000 ohm resistor 1-watt (I.R.C.)
- 1 300 ohm 1-watt resistor (I.R.C.)
- 1 150 ohm 1-watt resistor (I.R.C.)
- 1 250 ohm 3-watt resistor (I.R.C.)
- 1 .5 meg. potentiometer (I.R.C.)
- 2 .0001 mfd. mica condensers (T.C.C.)
- 1 .0005 mfd. mica condenser (T.C.C.)
- VALVES:**
- 1 6U7G, 1 6K8G, 2 6G8G, 2 6L6G, 1 80 (Brimar, Kenrad, Radiotron)
- SOCKETS:**
- 1 5-pin, 7 octal, 4 valve cans (Tasma)
- SPEAKER:**
- 1,000 ohm field for push-pull 6L6G (Rola, Amplion)

quality for which this set must be acclaimed.

To those accustomed to ordinary commercial sets, with tone controls, the reproduction may sound a little too crisp at first, but after a few minutes of listening to good recordings, broadcast from a properly ad-

justed transmitter, there can be nothing but appreciation. A minor difficulty, however, is that not all stations put out faultless broadcasting, and not every record put over is sure to be perfect.

The set shows up in no uncertain way the shocking quality of some of



Compare this view with the diagram opposite.

fidelity type of speaker, but we would point out that all our testing with this set was carried out with conventional 12" speakers of Rola and Amplion brand, and we found them both capable of handling the terrific power output of which the set is capable, and giving the perfection of tonal

the poorly recorded advertisements which are at times plugged over the air. Similarly the programmes from the Nationals are not always perfect after they have been relayed for a thousand miles, or so, over the land lines.

Blemishes of this kind are only too truly revealed by the fidelity of the set, but such a difficulty cannot be overcome if the full benefit of the good parts of the broadcast programmes are to be reproduced to perfection.

Power Output.

The set is capable of tremendous power output, but the full power should not be used. The set should be allowed to operate at normal strength on ordinary music, allowing the full power capability of the set to be used only for the distortionless reproduction of the loud passages. With

a set capable of handling only about three watts of power without distortion, there is sure to be overload on heavy passages if the average level of the power output is kept up around the full capacity. No one will want to run the "World Standard" at a level anywhere near its full power output, as otherwise they will stand a good chance of wrecking the loudspeaker, as well as offending their neighbours.

The Parts.

Before selecting the parts for the construction of the set it is necessary to decide whether you are going to build the chassis as a single unit or whether you are going to keep the power supply on a separate base. Naturally you will need to order the base accordingly.

The power transformer needs to be a heavy job, rated to supply 385 volts

SUNDRY HARDWARE.

It should be noted that, in addition to the components listed for the sets described in this issue, there should be added sundry hardware.

This includes a power flex or battery cable, wire, screws, soldering lugs, mounting brackets for condensers and dials, clips for valve caps, knobs, dial lights and similar odds and ends.

at 125 milliamps; in fact, if you want the very best, we suggest getting one which is rated to supply 150 milliamps. This will mean cooler running and allow highest power output for peaks without distortion.

To be on the safe side only the best electrolytic condensers should be used with a big power transformer of this kind, and we used condensers with a 600-volt peak rating.

The dual-wave tuner unit is obtained with a suitable dial, for preference one with the wave-lengths and station calls clearly marked on it, as these can be a help to getting proper alignment. It is essential, of course, for the dial to be the proper type to suit the gang condenser and the coil unit, as otherwise the markings will just lead you astray.

Assembly.

First step in the assembly is to fit the power transformer in the power unit base and the sockets for the rectifier and for the receiver plug. These can then be wired up and the power flex fitted, great care being paid to the fitting of this item as it carries the power line voltage, which is most dangerous. A knot or some other method must be used so that a pull on the power cord won't cause the wires to pull away from the power transformer terminal strip.

Assembly of the receiver chassis should be started by mounting the sockets, making sure to fit the valve cans for the first four valves. The base of the valve can is held in position by the same screws that hold the sockets.

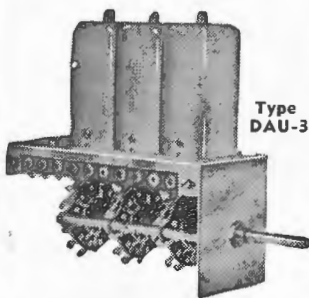
After the filament circuits of the valves are wired up with twisted wires the intermediate transformers can be fitted and wired in, and then the dual-wave tuning unit should be fitted.

The Strip.

To allow firm and simple mounting of several of the small resistors and condensers a strip is provided down at the audio end of the set. Up at the tuning end the by-pass condensers are soldered right on to the valve socket terminals for greatest effi-

RADIOKES

PRECISION PRODUCTS



Type DAU-3

DUAL WAVE UNIT

B/C 1500 to 550 k.c. S/W 16 to 50 Metres. Aerial, R.F. and Oscillator 460 k.c. A.C. Cat. No. DAU-3.

Retail Price £3/7/6

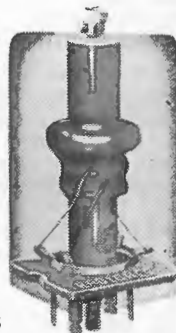
BROADCAST COILS

Air Core

Cat. No.	Retail Price
ACB Aerial	6/6
ACB R.F.	6/6
ACB Osc.	6/6

Permeability

BCP Aerial	8/6
BCP R.F.	8/6
BCP Osc.	8/6



Type ACB

RADIOKES KITS FOR THE SETS FEATURED IN THIS ISSUE.

- * RADIOKES COIL KIT for the "1940 World Standard. Type RK130. Price, £3/7/6.
- * RADIOKES COIL KIT for the "Dandy Three." Type RK131. Price, £1/10/3.
- * RADIOKES COIL KIT for the "Wonder One," consists of 5-band single section coil unit mounted on the wave change switch. Easily assembled and wired up. Type RK132. Price, £1/12/6.
- * RADIOKES FOUNDATION KIT for the "Wonder One" comprises coil unit as above, 5-band dial, audio choke and R.F. choke, trimming condenser and 2 midget condensers. Type RK133. Price, £4/12/6.

The following sets described in "Radio World" and "Radio and Hobbies" are available in coil kits or complete kitsets. Check the set you are interested in, cut out the coupon, and post to RADIO SUPPLIERS PTY. LTD.

R. & H. Portable	Picnic Portable Four
4/39 Dual Wave	Loop Aerial Receiver
Advanced 1939 B'cast	Pentagrid Three
Advanced 1939 D'wave	R. & H. S/Wave Converter
Economy 7 Battery	Loop Aerial 3 (I.C. I.F.'s)
Duplex Single	Super Advance
Dandy Three	Pentagrid Portable
Wonder One	1940 World Standard

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THE 1940 WORLD STANDARD

1940 version of the best-selling kit-set ever described in any Australian magazine, this new "World Standard" is a magnificent performer on both short-wave and broadcast. Special output circuit using beam tetrodes in push-pull delivers seven watts of high-quality output.

WRITE FOR DETAILS OF OUR SPECIAL LOW-COST KIT OF PARTS.

THE DANDY THREE

Using three new-type American valves in a brand new circuit, this sensational little receiver gives full five-valve performance. Builders wanting a set giving the maximum in results from a minimum of parts will find the "Dandy Three" ideal.

EVERY PART IN OUR KIT IS EXACTLY AS SPECIFIED BY THE DESIGNER . . . WRITE FOR A QUOTATION NOW!

THE WONDER ONE

World-wide reception on the short waves, and inter-state on broadcast, can be obtained from the "Wonder One," which uses the new 1D8GT two-in-one triode-pentode as detector and audio amplifier.

FOX & MacGILLYCUDDY PTY. LTD.

(In Liq.)

MERINO HOUSE, 57 YORK STREET, SYDNEY.

Telephone: B 2409-10 Telegrams: Foxradio.

iciency. The condenser and resistor associated with the oscillator section of the pentagrid converter are also soldered directly in place, as long leads or distributed capacities would be inadvisable at this part of the circuit. But at the audio end the strip is a great help. The components are mounted on the strip as shown in the picture diagram, and then the strip is fitted in position and the leads soldered to it. Grid resistors for the two output valves are soldered direct to the sockets.

Towards the end of the wiring job a piece of bare copper wire is run around to connect up all the "earth" connections, as efficient earthing is an important factor in getting stability.

Alignment.

Dual-wave tuning units receive care-

ful attention in the coil factories, and in ninety-nine cases out of a hundred the dual-waver proves simpler to align than an ordinary broadcast set. It is quite the usual thing to find that a dual-waver works to perfection immediately on completion and no adjustment is necessary at all.

Alignment, however, should be checked by swinging the dial down to about 2SM or some other station at the high-frequency (low wave-length) end of the dial. After tuning in carefully the trimmers on the aerial and r.f. coils should be adjusted with about an eighth of a turn at a time to see whether any improvement can be made. When these are right, the dial should be swung up to the other end of the dial and the padder adjusted to give maximum off station

noise level, or else best results from a station over which the dial is being rocked. The adjustment of the padder will shift the station up or down the dial a shade and it is here that the marked dial can be helpful. If the dial is set for 2SM the padder should be about right when 2FC falls on its dial marking.

For the short-waves the usual procedure is to adjust the trimmers for best results on the band used most. A check can be made of the aerial and r.f. trimmer adjustments on the strongest station to be heard. It will be found that the adjustments are not at all critical on the short-wave bands, and that it is seldom that a coil kit gives perfect alignment over the whole of the band, but that this is not important.

You Must Use

R.C.S. Coils and Coil Kits

to get

MAXIMUM EFFICIENCY from the ...

"1940 WORLD STANDARD"

The now-famous R.C.S. Dual-wave Unit provides the results obtained by the Technical Editor—the unit is laboratory engineered and tested to give you the longest lived service, highest sensitivity and absolutely perfect selectivity. Specify Kit Type K130. Price, £3/7/6.

"THE WONDER ONE"

The R.C.S. "Wonder One" 5-band single section coil unit has been specially designed to meet the requirements of the Technical Editor. The coils are wound on Trolitul and mounted on the wave change switch. One-hole mounting makes it easy to assemble and wiring-up is simplicity itself. Specify Coil Kit Type K132. Price, £1/12/6.

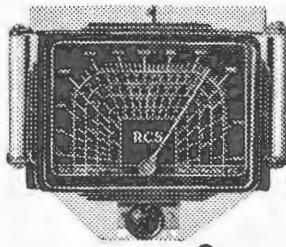
R.C.S. "WONDER ONE" FOUNDATION KIT consists of the coil unit, trimming condenser, 5-band dial, 2 midget condensers, audio choke and R.F. choke. Specify Kit Type K133. Price, £4/2/6.

"THE DANDY THREE"

The "Dandy Three" Coil Kit is made up of R.C.S. Trolitul coils and I.F.'s ensuring maximum sensitivity. They are simple to mount and easy to wire up. Specify Coil Kit Type K131. Price, £1/10/3.

NEW R.C.S. DIALS

For some time we have felt that we should provide dials for use with coils of our manufacture, thus assuring perfect tracking. The dials illustrated are the result of considerable thought and engineering experimentation in our laboratory. Both types are single glass Dual Wave dials, the type DA-2 having been designed especially for use with our Five Band Communications Receiver coil kit, and the "H" type condenser. Type DA-1 is a standard Dual Wave dial for use with R.C.S. Coils and the "F" type condenser.



DA-1. Standard D/W Dial. Retail Price, 22/6.

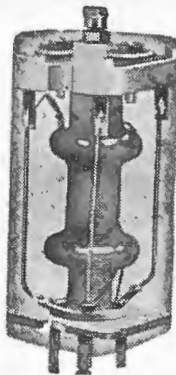
DA-2. Communications Dial. Retail Price, 22/6.

Illustrated Type DA-2

R.C.S. TROLITUL INTERMEDIATE TRANSFORMERS

The new R.C.S. Trolitul I.F.'s are extremely stable, due to new methods of construction made possible by the use of Trolitul formers and base. No loose wires to shift and alter frequency. Positively the best I.F.'s yet produced.

Cat. No.	Retail Price
Air Core, 465 k.c.	
IF107. 1st I.F. ...	7/6
IF108. 2nd I.F. ...	7/6
Iron Core, 465 k.c.	
IF109. 1st I.F. ...	11/-
IF110. 2nd I.F. ...	11/-
Air Core, 175 k.c.	
IE68. 1st I.F. ...	7/6
IE69. 2nd I.F. ...	7/6

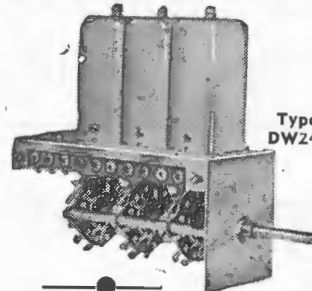


Type IF107

R.C.S. DUAL WAVE UNITS

Type DW24, as illustrated, consists of Aerial, R.F. and Oscillator Coils, Wave Change Switch, the necessary B/C and S/W Trimmers and Padder mounted on a rigid steel base, wired up ready to assemble in a set utilising 465 k.c. and an R.F. Stage. The bands are S/W 16 to 50 metres, and B/C 1500 to 550 k.c.

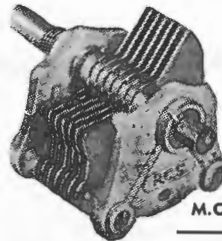
	Retail Price
DW24 for A.C. operation ...	£3 7 6
DW25 for Battery operation ...	£3 7 6



Type DW24

R.C.S. TROLITUL MIDGET CONDENSERS

R.C.S. Midget Condensers are made in two types, using Trolitul supports, thus guaranteeing practically no loss. The 14-plate equals old style 23-plate capacity. The M.C. type may be gang-ed.

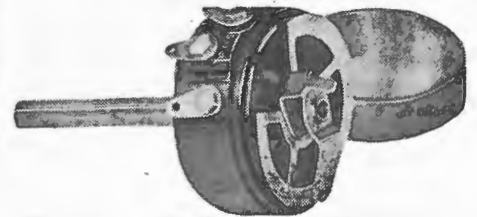


M.C. Type

STAR AND M.C. MIDGETS

Max. Cap. mfd.	Min. Cap. mfd.	STAR Plts.	STAR Cat. No.	STAR Retail Price	M.C. Cat. No.	M.C. Retail Price
10	3	2	CV43	3/6	CV41	6/9
15	3	3	CV35	3/9	CV42	7/3
25	3.5	4	CV36	4/-	CV43	7/10
35	4	5	CV37	4/3	CV44	8/6
50	4	7	CV38	4/9	CV45	9/-
70	5	9	CV39	5/4	CV46	9/6
100	6	14	CV40	5/11	CV47	10/3

R.C.S. POTENTIOMETERS AND RHEOSTATS



The R.C.S. Volume Controls are the result of improved and new methods of manufacture, together with alterations in design and final testing. Noiseless, they are constructed so as to cut off all volume.

	Cat. No.	Retail Price
6 ohm Rheostat	PT40	5/-
10 " "	PT38	5/-
20 " "	PT39	5/-
30 " "	PT34	5/-
400 " Potentiom.	PT46	5/-
1000 " "	PT47	5/-
2500 " "	PT49	5/-
5000 " "	PT51	5/-
10000 " "	PT52	5/-
15000 " "	PT53	6/6
20000 " "	PT54	6/9

R.C.S. AUDIO TRANSFORMERS AND CHOKES

Long experience in the production of highly efficient transformers, combined with extensive research into raw materials and design, has resulted in the production of an audio transformer of excellent performance and complete reliability.



TB6—"B" Class

Cat. No.	Retail Price
TA1 Audio Choke Bakelite Case ...	18/6
TM1 Modulation Transformer—Power ...	30/-
TB4 Single Input "A" Class Bakelite ...	20/-
TB5 Push Pull "A" Class Bakelite Case ...	21/-
TB6 Input "B" Class Bakelite Case ...	18/6
TB35 "A" Class High Fidelity Steel Case ...	67/6
TB36 "B" Class Input High Fidelity Steel Case ...	67/6
TB37 "AB" Class Bakelite ...	28/6

Obtainable from your local dealer or direct from—

R.C.S. RADIO PTY. LTD. 50 GLEBE ST., GLEBE. Phone: MW 2405

U.S. Circuits for 1940-41 Season

Keen students of circuit design should find much to interest them in this article dealing with trends being followed in the United States. It is compiled from data received direct from one of the leading American valve factories.

THESSE days, the design of Australian receivers is not so greatly influenced by the trend of design in the United States, but still it is interesting to study American practice.

An exclusive batch of technical data just received from the engineering department of the Ken-Rad factory at Owensboro, Kentucky, gives a good idea of the receivers upon which the American factory designers are at present working, and doubtless many of the innovations will actually see the market during the 1940-41 season.

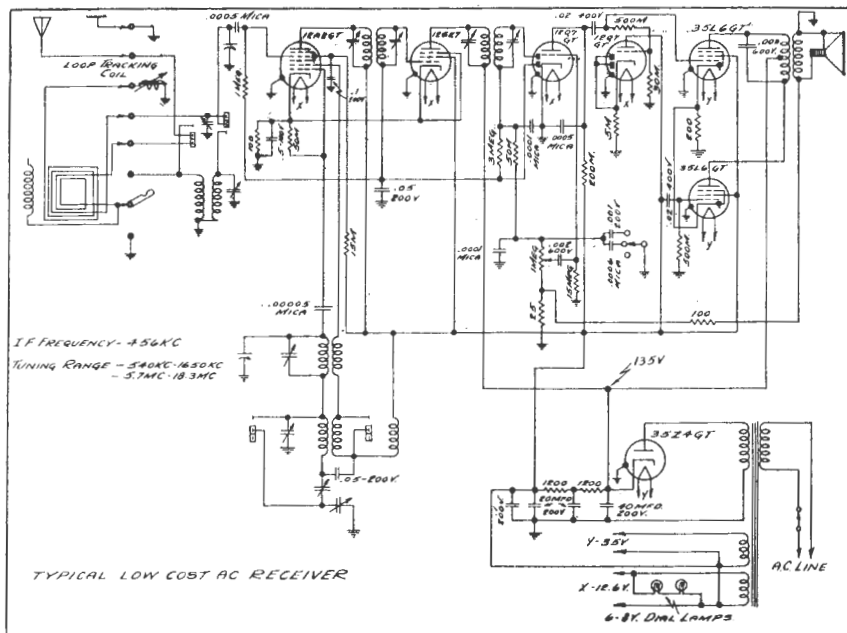
To be in possession of such advance information about future developments is indeed valuable and we are pleased to be able to publish the circuits on these pages, and a few remarks about the outstanding features of the designs.

Wide Range.

In America there is an even wider range of models than listed by the average Australian factory, and quite a few factories handle over 30 different chassis designs, each designed for some specific purpose. Naturally we are unable to devote sufficient space to show a full range of the designs, but those shown are of the type selected as being of greatest local interest here in Australia.

Low Voltages.

Circuit No. 1 shows a typical low-cost receiver, and it will be noted that one of the ways in which costs have been kept low is to use low voltages,



Circuit No. 1: This circuit reveals a most interesting audio amplifier design, with a resistance-coupled phase changer and inverse feedback applied over both audio stages. Low voltages are used throughout to allow cheaper components to give reliable service.

the maximum high tension being 135 volts. This allows cheap by-pass condensers and low wattage resistors to

be used throughout. It allows the use of a very simple and cheap type of filter, no choke being used at all and no filtering for the plates of the push-pull output valves. A resistance filter is used for the high-tension supply of the earlier audio stages of the set.

Such a saving in inductances is made possible by the use of high-capacity electrolytic filter condensers, it being a comparatively simple matter to make high-capacity electrolytic condensers if the working voltage rating is kept low.

As a point of interest we might mention that 40 mfd. electrolytics to work at 150 volts with a peak rating of 200 volts are readily available from our Ducon factory, although not normally stocked by city wholesale or retail houses.

In order to get adequate power output with the low high-tension voltage, a pair of the new 35L6-GT type valves are used, in a push-pull circuit with a valve acting as phase changer.

This part of the circuit in itself should be of great interest to those who study amplifier circuit design.

To these readers we would also point out the extremely simple way in which inverse feedback is applied by

Amplifier Championship

Biggest event in radio for 1940 is to be the Amplifier Championship of N.S.W. which will be conducted by A. G. Hull, on behalf of the Australasian Radio World.

Already a number of donations have been promised for the prize fund and it is expected that the contest will be even more successful than the original contest which was conducted by Mr. Hull in 1934.

Full details of the contest should be ready for publication in next month's issue, so if you have any suggestions to make about the framing of the rules, the judging or any other part of the contest, write now and let us have your views.

When the original contest was held about 170 amplifiers were entered, and from these a team of judges selected a dozen, which then appeared before a public audience and two sets of judges.

Prizes were allotted according to the technical judges, the musical judges and the public vote.

Then the Champion of Champions was decided on a points score basis.

This scheme worked well, and the contest was a great success in every way, but the method of judging threw too much responsibility on the initial judges. A solution to this problem is in mind, however, and everything seems to be ready for the launching of the most ambitious contest in the history of radio.

Watch next month's issue for details of the prizes, rules and the entry form.

putting a 100 and a 25 ohm resistor, in series, across the voice coil of the speaker, so as to be able to feed back portion of the output into the input circuit of the triode portion of the duo-diode-triode second detector.

Another point to notice is the use of high voltages on the heaters of the latest-type valves; 12 volts on the valves in the r.f. end of the set and 35-volt heaters for the output valves and the indirectly-heated rectifier valve.

Loop Aerials.

As will be seen from the circuit a loop aerial is used, this idea having again become popular since it was reintroduced for portable sets.

The loop, of course, is built into the cabinet of the set in similar fashion to the way it is fitted in a portable set.

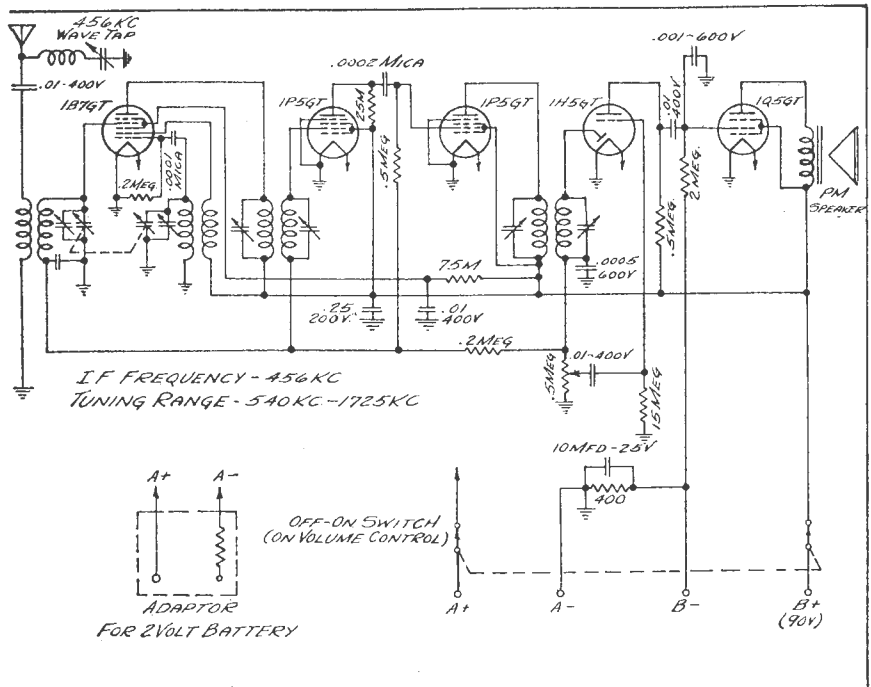
The use of the second diode plate of the 12Q7-GT to give a more effective automatic volume control is also a novel point, and it is significant to see that the 15 megohm grid-leak idea for biasing the triode portion of this valve is also adopted. Quite a bit has been heard locally about this same idea.

For Batteries.

Circuit No. 2 shows a typical circuit of the kind being used for battery-operated receivers for rural homes.

This circuit shows just how simple a circuit can be, with only four battery leads, no bias battery, and just a few resistors.

Two stages of intermediate frequency amplification are used, but



Circuit No. 2: This design for a battery receiver for country use features a resistance coupling between the two intermediate stages, allowing some gain, but not tending to upset the stability of the set.

with only two intermediate frequency transformers, the two stages being coupled by a resistance-capacity network. Naturally the selectivity would not be expected to be as great as with three transformers, but adequate

selectivity can be obtained to suit the countryman.

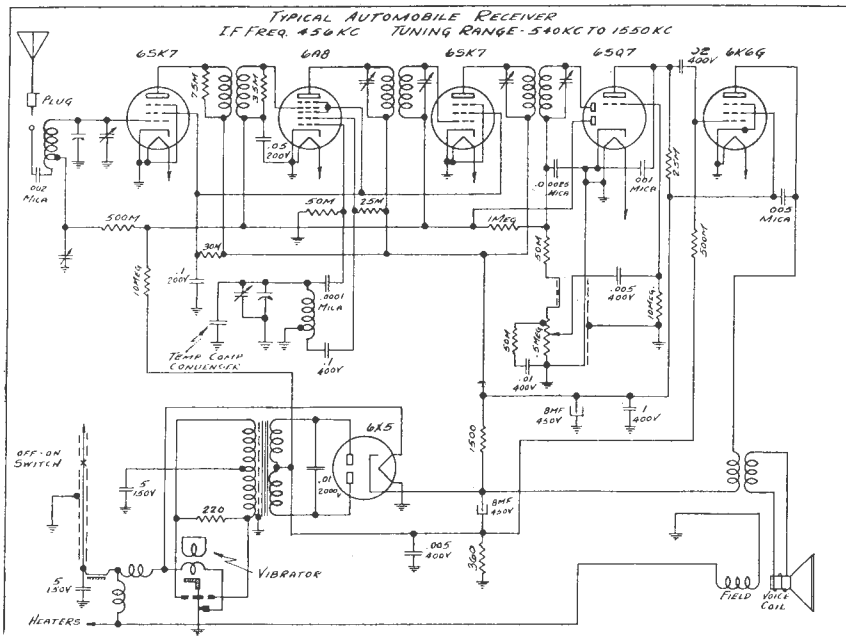
Loud-speakers.

Apparently electro-dynamic loud-speakers are a thing of the past, for the new designs all use permagnetic speakers. For the battery sets they need no energising current, for the car sets they make lower current drain possible, for the midget sets they claim greater sensitivity, and for the big a.c. sets they offer better fidelity of reproduction.

Before such a revolution can take place in Australia we must have cheaper and better permag. speakers, and this doesn't look too easy. So far, most of the successful magnets for the permags have been imported, and as everyone knows these days, we can't count on things which have to be paid for in sterling or dollars!

Cheapness.

American receivers are still suffering from the tragedy of cheap production. List prices are so low that in many cases it is a matter of building a set just as cheaply as possible. Few factory set designers are able to develop the kind of receivers which they know would be superior to existing models. There is a movement on foot, however, to try and improve the standard of construction, and quite a few of the factories are making strenuous efforts to impress upon the public that the cheapest sets are not always the best proposition.



Circuit No. 3: This design for a car receiver can be accepted as an ideal design. We do not recommend the building of car sets for the average radio enthusiast, but those who have sufficient confidence in their ability may find this circuit a sound foundation on which to experiment.

Group Trainer for Morse Code

By DON B. KNOCK

In these times of national emergency, the need for trained wireless operators for Naval, Army, and Air Force service is increasing daily. The self-contained instrument described here can be easily made up from a few inexpensive parts, and is particularly useful for elementary morse-code training.

WHEN the drums began to roll, heralding the rapid approach of the second Great War in which the British Empire has taken the lead in the struggle for the freedom of peace-loving nations, it became at once evident that in this era of scientific communication, the man who could handle a morse key and copy traffic speedily and reliably was much sought after.

Into the fighting services went the reservists, among them numbers of radio amateurs who had prepared themselves for the time when they might be needed, and the services thereby filled a temporary breach by the acquisition of proficient operators. Military procedure in traffic handling took the place of amateur methods and a new and interesting life began.

As Government advertisements appeared, calling for more men suitable

for training as operators, radio shops found a remarkable demand for morse keys, buzzers and parts for audio oscillators.

No longer was the microphone King; the key had taken the throne.

At intervals through the years there have been many descriptions in various publications of simple oscillators and buzzer outfits for learning the morse code, and these have all served their purpose.

Simplest of all is the buzzer, used with a battery and morse key in series, but unfortunately the cheap variety of buzzer is anything but reliable. Nothing is more distracting to the new recruit operator than a wavering watery note from an uncertain buzzer, and future operating capabilities can be made or marred by the initial apparatus used for introduction to the code. If buzzers are



The Author.

used for training, the only really suitable types are the high-grade "mosquito" kind, used with headphones.

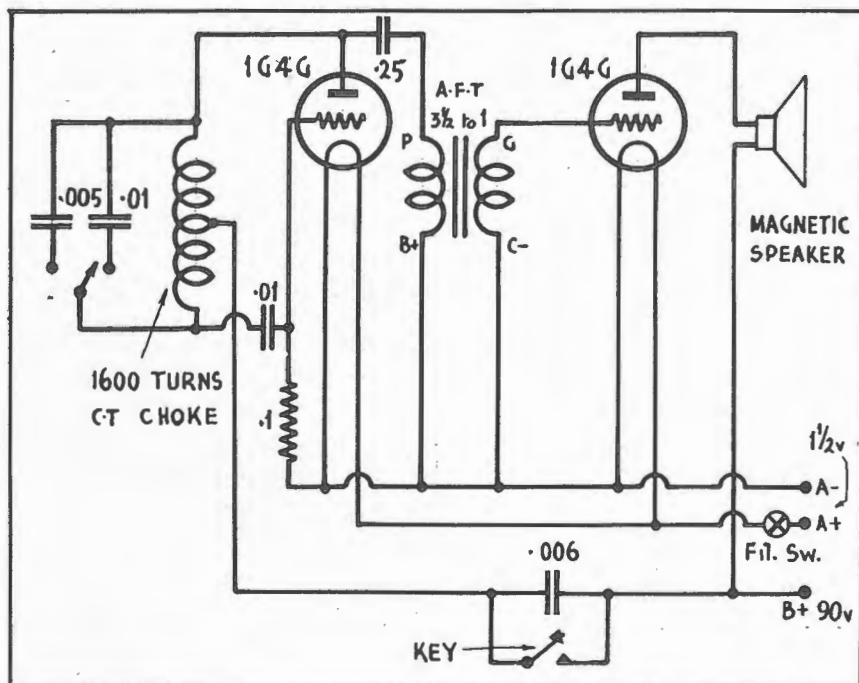
But the best kind of buzzer will sooner or later need adjustment and cleaning of contacts, the most prolific trouble being sticking of the armature, especially when battery voltage is low.

The valve audio oscillator serves the purpose much better, delivering a steady tone which can be regulated in one of many ways. Both theoretically and practically, the best method of morse training is by headphones, because future operating will invariably involve the wearing of 'phones, but where a batch of recruits needs primary instruction, there is no objection to loudspeaker output. Advantage of such a training outfit is that it can be self-contained and readily put into action anywhere at short notice.

Such training sets have recently been made up by the writer for use in training operators in militia signals units, and from their inception they have been of great use and much in demand. They consist, as the diagram and illustrations show, of a simple valve audio oscillator with an audio amplifier, operating a magnetic speaker unit, and powered from dry-cells.

Oscillator Specifications.

The circuit diagram of Fig. 1 shows the essentials. They consist merely of an oscillator using a triode choke with a centre-tapped iron cored choke and selector switch for shunted capacities, with an audio transformer coupling to the amplifier, and keying in the H.T. feed to the oscillator. In the writer's construction, the choke is



Circuit of the oscillator which provides suitable signals for the training of a large morse-code class.

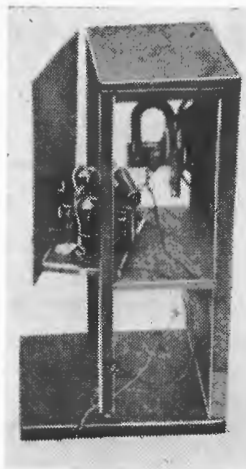
made up on the laminations of a burned-out speaker transformer, the winding consisting of 1600 turns of 38 D.S.C. tapped at 800 turns. Ready substitutes can be found for this choke, the secondary winding of some types of push-pull audio transformers being suitable, if in the region of about 300 ohms D.C. resistance. Also, the very old types of iron-cored I.F.T.'s from superhets of 10 years ago can be used for the purpose, with the primary and secondary in series, and the tap taken from the junction. Those old I.F.T.'s had close-coupled untuned windings and show a fairly low D.C. resistance.

A two-point switch is used to connect either a .01 mfd. or .005 mfd. condenser across the choke for tone variation if desired. With the 1600 turn choke, however, the .01 mfd. capacity seems about right for a 1000 cycle tone. Grid condenser is a .01 mfd. mica, with 1000,000 ohm leak to filament negative. The audio transformer can be almost any old thing, provided the windings are intact, as audio quality doesn't come into the picture.

As the H.T. feed to the oscillator is via the choke centre-tap, the transformer is used in shunt, coupled by a .25 or .5 mfd. tubular condenser to primary from the plate of the oscillator valve.

The circuit diagram suggests the

A general view of the original morse code trainer unit, showing the panel-type assembly.



use of two of the new 1.4-volt dry cell valves in the interests of filament battery economy. These are 1G4G's. However, in this series of valves a convenient arrangement is to use the 1G6G, which is a twin-triode intended for Class B audio work. In that case, one triode is the oscillator and the other the amplifier, in the same glass envelope.

The circuit diagram remains unaltered with the exception that the one filament serves both triodes. For filament supply an Eveready Standard cell is used, and, better still, for long

life, would be one of the special A cells made for 1.4-volt portables.

A 90-volt light-duty "B" battery of the portable kind provides the H.T.

It is not essential of course to use the 1.4-volt valves. Other combinations the writer has used consist of two 30's, two 34's or 32's with screen and plate connected as triodes, or a single 19. As these are 2-volt valves, two 1½-volt dry cells in series are needed for the filaments, with a resistor to drop to 2 volts.

Construction.

The oscillator and amplifier are made up on a small aluminium or even wooden baseboard and fitted into a case made of plywood, with a cut-out at the front for the magnetic speaker cone. A shelf permits mounting the oscillator-amplifier in the top section, and the lower half is used to house the batteries. The bottom of the case is made with a projecting board, on which the key can be mounted as a permanent fixture. It is not essential that the speaker be of the cone type; any of the old horn type units will do nicely for the job, or even a 2000 ohm headphone with a horn attached.

There is really nothing much to the job, but for the training of new operators the gadget is well worth the making. It delivers enough volume from the speaker for a fair-sized class.

Lamplough

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- SPECIAL ROLA 8" SPEAKER.
- ACCURATE CALL-SIGN CALIBRATED DIAL.
- SWINGING LOOP AERIAL INCORPORATING SPECIAL SAFETY LOCK.
- FIVE VALVES WITH EXCEPTIONAL BATTERY ECONOMY.
- PROVISION FOR A.C. OPERATION FROM POWER MAINS.

**"DANDY THREE"
"WONDER ONE"
"1940 WORLD STANDARD"**

We can supply complete kits of parts for all three receivers described in this month's issue—also for the three-range output meter. All components guaranteed of first quality as specified by the designer, while our prices are unbeatable. Save money by getting our quotation.

A STAMP MAY SAVE YOU POUNDS.



LAMPLOUGH RADIO COMPANY

I.O.O.F. BUILDING, 100 CLARENCE STREET, SYDNEY 'PHONE: BW 5438.

DANDY 3 Valve A.C. Superheterodyne

★

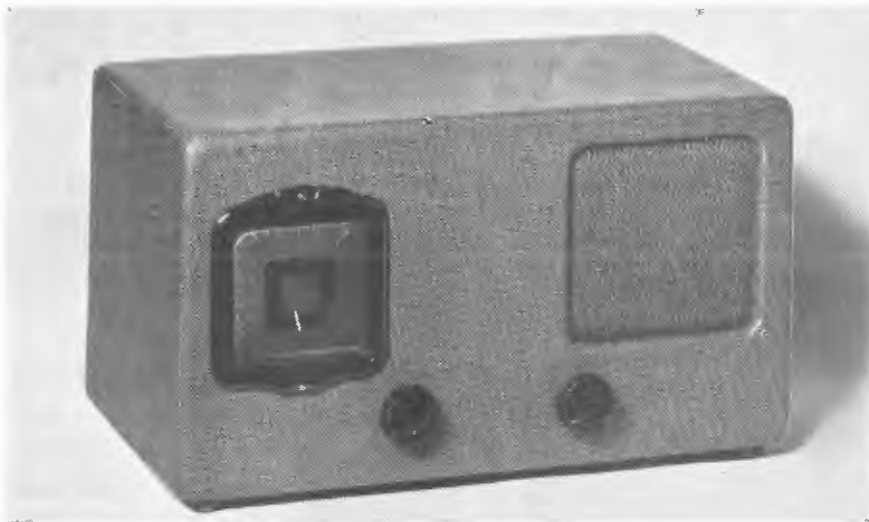
By using the latest types of valves, just rushed out from America we are able to provide a three-valve circuit which will do the work of a five-valve one.

EVERY once in a while new types of valves are introduced, and when they come they offer plenty of scope for the keen technician to think up ways and means of using them to best advantage.

Sometimes the valves which are featured as new releases do not prove to be anything really new after all, but then sometimes they do really turn out trumps. It is this way with the new batch of valve types which were landed by the KenRad distributors last month.

To run over the rated characteristics of these valves is enough to excite the most staid of technicians, and for those enthusiasts who like to get the last ounce of performance from a small set, well, these new types are just a dream come true.

First is a beam power output valve, with an inbuilt rectifier unit, so that



Dandy makes a neat set in a midget cabinet.

by using this valve you immediately save one valve from any conventional circuit. The type number is 70L7GT.

Next is the 25B8GT, a combined radio frequency pentode and a special detector valve, both built into the one glass bulb, and both designed for the purpose of intermediate frequency amplification and detection. Somewhat

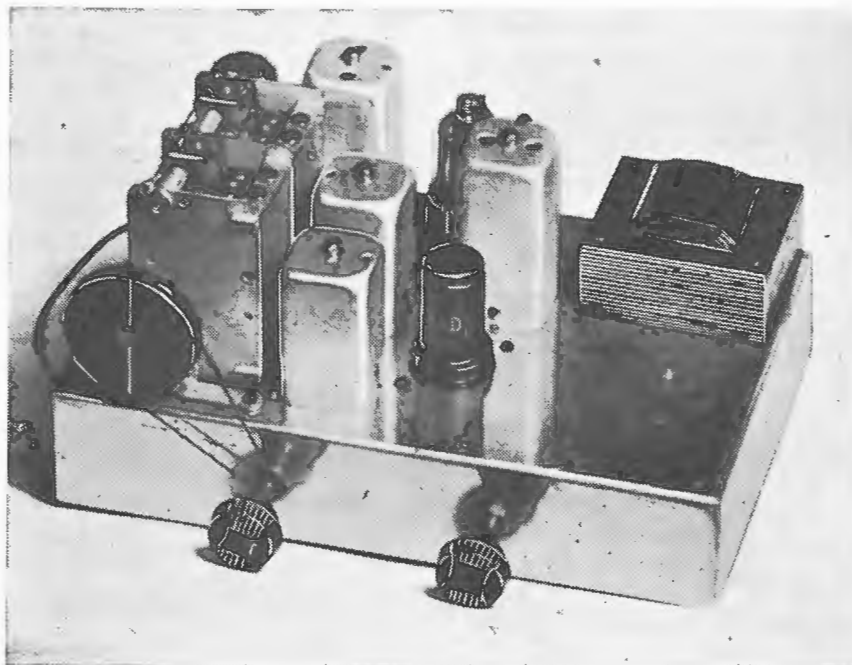
similar application has been made in the past by using the 6F7, a valve which was primarily designed for use as a frequency changer, but this new valve is designed for the job we are giving it.

The third valve is the 12SA7, a single ended frequency changer valve, with some remarkable characteristics which make it possible for a most simple circuit to be used. Normal pentagrid converters need to have different voltages applied to the oscillator plate, screen and main plate, with the necessary voltage dropping resistors and by-passes. But this new valve takes the full high tension on all of these elements, in fact, the oscillator plate and the screen are connected internally.

Quite Excited.

To read over these surprising characteristics and to find that the samples of the valves were immediately available, with adequate stocks due for release by the time these lines appear in print, was just like old times, in fact we readily admit that we got quite excited about it. We rushed together an experimental set to see just how they worked out in practice.

Within a few hours the set was finished and performing well, except for slight hum trouble. So we hiked back to the valve distributors to find if they had any further data, when, what should they produce but a circuit of a new receiver being listed by



A view of the bare chassis.

For truly high Quality Reproduction

Rola K12

FEATURING—

PERMACENTRIC CONSTRUCTION



Incorporating the most advanced features used in loud-speaker construction, Rola K12 is the ideal sound reproducer for high quality receivers and amplifiers.

NOTE THESE OUTSTANDING FEATURES

- K12 covers an abnormally wide range of frequencies and gives truly faithful reproduction of speech and music.
- Of robust design, K12 can handle tremendous volume without distortion. Furthermore, it has that rare quality of maintaining full efficiency at high volume levels.
- Special low carbon steel in the magnetic structure, lighter and more responsive diaphragm, improved spider assembly and other important features have resulted in a speaker of abnormal efficiency, reflected in a greater sound output for a given signal input.
- Permacentric and riveted construction guarantee that Rola speakers will remain free from all service worries even under the most trying conditions. Isocore transformers are absolutely electrolysis proof and will stand up indefinitely under all climatic conditions. All Rola speakers are fully dust and sand proof.
- K12 has an exceptionally heavy electro magnetic structure and requires slightly more excitation than standard speakers. Most circuits can be arranged to take a K12. In addition, Rola provides F12, a speaker generally similar to K12, except that it has a standard electro magnetic assembly and is therefore able to be used on sets designed for standard speakers.

K12, 50/-; F12, 41/-.

WRITE FOR FULL INFORMATION.

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SWAN ELECTRIC COMPANY LTD., High St., Auckland.

MANUFACTURERS OF THE WORLD'S FINEST SOUND REPRODUCERS.

the big American factory of Stewart Warner, and sure enough it was almost identical to ours.

So we made one or two amendments to the filament circuit according to the American factory arrangement, and it worked. The hum trouble went.

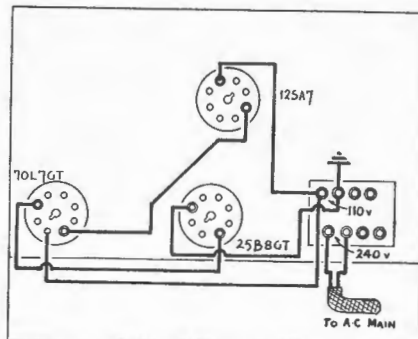
So, to cut a long story short, here is the description of a three-valve superhet, extremely simple, very cheap to build, containing the most revolutionary circuit arrangement, yet not to be doubted as a freak, as amply proved by the fact that an almost identical circuit is being used by an American factory which couldn't possibly take risks with anything likely to prove unreliable in service.

The Power Transformer.

Other novel features of the circuit will be immediately evident to keen students of circuit design.

First of all there is the power transformer.

Instead of the conventional transformer, a transformer with only two



Circuit for heater wiring.

windings is used; the usual primary for the 240-volt a.c. input and a single secondary winding of 110 volts at 250 milliamps current rating. Such a transformer is simplicity itself, needs a capacity for only about 27 watts, is about half the price of the ordinary transformer, yet supplies every requirement of the set.

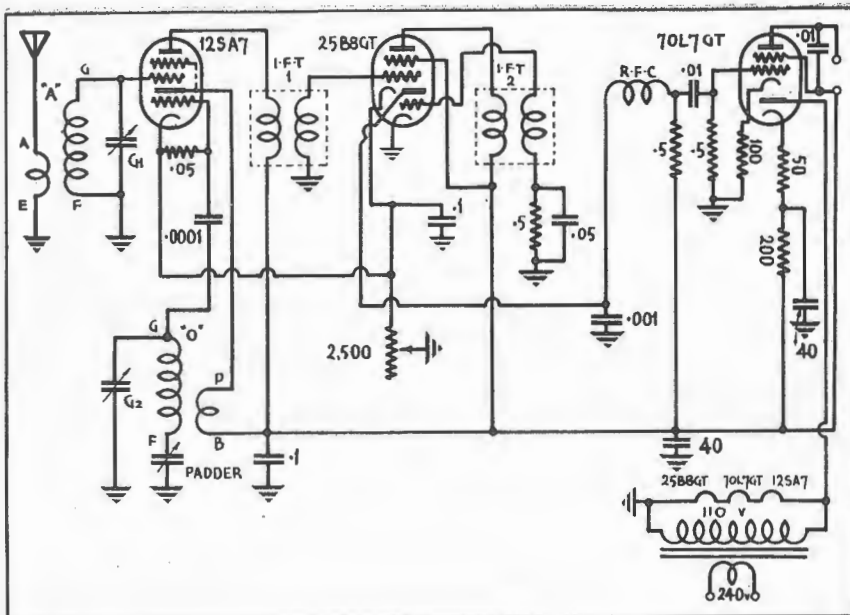
Next point well worth mentioning is that the highest voltage in the receiver, apart from the power line input, is 110 volts, so that low voltage condensers and low wattage resistors can be used throughout.

As it happens there are so few minor components in the set that this matter is more one of interest than a really effective economy.

But it is a point worth serious consideration by those designing big sets for commercial purposes where every penny saved in production cost means something.

Heater Wiring.

The heaters of the three valves are connected in series across the a.c. secondary of the power transformer, truly a startling way of doing things,



Note this extraordinary circuit.

yet highly practical when you come to consider it.

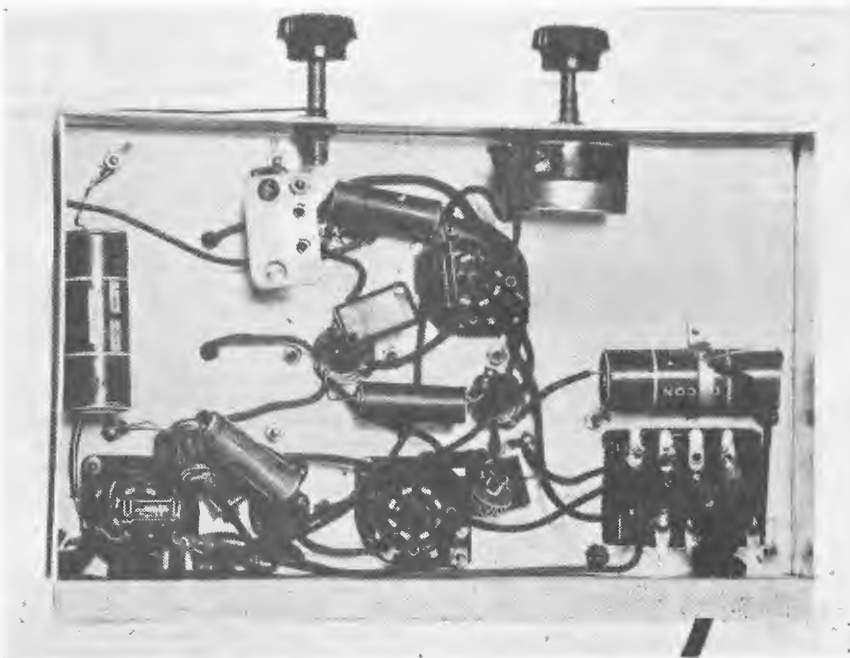
The combined output valve and rectifier takes 70 volts at 150 milliamps, the intermediate amplifier-detector takes 25 volts at a similar current, and the frequency changer 12. Added together, this makes 107 volts and, since the valves are rated to stand up to 120 volts overload, they are working to perfection when connected across the full 110-volt secondary.

The Filter.

The low working voltages used in

the set allow us to use 40 mfd. filter condensers, five times the normal capacity of high-voltage filter condensers, and simplifies the filtering problem. No need to worry about the field coil of the speaker as a filter choke, and we can use a low resistance field, our only consideration being to see that the field is adequately energised. This doesn't amount to much with the little five-inch electrolytic dynamics of the type you'd be likely to fit to a little set like this.

The element of safety is one which might be considered when talking of



This underside view shows the simplicity.

WESTERN CABINETS

are specified exclusively for the

"DANDY THREE"

and the

"WONDER ONE"

described in this month's issue.

- Both cabinets shown in the illustrations elsewhere were built by us to the Technical Editor's specifications, and by ordering a Western, you can be sure that your chassis will fit as accurately as the original.

- Each cabinet is strongly built, ensuring the greatest rigidity, and is covered in the latest airway-canvased leather-cloth. (A variety of tonings to suit individual tastes is available.)

Prices on Application.
CABINETS FOR ALL
PURPOSES.

- For years we have specialised in making cabinets for mantel radios of all types, for portables, and for test equipment.

- Our new factory is equipped to fulfil orders for one case, or for one thousand, while heavy stocks of latest covering materials in a variety of tonings enable us to offer clients a product that is the last word in smartness and durability.

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MILLION VOLT RESISTORS...

Maybe you don't need million volt resistors . . . yet it is worth knowing that the same famous IRC Metallized resistance principle, best known in the little 1/2-, 1- and 2-watt Insulated Resistors for radio use, has now made possible outstanding advances in both high voltage and ultra high frequency resistors for advanced scientific research purposes.

10,000 ohms at 1/2 watt—100,000 volts at 150 watts—1,000 megohms at 150 volts . . . regardless of the need, the IRC Metallized element can supply them all, dependably and economically.

"Metallized" Resistors are made under IRC patents in eight countries. The Metallized type of element is the most adaptable yet produced. No other resistance material holds such an outstanding record of past success. None holds such broad possibilities for future development. Whatever your need—insist on the best!

"They Stay Put"

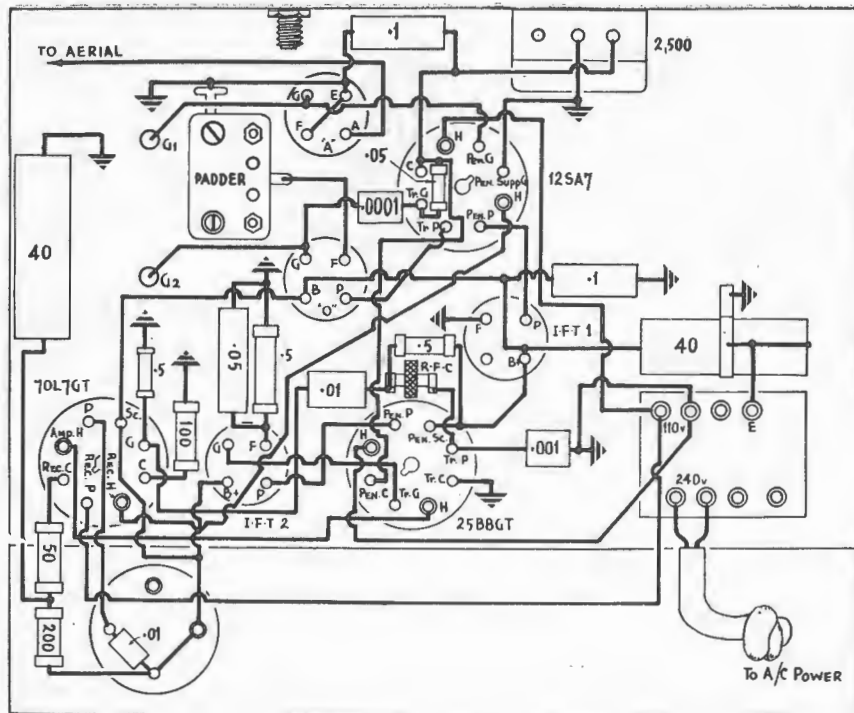


INSULATED

Metallized
RESISTORS

TYPE BT

W. J. McLELLAN & Co.
55 YORK ST. SYDNEY



Picture diagram of the wiring.

the merit of the practice of using low voltages.

Apart from the actual power input, it should be impossible to obtain a serious shock from any of the other terminals in the set. We don't recommend trying it out, of course, for a nasty little jolt can be had from 110

volts, but there should not be anything like the danger that is associated with a power transformer supplying 385 volts and capable of delivering 100 watts of power.

The Detector.

The detector circuit itself is also something rather unusual, and one we can't recall having seen published previously.

But enough of this meandering about the novelty of the circuit; let's get on with the job of building one.

The Parts.

First step, as usual, is to get the necessary parts together, and the most important of these is the base. Being the pioneer on the job, we had to get an aluminium blank and cut all the holes as required. Your task of duplicating the set is lots simpler, for you can take advantage of the template diagram which we publish. You can order a ready-drilled base from your radio dealer and rest assured that once you have this base you can't go wrong with the layout in any way.

The power transformer is not a stock line, perhaps, either, but it presents no difficulty. It is quite a simple transformer and again it should be merely a matter of placing your order and the transformer will be ready within twenty-four hours, if not already in stock.

The valves, of course, are very special. They may not be available yet in all brands, but you can rest assured that you will be able to get them in at least one thoroughly reliable brand.

THE "DANDY THREE."

List Of Parts.

- 1 Base, size 10 1/2" x 6 1/2" x 2" (Acorn)
- 1 Power transformer, 110 volt secondary (half wave), 250 milliamps, primary 220/40/60 (Radiokes)
- 1 Coil kit, aer., osc., 2-inters. and padder (R.C.S., Radiokes)
- 1 Tuning condenser 2-gang to suit, with trimmers (Stromberg)
- 1 Dial to suit (Efco)
- 2 40 mfd. 150-volt electrolytic condensers (Ducon)
- 2 .1 mfd. tubular condensers
- 1 .05 mfd. tubular condensers (Solar, T.C.C.)
- 1 .0001 mfd. mica condenser
- 1 .001 mfd. mica condenser
- 2 .01 mfd. mica condenser (E.T.C., T.C.C.)
- 1 50 ohm 3-watt resistor
- 1 100 ohm 3-watt resistor
- 1 200 ohm 3-watt resistor (I.R.C., R.C.S.)
- 1 50,000 ohm 1-watt resistor
- 3 500,000 ohm 1-watt resistors (I.R.C., Bradley)
- 1 Radio frequency choke (R.C.S.)
- 1 2,500 ohm potentiometer (R.C.S., Radiokes)
- 3 Octal sockets, 1 UX socket (Tasma)

VALVES:

- 1 12SA7, 1 25B8GT, 1 70L7GT (Ken-Rad, Brimar, Radiotron)

SPEAKER:

- 5" midget speaker (Amplion, Rola)

Coils.

The coil kit is quite normal, and the new type of frequency changer valve worked to perfection when used with the stock coils originally designed for use with the 6A7. As will be seen from the photographs of the original chassis, the coils are of the midget variety, fitted in small square cans for snug layout.

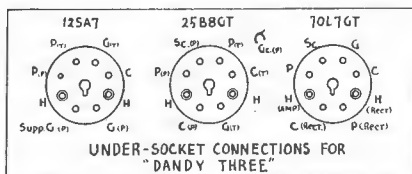
Actually, we could have built up this set into a really baby midget, especially as it uses only three valves in all, a baby transformer and so few other components. But we have a strong feeling that the small set idea has been rather overdone in the past six months. You need to be a wizard to get the bits into the space allowed in some of them, the picture diagrams become hard to follow, and the set itself becomes difficult to service. Accessibility in some of them must rate well below zero.

But not so with this job. An inch or two has been allowed, and we feel sure that it will be appreciated in the long run, for it helps to make things lots easier.

The Dial.

Being a cheap little set, we felt that it did not warrant the use of one of the big edge-lit dials, and so we fitted one of the simple dials designed for use with portable sets.

The dial consists of a drum which mounts on the shaft of the gang condenser, a shaft which mounts in a bushing in the base, and a piece of cord and a spring to connect them up. At first glance it looks as though the assembly might be difficult, but in practice it is as simple as A.B.C., and you get a sweet-acting little dial for less than half the cost of the next style listed.



Assembly.

Having obtained the parts, the next step is to tin the soldering lugs on the components.

If you do this before you start the assembly you'll find that it saves a lot of time, especially in the case of the valve sockets, the coil terminal lugs and the lugs on the gang condenser. Using an old file or a hack-saw blade, it is easy enough to scrape the metal well and get a good coat of solder to stick right into the metal, but not nearly so easy after the parts have been mounted on the base. Good

tinning of the lugs lays the foundation for good wiring with joints which will not be noisy when the set is in operation. Nothing is more difficult than to try and trace noises in a set which are caused by ineffective soldering.

The actual screwing of the parts to the base is the next step and when this is being done one eye should be kept on the photographs and diagrams to make sure that you have things around the right way. This remark applies particularly to the coils and valve sockets, which should have the lugs facing in the directions indicated in the diagrams.

Wiring.

Wiring should be started by connecting up the heaters of the valves. This matter is important, and so a special diagram is shown which should leave no room for doubt.

Then the coils can be wired in, and finally the minor components can be added. Great care will have to be taken to make sure that the socket connections are correct. Diagrams of the socket connections are given and should be doubly checked.

There are eight pins to each valve socket and you need only one mistake to mean that the set won't work, or even to mean that the valve is spoilt

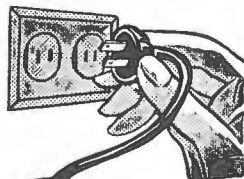
(Continued on page 27)

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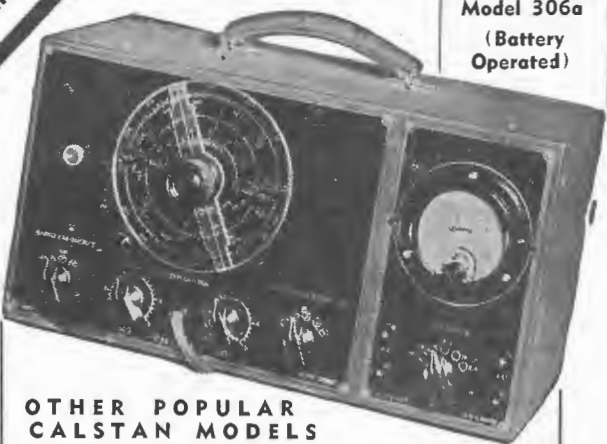
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Beyond the Gates

A short story about the design of battery sets for use in country districts.

AFTER you leave the main road there are seven gates in the next eight miles and then you'll see the homestead." These were the lines which fixed my attention one day when I received a letter in my office. The letter was from a radio enthusiast who had been making fairly good use of our query service, and quite a friendship was springing up between us. This latest letter contained an invitation to drop in and stay for a holiday, and it arrived when I was in a most receptive mood.

As a contrast to the bustling crowds of the city, the idea of the seven gates seemed the very essence of the peace and quiet of the real bush.

The holiday turned out to be a great success, too. I returned to the office feeling in the pink of condition, and also quite a bit informed as to the real problems of the listener in those parts of the State which are a couple of hundred miles from the city.

Pen Friend.

My "pen-friend," when I found him in the flesh, was a typical Aussie, gifted with keen perception and a discriminating mind. Heaven help any glib-tongued city slicker who ever tries to sell him anything he doesn't want, and likewise the radio set salesmen who try to prove that their receivers have long range, when their claims are not backed by effective performance.

Donald was his name, and, although he owns over ten thousand acres of sheep country, his heart is in radio. His little radio workshop is neatly fitted up with all the necessary meters and test equipment and he finds it a labour of love to look after the service problems of his friends for a radius of more than fifty miles around.

These friends might well be envied the service they get, for Donald can certainly make sets work, and his own receiver is easily the finest battery receiver which I have ever operated.

As I know lots of readers will be interested, I am giving a few details of its design and construction.

In the first place Donald is firmly of the opinion that a dual-wave receiver is no good unless it has one r.f. stage and two stages of intermediate amplification. For a straight broadcast receiver he'd prefer a job with an r.f. stage and a single stage of i.f. at 175 k.c. But if you have to use 465 k.c., since dual-wave kits are not to be obtained for the old 175 k.c. inter-

mediate frequency, then two i.f. stages are needed.

Valves.

When it comes to selecting valves Donald likes the two-volt series, having had bad luck with the 1.4-volt filaments when they have come through the post. Rugged filaments are essential to withstand the trip, and so 2-volt valves are preferred. As regards the r.f. and i.f. stages there's not much to choose between the American and Continental types, but in the converter stage, well that's where Donald thinks you can't get anything to compare with the KK2.

Coils.

When it comes to the matter of selecting coils our man from the bush expressed some firm opinions, which I have since checked to find that they are undoubtedly correct.

As regards coils for dual-wavers he won't touch the coil boxes or brackets, but prefers to get the individual coils, type D.I.C., wiring in the switch as part of the job of building the set.

High gain i.f. transformers with iron cores are used, and the resultant oscillation trouble is then patiently ironed out of the finished set by adding about half-a-dozen extra .1 condensers as by-passing at logical points along the high tension and screen lines, wiring a couple of feet of braiding over the plate leads, and even fitting small metal shields amongst the wiring until stability is obtained.

Quality Reproduction.

Quite a high standard of reproduction is obtained by using class B output, with quality components. According to Donald you have to pay the price if you want quality, and so he sets the example by using a Ferranti AF15C audio transformer and an Amplion L5 speaker.

Results with the 1K6 have not been up to expectations, and a 1B5 is preferred in the detector socket, again assisting to avoid distortion in the reproduction.

A crystal pick-up is used for gramophone record reproduction, and in this respect the results are quite surprising for a battery set, with lots of power and excellent quality.

Broadcast Only.

For a straight broadcast receiver the set which Donald says he has found to give the best results is a six-valver, using a KF2 or 1C4 r.f. amplifier, KK2 converter, one stage of

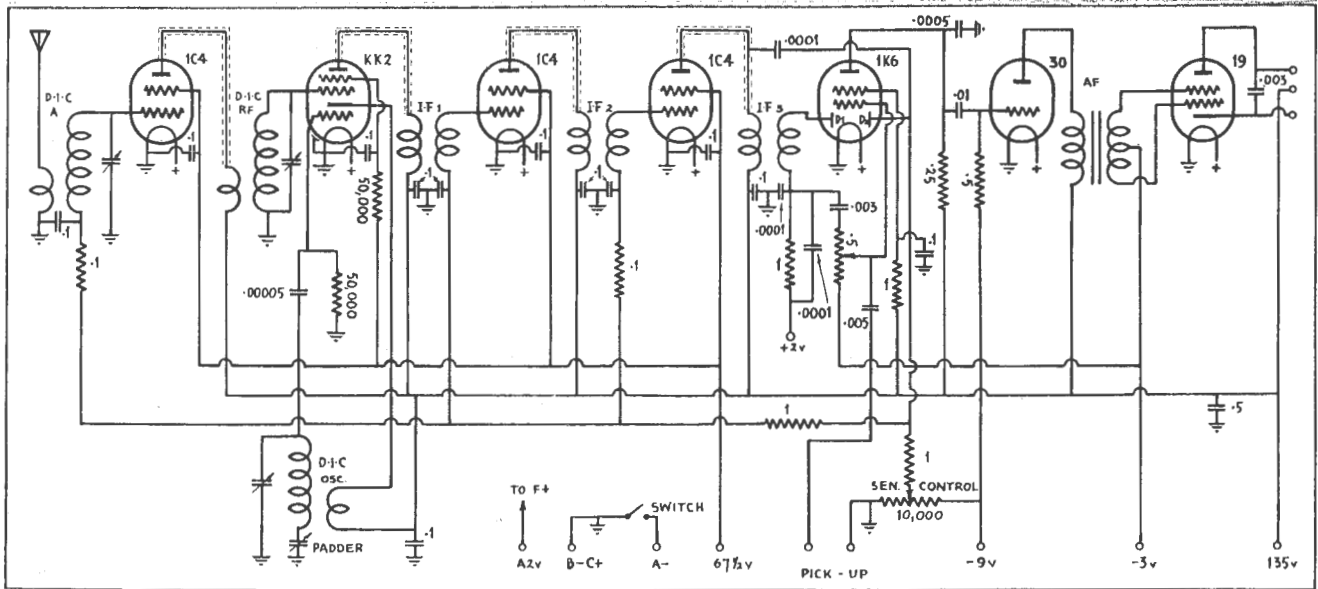


Donald.
Our bushman friend with one of his amplifiers. The top of a kerosene tin serves as the base.

i.f. at 175 k.c., and then the normal audio end consisting of a 1B5 detector, 30 amplifier and 19 output valve.

For such a set, however, there is a tip about coils which means quite a bit in practice. Don't use the maker's kit of coils, but insist on using type BIC aerial and r.f. coils, with a type BC2 oscillator coil. Especially with the KK2 converter this arrangement of coils gives better performance.

Such a hint is the kind of practical tip which you can get only from a practical man, and in many cases it is worth a whale of a lot of theory. It is on this account that I make no



Donald's circuit for a dual-wave battery set.

excuse for handing you on some of the little things I learnt while I spent a holiday beyond the seven gates.

Bush Tragedy.

Donald tells a good story of the time that he built an amplifier for the dance held in the village, twelve miles away. A baffle board was needed, and so Donald started to explain

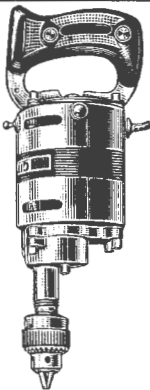
to the local carrier that he wanted him to get him one when visiting Bathurst the next day. Asked if he knew what a baffle board was, the carrier expressed doubt, but after the first few words of an explanation about it being a big board with a hole in the middle the carrier did not wait to listen further, but bustled away

to his truck.

Perhaps, therefore, it was not surprising that when the baffle board arrived it was an excellent affair, but unfortunately the hole in the middle, er—well, it wasn't perfectly circular; in fact, it was of a shape which made it hardly suitable for display in a ballroom!

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HOW TO BUILD AND USE AN OUTPUT METER

In accordance with our policy of dealing with testing equipment and its operation, we present this article by A. Earl Read on the output meter. Watch for further test equipment articles in future issues.

FOR accurate alignment of a receiver to ensure maximum gain, a service oscillator such as the "Radio World" All-Wave Service Oscillator described in the January issue, is essential. This instrument is provided with a five-band directly-calibrated scale that enables a modulated or unmodulated signal on any frequency between 150 k.c. and 30 m.c. to be chosen at will.

However, even alignment with a highly accurate service oscillator is not dependable, unless some reliable method is available of determining comparative audio outputs. Fair accuracy is possible using the ear for this purpose, but where optimum results are wanted the ear is not a very satisfactory indicator, because it cannot easily distinguish small changes in intensity of sound.

This can be easily proven by connecting an output meter to a receiver that is being aligned, when it will be noticed that the output as recorded by the meter will vary a few divisions for each stage adjusted before the ear

A general view of the Calstan output meter described in this article.



detects any change. With five or six tuned circuits to align, it is obvious that the effect is cumulative, and that a receiver aligned by ear, no matter how carefully, can easily give a vastly superior performance when aligned using an output meter.

Cheap, Yet Effective.

An output meter is essentially an a.c. voltmeter, a moving coil movement with a copper oxide rectifier to rectify the a.c. being generally used. However, instruments of this type are expensive, and actually are far more elaborate than is necessary as far as receiver alignment is concerned. All that is needed is not absolute measurement of wattage output or peak signal voltage, but merely a means of comparing varying volume levels of a signal fed into a receiver from a service oscillator.

With these facts in mind, Slade's Radio, manufacturers of Calstan test equipment, have developed a new type of output meter that is cheap, reliable, and fulfills all the essentials of an instrument of this type designed for general service use.

The basis of the instrument is a high resistance, high sensitivity moving iron meter specially developed for the job. Wirewound multipliers are used to provide three ranges (0-2½, 10 and 50 volts) that will take care of all variations in output voltages.

The Calstan kit of parts comprises the moving-iron meter, crackle-finished steel case, four terminals, three wirewound multipliers, and a pair of test leads fitted with crocodile clips.

In building the instrument, the

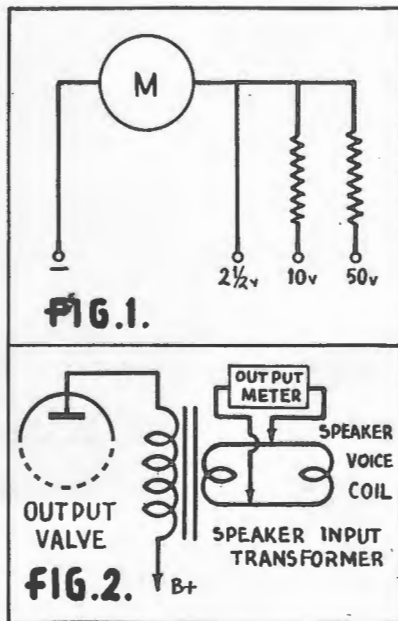
meter is first bolted in place, and the four terminals mounted. Next, the multipliers are wired in circuit (see Fig. 1) and the job is complete.

With the moving coil type of output meter, there are several alternative ways of making connection to a receiver, that chosen generally depending on the type of output circuit used. With the moving iron type, however, there is only one correct connection with all types of sets—battery or a.c., with single-ended or push-pull output. This connection is across the speaker voice coil, as shown in Fig. 2.

Operation.

In operation, the crocodile clips fitted to the test leads provided are clipped either to the two lugs at which the flexible leads from the speaker voice coil terminate, or across the speaker input transformers secondary, whichever is the more convenient. The voltage range chosen should be such that the meter needle is approximately at the centre of the scale. As the receiver comes into line, the oscillator output should be reduced by means of the attenuator, the output meter range also being altered if necessary.

It will be found that for comparing sound outputs only, this Calstan moving iron instrument loses nothing in comparison with the much more expensive moving coil type. As well, its use in conjunction with a service oscillator, while not essential, is desirable as a means of ensuring maximum accuracy in receiver alignment.



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SYDNEY AND MELBOURNE

The WONDER ONE

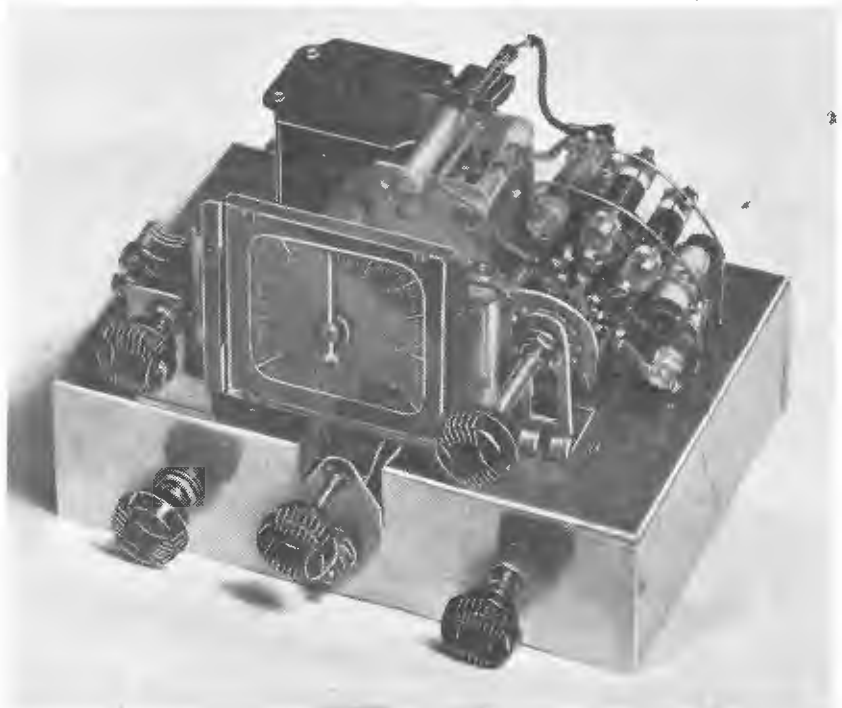
A five-band one-valve battery set, capable of giving loud-speaker results. The circuit is also ideal for a straight broadcast receiver or a dual-waver with plug-in coils.

MODERN radio development is not so spectacular as it was ten years ago, but there is still a lot of improvement when you look closely into things. Then you find that correct application of new valves makes for remarkable results, and when you come to the subject of little one-valve sets you find that advances made recently are positively sensational.

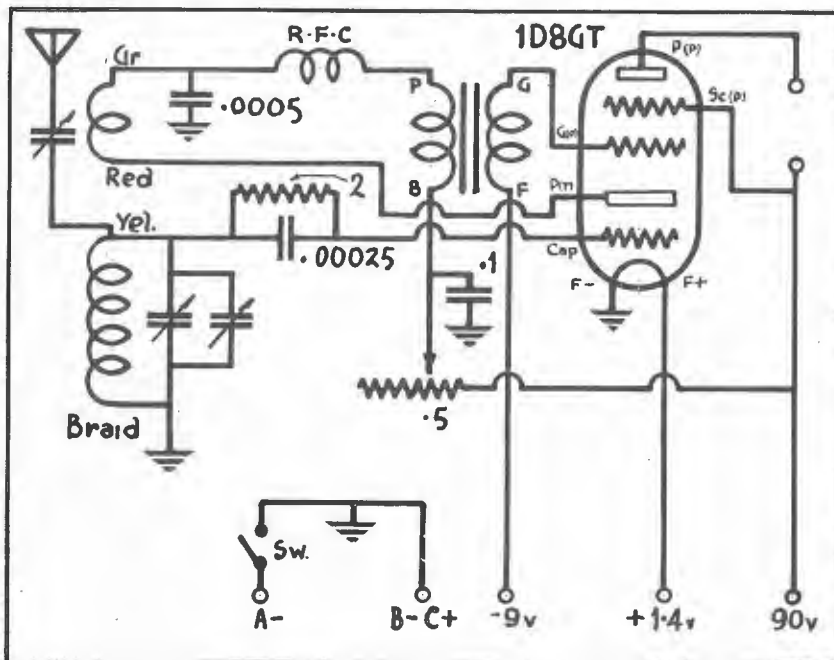
Even up to a few years ago a one-valve set had only limited scope, and all that could be expected of it was headphone reception from nearby stations. Then came the twin-triode types of valves, designed for push-pull operation in class B amplifiers, and adapted to one-valve receivers by cunning circuit designers. Performance in many cases was just about equal to that which could be expected from a pair of ordinary general purpose type triode valves of the style normally used in battery receivers a few years ago.

Then only a few months ago came the new type valve known as 1D8GT.

This valve has been designed by the technicians of the valve factories to simplify the construction of midget portable receivers, and consists of so many internal elements that it can



Only a one, but what a one!



The simple circuit used.

operate as a diode detector, supply the necessary voltages for automatic volume control, give audio amplification and yet in the same bulb is a complete beam power type of output valve unit.

This valve has already been used in portable circuits in the way for which it was designed, such as in the portable receiver detailed in our issue for last November.

Now we apply it to the circuit of a one-valve set and what a wonderful set we get, surely well merited for the title, "Wonder One."

Performance.

Tested at Rose Bay immediately on completion, the original receiver, shown in the photographs, proved that it was something quite out of the ordinary run of one-valve sets by bringing in the eight local stations at comfortable loud-speaker strength on a permagnetic speaker. Without exaggeration, the volume from the speaker was so loud that every word from the radio announcer could be heard all over the house. That was in the daytime, and when evening came we were

not surprised to find that several distant stations were heard on the loud-speaker, too, three or four of them being pulled in over distances of more than 500 miles. Surely wonder results from a one-valve set!

The Coils.

In search of something still more sensational, we have built up the set with a coil unit consisting of one of the sections of the big R.C.S. communications-type five-band tuning assembly. This allows tuning over the entire spectrum from 9 metres to the top of the broadcast band, but we

would point out, for the benefit of those readers who want a simple broadcast set, that the circuit as described is equally suitable for use with an ordinary broadcast coil; the chassis, layout and the rest of the components remaining exactly as specified.

The Circuit.

A glance at the schematic of the circuit will show that we have neglected the diode plates of the valve, used the triode portion as a leaky grid detector and transformer-coupling it to the beam-power portion. We have

obtained regeneration by using a feedback coil to couple the plate circuit back to the grid circuit and then controlled the regeneration by regulating the plate voltage on the detector by using a half-megohm volume control as a variable series resistor. The essentials of this circuit, i.e., the transformer coupling and the plate voltage type of regeneration control, have proved themselves ideally suited to little sets of this type, and, although we tested out the use of resistance coupling and capacity-controlled regeneration, we haven't the slightest hesitation in saying that this set, exactly as detailed, represents the last word in one-valvers.

Until such time as further revolutionary changes are made in valve design it should be well nigh impossible to get greater efficiency or better performance from any one-valve receiver.

Construction.

The building of a little set of this kind is just child's play, and there are only one or two minor details to be watched.

One of the most important is to get a good and carefully-selected kit of modern component parts. Although this set can be built from junk, we can only recommend such work to those who are experienced builders and of the type prepared to spend a few hours straightening things out after the set is built. But if you are of that type you won't be worried to read this far; in fact, you'll already have the set built and operating, and so I will direct my instructions to those novices who need them.

And so, as I was saying, get a kit of selected components from a radio dealer who specialises in supplying such kits. If he is accustomed to handling the business, he will be able to help you in many odd ways, but if he is just the kind of radio dealer



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THE "WONDER ONE."

List Of Parts.

- 1 Base, size 9" x 6" x 2" (Acorn)
 - 1 Tuning unit (R.C.S., Radiokes)
 - 1 Single-gang condenser (Stromberg)
 - 1 Dial to suit (Efco)
 - 2 3-plate midget condensers (Raymart, R.C.S.)
 - 1 Audio transformer (R.C.S., Radiokes)
 - 1 .5 meg. potentiometer (I.R.C., E.T.C.)
 - 1 2 meg. resistor (I.R.C.)
 - 1 .1 mfd. tubular condenser (Solar, T.C.C.)
 - 1 .0005 mfd. mica condenser (T.C.C., E.T.C.)
 - 1 .00025 mfd. mica condenser (T.C.C., E.T.C.)
 - 1 R.F. choke (R.C.S., Radiokes)
 - 1 Switch (Alfa)
 - 1 octal socket, 1 6-pin (Tasma)
- VALVES:
- 1 1D8GT (Radiotron, Brimar, Ken-Rad)
- BATTERIES:
- 1 PR8 1.4-volt cell, 2 PR45 "B" batteries, 1 9-volt "C" battery (Ever-ready)
 - 1 Phones or speaker.



"Wonder One" complete.

who sells sets as his main business, then he may make minor mistakes in getting together the kit, these minor mistakes growing to major headaches by the time they are handed on to you.

Assembly.

Once you get a good kit, with a ready-drilled base, the assembly is a simple task and the wiring up is the main difficulty.

It is a great help to be able to solder properly, and so a few words in this direction won't be out of place. To get joints soldered cleanly and efficiently, it is highly desirable to get the two surfaces cleaned and scraped first, then tinned with a coating of solder on each individually.

Next step is to put the two surfaces together, apply equal heating to both from a clean iron and there you are, with a neat and effective joint. But trying to solder dirty wire to tarnished lugs is a hopeless job, no matter how hard you try. So our tip is to scrape and tin the solder lugs first, before you even start to assemble anything. Take the valve sockets, the lugs on the condensers and the volume control and all other soldering lugs and scrape them with a hack-saw blade, an old file or even a blunt pocket-knife blade. Apply a thin smear of fluxite, run on some solder with a clean iron, and then wipe the surface of the lug with the face of the soldering iron, thus running the solder right in to the very pores of the metal.

With the lugs all tinned before assembly and using the proper kind of hook-up wire, with stranded cable of tinned copper wire, the wiring up process loses all its terrors.

To return to the assembly instructions; fit the three valve sockets first, the four-pin one for the speaker, the six-pin one for the battery lead plug, and the eight-pin one for the valve. Next fit the audio transformer, with four pieces of hook-up wire soldered to its lugs, if wires are not already provided with this component.

Next the condensers can be fitted, with the dial fitted to the main tuning condenser, and a six-inch length of

Here's why I bought a

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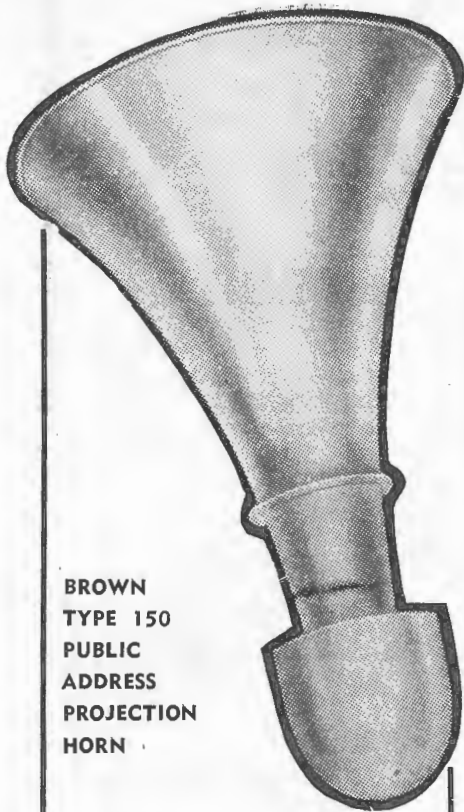
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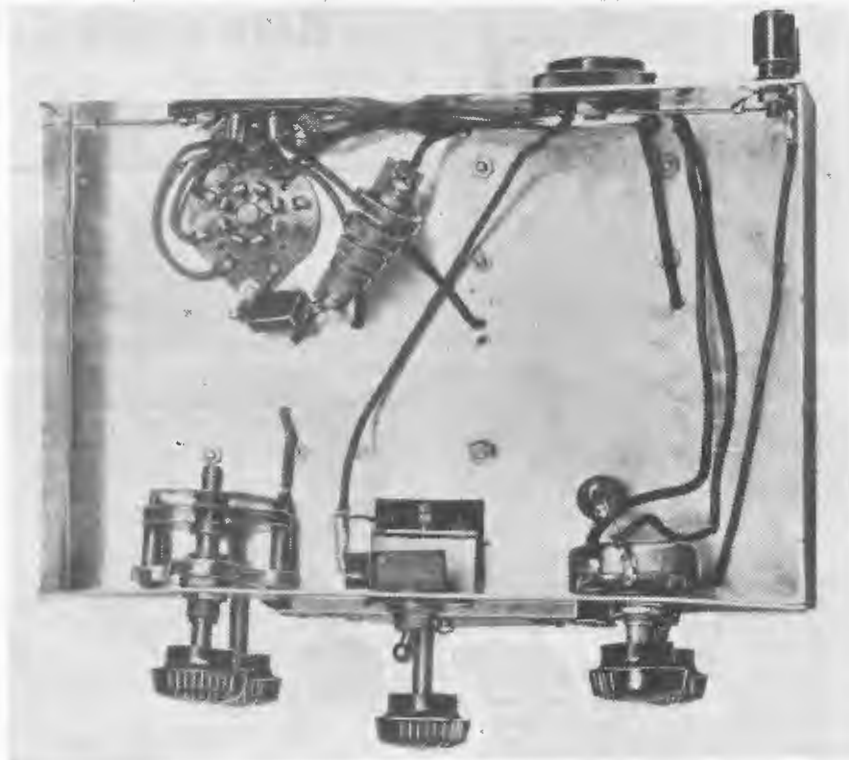
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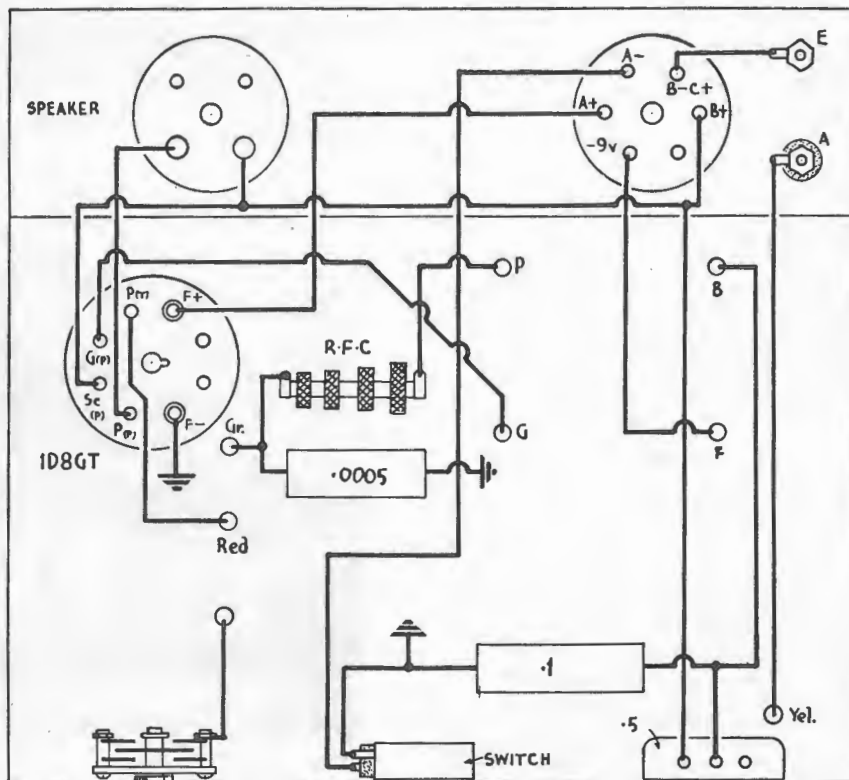
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Compare the picture diagram, below, with the photograph of the original receiver, above, and you will get a good idea of the wiring and the arrangement of the small components.



wire soldered to the bottom insulated terminal of this condenser before mounting.

If the kit has been selected properly there won't be the slightest difficulty to make the dial and condenser fit, and after the volume control has been fitted the actual wiring can be started.

Towards the end of the job the coil unit can be wired into place, but we strongly advise that the coil unit be left off until the wiring is nearly finished, otherwise the coil stands an excellent chance of getting knocked about when the chassis is upside down for the wiring process.

Wiring.

First wires to be fitted should be to the filament of the valve. Noting carefully the position of the key indicator in the centre of the octal socket, the filament terminals are selected and wired to the battery plug socket. Looking at the bottom of the octal socket the pins are considered to be numbered, running in a clockwise direction from the key. The filament terminals are No. 2 and No. 7, and the picture diagram of the wiring should be watched carefully and the

DANDY—contd. from p.17.

if the set is switched on with the wrong connection.

Testing.

After the wiring has been thoroughly checked to make sure that there are no mistakes, the valves can be fitted, the speaker plugged in, and the set tested with a short aerial.

The valves should heat up until the heaters can be seen as glowing red, and the set should then tune in the local stations with a swing of the dial.

Alignment.

Swinging down to a station at the bottom end of the dial, such as 2SM, the trimmer on the aerial section of the ganged condenser should be adjusted for best results.

Then swing up to the other end of the band, such as to 2FC, and adjust the padder whilst rocking the dial to and fro, keeping the volume low during the alignment process, by means of the volume control. At low volume levels it is easier to tell whether an adjustment is increasing the strength or not.

Faults.

If some fault is built into the set it should be easy enough to find it by re-checking the job with the diagrams, but if this fails you may have to enlist the aid of the radio dealer who supplied you with the parts.

If you prefer you can take advantage of our laboratory service, as detailed on another page in this issue. In ninety-five cases out of every hundred, however, the set should work to perfection and require no attention whatever.

filament wiring checked from it at least twice.

About the worst tragedy that can happen to a set of this kind is to have the valve filament burnt out by applying high tension current to it by mistake.

The rest of the wiring is simple enough and its completion is merely a matter of following out the picture diagrams.

About the base there are a few items to be wired. The grid-leak and condenser can mount directly on to the gang condenser terminal and then run straight over the cap clip for the

valve.

Operation.

When the set is in operation the volume control will not act like the volume control on an ordinary broadcast superhet or other big receiver. Actually it is a regeneration control, not a volume control, and it will be found that as it is advanced the volume will grow louder and louder and then the set will squeal. It must not be operated in a squealing condition, as any experienced operator should know.

The best results are obtained just below the point where the set squeals.

Reach Out for Results . . .

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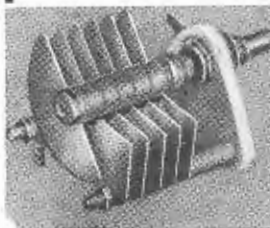
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* * *

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FALCON D/W FOUR	1—DC2 2—ISC or ISP/465 I.F.'s	" "
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Shortwave Review

CONDUCTED BY
ALAN H. GRAHAM

More New Stations Heard ★ Conditions Improve As Autumn Approaches ★ Byrd Expedition Heard On 20 Metres ★ U.H.F. Bands Improve A Little ★ Full List Of Month's Loggings ★ QSL Exchange Bureau.

Review Of Conditions.

Since the middle of February the approach of autumn has resulted in a marked improvement in signals on all bands; and reception conditions are now very good throughout most of the night and day. It is not surprising therefore that several new stations appear in the list of the month's loggings.

New Stations.

The attention of readers is drawn to the following new stations; the majority of them have been heard quite well, and DX fans should have little difficulty in adding them to their logs.

The new Argentine station, LRA-3, has been heard some mornings on the same frequency as WRUW—11730kc., 25.58m.

Egypt now has a regular shortwave transmission, through a station on 7860kc., 38.17m. This station has been heard quite well between 4.30 and 6.30 a.m. Call is thought to be SUX, but this has not been verified.

A new Australian transmitter is using VK3ME's old frequency; this is VLQ-5, 9590kc., 31.28m. Listeners will also have noted changes in the frequencies of VLR-3 and VLW-2

A new NIROM station, carrying the same programme as YDC and YDB, has been reported on 11910kc., 25.19m. Although not heard yet in our locality, it is reported at good strength from Western Australia.

Rangoon, known to DX-ers through XYZ, has another transmitter on the 49-metre band—on 6056kc. Call is unknown, but no difficulty should be experienced in logging this station, as it is much stronger than XYZ.

The latest Paris Mondial station heard is on 9520kc., 31.5m. It is apparently used during the afternoons in place of TPC on 9680kc.

Unidentified.

One or two "mystery" stations have been reported during the month. One of these, heard by our W.O. observer, Mr. Pepin, is an Eastern station on 34 metres. He thinks it may be a Jap—possibly JIB, 8650kc., 34.71m., or perhaps ZBW, Hong Kong, back on their old channel of 8750kc., 34.29m.

Another station reported by Mr. Pepin is an Italian 'phone station heard testing on approx. 18.4m. In

all probability this would be ITK, It. Somaliland, 16385kc., 18.32m., or IRY, Rome, 16117kc., 18.61m.

A third unidentified station is a new South American on the 31-metre band, on the same frequency as WBOS. It is heard in the early mornings, and is probably a Colombian, but QRM renders the obtaining of further details most difficult.

Byrd Expedition.

20-metre fans will doubtless be concentrating all their attention on logging the stations operated by the Byrd Expedition in Antarctica. Already Mr. Hastings, one of our Queensland observers, has succeeded in logging KC4USC, one of the Byrd stations. This station, together with KC4USA and KC4USB, operates on 10, 20 or 40 metres; but the 20-metre band would seem easily the best bet for reception here.

Australia Tells The World.

Australia is certainly telling the world where she stands in the present conflict through the new VLQ stations of the Ministry of Information. In addition the A.B.C. programmes are relayed through VLR and VLW.

Acknowledgements.

We wish to acknowledge reports from the following:—Messrs. Bantow, Neill, Hastings, Chapman, Taylor,

Coggins, Ferrier, Pepin, Dignam, Johns and Cushen (all "Radio World" observers). And also from Messrs. Washfold and Coucher.

Readers forwarding reports for the Shortwave Review are requested to let us have them by the fourteenth of each month.

Calls Heard

(Reports to hand from Messrs. Pepin, Dignam, W.A.; Taylor, N.S.W., and Hastings, Qld.)

10 Metres.

United States: W- 2BUR, 4AYU, 4FJM, 4EJQ, 6KID, 6LVK, 6RKI, 6CIN, 7HGK, 7HKI, 8FCO, 9BRZ, 9CXU, 9DAF, 9BCX, 9QHO.

Hawaii: K6- KWT, ILG, PLZ, PCW.

20 Metres.

South America: CE- 1AO, 1AS, 1AR, 3CC, 3CZ, 3AC, 2AM, 5HE (Chile).

Central America: K5AM (Canal Zone).

The East: J2NF (Japan), PK1MF, PK1OG (Java), PK5HL, PK5JP (Borneo), XU- 1A, 1B, 1HI, 8AM, 8ET, 8MC, 8LA, 8RJ, 8MY, 8HN, 8XA, 8AF (China); KA- 4LH, 1AF, 1LB, 1FM, 1AG, 1BH, 1JM, 1AR, 1MN, 1CW, 1SM, 1OZ, 1FG, 1BB, 1GC, 1FH, 1LZ, 4RP, 4LA, 7RF, 1AM, 1ME, 1LB (Philippines).

Pacific: K6- CMC, BNR, MVA, QHU, OJI, MZQ, NYD, YVU, OGE (Hawaii), KF6JEG (Canton), KB6- ILT (Guam).

Antarctica: KC4USC (Byrd Expedition).

Latest Station Schedules and Changes

Egypt.

In addition to the new 38-metre station referred to elsewhere in these notes, it is learnt that a new 500-watt transmitter in Cairo is, or soon will be, testing on a number of frequencies, including 6010kc., 49.92m., and 11780kc., 25.47 (N.Z. DX-tra).

Nepal.

It is reported from U.S.A. that a station in Nepal, announcing as "Radio Katmandu," is operating on 14780kc., 20.3m. (I.D.A.).

Greece.

A 10kw. station at Sparta is expected to commence tests shortly. Frequencies and calls to be used are:—SVD, 6885kc., 43.6m.; SVL, 7228kc., 41.5m.; SVG, 7805kc., 38.4m.; SVH, 9030kc., 33.3m.; SVI, 9695kc., 30.93m.; SVJ, 9825kc., 30.5m.; SVM, 9935kc., 30.2m.; SVN, 10705kc., 28.0m.; SVP, 12195kc., 24.5m.; SVQ, 13640kc., 22.0m.; and SVT, 15015kc., 19.9m. (N.Z. DX-tra).

Guatemala.

The amateur station, TG5JG, which has been experimenting on 11750kc., 25.53m., may receive a licence to continue regular transmissions on this frequency. (I.D.A.)

Lithuania.

Latest schedule gives LYR's hours of transmission as:—Daily, except Sundays and Mondays, 6.30-7 a.m.; 4-4.40 p.m.; Sundays, 5.30-6.15 p.m.; 10-11.45 p.m.; Mondays, 3.30-5.15 a.m.; 6-7.30 a.m. LYR operates on 9290kc., 32.3m. (Rodex)

U.S.A.-Hawaii Relays.

Stations heard carrying relays between U.S.A. and Hawaii, in addition to KKQ, which is mentioned elsewhere, are KKH, 7520kc., 39.9m.; KQH, 14920kc., 20.1m.; and KQZ, 17980kc., 16.7m. (WDXA and GCDXC).

United States.

Latest schedules for WGEA are:—13 metres: 8.30 p.m.-11.30 p.m.; 19 metres: 11.45 p.m.-6.30 a.m.; 31 metres: 6.45-9.45 a.m.

WGEA will soon place in use new 100kw. transmitters on 6190 and 21590kc.

Mexico.

A new Mexican station is XEKW, Morelia, on 6030kc., 49.75m. (Universalite).

Newfoundland.

In addition to VOFB on 24 metres, Newfoundland now has a station on 9475kc., 31.6m. Call is VONG, and location St. Johns.

THE MONTH'S LOGGINGS

(Stations not listed in this section in the previous issue are indicated by an asterisk).

N.B. ALL TIMES ARE AUSTRALIAN EASTERN STANDARD.

SOUTH AMERICA.

Peru.

***OAX47**, 9556kc., 31.38m., Lima: Reported from New Zealand. Card recently to hand gives schedule as 2-4 a.m. (Johns).

OAX4J, 9340kc., 32.12m., Lima: Still a fairly regular station; heard either around 7 a.m., or latish on Sunday afternoons.

***OAX1A**, 6335kc., 47.33m., Ica.: Heard in New Zealand with weak signal on Sundays at 3.30 p.m.; signs with "Goodnight Song," by Ted Lewis (Johns).

OAX4Z, 6077kc., 49.37m., Lima: Still reported from New Zealand; also believed to be audible in Queensland. Latest schedule given as 2.30 a.m. to 4 p.m. (Johns).

Ecuador.

HCJB, 12460kc., 24.08m., Quito: Fairly regular station at night between 10 and 11 p.m.; sometimes puts in quite a good signal (Chapman).

***HCODA**, 9445kc., 31.77m., Guayaquil: This unusual station is reported from New Zealand; heard around 3.30 p.m. on Sunday afternoons. Address is P.O. Box 704 (Johns).

Colombian Republic.

HJFK, 9740kc., 30.8m., Pereira: Good strong signal nightly, opening at 10 p.m.

Chile.

CD-1190, 11910kc., 25.19m., Valparaiso: Reported with fair signals in New Zealand on Sunday afternoons, 1.45 p.m. (Johns).

CB-1170, 11700kc., 25.64m., Santiago: Still heard quite well at times; either early morning around 7 a.m., or in mid-afternoon. (Chapman).

Argentina.

***LRA-3**, 11730kc., 25.58m., Buenos Aires: New South American station heard in early mornings. Difficult to log as on same frequency as WRUW.

***LRA-1**, 9690kc., 30.96m., Buenos Aires: Again being heard fairly regularly in the mornings, opening at 8.30 a.m. Weak.

CENTRAL AMERICA AND WEST INDIES.

Guatemala.

TGWA, 15170kc., 19.77m., Guatemala City: Widely heard with good signals; mornings around 7 a.m. (Mondays), and also occasionally on Sunday afternoons (Coggins, Washfold).

TGWA, 9685kc., 30.96m., Guatemala City: Still heard during afternoons, till 4.30 p.m. on Sundays (Johns).

TGWB, 6480kc., 46.2m., Guatemala City: Fair signals on Sundays around 4 p.m.; reported at better strength in N.Z. (Johns).

TG-2, 6195kc., 48.43m., Guatemala City: Still to be heard on Sunday afternoons between 5 and 6 p.m.

Costa Rica.

TIPG, 9615kc., 31.21m., San Jose: Remains a good signal from 10 p.m. nightly; also reported at 8 a.m. (Johns).

TILS, 6165kc., 48.66m., San Jose: Also opens at 10 p.m.; not nearly as good as some months ago (Neill).

Panama.

HP5A, 11700kc., 25.64m., Panama City: Heard regularly with good signal from 10 p.m. (Cushen, Chapman).

***HP5K**, 6005kc., 49.97m., Panama City: Opens with English announcements at 10 p.m.

Cuba.

COGF, 11800kc., 25.42m., Matanzas: Heard in the mornings after 7 a.m. when JZJ are off the air.

COCH, 9437kc., 31.8m., Habana: Now heard at various times; mornings around 7 a.m., at night (when often marred by code QRM), and sometimes in the late afternoons (Coggins).

COBC, 9350kc., 32.08m., Habana: Quite a good signal nightly from 10 p.m. (Washfold).

COCC, 3825kc., 33.98m., Habana: Fairly strong at night around 10 p.m.; and also heard at times at 7 a.m. (Washfold).

COHI, 6460kc., 46.44m., Santa Clara: Heard at good strength nightly; and also heard in N.Z. from 3.30 to 4 p.m., closing with a waltz number. Frequent mention of Westinghouse General Electric makes identification easy (Johns).

COCQ, 6360kc., 47.17m., Habana: Opens at 9.50 p.m.; slightly stronger than old 33m. channel.

COCW, 6324kc., 47.4m., Habana: Heard with good signal from 10 p.m. nightly (Washfold).

Dominican Republic.

H11N, 12486kc., 24.03m., Trujillo City: Reported from N.Z., with weak signal around 10.30 p.m. (Johns).

NORTH AMERICA.

Mexico.

XEQQ, 9680kc., 30.99m., Mexico City: Latest information reveals that call of this new station is **XEQQ** (not **XEWQ**). Heard daily till 4 p.m.; closing with "Bolero" (Johns).

XEWV, 9503kc., 31.57m., Mexico City: Heard regularly around midnight, and sometimes in the afternoon around 4 p.m.

XEXA, 6175kc., 48.58m., Mexico City: Reported from N.Z. on Sundays with English session, 2-3 p.m. (Johns).

United States.

WCBX, 21570kc., 13.91m., New York City: Cannot be heard at 11 p.m. when it comes on the air, but puts in fair signal after 1 a.m. Only 13-metre American now audible.

WNBI, 17780kc., 16.87m., Bound Brook: Still heard during mornings and early afternoons; seldom very strong; news at 1 p.m. (Johns).

WGEA, 15330kc., 19.56m., Schenectady: Good morning station, with news at 7.30 a.m. (Washfold, Bantow, Chapman).

KGEI, 15330kc., 19.56m., San Francisco: Heard sometimes after noon, with news at 2 p.m. (Johns).

WCAB, 15270kc., 19.65m., Philadelphia: Another good early morning station (Washfold).

WCBX, 15270kc., 19.65m., New York City: Only a weak signal now, just before closing at 6.30 a.m. (Chapman).

WPIT, 15210kc., 19.72m., Pittsburgh: Good signal around midnight (Chapman).

WRUW, 15130kc., 19.83m., Boston: Quite a good signal between 6 and 7 a.m. (Chapman).

KKZ, 13690kc., 21.91m., Bolinas: Heard during afternoons with special relays.

KKQ, 11950kc., 25.1m., Bolinas: As **KKZ**.

WPIT, 11970kc., 25.27m., Pittsburgh: Now very good signal at 7 a.m.; one of strongest morning stations (Washfold, Chapman).

WCBX, 11830kc., 25.36m., New York City: Heard at same time as **WPIT**, also a strong signal (Bantow, Chapman).

WRUL, 11790kc., 25.45m., Boston: Heard in the mornings between 7 and 8 a.m.; seems to be used alternatively with **WRUW**, 11730 kc. (Cushen, Chapman).

WRUW, 11730kc., 25.58m., Boston: Heard some mornings in place of **WRUL** (Washfold).

WRCA, 9670kc., 31.03m., Bound Brook: Quite a good signal during late afternoons, till as late as 5 p.m. (Johns).

WCAB, 9590kc., 31.28m., Philadelphia: Another late afternoon station, closing at 5 p.m.; news just before signing-off (Washfold).

WBOS, 9570kc., 31.35m., Boston: Still heard just before closing at 5 p.m.; news at 4.55 p.m. Signals rather weak usually.

WGEA, 9550kc., 31.41m., Schenectady: Heard weakly in the mornings (latest schedule being 6.45 to 9.45 a.m.); and also reported in late afternoons, around 5 p.m. (Cushen, Johns, Bantow).

WGEQ, 9530kc., 31.48m., Schenectady: Good strong signal in mornings, latest schedule is 5.30 a.m.-2.15 p.m. (Johns).

KGEI, 9530kc., 31.48m., San Francisco: Reliable signal in late afternoon and also from 10 p.m. (spoilt by QRM from **JZ1** in many localities) (Chapman).

QSL Exchange Bureau

W. J. S. Eddy, Irwell R.M.D., Canterbury, New Zealand.

Sam A. Tucker, Bluff, via Nome, Alaska.

Earl G. Marshall, 944 Mahoning Road, Canton, Ohio, U.S.A.

F. W. Hewitt, Springston R.D., Christchurch, New Zealand.

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John Versfeld, Klaasenbosch, P.O. Constantia, Cape Town, South Africa.

George Putman, 68-48 Kessell St., Forest Hills, New York, U.S.A.

E. H. Barker, 713 Ferry Road, Christchurch, SE1, New Zealand.

Felix Duval, rue Haine St. Paul 14, Bois-d'Haine, Belgium.

WCBX, 6120kc., 49.02m., New York City: Still heard at good strength in N.Z., 3-5 p.m. session (Cushen).

WLWO, 6060kc., 49.5m., Cincinnati: Very weak now in the late afternoon; heard much better in N.Z. (Cushen).

WDJM, 6040kc., 49.67m., Miami Beach: Reported from N.Z.; best on Sunday afternoons (Johns).

AFRICA.

Kenya.

VQ7LO, 6083kc., 49.31m., Nairobi: Continues to be heard regularly in early mornings; relays Daventry news.

Bechuanaland.

ZNB, 5900kc., 50.85m., Mafeking: Still to be heard when conditions are good; closing with National Anthem at 5.30 a.m.

Mozambique.

CR7BE, 9640kc., 31.12m., Lourenco Marques: A new African station heard at good strength in the early mornings from 5-7 a.m. An English news service is usually given. QRA is Box 594.

WAVERLEY RADIO CLUB NOTES

With the commencement of the New Year this club has made a determined effort to maintain the pre-war standard of activity during the meetings.

At the first meeting in 1940 members were treated to another of those interesting demonstrations by Jack Howes.

On this occasion Jack recorded the voices of those present. The highlight of this event was a vocal trio of jitterbugs who crooned some war songs into the mike.

The following week Mr. Howes again entertained with a full-length movie programme which included Charlie Chaplin and a cowboy film, causing great hilarity.

On January 23 your scribe, D. Dunn, came forward with a modest talk on the design of receivers.

It is interesting to note that the discontinuation of amateur transmitting has not affected the enthusiasm of the club members, the only absentees being those who are in camp.

South Africa.

ZRO, 9752kc., 30.77m., Durban: Nice signal heard just before 2 a.m.

ZRL, 9606kc., 31.23m., Klipheuvall: Heard at same time as **ZRO**; fair signal.

***ZRK**, 6098kc., 49.2m., Klipheuvall: Reported from northern States around 6 a.m.

***ZRH**, 6007kc., 49.94m., Roberts Heights: Quite a nice signal at 5.30 a.m.

Ethiopia.

***12AA**, 9650kc., 31.09m., Addis Ababa: Heard at good strength in early mornings, from 1 a.m. (Goucher).

Algeria.

***TPZ-3**, 8960kc., 33.48m., Algiers: Reported from N.Z., though not heard for some time in our locality (Johns).

Egypt.

***SUX** (?), 7860kc., 38.17m., Abou Zabal: New Egyptian station; call is not definite, but is that given in station lists. Power is 10kw. Present schedule is 4.30-6.30 a.m., and station has been heard at reasonable strength on several mornings (Goucher).

AUSTRALIA AND OCEANIA.

Australia.

VLR-3, 11880kc., 25.25m., Lyndhurst: This transmitter has been using a new frequency, 11850kc., 25.32m. However, it is understood that it will be back on its old frequency by the time these notes will appear in print (Washfold, Bantow, Neill).

VLW-3, 11830kc., 25.36m., Perth: Heard widely with good signal, 10 a.m. to 8 p.m. (Cushen, Washfold, Dignam, Bantow, Neill, Chapman).

VLQ-2, 11870kc., 25.27m., Sydney: Australian national station for special overseas broadcasts (Pepin, Bantow, Dignam).

VLQ, 9615kc., 31.21m., Sydney: As **VLQ-2** (Pepin, Washfold, Bantow).

***VLQ-5**, 9590kc., 31.28m., Sydney: New national transmitter, using **VKZME**'s old frequency. Heard late at night.

VLW-2, 9650kc., 31.08m., Perth: Has changed frequency from 9560kc., thus voiding interference from **DJA**. Very strong at night (Washfold, Bantow).

VLR, 9580kc., 31.32m., Lyndhurst: Carries A.B.C. programme from 5.30 p.m. (Pepin, Bantow, Washfold, Chapman).

VLW, 6130kc., 48.94m., Perth: Replaces **VLW-3** at 8 p.m. (Pepin).

Fiji.

***VPD-2**, 9535kc., 31.47m., Suva: Back on the air again late in January.

New Caledonia.

***FK8AA**, 6122kc., 49m., Noumea: Only audible occasionally, and then weakly. Recent card gives schedule as 5.30-6.30 p.m. on Thursday and Saturday.

THE EAST.

Philippine Is.

KZRH, 9660kc., 31.06m., Manila: Strong station, heard nightly (Pepin, Washfold, Bantow, Dignam).

KZRM, 9570kc., 31.35m., Manila: Also puts in a good signal every night (Pepin, Coggins, Washfold, Bantow, Dignam, Chapman).

KZIB, 9500kc., 31.58m., Manila: Yet another strong signal at night (Pepin, Washfold, Bantow, Dignam, Chapman).

KZEG/KZRF, 6140kc., 48.86m., Manila: Probably the strongest 49-metre signal at night. Still uses both calls (Pepin, Cushen, Washfold, Bantow, Johns).

KZRH, 6090kc., 49.25m., Manila: Heard nightly; fairly strong (Coggins).

KZIB, 6040kc., 49.67m., Manila: Fairly strong, with same programme as 9500kc., transmitter (Washfold).

Japan.

JZK, 15160kc., 19.79m., Tokyo: Fairly good in mornings; around 7 a.m. is best (Pepin, Coggins, Washfold, Dignam).

JVH, 14600kc., 20.55m., Tokyo: Reported from the West; heard just after 12 noon (Pepin).

JZJ, 11800kc., 25.42m., Tokyo: Regularly in the mornings, and at night with English session (Pepin, Bantow).

JVW-3, 11720kc., 25.6m., Tokyo: Strong signal at night; best from 8 p.m. Eastern programme (Washfold, Johns).

JLT-2, 9645kc., 31.1m., Tokyo: Strong signals at times from this early morning station, which closes at 6.30 a.m. (Neill).

JZJ, 9535kc., 31.47m., Tokyo: From 10 p.m., badly interfering with **KGEI** in some localities (Coggins).

JVW, 7258kc., 41.34m., Tokyo: Used with other Tokyo **JZ** stations in early morning session (5-7 a.m.) (Johns).

Hong Kong.

ZBW-3, 9525kc., 31.49m.: Heard nightly at good strength. One listener reports this station an approx. 9600kc., but have no confirmation of this (Bantow, Washfold).

India.

VUD-3, 15290kc., 19.62m., Delhi: Not heard in our locality lately, but reported from N.Z. around 2 p.m. (Cushen, Johns).

VUD-2, 9590kc., 31.28m., Delhi: Very good signal, opening at 10.30 p.m. with news session (Pepin, Cushen, Bantow, Chapman).

VUD-8, 4960kc., 60.48m., Delhi: Fair signal amid a lot of noise; news as **VUD-2** at 10.30 p.m. (Johns).

VUM-2, 4920kc., 60.98m., Madras: Weakest of low frequency Indians; better in N.Z. (Johns).

VUB-2, 4880kc., 61.48m., Bombay: Fairly strong (Johns).

VUC-2, 4840kc., 61.98m., Calcutta: Fairly strong (Johns).

Malaya.

ZHP, 9690kc., 30.96m., Singapore: Still heard fairly well at times, but often marred by **QRM** (Pepin, Washfold, Bantow, Chapman).

ZHJ, 6080kc., 49.3m., Penang: Still fairly strong at times, but becoming more erratic (Washfold, Bantow).

French Indo-China.

Radio Saigon, 11790kc., 25.47m., Saigon: One of strongest stations now heard. English

sessions nightly (Pepin, Cushen, Bantow, Washfold, Chapman).

China.

XGOX, 15190kc., 19.75m., Szechwan Province: Widely reported at good strength; usually around 7 p.m. (Pepin, Cushen, Washfold, Bantow, Johns, Dignam, Chapman).

XGOY, 11900kc., 25.21m., same location: Much the same as last month; much louder at night (Pepin, Coggins, Washfold, Bantow, Chapman).

XMHA, 11855kc., 25.3m., Shanghai: Reasonably good signal at night (Neill).

XGOK, 11650kc., 25.75m., Canton: Fairly strong; news at 11.15 p.m. (Bantow, Chapman).

XTC, 9295kc., 32.28m., Shanghai: Just fair on some nights.

XGAP, 9560kc., 31.38m., Peking: Sometimes heard around 1 a.m.

XPSA, 7000kc., 42.8m., Kweiyang: Still a nice signal from 11 p.m. (Coggins, Cushen, Washfold, Bantow).

Dutch East Indies.

YDB, 15310kc., 19.6m., Bandoeng: Reported from several sources. Heard in West at 12.30 p.m.; and on Sunday afternoons at 4 p.m. in the Eastern States (Pepin, Washfold).

YDC, 15150kc., 19.8m., Bandoeng: Regular night station; also heard from 9 a.m., and around noon in the west (Pepin, Coggins, Johns, Washfold, Bantow).

*—, 11910kc., 25.19m., location unknown: New NIROM transmitter heard in west with same programme as **YDB** and **YDC** around noon (Pepin).

PLP, 11000kc., 27.27m., Bandoeng, NIROM relay: Best at night (Pepin, Washfold, Bantow, Chapman).

PMN, 10260kc., 29.24m., Bandoeng: As **PLP** (Pepin, Washfold, Bantow, Chapman).

YDB, 9550kc., 31.41m., Bandoeng: Heard best around midnight; good signal in the west (Pepin).

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. The details you require are given below:

Name.....

Address.....

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

My set is a.....

(Give make or type, number of valves, and state whether battery or mains operated).....

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

(Signed).....

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



RADIOTRON VALVES are supplied in factory-sealed cartons — YOUR guarantee that the valve you buy is new. The carton must be destroyed to remove the original valve . . .

For more enjoyable radio entertainment



To Destroy
"TONE BOGEY"
Re-value with
RADIOTRONS
The valves in the sealed cartons

PMH, 6720kc., 44.64m., Bandoeng: Very reliable station; strong signal every night (Pepin, Coggins, Washfold, Bantow).
YDD, 6045kc., 49.63m., Bandoeng: Still heard fairly well after 9.30 p.m. (Cusher, Washfold, Bantow).
PMV, 5145kc., 58.31m., Bandoeng: Very strong in west; noise usually mars reception (Pepin).
***YDE-2**, 481Ckc., 62.37m., Solo: Another low-frequency station reported from the west (Pepin).
***YDL-3**, 3450kc., 86.9m., Solo: Reported from N.Z. with fair signal at 12.45 a.m.
***YDP-2**, 3430kc., 87.4m., Soerabai: Also reported from N.Z.; heard around 1 a.m.
***YDA**, 3040kc., 98.68m., Tandjongpriok: Reported from west (Pepin).
Manchukuo.
MTCY, 11775kc., 25.48m., Hsinking: Daily from 7 a.m., with news at 7.15 a.m.; fair signals (Chapman).
MTCY, 6125kc., 48.98m., Hsinking: A

Ultra-High-Frequency Notes

Conditions Improve Slightly.

As has been the case in the past few years ultra-high-frequency conditions have improved since about the middle of February. Although, at the time of writing, signals on 10 and 11 metres are by no means strong, they are much more consistent than earlier in the year. The 10-metre amateur band has improved a good deal, and this would seem to indicate that the police bands may open up again for a while before winter.

11-Metre Band Loggings.

W8XNU, 25950kc., 11.56m., Cincinnati: Still the best station on the band, with a fairly good signal practically every morning.
W4XA, 26150kc., 11.47m., Nashville: Greatly improved during the last few weeks, and nearly as strong as **W8XNU** on some mornings.
W9XPB, 25900kc., 11.58m., St. Louis: Heard almost every morning, but always a weak signal.
W9XH, 26050kc., 11.52m., South Bend: Difficult to log, but sometimes heard before closing at 9.30 a.m.

Verifications.

An interesting verification is to hand from the County of Los Angeles police transmitter, **KQBV**, 31900kc. This confirms our report of November last, and mentions that **KQBV** uses a power of 500 watts.

Additional verifications from the Crosley Corporation station, **W8XNU**, Cincinnati, on 11 metres, gives the latest schedule for that station as:—Week-days: 10 p.m.-4 p.m. next day; Sundays: 11 p.m.-4 p.m. Monday.

strong signal nightly; no English used (Coggins).

Thailand.

HSP-6, 7968kc., 37.56m., Bangkok: Note call letters of this new station which replaces **HS6PJ** and **HS8PJ**. Good signals from 11 p.m., with frequent English announcements (Pepin, Cusher, Johns).

Taiwan.

JIE, 7295kc., 41.13m., Tyureki: Weakish signal after midnight.

Burma.

XYZ, 6007kc., 49.94m., Rangoon: Fairly strong at times, but varies a good deal; best around 12.30 a.m. with news (Bantow, Cusher).

*****, 6056kc., 49.54m., Rangoon: New station, which carries the same programme as **XYZ**. Strong signal, better than **XYZ**.

EUROPE.

Portugal.

CSW-4, 15215kc., 19.71m., Lisbon: Still putting in a fine signal on opening at 2 a.m.

CSW-6, 11040kc., 27.17m., Lisbon: A fairly good signal between 4 and 6.30 a.m. (Neill, Chapman).

CSW-7, 9740kc., 30.8m., Lisbon: A good consistent signal after 7 a.m. (Bantow).

Sweden.

SBT, 15155kc., 19.8m., Motala: Only on Sundays from 6 p.m.

SBP, 11705kc., 25.63m., Motala: Still audible on some mornings till 7.15 a.m., but rather poor signal.

Turkey.

TAP, 9465kc., 31.7m., Ankara: Still a fine signal every morning (Coggins, Bantow, Johns, Chapman).

Holland.

PHI-2, 17770kc., 16.88m., Huizen: Audible at night from 10.40 p.m.; but hard to separate from **TPB-3** on new frequency of 17775kc. (Coggins, Washfold, Chapman).

PCJ-2, 15220kc., 19.71m., Huizen: Good signal from 10.40 p.m. (Coggins, Cusher, Chapman).

PCJ, 9590kc., 31.28m., Huizen: Heard on Monday and Wednesday mornings from 5 a.m. (Coggins, Chapman).

Spain.

EAQ, 9860kc., 30.43m., Madrid: Erratic, but can be heard in early morning; news in English around 6.15 a.m. (Coggins, Neill).

Yugo-Slavia.

YUC, 9505kc., 31.56m., Belgrade: Still a good signal, but suffers badly from QRM from **GSB** (Johns, Chapman).

YUA, 6100kc., 49.18m., Belgrade: Still heard in the mornings (Coggins).

Switzerland.

HBJ, 14535kc., 20.64m., Geneva: Heard only on Sunday afternoons, around 6 p.m.

HBO, 11402kc., 26.32m., Geneva: As **HBJ** (Chapman).

Hungary.

HAS-3, 15370kc., 19.52m., Budapest: Watch for this one at midnight on Sundays.

Vatican City.

HYJ, 6190kc., 48.47m.: Heard at quite good strength in the early mornings before 6 a.m.

Belgium.

ORK, 10330kc., 29.04m., Ruysselede: Reported from several places, but not heard lately in our locality.

Albania.

ZAA, 6085kc., 49.3m., Tirana: Still heard at fair strength from 3.20 a.m.

Norway.

LKV, 15170kc., 19.78m., Oslo: Still a good signal from 1 a.m.

Italy.

Stations logged: **2RO-8**, 17820kc., 16.84m.; **2RO-6**, 15300kc., 19.61m.; **2RO-14**, 15230kc., 19.7m.; **2RO-5**, 15170kc., 19.78m.; **2RO-12**, 15100kc., 19.87m.; **2RO-4**, 11801kc., 25.4m.; **2RO-15**, 11760kc., 25.51m.; **2RO-9**, 9667kc., 31.03m.; **2RO-3**, 9630kc., 31.15m.; **1QA**, 14795kc., 20.28m.; **1QY**, 11673kc., 25.74m.; and **IRF**, 9830kc., 30.52m.

Of these stations the best are **2RO-3** (mornings and at 4 p.m.); **2RO-4** (strongest at 2 a.m.) and **IRF** (mornings).

France.

***Paris Mondial**, 9520kc., 31.5m., Paris: New transmitter heard at good strength during afternoons till just after 4 p.m.—has apparently replaced station on 9680kc. (Washfold, Johns).

***TYA-2**, 9040kc., 33.19m., Paris: Heard at quite good strength around 7 a.m.; no English announcements (Johns).

TPC, 11843kc., 25.35m., Paris: Note call of this Paris Mondial station which continues to put in a very good signal around 7 a.m.

TPC, 9680kc., 30.99m., Paris: Note call. Apparently replaced by 9520kc. transmitter.

Also logged: **TPB-3**, 17775kc., 16.88m.; **TPA-2**, 15245kc., 19.68m.; **TPB-11** and **TPB-12**, 11885kc., 25.23m.; **TPA-4**, 11718kc., 25.6m.; **TPB-11**, 7280kc., 41.21m.

U.S.S.R.

Stations heard: **RV-96**, 15400kc., 19.47m.; **RV-95**, 15180kc., 19.76m.; **RNE**, 12000kc., 25m.; **RAN**, 9600kc., 31.25m.; **RV-96**, 9520kc., 31.51m.; **RKI**, 7520kc., 39.89m.; **RV-96**, 6030kc., 49.75m.; **RV-59**, 6000kc., 50m.; **RV-15**, 4273kc., 70.21m.; and the new station on 9680kc., 30.97m.

The Story of R.C.S. Radio

PART 4

In last month's instalment the test equipment installed in the R.C.S. laboratory was described, with details of the applications of each instrument.

This month the tests to which components are submitted are outlined-

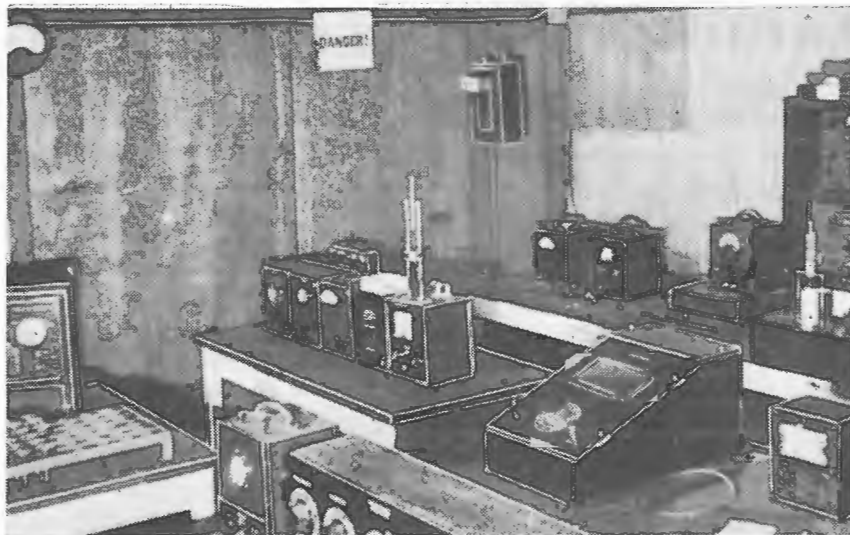
Checking I.F. Transformers.

All i.f. windings are sent to the laboratory for a "Q" test on a Boonton "Q" meter. All bases are then "Q" tested and capacity checked.

After assembly, the i.f. primary and secondaries are checked on a low resistance ohmmeter, which indicates any broken Litz strands or open circuit windings. They are then checked on an instrument that indicates coupling between primary and secondary, and phrasing.

The i.f. is then fitted in its can and is sent to the laboratory for a further test, which is carried out using a standard i.f. channel to which is coupled a signal generator with a calibrated attenuator. The output of the i.f. channel is fed into an output meter calibrated at 50mw. By this means a direct comparison of i.f.'s can be obtained, both as regards selectivity and sensitivity.

In the same instrument is incorporated a small oscilloscope used in conjunction with the signal generator, which can be used as a frequency modulated oscillator (capacity variation type). This arrangement is used to inspect the selectivity curves of a percentage of each batch of intermediates.



A glimpse of the test laboratory.

Coil Checking.

The coil after inspection is plugged into an instrument that will indicate the degree of coupling between primary and secondary, as well as the phasing of windings and open circuit windings. By this means the oscillator coil grid current can be held to a close tolerance. The next test is to plug the coil into a low resistance ohmmeter to check for broken litz strands. The coil is now ready for matching and "Q" tests. This is carried out on either a Boonton "Q" meter or a comparative "Q" meter similar to the Boonton, but employing a higher r.f. output. The coil is then flash-dipped in a high "Q" wax of low temperature melting point, and is then fitted in its can. Finally, it is re-checked for matching to standard, and for coupling and phasing, by being plugged into one oscillator section of a beat frequency oscillator. This check of course is purely a comparison against a standard coil.

Potentiometers.

After removal from the winding machine, the windings are bridge-checked for resistance, the percentage accuracy being plus or minus 5%. The potentiometer is then assembled in several operations, and after each

operation is continuity checked. This check of course is only arbitrary and of no particular accuracy. The potentiometer is now adjusted for tension of movement and carefully inspected. On being sent to the laboratory, the potentiometer is plugged into an ohmmeter employing a meter with high-speed movement and an accuracy of plus or minus 5%. The purpose of the high-speed meter is to be able to follow even the most minute jump in resistance or open circuit due to unevenness in action of the potentiometer. In this instrument, faults such as residual resistance at the ends of the winding, open circuits, resistance jumps and short circuits are easily located. After the cover has been fitted this test is repeated.

Vibrator Units.

A few words about the checking instrument will not be out of place, as a clearer idea of the test can then be visualised. Firstly, the tester employs two high-gain battery receivers of under one microvolt gain, using dummy aerials. One receiver employs directly heated valves, and has a switch in circuit that permits a $\frac{1}{2}$ -ohm choke and 500 mfd. electrolytic to be inserted in the filament circuit at will. The total load of this receiver



Assembly benches for the minor components.

LABORATORY SERVICE FOR READERS

For the assistance of bona-fide amateur set builders, we are installing laboratory equipment at our head office, 117 Reservoir Street, Sydney.

At this laboratory we will inspect and test receivers built up according to constructional articles published in this or any future issues of Australasian Radio World.

We will not carry out repair work, or make adjustments or alignments, but we will be prepared to inspect and test the receiver, and report on its performance.

If not up to standard, we will indicate what we think should be done to obtain normal results.

A nominal fee of 2/6 will be charged for the service.

The Story Of R.C.S. Radio.

(continued)

is 30 m.a. The other receiver uses indirectly-heated valves, and is used for testing units rated above 200 volts. The load of this receiver is 60 m.a. Input voltages for the units are obtained through a switch which will tap off 2, 4, 6, 12 and 32 volts from a battery supply. In the input circuit is included an ammeter to measure the input current, and a voltmeter whose shunts are switched with the voltage switch. The output circuit has a voltmeter to measure the output voltage, and, as previously mentioned, the output load is fixed at either 30 m.a. or 60 m.a. From the foregoing it can be seen that the following tests can be made: input voltage, input current, output voltage under load, hash content at full sensitivity, hum level with or without smoothing.

Base And Trimmer Checking.

Bases and trimmers are firstly checked for short circuits between plates and also to adjusting screws. The voltage used is 750 volts a.c., derived from a flash tester. They are then tested for "Q" and capacity range on a Boonton meter.

Midget Condensers.

Midget condensers are plugged into a flash tester delivering 600 volts a.c., and the moving plates are then rotated. This voltage is such that if the plates are out of alignment more than a pre-determined tolerance, a small neon globe will indicate short circuit.

Padders.

Padders are flash checked at 750 volts for short circuits between plates and also to adjusting screws. They are then capacity checked on a capacity bridge.

Voltage Dividers.

After removal from winding machine, the windings are bridge-checked to an accuracy of plus or minus 5%. The completed voltage divider is flash-checked with a voltage of 1500 volts to indicate short circuits between winding and mounting lugs. They are then bridge-checked to an accuracy of plus or minus 5%.

Resistors.

These items are bridge-checked to an accuracy of plus or minus 5%.

R.F. Chokes.

The cheaper types of r.f. chokes are resistance-checked on a low resistance ohmmeter. All other types are inductance checked on an inductance bridge to an accuracy of plus or minus 5%, unless a higher degree of accuracy is specified, in which case they are accurately adjusted on a General Radio C, L & R bridge to very fine limits.

Line Filters.

These components are tested under load in an instrument which checks condensers for leakage or short circuits, open circuit windings, approximate inductance of windings and for short circuits from active and neutral to earth.

Coil Units.

All coil units are receiver-checked with a signal generator and output meter. A microammeter is permanently in circuit to measure the grid current in the oscillator circuit. As time is involved in fitting each unit in the chassis, clips are used, and naturally this introduces complications regarding coverage at high frequencies. Accordingly, the coverage on short waves at the high frequency end is taken as a comparison against a standard unit.

Power Transformers.

Transformers are checked with the correct A.C. input voltage and must equal standards for input current and output voltage under fixed loads. They are also checked for breakdown at 3,000 volts A.C.

Audio Transformers.

These are checked for voltage ratio between primary and secondary, and input current as compared to standard transformers. Breakdown tests are carried out at 1500 volts.

As can be seen from the foregoing many of the tests carried out are purely comparisons against standards.

This method naturally is the only one by which standardisation can be achieved in a factory in which runs of perhaps a 1,000 of any particular item are not unusual.

In all cases the standards are carefully checked and maintained by the laboratory design instruments, which ensure that all batches of components must be identical, both mechanically and electrically.

THE TESTS.

Briefly, the receivers will be tested as follows:—First, the valves will be checked for emission and mutual conductance, the electrolytic condensers tested for capacity and leakage, wiring tested for high-resistance joints, and the main resistors and condensers will be checked to make sure that they are according to their ratings.

Then the receiver will be tested for comparative performance with an oscillator and output meter and finally the receiver will be tested on the air under normal running conditions.

CONDITIONS.

Normally the service will take about 24 hours to perform, and receivers left for inspection on one day should be ready to be picked up by 5 p.m. on the day following.

In the event of the service proving even more popular than we anticipate, a slightly longer period of time may be required for the inspection.

Receivers forwarded from distant readers will be un-packed and re-packed without extra charge, but no freights or carrying charges will be paid.

Great care will be exercised in the handling of the receivers entrusted to us, but we cannot accept any responsibility.

NEW ERA.

This progressive step marks a new era in the history of radio set building as a hobby and should do much to foster the movement, which is at present enjoying greater popularity than at any time in the past.

When broadcasting first started practically every receiver was home-built and the amateur set builder was prominent. To-day, the hundreds of thousands of factory-built sets rather overshadow the efforts of the amateurs, although, numerically, they are stronger than ever.

Now, with this remarkable guarantee of performance, we anticipate further popularity for our constructional articles.

What's New In Radio

Counter Checkers

LATEST Delta test equipment releases by W. G. Watson & Co. Pty. Ltd. comprise three counter-type testers that should find a ready sale among radio and electrical dealers.

Delta Model D2000 appliance tester provides a quick and accurate means of testing power consumption of radios, refrigerators, fractional horsepower motors and household appliances generally under actual running conditions. An invaluable feature is the "Hours Per Unit Cost" scale which indicates the number of hours that the appliance under test will operate for the cost of one unit.

Power factor adjustment can be made when testing fractional horsepower motors, fans, etc., or any inductive loads, while another selector switch adjusts the line voltage from 200/250 to correspond with the operating voltage.

In addition to the above applications, the Model D200 can be used as a wattmeter (ranges, 0-25-100-250-1000-2500), as an ammeter (ranges, 0-0.1-0.5-1.25-5-12.5) and as a voltmeter (ranges, 0-125-250). The instrument also incorporates a neon earth leakage indicator and continuity tester.

The tester, which is fitted with sloping etched silver front panel, is housed in a crackle-finished steel cabinet measuring 9" wide x 7" high x 8" deep.

Delta Model 1506 component tester has been designed primarily to provide a quick and accurate means of testing radio components, including valves, in view of prospective purchasers in shops and warehouses.

Tests provided for include those for: Valve merit (emission test); shorts and leakages between valve elements; efficiency of electrolytic condensers; condition of paper condensers; resistance tests from 5 ohms to 5 megohms; the conditions of dry batteries by voltage test; pilot lamp tests.

Delta Model D1505 valve tester, the third of this new series of instruments, is identical both in appearance and design with the Model D1506 reviewed above, except that it is a valve tester only, with no provision for checking components.

Further information on the above instruments is available free to readers writing Messrs. W. G. Watson & Co. at 279 Clarence Street, Sydney.



The new Delta appliance tester.

RADIO ART UNION

Tickets Now Ready.

Under the auspices of the R.I.F. Club of Sydney a Radio Art Union has been organised, and a special committee, consisting of Messrs. A. R. Allen (chairman), A. F. O. Brown, A. P. Hosking, O. F. Mingay, Eric Dare and S. D. Dwyer, with Mr. J. Bristow as hon. publicity officer, have been appointed to supervise the conducting of this Art Union.

The proceeds are in aid of the R.I.F. Club Provident Fund, and also the

supplying of comforts to those radio people who go overseas with the Forces. The Provident Fund will no doubt also give close attention to any of the dependents of the Diggers who may be in necessitous circumstances.

First Prize Electric Kitchen.

The first prize for this art union is an all-electric kitchen, worth about £150, including an electric range, refrigeration, other heating and cooking equipment and of course, a radio set.

The second prize is a radio-combination set valued at about £100; the third prize is a refrigerator worth about £67; the fourth prize another radio set; and about 21 other prizes, the whole list of prizes totalling about £450.

The tickets for this art union are 6d. each, and will be available from all radio manufacturers, wholesalers and retailers, all of whom are asked to cooperate in selling these tickets as a contribution to the A.I.F. Diggers and the Provident Fund.

Kit Specialist

We wonder if anybody in Australia has had more experience with kits of parts than Norm Cohen.

Norm has been handling kits for over ten years originally in "Radio Arcade," then with one of the biggest wholesalers, and now he is manager with a firm of kit-set specialists, Invincible Radio, at 102 Clarence Street.



The JUNIOR TECHNICAL SECTION

Conducted by A. J. BARNES

The Workshop

START RIGHT

THE almost incredible present and planned expansion of our manufacturing industries is calling for more and still more technicians. Yes, the chap who can use hands as well as his brain—that fellow of nimble wit and finger has a future assured—he is the man of the hour.

What a fascinating business it is, this making and mending of things, as a hobby as well as a trade! The many different avenues we may follow—the pride of accomplishment we enjoy when we see things that we make doing things that we planned!

Simple Tools.

We need tools, for making and mending but even for the best of work our equipment need not by any means be expensive or elaborate.

I once watched a blacksmith fashion from a bar of iron the likeness of the most exquisitely detailed spray of fern. He used a hammer, a chisel and an anvil.

If you are a newcomer to the fine hobby of radio and electrical making and mending you will find it the best plan to start with a few simple tools and add to them as you find it necessary. In fact the average fellow just HAS to do this, because pocket money usually doesn't go far! Perhaps it's a good thing too, for it teaches us to use what we have to the best advantage and we learn to make much out of little.

Start a junk-box right now—save every single screw or fitting—every piece of wire, brass or copper, in fact anything that has even the remotest possible use, meanwhile we can be putting our workshop in order.

The Bench.

Of course, first of all we must find a place in which to work and this depends on just what kind of house we live in. There may be a spare room, a cellar, space under the house,

a garage or we can even rig up our bench in the bedroom. Dad will be sympathetic, I know—Mother will be doubtful about the appearance of such an unusual addition to the furniture. If, however, you explain how neat a cheap chintz cover will look and how necessary it is to have a place to keep the pliers with which you intend to fix the clothesline—then I'm sure it will be all right!

A heavy packing case, a table or

Our Query Column.

We are going to have our own Junior Technical query column. Queries need not necessarily be about articles that appear. If there is anything you would like to know about hobby work tell us and watch for your answer in the query column.

Send your letter to the Editor, with the envelope endorsed "Junior Tech."

the lower section of an old sideboard will make a fine bench to the back of which we nail a board about two feet high. On this board we hang our tools—a place for everything and everything in its place. For instance, two screws or nails about half an inch apart will form a holder for a screw-driver hanging blade downwards. Other tools may call for hooks and so on.

Paint the bench brown or grey and the handles of the tools a bright contrasting colour.

Remember a good hobbyist keeps his gear tidy.

Vyce Important

A vyce is a most necessary item. With it you not only hold things whilst you drill, file or cut them, but as well you can use it as a press or an anvil or a bending machine. A good choice of vyce is the three inch engineer's type. Mount it on the bench where it is properly accessible, yet least likely to get in the way, remembering that

the rear jaw should project slightly over the edge of the bench; by so doing we can hold long rods etc. in the vertical position. The vyce is the most expensive tool, it will cost about fifteen shillings, this same amount will easily cover the cost of the remaining tools listed below.

Hacksaw

Set of drills up to ¼ inch

"Eggbeater" drilling machine

Hammer

Pliers

Files — 10 inch, flat and round

Rule

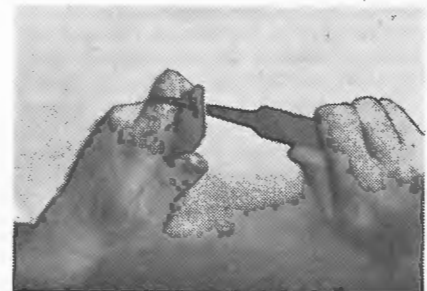
Screwdriver

Centre Punch

There are lots of useful tools that can be home-made in many cases especially if we have the use of a grinding wheel. Centre punches, pin punches, chisels all can be fashioned from pieces of old round or square files. If you can possibly manage to get a small hand grinding wheel by all means do so for it will keep drills, punches, screw-drivers, shears and so on in the best of trim.

By the way; our list didn't include a soldering kit. You simply must learn to solder.

Soldering is an operation so necessary and useful that we are shortly having a special chat about it.



The tang (handle end) of a file makes a handy reamer for enlarging holes.

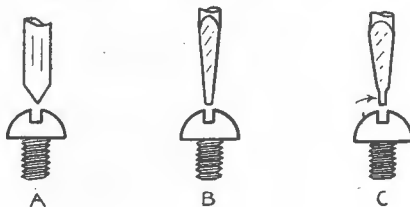
SCREWDRIVERS

In the future course of our Junior Technical work we will find quite a lot of use for the humble screwdriver. In this little chat we see that for the best of work the screwdriver blade must be properly trimmed.

One need not be a detective in order to point out the job that has been put together with an improperly trimmed screwdriver—broken and burred screw slots, scratched and gashed panels are the first indications—not to mention the possibility of the chap who did the job collecting a gash or scratch by the same cause. Yes, a slipping screwdriver can cause quite a nasty accident.

Hard Steel.

A screwdriver blade is made from hardened steel, so in order to do any trimming we usually find that a grinding wheel is called for. Sometimes



the steel may be soft enough to be trimmed with a new fine-cut file and, as a last resort, we may soften the blade by heating to a dull red and allowing it to cool slowly. After trimming, the blade is re-hardened by heating to a bright red and then plunging into clean cold water.

Points To Watch.

If we look at the slot in a screw we will notice that the sides are parallel and in Fig. A we see shown in an exaggerated manner the most common and also the worst possible way in which a screwdriver may be trimmed. Obviously the point will not enter the screw slot but it will ride on top of the screw, giving no purchase whatever. This would be more or less the correct angle at which to grind a bradawl, but a screwdriver—certainly not!

On purchasing a new screwdriver we find that the blade is trimmed to the shape shown at Fig. B. The sides of the blade are nearly parallel and this of course permits it to enter deeply into the screw-slot with less chance of rising out when subjected to the twisting strain. This is the best way to trim a screw-driver for all-round work. Note that the extreme tip of the blade is never ground to a

chisel point, but has a thickness equal to the width of the slot in the smallest screw likely to be used.

A broken blade can only be trimmed to its original dimensions when it has first been roughly forged to shape under heat and hammer.

Soon we find the need for at least three screwdrivers of different sizes:—A small one with a blade $\frac{1}{8}$ " wide for manipulating the grubscrews in knobs and dials, etc. The next size may have a blade $\frac{3}{16}$ " or $\frac{1}{4}$ " wide to be used mostly for work with the common $\frac{1}{8}$ " metal thread screw in radio chassis construction. The third size of 'driver is advisedly a hefty one, with a man-sized blade and handle. Invaluable, this fellow, when rusted woodscrews and the like are to be dealt with.

Fig. C shows a little-known "trick of the trade" which may be used when trimming a collection of screwdrivers. Here we can afford to keep one 'driver for each size of screw in general use and get the maximum purchase on the screw. To do this we grind the extreme tip of the blade, so that the sides are parallel and a snug fit in the screwslot. This is a particularly valuable tip for the trimming of intermediate transformer and padding aligning tools as usually the screwslots in such components are rather shallow.



ALF. BARNES (VK2CE)
Well-known radio experimenter and amateur photographer extraordinary, who will be in charge of this new feature section.

Mark Sockets.

It is always a wise precaution to mark the valve sockets on any chassis.

You never know when the occasion will arise and your wife, or some other non-technical person will try a 2A3 in the socket meant for the 80. Wonderful, too, how short a time it takes for the valve to burn out under such circumstances, and with valves the price they are—well, as we said before, it's a good scheme to mark the chassis to show which valves go where!

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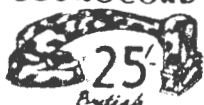
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"WATES" BRITISH POCKET VOLT METERS. 4-in-one combination, 14/- Reads 0 to 6, 0 to 15, 0 to 180 Volts, 0-30 M/Amps. "EMICOL" Pocket Meter, 12/6. 0 to 6, 0 to 150 Volts, 0 to 30 M/Amps. For Testing Meters and Analysers. Ask or write for List.



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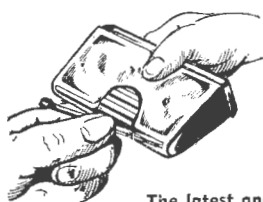
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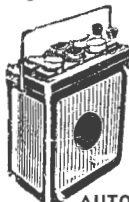
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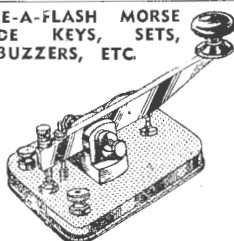
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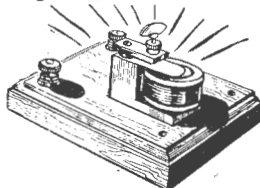


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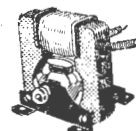
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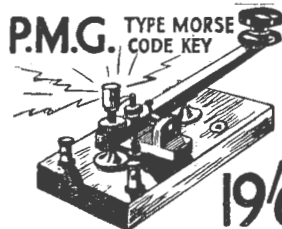
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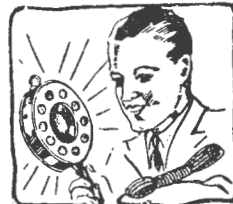
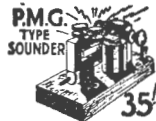
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SPEEDY QUERY SERVICE

Conducted under the personal supervision of A. G. HULL.

I.A.M. (Manly) wants to know how you find the wave-length of a station, if you know the frequency.

A.—To find either frequency or wave-length you have only to divide 300,000 by what you have, and you will find what you want to know. For example, if the wave-length is 300, the frequency is 1,000. If the frequency is 30,000 cycles the wave-length is 10 metres. Quite simple when you know how, but a puzzler to work out from a list of stations.

* * *

A.A. (Bankstown) must be an ardent cyclist, for he wants to build a crystal set to operate on a push-bike while going along the road.

A.—It's just one of those things which it would not be safe to say could not be done, but it is not a practical scheme. Apart from ordinary difficulties of riding a bike with headphones over your ears, instead of listening for motor horns, and so on, there is the difficulty of getting an efficient aerial and an effective earth connection. Then there would be the difficult task of adjusting the cat's whisker while riding along. Most people find it difficult enough when sitting at a table. Our tip is to take your pleasures separately; keep the radio for home.

* * *

"Dom" (Prospect) has had his patience exhausted.

A.—Sorry, but there isn't any trace of your previous query around the office at present, and without your questions it is impossible for us to help you. We can only suggest that you write again, marking the letter as urgent and we'll make a certainty of getting you a reply in the next issue, if it will still be in time to help you. Sincerely hope that we will be able to look after the query service more efficiently in future.

* * *

R.W. (Gosford) sends a circuit for approval.

A.—We cannot recommend the circuit, as you would be almost certain to get into trouble with the authorities if you use it. Such circuits are capable of giving exceptional range, but they emit interference which will be picked up by other receivers in the neighbourhood. To operate a receiver in such a condition constitutes an offence. We can recall a case of this kind in which action was taken and a fine of £2 imposed, and the set confiscated, if memory serves us right. Even with ordinary small receivers, using regeneration, it is necessary to handle the controls intelligently, and not operate the set with the reaction control sufficiently advanced to have actual oscillation.

T.W. (City) is having trouble with a 1933 Standard. At normal volumes it is fair enough, although not quite as good as it used to be. At low volumes bad distortion is introduced.

A.—Normally when a 1933 Standard distorts at low volume, the trouble is due to inaccurate alignment of the intermediate transformers, but in a case which reported

SPEEDY QUERY SERVICE.

Readers should note that our radio information service has now been re-organised and we offer two distinct forms of assistance.

Letters received by the 15th day of any month will be answered in these columns in the next issue. There is no charge for this service, no coupon is required and all readers and their friends are invited to use the service for any queries dealing with radio, photography, model aeroplanes, and any other subjects for which we are likely to be able to get helpful information.

The other service is for a reply by mail, and in this case a fee of 1/- is charged.

Every effort will be made to get replies to such queries away within 24 hours, but no guarantee of this can be given, as there may be times when pressure of other work will make it necessary to hold over queries for a day or two. Answers to such queries are limited to a single sheet of letter paper, and there is no hope of such a service covering the design of special circuits, the calculations for special power transformers, coil windings, etc.

Address all correspondence to
**AUSTRALASIAN RADIO
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117 Reservoir Street,
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similar symptoms to yours, and which we investigated personally a few months ago, the trouble was found to be an open-circuited bias resistor for the 55. The circuit had been changed for gramophone operation, with bias for the 55. The resistor was open circuited, yet the set continued to operate, as the leakage of the 25 mfd. electrolytic by-pass condenser, across the resistor, acted as a bias resistor, but gave too much bias for distortionless operation. Glad to know that the set is still considered so good, and pleased that you have written to us for help.

* * *

M.F.T. (Bexley) sends a letter headed "Some Constructive Criticism," and amongst other things says, "Give us decent articles, and less of these Go-gettem 2 variety."

A.—We appreciate criticism, but after reading your letter twice we have formed the opinion that the views expressed are rather narrow in their outlook. The fate of the magazine which you hold up as an example tells its own tale. We know that it would be nice to be able to publish a magazine of the type you suggest, but years of close contact with the business side of things shows us that it is economically unsound. The simple sets are a great help in providing both circulation and advertising revenue, and although such matters should be too low for consideration by an editor, they must be considered if survival is hoped for. These things can be proportioned, however, and we feel sure that if you watch the "Radio World" over the next few months you will find lots to interest you. Incidentally, there has not been a decline in circulation over the past twelve months.

* * *

C.M. (Shepparton, Vic.) built a set, but failed to get it going. Now he wants an alternative circuit to use the same parts.

A.—Fifteen years ago there was magic in circuits, but not to-day. If a modern set fails to work it isn't the slightest use looking for a new circuit. Look for the faulty component in the set you have built. If a valve, resistor, condenser or any other part is faulty, it is most unlikely that it will be any more successful in any other circuit. Stick to the one you have, apply some carefully planned testing, checking step by step until you find the fault. If all else fails enlist the aid of some other enthusiast or a radio serviceman, but don't give up until you get the set working as best you can. If then you find that there is insufficient range, selectivity, power or tonal quality, you can perhaps use some of the parts in the construction of a more elaborate set, but it is most unlikely that any improved performance will be made possible by using the same parts in another circuit of similar design.



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"TONE BOGEY"
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"Ex-VK" (Bondi) has a quantity of radio ham gear on hand, and wants to know whether there is any market for it, or whether we would advise him to keep the gear in the hope that licences will soon be restored.

A.—Frankly we don't think that you will have the slightest success in getting a buyer for the equipment, except perhaps for the microphone, and the receiver. Something might be done with the modulator to make it into a public address amplifier, but the 809 tubes, the split-stator condensers and the high-voltage transformers may be difficult. We think that if there is any chance that you will retain your interest in ham radio you would be well advised to put the gear into safe storage, especially if you are not pushed for ready cash. No one can say just when the war will end or when licences will be restored, but it is pretty certain that as soon as the happy day comes it will be found that there will be a shortage of essential gear, as none is being imported at present. Many thanks for the good wishes.

"King Kong" (Wyong) sends greetings and salutations and asks a few questions about policy.

A.—Glad to have your letter and it is certainly fine to know that so many still remember the good old days. As you say, the amplifier championship was one of the best functions ever held, and you will see that your suggestion has been acted upon, and the 1940 Amplifier Championship announced in this issue. At the moment there is no intention to include articles dealing with other hobbies, and it is unlikely that any such articles will appear until things have developed sufficiently to allow extra pages to be added to carry these features, so that the radio section will not be weakened in any way.

N.T.T. (Hornsby) is going to build a portable receiver and suggests a certain circuit.

A.—We think that it is highly desirable to have an r.f. stage of amplification, especially if you are going to use the set for the type of work you mention. The r.f. stage gives infinitely greater gain, without increasing the noise level. We don't think you could do better than the "Picnic Portable" described in our November issue. A more compact set could be made, we readily admit, but surely this is not so important to you.

M.L. (Leura) is experiencing trouble with a two-valve regenerative set which has a fierce howl when just off oscillation point.

A.—This is often encountered, and the stock remedy is to fit a .1 megohm resistor across the secondary of the audio transformer. It is not a bad scheme to put a .002 mfd. condenser across the 'phone terminals, too.

J.J. (Bathurst) seems to imagine that he is entitled to operate a small transmitter.

A.—No, quite definitely there is not the slightest shadow of doubt that the operation of such a transmitter would be illegal, and you could get fined about £500, together with ten years' hard labour, if you proceed with your scheme. The Act is perfectly clear on the subject, and especially in time of war it would be most unwise to take any risks. Although you might imagine that the short range would mean that you wouldn't get caught, it doesn't work out that way, and once a message is broadcast it is surprising how many ears will hear it.

B.E.E. (Rockhampton) asks whether wind-chargers are satisfactory.

A.—Individual installations of wind-chargers appear to be quite successful, but as a line to sell to the public, wind-chargers have been a bit of a headache. What we mean is, that if an intelligent owner of a wind-charger knows what to expect and plans

his charging and discharging properly he will find it a good proposition, especially if it is correctly installed. But to sell wind-chargers to all and sundry and to promise that they will keep the batteries charged enough to allow lighting the home, operating a refrigerator, electric radiator, fan and so on, well, that is where the headache starts. Every installation does not take best advantage of winds, and it is quite useless to mount a charger fairly close to the ground, or on the lee side of a plantation of trees.

E.H.G. (Caulfield, Vic.) writes: "My set stopped working recently. I took the valves to a radio dealer and he told me that the type 80 was burnt out, and so I bought a new one, but the set still did not work, and when I took the set to the dealer he told me that I had ruined the new valve and I had to pay for another one as well as 10/6 for repairs. Was this fair?"

A.—Yes, so far as we can see it was fair enough, because it was not really the dealer's fault that the new valve was destroyed when you put it in the faulty set, although if he had had any imagination he might have pointed out to you the danger of replacing a rectifier until you have found the reason why the original one burnt out.

From what we can gather, your trouble was a short-circuited condenser somewhere, which resulted in a terrific overload on the rectifier valve, burning it out. The new valve went the same way as the original, as the short-circuit was not remedied before it was fitted, and so it had to take the same overload.

W.R. (North Sydney) has an amplifier which has been using a crystal pick-up, but two pick-ups proved faulty in the past twelve months, and so he has now fitted a magnetic type but cannot get the same volume.

A.—We are afraid that this is only to be expected. The output of the crystal type pick-up is very high, to the order of something well over a volt. Few magnetic pick-ups deliver more than three-quarters of a volt. This is not actually a draw-back, as it is simple enough to design an amplifier with ample gain to obtain full power output from such an input. Doubtless your amplifier could be altered to give it the necessary increase in gain, but we can't help you in this direction without any knowledge of the circuit used. If you can let us have the schematic circuit of your amplifier we will be pleased to indicate the alterations necessary. Without altering the amplifier the only hopeful solution to the problem would be to use a step-up audio transformer, feeding the input to the primary from the pick-up and feeding the output of the secondary into the amplifier, with one side of each winding earthed if hum trouble is encountered. You will probably find, however, that your tonal quality will be adversely affected, and to amend the circuit to give added gain is the procedure which we recommend.

D.K. (Wallsend) enquires about back numbers.

A.—We have fairly complete stocks of back numbers, only one or two issues being unobtainable. Issues up to May, 1939, are available at 6s. each, and the more recent issues at the usual price, but post free in both cases. The complete series dealing with breaking into the amateur game is not available, as the March issue of 1938 is one of those of which we have no copies.

S.L.N. (St. Kilda, Vic.) asks whether 27/- is the right price for the 1D8GT type valve.

A.—Yes, we understand that 27/- is the right price for this valve, and, although we agree that it is a fairly high price, it must be remembered that the valve is a complicated one, and capable of giving exceptional results.

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