THE AUSTRALASIAN

Radio World

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VOL. 5 . . . . . NO. 8 JANUARY 1941

Special Xmas & New Year Issue

NEW S.T.C. SETS — SEE DETAILS WITHIN

FULL DETAILS XMAS PORTABLE

COUNTRYMAN'S 6 BATTERY SET

A PUSH-PULL PROPOSITION

TWO CHAMPION AMPLIFIERS

The Australasian

RADIO WORLD

Incorporating the

ALL-WAVE ALL-WORLD DX NEWS

Vol. 5 JANUARY, 1941 No. 8

CONTENTS:

The "Australasian Radio World" is published monthly by A. G. Hull.

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PERSONAL

Rapidly drawing to a close, the year 1940 has been full of interest to me.

Cutting adrift from the "old firm" after ten years, it was a big step to take over the "World," especially in such troublous times.

Fortunately, the venture has been a grand success, and with the valuable assistance of Earl Read, I have been able to make a lot of progress.

With the New Year looming up, however, thoughts turn to New Year resolutions. To stand still is to go backwards, and so we have in mind several ideas which we expect to improve the style of the paper. Maybe a few of these will share the usual fate of New Year resolutions, but let us hope that some of them will be found practical.

Day by day, it seems to be indicated more clearly that deeper and deeper technical articles will be required to satisfy the demand from radio engineers, servicemen and enthusiasts who are all progressing at a fast rate.

A couple of years ago, our readers were interested in articles on how to use a multi-meter, then they became interested in using oscillators, then valve and circuit testers. It looks as though, in the New Year, they will be interested in cathode ray oscilloscopes, having already obtained and mastered the simpler test equipment.

Advertising is likely to follow a similar trend, as most of our readers already possess the simpler types of receivers and test equipment. They are now interested in more advanced circuit designs and in more advanced test equipment.

We feel that, in this progress, we must set the pace, and so that is one of our modest (?) New Year resolutions.

Another resolution is to go into the matter of posting out all copies in flat envelopes instead of rolling or folding.

We know that it is much nicer to open up a magazine after it has been posted flat, and the only real drawback to the scheme is the cost of the necessary envelopes. As is to be expected in the highly specialised field we cover, our direct subscribers are a big proportion of our total circulation and the bill for the envelopes, even at less than a half-penny each, would be quite beyond us. It seems, therefore, that an extra charge of 6d. per annum will be necessary for this special posting service.

A. G. HULL.

COUNTRYMAN'S SIX

Designed by A. G. Hull in collaboration with countryman Donald Dove, this circuit has been produced to give the best possible performance on the broadcast band. It is completely free from tricks and should be one of the most dependable circuits ever offered for battery-operated receivers.

FROM readers in country districts it has been learnt in no uncertain terms that they consider that they have not been fairly treated by radio technicians. Practically every letter from the country refers in a more or less envious way to the great strides being made with the designs for all-electric receivers and amplifiers. They claim that little appears to be done to help those whose problems are really more pressing, the men who live in remote parts, far from the alternating current power lines.

Actually this is not as much a matter of neglect as of lack of opportunity.

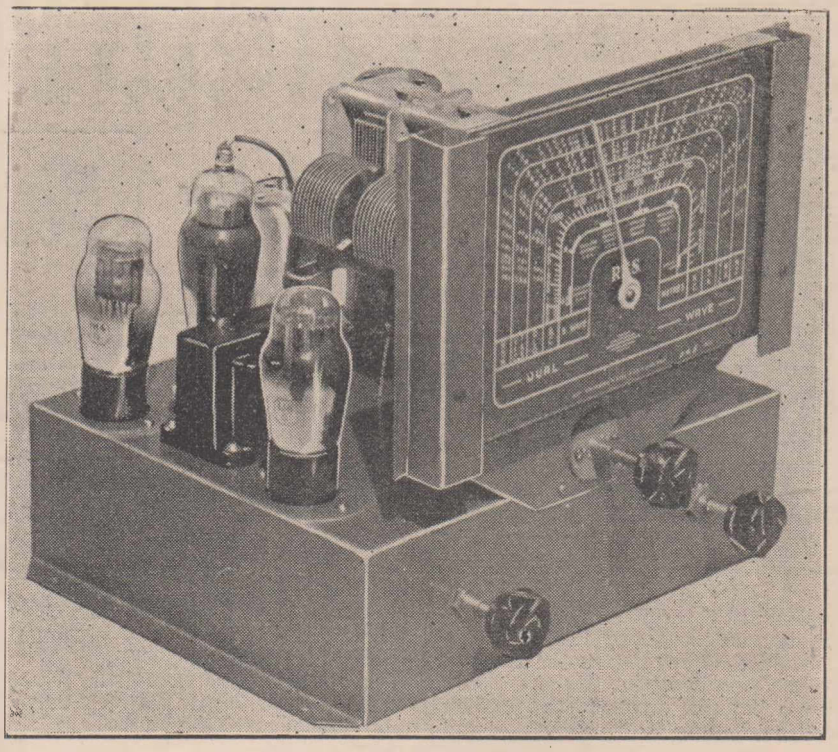
The introduction of new types of valves always increases the scope for their application, but in the battery ranges there are not so many new types.

Valve Improvements

In the ordinary range of two-volt valves the only major change for many years has been the fitting of the octal bases, allowing the valves to be used with the standardised and handy octal sockets. But the fundamental characteristics of the valves are practically the same as those which have been available for a long time.

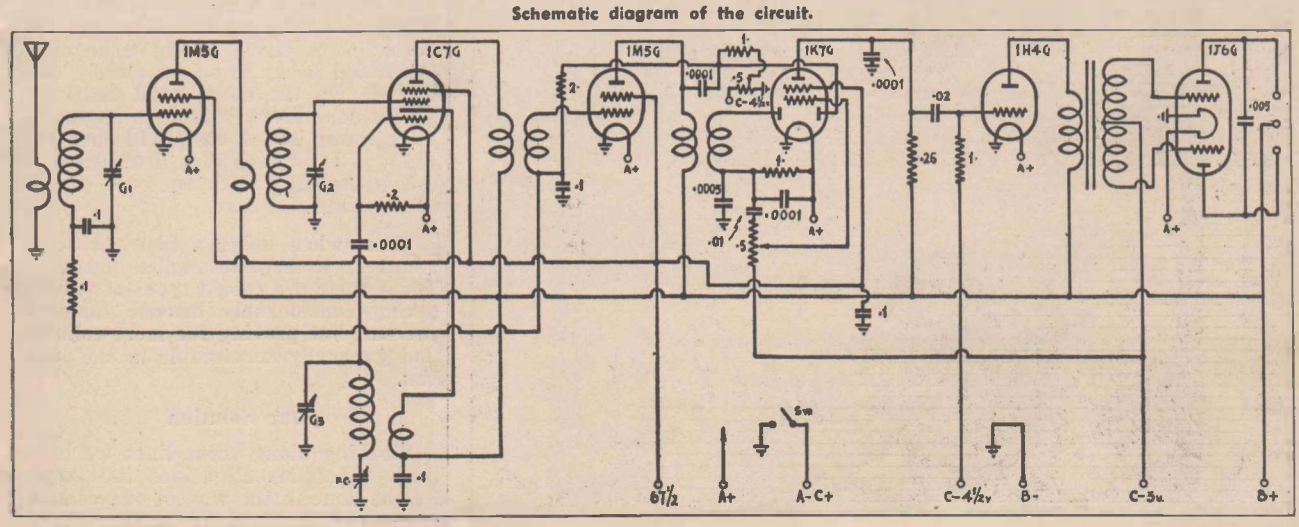
More recent was the introduction of the 1.4 volt valves, which were designed to operate from a single dry cell for the filament supply, in order to assist in the development of self-contained portables. These little 1.4 volt valves have proved to be a handy issue and they have well served their purpose in portable receivers.

They have also provided some eco-



Front view of the completed chassis.

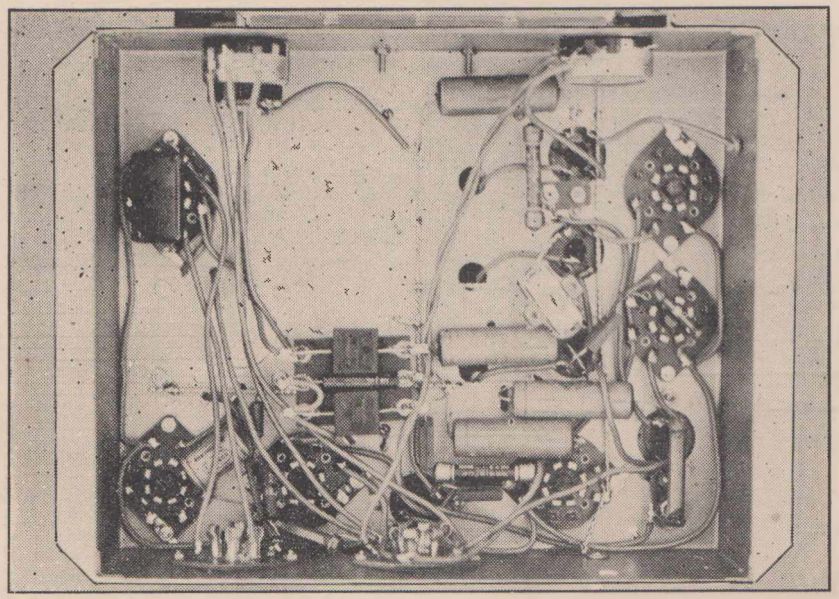
Schematic diagram of the circuit.



nomical little receivers for household use, but unfortunately they have not been quite as rugged as the two-volt series. This is always to be expected from a battery valve. If the filament wattage is low it is almost certain that the filament will be a fine one, and not able to withstand the rough usage of a heavier type.

Searching around to find the reason for the desire to use 1.4 volt valves in household receivers we find that the main reason is that the valves are capable of giving normal performance with a high tension voltage of 90, whereas the two-volt valves are rated to require 135 volts.

Compare this photo of the wiring with the picture diagram.



Accumulator Advantages

The matter of the filament supply does not appear to be so important, as although the single dry cell is more convenient than an accumulator it does not prove a good business proposition in the long run. The dry cell cannot be re-charged, and when once exhausted it has to be completely discarded. On the other hand the two-volt accumulator, although having a little more initial cost, will last for years. Every time it is discharged it can be readily re-charged at a cost of a shilling or two.

Thus, when using a two-volt accumulator, it becomes quite practical to use the more robust types of valves, taking considerably heavier filament current, but proving far more reliable and generally serviceable in the long run.

Our Solution

Working along these lines we have made some investigations into what can be done in the way of overcoming

the high tension problem and yet using these heavy-duty two-volt valves. Here is the solution to the problem, in the form of a solid six-valve set which has several outstanding features which should greatly appeal to the countryman.

In the first place the high tension required is only 90 volts, and the current drain is well below 10 milliamperes, even when working at full room strength. The need for only two high tension units of 45 volts each, and the low current drain means real economy, as the high tension batteries are always the big expense in battery upkeep.

Filament current is higher than could be achieved by using valves with lighter filaments, but we have made a point of avoiding the use of such valves. Those specified are the most rugged in their particular types. Although the result means a slightly higher current drain on the filament accumulator, this is not a real problem in practice.

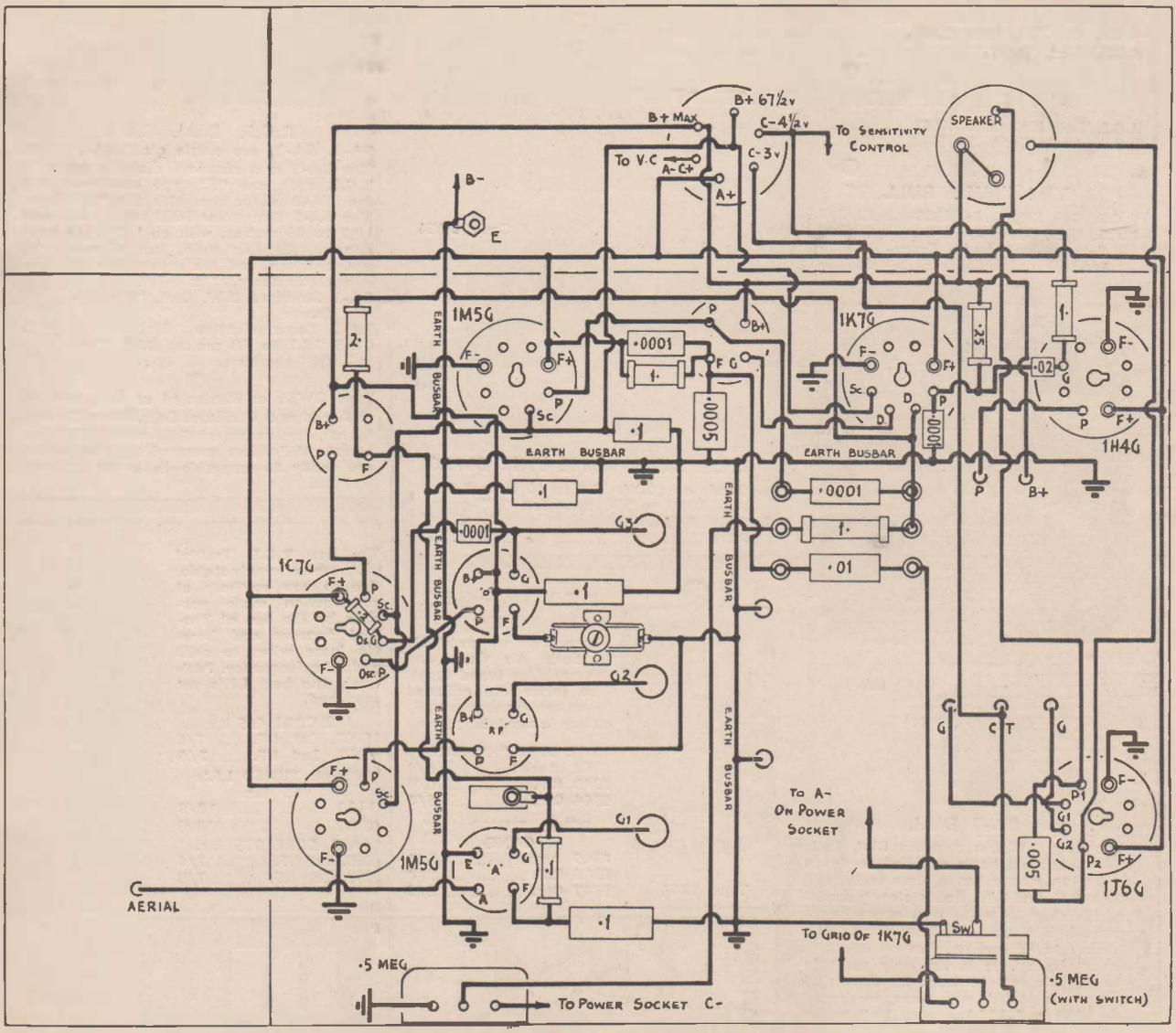
A big accumulator is not at all expensive and should mean about 80 to a hundred hours running between recharges. Few re-charging stations ask a higher fee for charging a bigger accumulator.

Speaking of the design of the set and its features we must point out that the receiver is essentially a broadcast job and it has been designed with a view to performance, economy, and reliability. Shortwave reception, however, has not been brought into the picture at all, and the circuit is only recommended for use as a straightout broadcast receiver.

Although dual-wave coils might be fitted and might work in this circuit we do not recommend the idea at all. Good performance on short-waves with battery-operated valves appears to be a matter of considerable luck, judging by reports received, and often enough we hear hard luck stories about receivers which will work with only one particular valve, another of a similar type not giving similar performance.

On the broadcast band, however, the converter valve has an easier life, and we haven't the slightest doubt but that every receiver built to this cir-

(Continued on page 9)



The wiring diagram. Note the way in which a bare wire is used for thorough earthing of all components.

R.C.S. TROLITUL COILS and COMPONENTS GIVE—

• Keener Sensitivity
• Greater Selectivity
• THE BEST RESULTS!

FOR THE "XMAS PORTABLE"

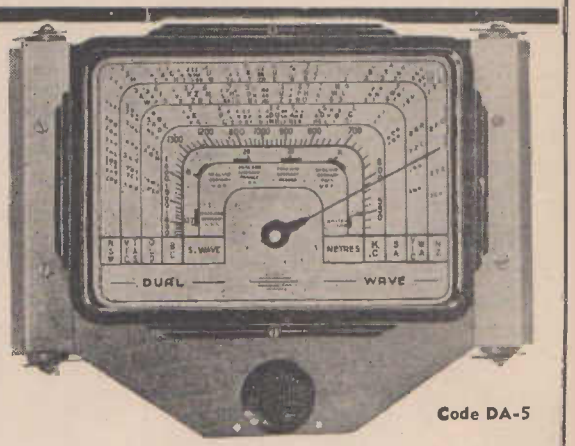
For the highest gain and micro-accurate tuning, specify this new R.C.S. Coil Kit, for the "Xmas Portable." Trolitul insulation throughout is your assurance of high fidelity reception — designed for easy mounting — the last word in sensitivity and selectivity. Kit comprises air-cored aerial, r.f. and oscillator coils, and two I.F. transformers complete with 465 k.c padder. For "H" gang. ....
R.C.S. Coil Kit, Code K164, ... £1/16/9
R.C.S. Dial, DA-7, ... 9/-

FOR THE "COUNTRYMAN'S BATTERY 6"

R.C.S. Coil Kit, Code K167 .... £1/16/3
R.C.S. Dial, Code DA-5 .... £1/2/6

FOR THE "PUSH PULL 7"

R.C.S. Coil Kit, Code K168 .... £2/2/6
R.C.S. Dial, Code DA-5 .... £1/2/6
TB 5 Push Pull Audia Transformer £1/1/-

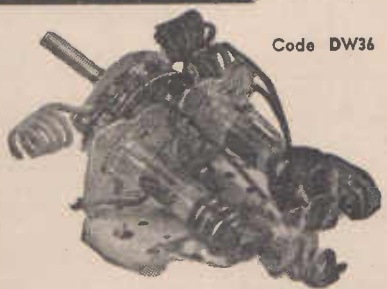


Code DA-5

R.C.S. DIAL DA-5

DA-1, DA-2, are single glass D.W. Dials, The DA-1 is a standard dial for use with R.C.S. coils and "F" type condenser and the DA-2 is for use with the "H" type. The DA-5 Dial is for 1600 to 550 k.c. and 13.7 to 40 metres, with an "H" type condenser. All this series are edge-lit and wedge-driven, and the escutcheon aperture is approximately 7" x 4-7/8"

DA-1 Standard D.W. Dial, "F" condenser 22/6
DA-2 Communications Dial 22/6
DA-5 13.7 to 40 metres D.W. Dial, "H" condenser 22/6

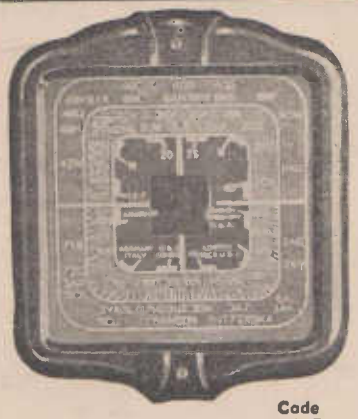


Code DW36

R.C.S. DUAL WAVE UNIT DW36

Bands are: S.W. 13.7 to 40 metres and B.C. 1600 to 550 k.c. For "H" gang. Code DW36.
Price £1/7/6

Type DW36 as illustrated at left, consists of Aerial and Oscillator Coils, Wave Change Switch, the necessary B.C. and S.W. Trimmers and Padders mounted together, wired up, ready to assemble in a set utilising 465 k.c.



Code DA-7

DA-7 DIAL

The new D.W. Portable Kit Dial, Code DA-7, has all parts supplied ready to assemble, and it has a glass scale with both B.C. and S.W. Bands clearly marked, finished in white with green background. The special walnut escutchean is easy to fit and requires an aperture of 3" by 3". It is the only portable dial which can be edge-lit. Available for use with "H" type gang condenser on 1600 and 550 k.c. and 13.7 to 40 metres S.W. Bands.
Code DA-7 .... Price 9/-

Type E342

R.C.S. Trolitul B.C. Coil

These coils are available in both Air Core and Permeability tuned types. The latter are adjusted to ensure maximum efficiency in our laboratories.

AIR CORE "H" GANG
E342 Aerial 6/6
E343 R.F. 6/6
E344 Osc. 6/6

PERM. TUNED "H" GANG
E345 Aerial 8/6
E346 R.F. 8/6
E347 Osc. 8/6

R.C.S. TROLITUL 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.

.... AIR CORE 465 k.c. ...
IF107. 1st I.F. 7/6
IF108. 2nd I.F. 7/6

PERM. TUNED I.F.'s 465 k.c.
IF130 .... 13/9
IF132 .... 13/9

AIR CORE 175 k.c.
IE68. 1st I.F. 7/6
IE69. 2nd I.F. 7/6

Code IF107

RCS RADIO

50 GLEBE STREET, GLEBE. Phone: MW 2405

OBTAINABLE FROM YOUR LOCAL DEALER

COUNTRYMAN'S SIX
(continued)

cuit will give sterling performance, even if the valves are a little abnormal or subnormal in the matter of the actual electrical characteristics.

Construction

The actual assembly of the chassis is child's play, as ready-drilled bases are readily available through any radio dealer. Using one of these bases in conjunction with a properly selected and matched kit of component parts it is only a matter of following out our photographs and picture diagrams.

Even a novice set builder should have no difficulty in building a first-class job and getting splendid results from it. The main thing is to be able to solder effectively, and most country men are handy in this way, although they don't have the facility of an electric soldering iron.

Assembly

First step in the assembly is to fit the sockets, coils, and the two potentiometers, one of which operates as a volume control and the other as a sensitivity control and economiser.

The main thing about mounting the sockets and coil is to see that they are fitted around in the same direction as shown in our diagrams of the terminals. In the case of the sockets this means that the key hole indicators in the centre of the sockets point outwards towards the outside of the base in every case. When mounting the sockets for the two 1M5G valves it is necessary to mount a valve can base under the heads of the screws. Valve cans are not essential for the other valves, although they might be found helpful in individual cases where instability is encountered.

When mounting the sockets a solder lug under one of the screws of each socket can be fitted in order to "earth" all of the filament negative terminals. These are shown clearly on the picture diagram and it should be remembered that there is a definite negative and positive to these terminals and in every case it is the negative one which is earthed.

Wiring

With the coils and valve sockets mounted the wiring can be started, the first step being to hitch together all the filament positive terminals and run them to the battery plug socket in the rear of the base. Next the coils can be connected up by running from P of coil to P of socket and so on.

Next the whole of the B plus run of the wiring can be finished off.

Then the screens can be tied together and taken to the battery plug socket.

As this wiring is finished off, the smaller components can be fitted, in most cases just hanging on their own pigtails and connecting up with the shortest possible leads.

Use Mounting Strips

In the case of the resistors in the a.v.c. line, however, it will be found highly desirable to use a couple of mounting terminals, lugs mounted up

(Continued on page 10)

COUNTRYMAN'S SIX — Parts List

1—Base, size 10½" x 8½" x 2½" (Arcadion).
1—Set of Coils as specified (R.C.S., Radiokes).
1—3-gang Tuning Condenser (Stromberg-Carlson type "H").
3—Trimmer Condensers for same (R.C.S., type CG15).
1—Dial to suit Gang and Coils (R.C.S., Radiokes).
1—Class B Audio Transformer (R.C.S., Airzone, Radiowes).
1—.5 megohm Volume Control (I.R.C.).
1—.5 megohm Volume Control with switch (I.R.C.).

CONDENSERS —
4—.1 mfd. Tubular (T.C.C.).
1—.02 ffd. Tubular (T.C.C.).
1—.01 mfd. Mica (T.C.C.).
1—.005 mfd. Mica (T.C.C.).
1—.0005 mfd. Mica (T.C.C.).
4—.0001 mfd. Mica (T.C.C.).

RESISTORS —
1—.1 megohm 1-watt Resistor (I.R.C.)
1—.2 megohm 1-watt Resistor (I.R.C.).
1—.25 megohm 1-watt Resistod (I.R.C..
3—1 megohm 1-watt Resistors (I.R.C.).
1—2 megorm 1-watt Resistor (I.R.C.).

VALVES —
2—1M5G, 1—1K7G, 1—1H4G, 1—1J6G (Philips, Mullard, Brimar, Radiotron).

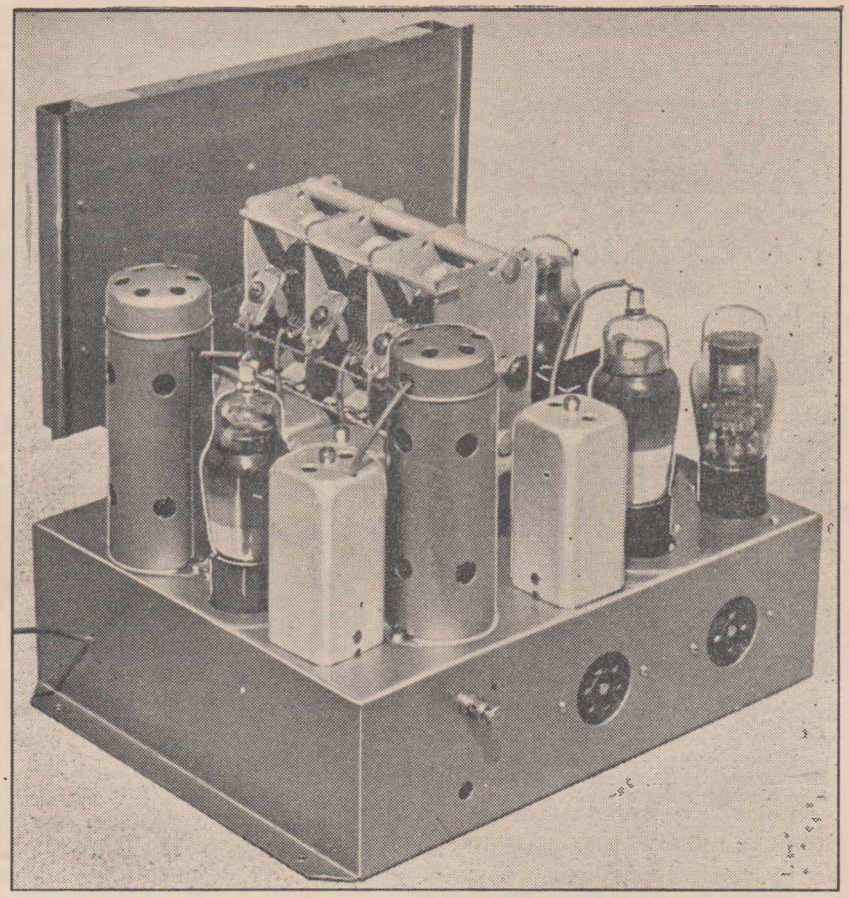
SOCKETS —
6—Octal, 1—6-pin, 1—4-pin, 2—Valbe Cans to suit.

BATTERIES —
2—45-volt "B" Batteries, 1—4½-volt "C" Battery, 1—2-volt Accumulator (Clyde).

SPEAKER —
Permagnetic to suit (Rola, Amplion).

THE COILS

Coils required are as follows — 1 aerial coil unit, 1-r.f. transformer, 1-oscillator coil, 1-padder condenser and two intermediate transformers. The intermediate frequency can be either 465 k.c. or 175 k.c., according to taste, but whichever frequency is chosen the oscillator coil, padder and intermediates must match. Similarlly the coils must be of the type to suit the type of ganged condenser used, and the dial must be of the type to suit both coils and gang. R.C.S. recommend the use of their type E342 aerial coil, E343 r.f. coil, E344 oscillator coil, with 460 k.c. padder, and 465 k.c. intermediate transformers, "H" type gang condenser and a DA7 dial.



Rear view of the completed chassis.

COUNTRYMAN'S 6

(continued)

in little chips of bakelite so that a firm mounting is obtained for the resistor. If these are not on hand they can be made up out of a small piece of pressing bakelite or any insulating medium, about three-quarters of an inch long and a quarter of an inch wide, with a couple of one-eighth-inch holes, one to mount on the screw and the other to take the pigtail of the resistor and the connecting wire.

As will be seen from the photograph of the wiring of the original chassis, a three-unit mounting strip was used and proved a great help to get a firm mounting for three of the smaller components which did not readily find a firm mounting by their own pigtails.

Before mounting the audio transformer it is a good plan to fit leads to the terminals, and poke these through to the under side of the base as the transformer is bolted into position.

The Gang Condenser

Last job in the wiring is to mount the gang condenser and wire it into the circuit. The condenser should not be fitted until last, as otherwise it may be damaged when the chassis is upside down for the wiring job.

All modern dials are calibrated for "H" type gang condensers and "H" type tuning coils, but unfortunately the "H" type gangs are not available with trimmers as are required when straight broadcast coils are used. As a result it becomes necessary to fit trimmers to the gang. This is not really a difficulty but it is a point which needs a certain amount of care, as the trimmers must be effectively earthed. Suitable trimmers are readily available and are listed out in our parts list. They can be conveniently mounted to the upper row of gang section terminals and then a length of heavy copper wire is run across from one side of the frame of the gang to the other, each condenser being firmly soldered to this wire.

This matter is shown very clearly in the special photograph.

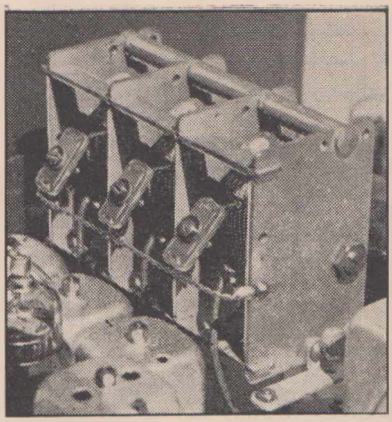
REACTION TIP

•

There is no need to keep reversing the reaction windings when your set fails to oscillate, as there is a simple rule that gives the correct connections. It is this:

Imagine that the currents in the two windings are flowing from the grid in the grid winding and from the plate in the reaction winding.

Reaction will be obtained when these currents flow through the windings in opposite directions.



Above: How the trimmers are mounted on the gang. The use of heavy gauge earth wire gives a neat finish to the job.

Alignment

When fitting the dial care is taken to see that the movement of the dial needle corresponds to the movement of the rotor plates of the gang condenser. In other words, when the needle indicates the dial is set zero, then the gang plates should be fully unmeshed. Tightening the grub screws at this, the proper alignment of the receiver can then be carried out according to the dial markings. This is only possible when matched components are used, as they should be. With the proper type of gang, trimmers, matched coils and gang condenser the station markings should be exact when the padder and trimmer alignment is correct. Working on this theory you can't go wrong and you will find that by easing off every adjustment about half a turn you will be able to tune in a station, then pull it into proper position on the dial by adjusting either the trimmer of the oscillator section of the gang condenser, or by the padder.

Use Padder To Align 2FC

Always work on the padder for the top end of the dial around 2FC and use the oscillator trimmer for the lower wave-lengths around 2SM. Once having made the stations fall correctly on the dial you can trim the aerial and r.f. sections of the gang, working on a station at the low wavelength end of the dial, and this should work out right for the top end as well.

(Continued on page 50)

A QUARTER-CENTURY OF *Mullard* LEADERSHIP . . .

A quarter of a century ago, Mullard engineers in England were among the handful of pioneers working unceasingly to develop wireless valves for use during the Great War, 1914-18. To-day, when radio is fulfilling a vital service to mankind, flashing history-making news all over the world and bringing entertainment to every nation on earth, Mullard engineers throughout the Empire are still among the leaders in a gigantic industry . . . still maintaining the unexcelled prestige that has made the name of Mullard a household word wherever the British flag is flown.

Mullard VALVES SET THE STANDARD!

From the days of the original "bright-emitter" . . . from the time when the Mullard "ORA" was held in high esteem . . . Mullard valves have been recognised by those who know, as setting a standard of perfection in manufacture and performance that has never been excelled.

The progress of radio has meant the development of hundreds of different valve types — many of them coming from the Mullard laboratories — **but there is now and always has been a Mullard valve for every purpose.**

THERE NEVER HAS BEEN FOR **ANY** PURPOSE
A BETTER VALVE THAN MULLARD

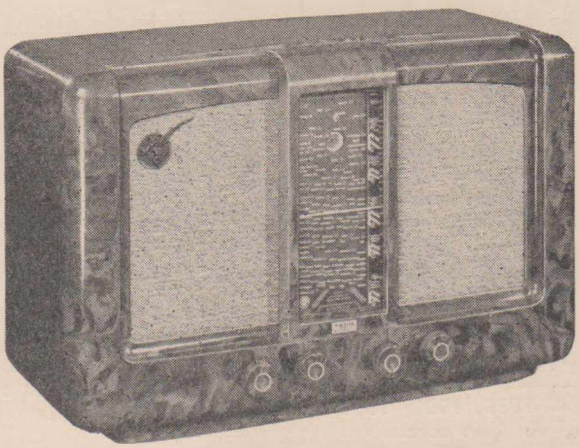
. . . And the same superiority is maintained in *Mullard* Receivers!

MULLARD WORLD-MASTER MODEL 61

Shown opposite is the famous Mullard World-Master, sensational record-breaker for world-wide reception on the short waves. Alan H. Graham, for years Short Wave Editor of "Radio World" and a noted authority on short-wave reception, says of the Model 61:

"In all tests on the short waves, the Mullard 61 proved outstandingly satisfactory in sensitivity and selectivity. . . . *On the broadcast band the Mullard 61 more than measures up to any dual-wave receiver we have heard, giving remorkable reception results. Practically all the Australian and New Zealand stations were logged nightly, and in addition numerous stations in the East and in Europe."

***Note: A list of the 115 world short-wave stations actually logged by Mr. Graham during the test period is available from all Mullard distributors.**



In the same manner, every receiver in the entire Mullard range is designed and built to the identical exacting standards as the Mullard valves it uses. In brilliance of technical design, coupled with perfection of styling and incomparable performance, Mullard receivers have been acclaimed as offering the greatest value in radio to-day.

RADIO Mullard AUSTRALIA

Mullard
RADIO AND RADIO VALVES

MULLARD-AUSTRALIA PTY. LIMITED, 367-371 KENT ST., SYDNEY, N.S.W., Telephone: MJ 4688 (4 lines)

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Just Out!

. . . VOL. 3 AUSTRALIAN OFFICIAL RADIO SERVICE MANUAL

This is Australia's ONLY Standard book of receiver circuits and data covering each year's models. There is NO OTHER WAY of securing complete reference year by year of every national receiver.

The third volume just off the press, covers 1939 models. Clear, concise, and accurate, this book is specially edited for speedy, easy reference. You will show a profit on the entire cost of the book with the first 1939 set you service.

Imagine the convenience of being able to refer to any 1939 national receiver circuit at a moment's notice and have all the information you require. No guesswork, no calculations — there before you is the manufacturer's circuit and data.

Price 15/- (stiff covers), 12/6 (limp covers)

A small quantity of Volume 1 (1937 circuits) and Volume 2 (1938 circuits) is available at special concession prices — 10/- (stiff covers), 7/6d. (limp covers). Thus, for 35/- you can secure all Australia's national receiver circuits for 1937, 1938, 1939 in stiff covered Volumes, or only 27/6d. in limp covers.

Copies are obtainable from your electrical and radio house, booksellers, or the publishers, The Strand Press, Box 1538V, G.P.O., Brisbane.

The One Radio Book You Can't Be Without

Vol. 3 contains the Circuits and Data of Australia's 425 National 1939 models

SCOTT PRODUCES A COMMUNICATIONS RECEIVER

Great interest has been aroused by the announcement that Mr. E. H. Scott, manufacturer of the world's most expensive radio receivers, is now to offer a communications-type receiver. We are fortunate in being able to reproduce the circuit diagram of this set and also some technical data about the many ingenious features in it.

ALWAYS worthy of note, the circuits of the world-famous "Scott" receivers are full of interest to students of receiver design.

"Scott" receivers are amongst the world's most expensive, and some of the more elaborate models sell for thousands of dollars. Even the simpler models cost as much in America as a medium-priced sedan car. Needless to say there is no skimping when it comes to using valves and components.

The most popular model of the "Scott" receivers is fitted with 23 valves, but one model has forty in all.

The latest news from America announces that Scott has now turned his attention to the marketing of a communications-type receiver.

By courtesy of "Radio and Television" (New York) we are able to reproduce the full circuit diagram of this remarkable receiver.

It is one of the most ambitious designs so far developed for a communications type receiver, capable of covering all of the usual short-wave and broadcast bands, plus a long wave band.

The frequency coverage ratio is approximately 460:1, extending from 140 kc. to 64 mc. in 9 tuning ranges (2142 to 4.68 metres), as follows:—

I	140 kc. to 395 kc.
II	520 kc. to 1710 kc.
III	1.7 mc. to 2.9 mc.
IV	2.8 mc. to 4.9 mc.
V	4.8 mc. to 8.1 mc.
VI	7.9 mc. to 13.9 mc.
VIII	20.1 mc. to 37.0 mc.
IX	33.3 mc. to 64.0 mc.

It will be noted that ample overlap is provided between each tuning range and that the only gap occurs around the intermediate frequency point.

The tube complement is employed in the following manner:

2 Type 6U7G—broadcast & long wave R.F. Amplifiers
1 Type 6L7G—broadcast & long wave mixer
1 Type 6J5G—broadcast & long wave oscillator
2 Type 6U7G—short wave R.F. amplifiers
1 Type 6L7G—short wave mixer
1 Type 6J5G—short wave oscillator
3 Type 6K7G—i.f. amplifiers

A snap of Mr. E. H. Scott chatting with our Editor, taken on the roof of the Scott Laboratories in Chicago in 1936.

1 Type 6B8G—a.v.c. i.f. amplifier & a.v.c. detector
1 Type 6B8G—audio signal detector & beat frequency oscillator
1 Type 6K7G—1st audio amplifier
1 Type 6J5G—phase inverter
2 Type 6J5G—audio driver amplifiers
2 Type 6L6G—audio output amplifiers
1 Type 6B8G—static and scratch suppressor
1 Type 6J7G—static and scratch suppressor
1 Type 6J5G—tuning meter amplifier
1 Type 6H6G—noise limiter
1 Type VR150—oscillator — voltage regulator
2 Type 5U4G—rectifiers

The following features are incorporated in the receiver:

1. Two Tuned R.F. Stages on all bands to provide maximum signal-to-noise ratio as influenced by the receiver.

2. Super Shield Antenna Coupling System on all important bands. This system uses a special method of electro-static shielding and electro-magnetic coupling between the primary and secondary of each antenna transformer, thereby eliminating practically all noise voltage picked up in the lead-in under the most severe conditions.

3. Separate R.F. and Mixer Channels with separate variable condensers are used for the low frequency bands and the high frequency bands. The optimum stage gains are possible only under these conditions.

4. Electrical Band Spread Tuning is provided for all high frequency bands. Accurate logging and ease of tuning are assured by a stable mechanical drive arrangement developed in our laboratories.

5. Three degrees of variable selectivity are incorporated in the normal I.F. system and six degrees of crystal selectivity are added to allow a choice of the most suitable bandwidth for given interference conditions.

6. Diode type Noise Limiter effectively reduces ignition and other types of peak impulse noise when weak signals are being received.

7. Beat Frequency Oscillator at the intermediate frequency with variable pitch control permits detection of the weakest possible signals.

8. A circuit developed for the elimination of surface noise and needle scratch from records is incorporated because of its ability to improve the signal-to-noise ratio on weak radio signals with respect to high frequency hiss and static. This system is known as the scratch suppressor.

(Continued on next page)

SCOTT COMMUNICATIONS
(continued)

9. R.F. Gain control permits the selection of a sensitivity level for maximum signal-to-noise ratio, and an adjustment of the tuning indicator to correct reference level.

10. Antenna Compensator Condensor provides a means for tuning the antenna circuit for maximum gain and signal-to-noise ratio on all short wave bands. Possible detuning by various types of antenna systems may be compensated for by this control.

11. A calibrated Tuning Meter is included so that the operator will know the relative strength of all received signals in terms of DB and R level.

12. Audio Tone Controls for both low and high audio frequencies allow a choice of the most desirable audio range for a given type of programme, and thus permit an even more favourable signal-to-noise ratio than that obtainable by the most effective use of the selectivity control.

13. An Audio system of wide range fidelity characteristics allows the listener to obtain the maximum frequency range on the broadcast band, and the high power handling capacity of the system provides a remarkable volume and tonal range.

14. Provision is made for the use of phones or loud speaker.

15. AVC Switch permits removal of AVC voltage for weak signal or code reception.

16. Three stage I.F. amplifier provides gain and selectivity adequate for all reception conditions.

17. Stable Separate Oscillators at low and high frequencies insure accurate dial calibration at all points.

18. Rugged mechanical construction of chassis and all components insures freedom from drift or alteration of characteristics.

ROLA RADIO NEWSREEL

THIS is an age of News and News Commentaries and it is not surprising to note the very rapid growth in prominent features and station times set aside for these important transmissions.

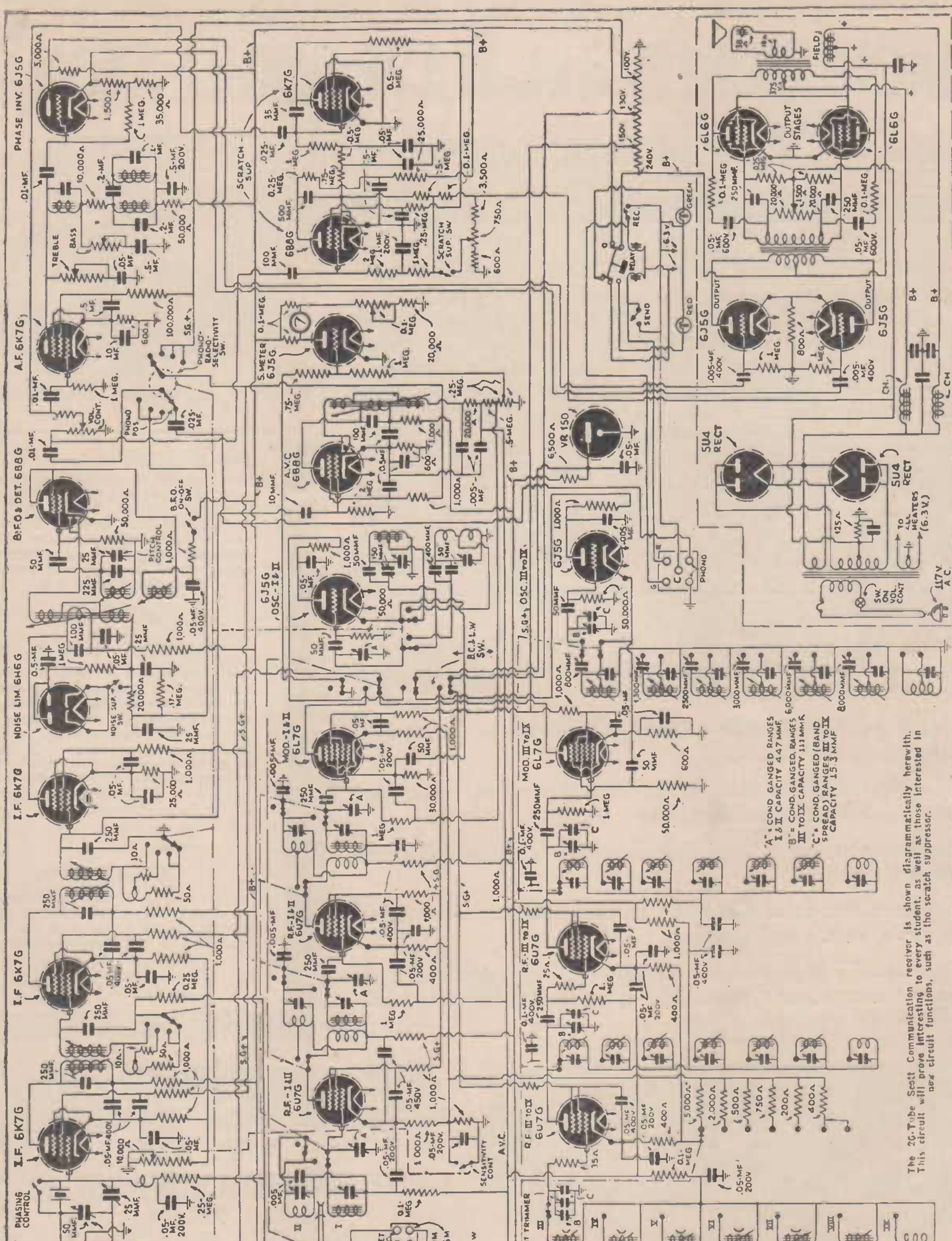
In September last, Rola Company, manufacturers of the world's finest loud speakers, entered, for the first time, the field of sponsored radio and selected 'Radio Newsreel', as the programme to which they pinned their faith.

Series of Interviews

The programme was concieved to be a series of interviews and commentaries on the news highlights of the week. Although not altogether new in its conception, 'Radio Newsreel' was the first sponsored session of its type to be broadcast in Australia and a tremendous amount of developmental and experimental work had to go into the preparation of this programme.

Difficult Material

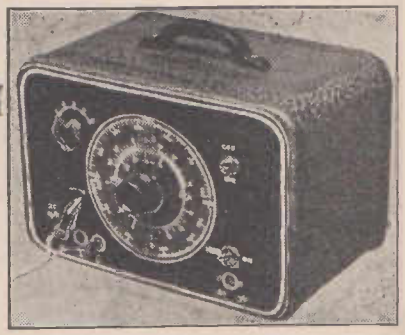
Working with this new and difficult material Rola Company, their advertising agents and the stations concerned — 2UE and 3XY, did some hard developmental work. At times, results were far from what was expected, but far from swinging away from the idea of the 'Radio Newsreel', those concerned with its presentation persevered with every detail. Changes were made in the presentation, new elements were introduced, each week the programme being critically analysed and strengthened. To-day after having run for, at 8th December, 1940. 14 weeks, the 'Rola Radio-Newsreel' is one of the most outstanding sessions on the air. It is broadcast on relay from 2UE and 3XY every Sunday evening at 7.



Circuit of the "Scott" communications receiver, showing how twenty-six valves are used to give maximum performance.

"RADIO WORLD" ALL-WAVE OSCILLATOR

uses CALSTAN pre-tracked foundation kit



Sensational New Design Cuts Service Time: Increases Profits.

Laboratary accuracy, combined with maximum flexibility and impressive all-round performance, are built into this sensational new Star all-wave oscillator, designed to provide servicemen and experimenters with a high precision instrument at lowest possible cost. (Complete constructional data appears in the November, 1940, issue of "Radio World.") A kit of parts costs pounds less than commercial models of equivalent performance. Study the many features listed below.

STAR FEATURES ★

- ★ **Continuous coverage from 150 k.c. to 30 m.c. in five bands. 150 k.c. to 15 m.c. on fundamentals, 16 to 30 m.c. on harmonics.**
- ★ **Coils, band switch and attenuator are wired and sealed in a compact steel case, modulation choke and condenser gang being mounted externally.**
- ★ **ONLY FOUR COLOUR–CODED LEADS to connect Foundation Unit into circuit.**
- ★ **Band coverage is accurately pre-adjusted to track with five-band direct-reading scale.**
- ★ **Electron-coupled r.f. oscillator circuit ensures high frequency stability.**
- ★ **Five-inch five-band dial with non-slip planetary drive direct in k.c.'s, m.c.'s and metres.**
- ★ **Provision for high and low r.f. output, with particularly efficient attenuator system. 400-cycle modulator note available when required.**

FOUNDATION KIT

The Calstan Star All-wave Oscillator foundation kit comprises: One steel cabinet, 10½" x 6¼" x 7"; oscillator unit, mounted in steel box, with modulation choke and condenser gang; knob and indicator; scale printed on heavy art paper.

Price, Foundation Kit

£4/17/6

COMPLETE KIT

The complete kit of parts for the Star All-wave Oscillator comprises the Foundation Kit described alongside, together with all necessary resistors and condensers, valve, batteries, etc., as detailed in the list of parts accompanying the constructional article elsewhere in this issue.

Price, Complete Kit

£7/17/6

COIL KIT

Coil Kit only, comprising five-band coil assembly and attenuator mounted in steel box with modulation choke and condenser gang bolted in position.

£3/7/6

CALSTAN

(CALibrated to STANdard)

TEST EQUIPMENT

SLADE'S RADIO PTY. LTD.

LANG STREET, CROYDON. N.S.W.

PHONES... UJ 5381 - 82.

Makers of Highgrade Radio & Electrical Testing Equipment

Distributors: N.S.W.: Radio Equipment Pty. Ltd., Martin de Launay Pty. Ltd., Bloch & Gerber Ltd., United Radio Distributors, John Martin Ltd., Electric Service Co., Newcastle. QUEENSLAND: Chandlers Pty. Ltd.; A. E. Harrold, 123 Charlotte Street. SOUTH AUSTRALIA: Radio Wholesalers Ltd., Adelaide; A. G. Healing, 151 Pirie Street, Adelaide. WEST AUSTRALIA: Norman J. Burnell & Co., 13 Queen Street, Perth. VICTORIA: Australian General Electric Ltd., Melbourne; Arthur J. Veall Pty. Ltd., Melbourne; Hartley's Ltd., Flinders Street, Melbourne. TASMANIA: Oatlands Garage, Oatlands. NEW ZEALAND: Turnbull and Jones, all branches.

How To Use The

"RADIO WORLD" ALL-WAVE OSCILLATOR

This article explains the operation of this popular all-wave oscillator, together with the method of aligning dual-wave superhets.

★ ★

SOME pointers on the operation of the "Radio World" oscillator, including an outline of the correct method of aligning dual-wave superhets., are given below. As anticipated, this oscillator is proving widely popular among readers, Slade's Radio reporting a very brisk demand for foundation units and kits of parts.

Useful Accessories

The "Radio World" oscillator is designed to give a high standard of accuracy. If correctly assembled and wired, accuracy is within 1% on bands 1 and 2, and 2-3% on the short-waves (bands 3, 4 and 5). A point worth mentioning here is that it is a good plan to switch the instrument on three or four minutes before using, and allow it to stabilise.

A handy accessory that ensures highest possible accuracy in alignment is a dummy aerial. This contains standardised values of resistance, capacity and inductance, and when used it ensures that the loading placed by the oscillator on the first tuned circuit simulates that of an average aerial.

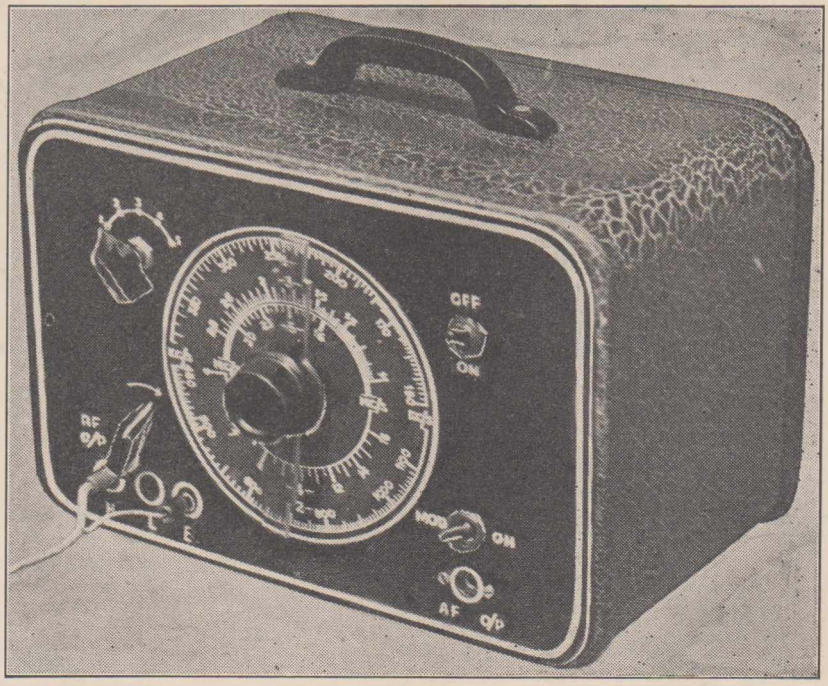
Slade's Radio can supply readers with their standard dummy aerial as used with all Calstan oscillators for 7/6.

Valuable Accessory

Another valuable accessory well worth using is a pair of shielded leads for use between the oscillator and set to eliminate stray fields. Slades Radio can also supply these, price 4/6 pair.

The alignment of superhets presents no difficulties, providing certain precautions are taken. In the first place, it should always be considered as the final operation before the set is replaced in its cabinet. In other words, the chassis and components should not be interfered with after alignment is completed.

Secondly, the input voltage from the oscillator should be kept low, and alignment carried out with the receiver volume control at or near maximum.



The "Radio World" all-wave oscillator. Complete constructional details appeared in the November issue.

The use of small input voltages is particularly important when dealing with a receiver equipped with a.v.c., since at high signal inputs the a.v.c. becomes fully operative and changes in output level are greatly reduced by its action.

Aligning A Superhet

Correct procedure for aligning a superhet of standard design is as follows:—

The i.f. transformers should be first of all peaked to their correct operating frequency, as unless this is done, accurate tracking of the r.f. and oscillator circuits is impossible.

In Australia to-day, 465 k.c. (or thereabouts) is the standard intermediate frequency adopted by practically all manufacturers. A point to bear in mind here is that unless for a definite reason, it is not advisable to alter the intermediate frequency of an existing receiver. This can easily lead to trouble with "joeys" and will upset dial tracking.

To adjust the i.f's., turn the oscillator wavechange switch to Band 2 (450—1100 k.c. and connect the output leads between the grid of the mixer valve and earth.

Now set the oscillator dial to 465 k.c. and, keeping the modulated r.f. output tuned low, adjust each i.f. trimmer in turn for maximum output. Commence with the trimmer across the secondary of the second i.f., and work through to the primary of the first.

Signal Frequency Circuits

Having accurately adjusted the i.f. transformers, the next step is to adjust the signal frequency trimmers on the condenser gang or coils associated with it.

Alignment of the tuning circuits presents little diffifulty in the case of receivers in which the dial is marked only in terms of an arbitrary scale. The procedure usually adopted is then as follows:—

The stations on the high-frequency end of the band are set to a satisfactory position by means of the oscillator trimmer. Reducing the capacitance of this trimmer will shift the stations towards the centre of the dial scale, while increasing it will have the opposite effect. The modu-

(Continued on page 18)

"R.W." ALL-WAVE OSCILLATOR *(continued)*

lated oscillator is set to 1400 k.c.'s and the output lead connected to the aerial terminal in place of the aerial. The signal is carefully tuned in and the aerial and r.f. trimmers adjusted for maximum output. The modulated oscilattor is now set to 600 k.c.'s and, with the receiver tuned to this frequency the padding condenser is adjusted to give maximum output, the gang being "rocked" to allow for alteration in oscillator frequency. The optimum adjustment is that when any variation in the padder setting causes a falling off in output, no matter which way the gang condenser is turned. Having adjusted the padder, it is necessary to re-check the aerial and r.f trimmers at 1400 k.c.'s.

Calibrated Dials

When the receiver dail is calibrated with station names, or in terms of frequency and/or wavelength, the same general procedure should be follower, aligning first the trimmers and then the padding condenser.

With the padding condenser adjusted, the receiver is tuned to a station at the low-frequency end of the band (e.g., 2FC or 3AR on 610 and 620 k.c.'s, respectively) and the dial pointer is set to its calibrated position. A local station on about 1300 k.c.'s is then brought to its calibrated position by means of the oscillator trimmer. The aerial and r.f trimmers must then be readjusted, using the modulated oscillator. Then, providing the dial is calibrated to the particular gang condenser and coil kit used, the remaining stations should fall near their calibrated positions.

A General Rule

The general rule therefore is to set the dial pointer by the low-frequency stations and adjust the positions of the high-frequency stations to coincide with their dial calibrations by means of the trimmers.

This rule also holds in receivers where the tuned circuits are aligned inductively by means of variable iron cores. The process may be rather more tedious, however, since the adjustments on the high and low-frequency ends of the band are less independent.

On the short wave bands, it is recommended that the tuning circuits be lined up with the normal aerial connected, and the output lead of the oscillator twisted around it. As before, no higher input voltage should be used than is necessary.

As in the majority of receivers a fixed padder is used, the only means of setting the dial calibration is by means of the oscillator trimmer at the high frequency end of each band.

With the oscillator trimmer adjusted to give correct dial tracking, the aerial and r.f. trimmers are carefully "touched up" in turn for greatest gain. It should be noted that care must be exercised to discriminate between the signal and the "image" which may be very prominent in small receivers.

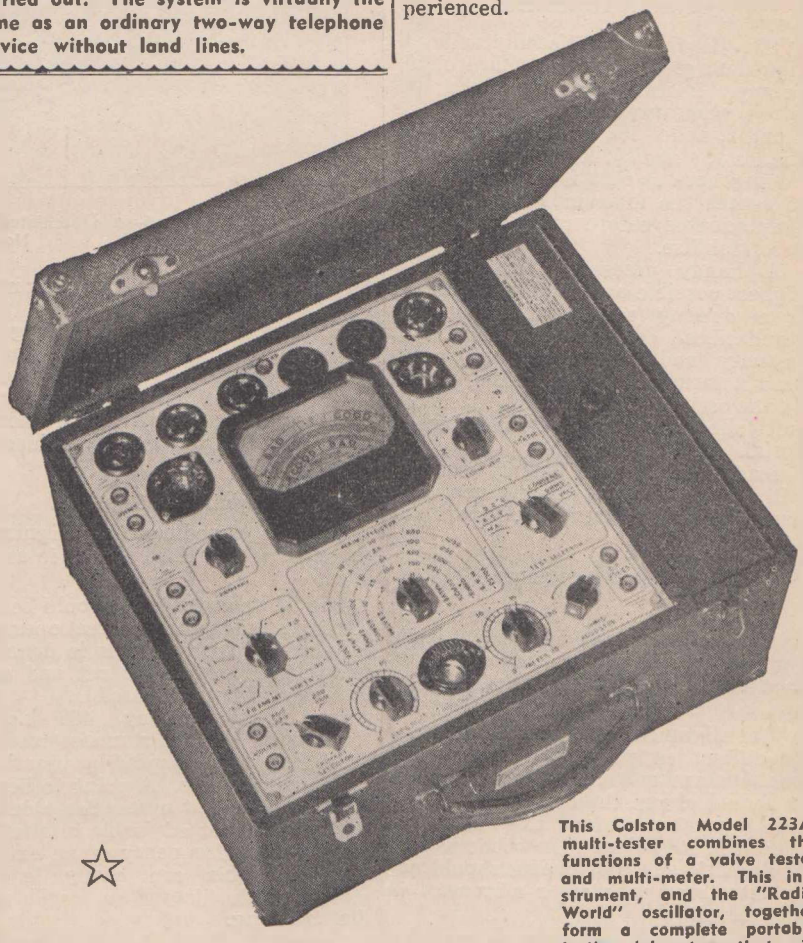
"Crossing-over" Effect

Another effect which must be appreciated is the "crossing-over" effect. In the majority of receivers the oscillator is tuned to a frequency higher than the signal frequency, the oscillator coil being slightly smaller than the aerial and r.f. coils. If, however, the range of the trimming condensers is great, it is sometimes possible at the high-frequency end of the band to tune the local oscillator to a frequency lower than that of the signal frequency circuits. Under these conditions, as the receiver is tuned across the band, the resonant frequency of the aerial and r.f. circuits decreases more rapidly than that of the oscillator circuit and a point of cross-over occurs beyond which the oscillator frequency is above the signal frequency. At the point of cross-over, i.e., where the two frequencies are equal, instability is likely to be experienced.

COUNTY COUNCIL WIRELESS ON SERVICE CARS

The Sydney County Council has instructed Amalgamated Wireless to fit radio telephony equipment on a further batch of 16 of the Council's service cars. This will increase the number so equipped to 62.

Two years have elapsed since the County Council started to use wireless telephony as a means of communicating speedily with its men while on duty. A central transmitting station was established at the Radio Transmitting Centre of Amalgamated Wireless at Pennant Hills, also six receiving centres in the suburbs. The officer-in-charge at headquarters calls up any car in order to convey instructions regarding work to be carried out. The system is virtually the same as an ordinary two-way telephone service without land lines.



This Colston Model 223A multi-tester combines the functions of a valve tester and multi-meter. This instrument, and the "Radio World" oscillator, together form a complete portable testing laboratory that will take care of all kinds of receiver faults.

An Interesting

CIRCUIT from W.A.

JUST what can be done in the way of obtaining results from modest receivers can be gauged from the letters we receive from some of our readers.

To bring in broadcasting stations from Europe on the medium waveband seems to be an everyday occurrence to some readers who happen to live in especially favourable locations.

Brought under our notice recently is a circuit which is being used to great effect by a Mr. J. Halse, of the School House, Karragullen, Western Australia. This circuit does not profess to be the last word in technical development, in fact the primary consideration in the design was to use the valves which happened to be on hand, and it will be noticed that they are an odd lot.

Circuit Features

There are two r.f. stages, one using an English-type VP2 valve and the other a 1M5G Australian-made valve.

The detector reveals a couple of most interesting points, being a duplex-triode valve with the input to both grids, but one plate being used for reaction alone, while the other is connected in the usual way. According to Mr. Halse this hook-up for the detector circuit resulted in giving the set the most desirable type of velvet reaction, and contributing largely to the performance.

The idea is equally applicable to several other types of sets using regenative detectors and is one well worth keeping in mind for future reference.

The detector is transformer-coupled into an audio stage, which is arranged with an effective plate feed de-coupling filter in order to allow full gain without motor-boating.

The audio stage drives a KL4 pentode output valve through a resistance-capacity coupling, with an audio volume control, which can also be used to assist in maintaining stability.

Construction

The original set was built up from the remnants of an old "Cossor Melody Maker," the original metal cabinet being used to accommodate a new metal base, fitted with metal screens both above and below in order to give the most effective screening to separate the r.f. stages and allow their full gain to be utilised without any feedback being allowed to cause instability.

Incidentally, both r.f stages and the detector stage were independantly tuned, each having a separate dial.

This makes for cumbersome appearance and handling, but is one sure way of getting perfect alignment for each stage.

A small midget condenser is fitted in parallel with the main tuning condenser for the detector stage, this being used as a band-spread condenser to give a finer adjustment on short-

WORKING TO MUSIC

Within recent weeks the question of making monotonous work less monotonous has arisen and at this time when some phases of important work like the production of munitions are routine and uninteresting, consideration is being directed to means of relieving the irksomeness and counteracting fatigue.

In this regard no more valuable agent has been found than amplified music, the equipment for which is manufactured and installed by Amalgamated Wireless. Recently that company was advised by a factory executive employing large numbers of girls, after a set of amplifiers had been in use for three months, that output had increased both because the girls listened to the music instead of talking and because they gave out further effort which appeared to come from a feeling of contentment.

This executive stated also that the girls did not resign their jobs so readily. Previously there was a drift arising from their searching for work in surroundings or circumstances more to their taste; now they seemed comfortable and happy, and sang with the music. The management had found the introduction of the microphone a further advantage as it enabled the firm to make contact with the whole staff. It was now possible to explain the company's reasons for any course of action and to organise quickly and easily social affairs in connection with war efforts. It welded the whole of the employees into one happy family.

The manager of a large company employing many girls said records containing plenty of rhythm, swing bands, marches, piano duets and accordian music were preferred. The ryhthm should be preserved and the music should have pep.

wave tuning. The other stages are not so critical and can be roughly tuned to the correct wave-length, the detector trimming finished off and then the r.f stages re-tuned for best results.

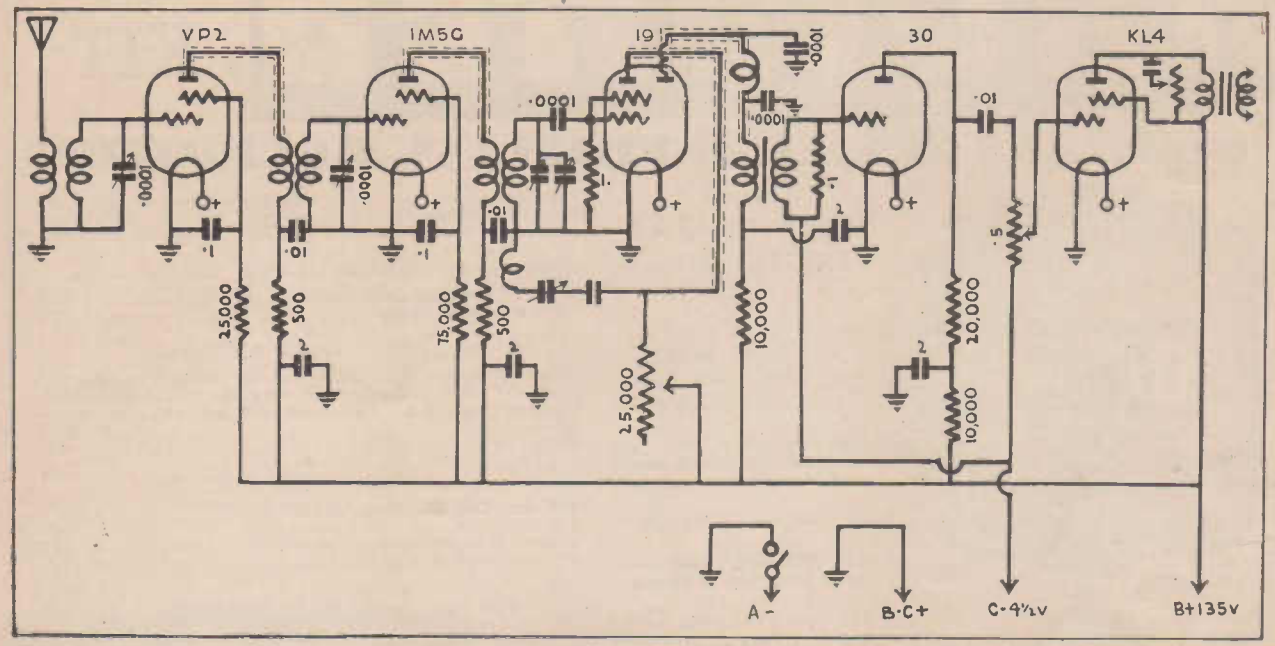
The Audio Transformer

Any serviceable audio transformer should be suitable for this circuit, the one used in the original set being taken from the original "Melody Maker" which was the foundation for the set.

Circuit of the battery receiver sent in by Mr. Halse of Western Australia.

Coils

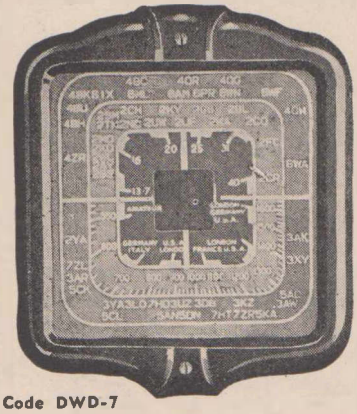
Plug-in coils were used on all bands, and these were home-wound to standard data, two sets being needed to cover the broadcast band with the condensers used, which had a maximum capacity of approximately .0001 mfds.



THIS LOW-PRICED, EASY-TO-ASSEMBLE

RADIOKES COIL KIT

GUARANTEES HIGH FIDELITY RECEPTION



Code DWD-7

with the

"COUNTRYMAN'S BATTERY SIX"

•

RADIOKES DIAL FOR THE "XMAS PORTABLE"

- Dial shows Dual Wave and Broadcast Stations clearly marked in white on green.
- This Dial can be edge-lit.
- Neatly finished walnut escutcheon af attractive design.
- The aperture required for the Dial is 3" x 3".
- For "H" Gang, B.C.1600 to 550 k.c. and S.W. 13.7 to 40 metres. Radiokes Dial, Type DWD-7 .... 9/-

Perfectly matched and carefully tested before dispatch, are the new Radiokes Coil Kits designed for sets featured in this issue. You can't go wrong if you specify Radiokes!

•

FOR THE "COUNTRYMAN'S BATTERY SIX"

Radiokes Coil Kit, Code CK1026 .... £1/16/3
DWD-5 Dial, to track £1/2/6

•

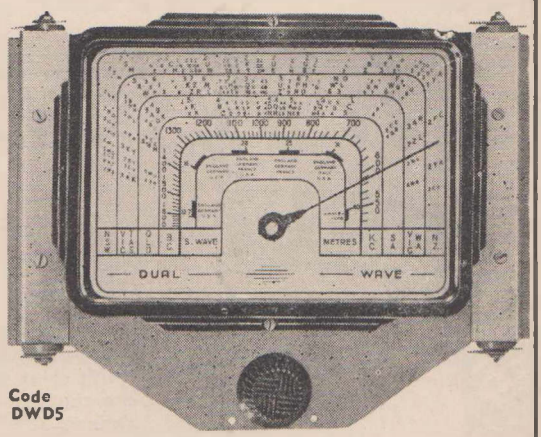
FOR THE "XMAS PORTABLE"

Specify Radiokes Kit, Code CK1022, comprising air-core aerial, r.f. and oscillator coils, and two I.F. transformers, complete with 465 k.c. padder. For use with "H" gang.
CK1022 .... £1/16/9
DWD-7 Dial, to track 9/-

•

FOR THE "PUSH PULL 7"

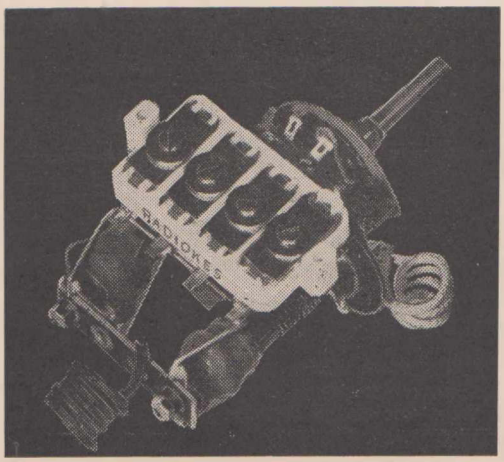
Radiokes Coil Kit, Code CK1027 .... £1/7/6
2 I.F.'s 15/-
DWD-5 Dial, to track £1/2/6
TB5 Push-Pull Audio Transformer £1/1/-



Code DWD5

RADIOKES DIAL for the "COUNTRYMAN'S BATTERY SIX"

Radiokes Dials DWD-1, DWD-2, DWD-5, are edge lit and wedge driven, and dial apertures required are 7" x 4 7/8".
DWD-1 Standard D.W., "F" Type Condenser 22/6
DWD-2 Communications Diol, "H" Type Condenser 22/6
DWD-5 13.7 to 40 metres D.W. Dial, "H" Condenser 22/6



RADIOKES DUAL-WAVE UNIT for the "PUSH PULL 7"

Highly selective unit with exceptionally wide range. To match "H" type gang condenser. Incorporating 4-in-1 padder. Solidly mounted with coils.

Type DWU-1, List Price 27/6

RADIOKES "H" TYPE COILS WILL TRACK ONLY WITH RADIOKES "H" TYPE DIALS

RADIO SUPPLIERS PTY. LTD.
Sole Agents for Radiokes Products,
Wingello House, Angel Place, Sydney. 'Phone B 4586.

I am interested in selling and using Radiokes Precision Products.

I am a HOME CONSTRUCTOR .....
I am a RADIO DEALER .....
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(Cross out whichever does not apply).

Please send full details of prices of new Radiokes Produces, to:—

NAME: .....

ADDRESS: .....

XMAS PORTABLE

In last month's issue we gave the preliminary announcement of our Xmas portable, o most powerful and compact self-contained receiver. Here is the full orticle covering the constructional details.

AT this time of the year there is increased interest in portable receivers.

Everybody wants to hear the news on the radio and quite a big percentage of the listening public are also interested in sports results. But you can't sit around in front of a radio set waiting to listen in to what you want to hear.

The outdoors calls to you.

There is one certain answer. Take a portable radio with you.

Many Advantages

The modern portable receiver is light and economical, and will give perfect reception without any external aerial or wires. It is completely self-contained, and no matter where you are you have only to throw over a switch and you have your choice of programmes.

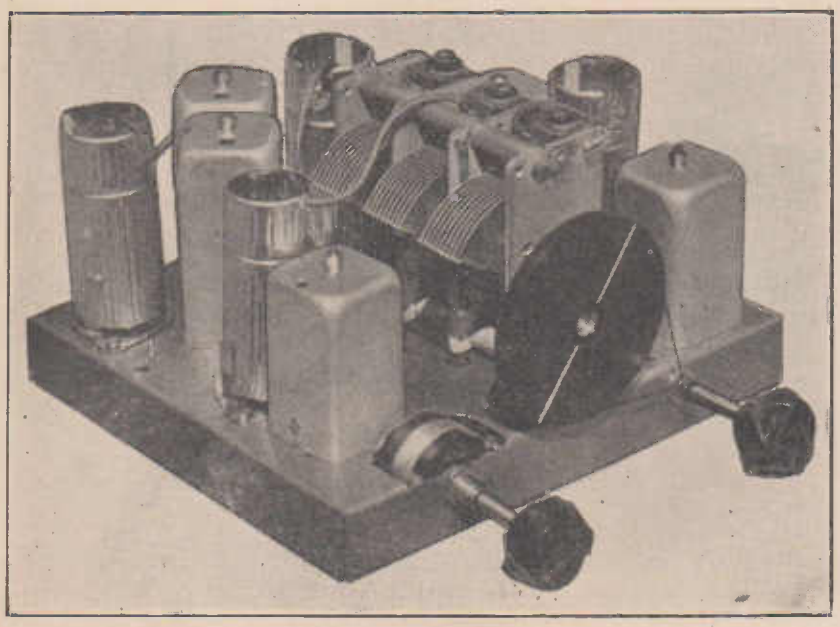
The self-contained portable is far more versatile than the car set when it comes to reception "on the road." The in-built car set has the advantage of requiring no batteries, so that running costs are negligible, but the portable has many advantages. It can be used in the car, but when the car is in the garage the set can be used in the home, at the bedside, in the garden or, in fact, anywhere at all.

Note the attractive design of cabinet.

For a camping trip the portable is an absolute blessing, giving you correct time, latest news and filling in the evenings after sundown.

Circuit Considerations

When considering the best circuit for a portable receiver there are three main considerations:—(1) Whether to use a tuned-loop aerial; (2) whether to use an r.f. stage; (3) whether to use a dual-purpose detector-output valve or two separate audio valves.



Left — A completed view of chassis, showing compact layout.

Dealing first with the matter of aerials, we find, as with most arguments, that there are points both for and against, and a lot depends on your particular outlook. Undoubtedly, the

(Continued on page 24)

XMAS PORTABLE

(continued)

tuned loop is the most attractive type of aerial, as no trailing wires are required, just the in-built loop, and all you have to do is to throw the switch to get results.

Problems With Loop

But in practice the loop is not such a simple proposition, as its effective inductance is largely dependent upon how and where it is mounted.

Especially if you want the dial needle to track properly with the dial markings, the loop aerial is a potential source of difficulties.

So, for the benefit of those who may be a little doubtful about the problem of the tuned loop, we describe this set as a straight-forward receiver with an ordinary aerial coil.

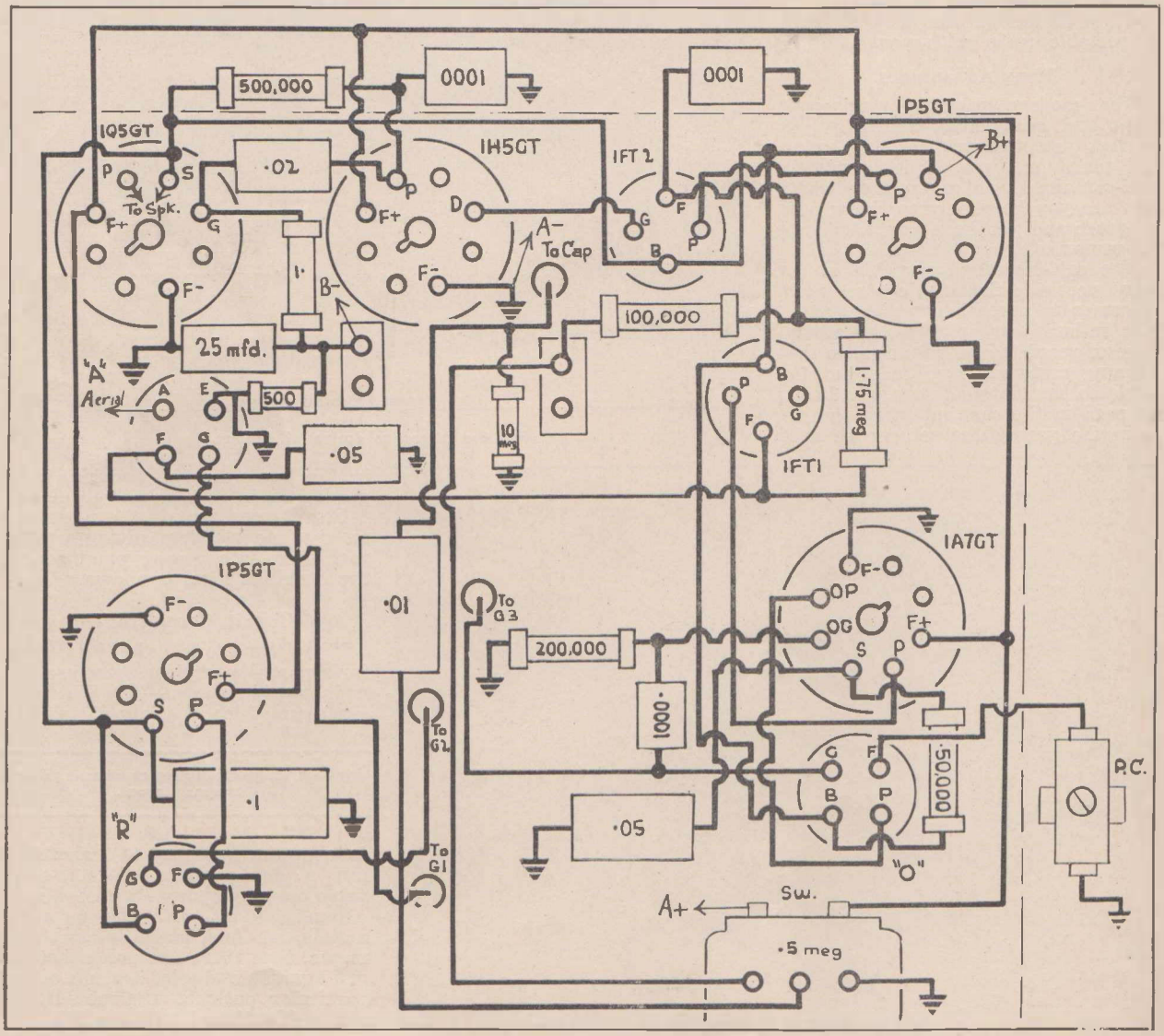
As such, the set will bring in all the local stations with an aerial consisting of a three-foot length of wire, good range can be obtained with about twenty feet of wire wrapped around inside the cabinet, and stations from every part of the Commonwealth simply roar in with an external aerial consisting of fifteen feet of wire strung around a picture rail.

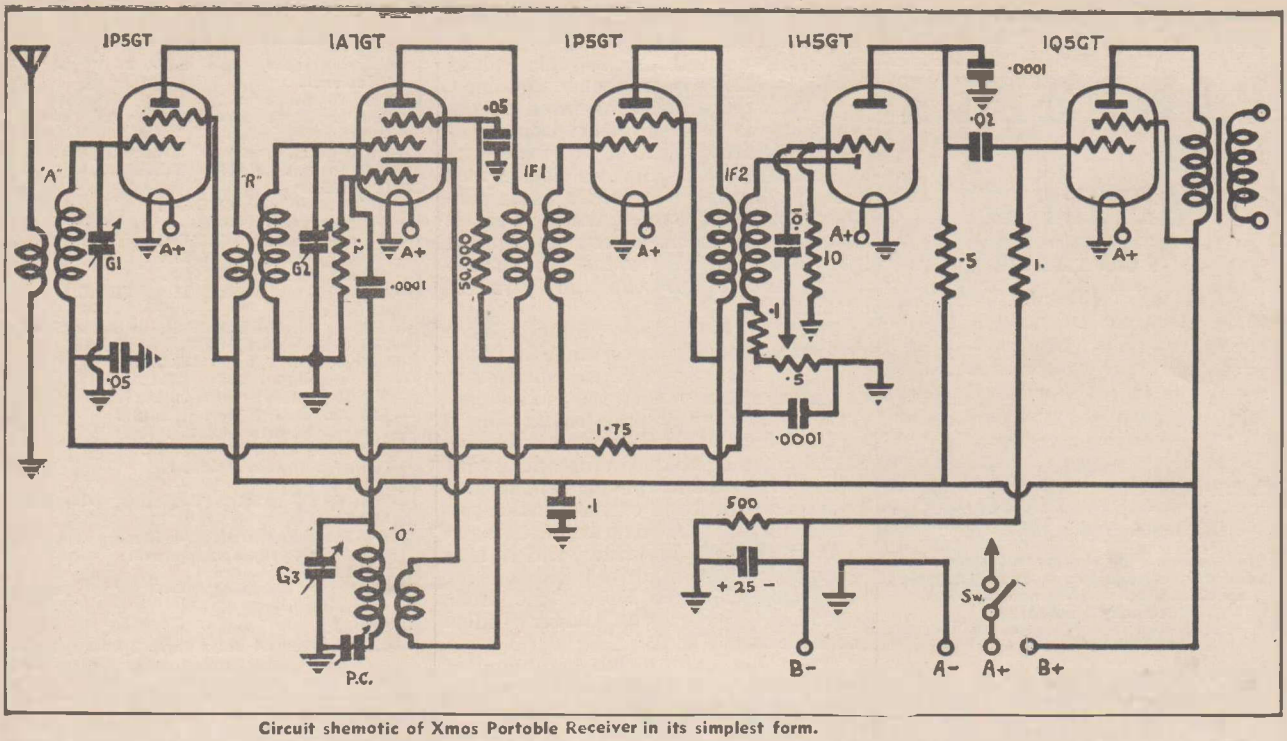
Those who are prepared to see the matter through can use the tuned-loop aerial, it being simply a matter of ordering a coil kit of this type.

The R.F. Stage

Problem number two is about the r.f. stage. As everybody knows, or should know, an r.f. stage ahead of the converter valve gives greater sensitivity to any set. Not only does it give greater sensitivity, but also greater effective selectivity and also a lower ratio of noise to signal. With a portable receiver operating from a comparatively inefficient aerial, we feel that this increased sensitivity and lowered noise level is well worth the extra cost incurred. This extra cost amounts to the difference in price between a three-gang and a two-gang tuning condenser, the cost of the aerial coil and the valve itself, as well as a few minor components. The total of the extra initial cost is probably between a pound and thirty shillings Then there is also a slightly increased running cost, as the drain on both batteries will be higher with the extra valve. The increased drain is not large, however, and may mean a difference of ten or twenty hours in the life of each set of batteries.

In our opinion, the added cost and running expense is well worth while, and we strongly recommend an r.f.





Circuit shemotic of Xmos Portoble Receiver in its simplest form.

stage in preference to the alternatives — a simpler set or a set with two i.f. stages.

The Output Valve

When we come to the third consideration, we get on to rather dangerous ground, and if we really said what we thought of the 1D8GT or even repeated some of the remarks made in letters received recently from our readers, we might be very sorry for them later.

The 1D8GT is a remarkable valve and when working properly it gives two-valve results from a single valve, making a four-valve portable do the same work as a five-valve job.

When you really get down to tin tacks, it is doubtful whether this is such a wonderful advantage. The 1D8GT costs nearly as much as two separate valves, takes nearly as much filament and high tension current, and has the undoubted disadvantage of requiring complete replacement in the event of either section proving faulty or becoming damaged.

There is not much to it, but since our previous portables have used the 1D8GT here is one with separate audio valves.

It makes up as a five-valve job, which is on the big side as portables go, but since it is a nice lightweight in actual avoirdupois, and small in inches, it is really a nuggetty job, with exceptional performance.

It carries a strong recommendation as the last word in self-contained battery portables.

The Layout

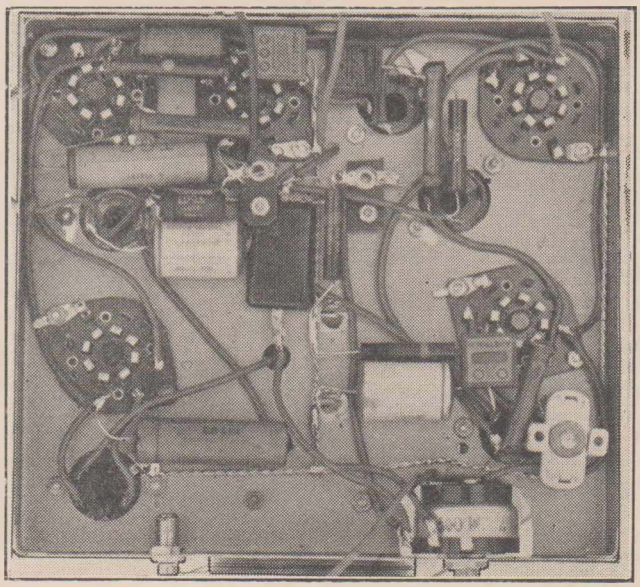
A fair amount of thought has gone into the design of the layout. The primary consideration was to get a layout as compact as possible, but we would not stoop to that dirty trick of making a three-layer wiring with coils mounted on special brackets down amongst the layers of wiring. It is easy enough to design compact sets that way, but to the set-builder of comparatively brief experience they are a thorough pain in the neck.

They make the picture diagrams hard to follow, too, and have nothing in their favour.

So, as you can readily imagine after the above remarks, we selected a shallow base for this job, just deep enough to carry the small components.

For the plan of the layout our main problem was to get the gang condenser a central mounting, so that the dial would come in the centre of the top of the cabinet, our idea of a cabinet being to stick to the lines of the "Trans-Port," which was shown in last month's issue. That particular design, with the chassis and dial up

(Continued on page 26)



Compore this photograph with the picture diogrom opposite and ycu con't go wrong.

XMAS PORTABLE —(Contd).

top and the speaker down below seems to have been greeted with general approval, and so for this job we have a similar design, much smaller and with the batteries mounted down near the speaker.

Hardly a cubic inch of space is wasted, so that the finished job is one of the smallest portables on the market, yet using full-size components throughout.

To put the dial centrally doesn't seem a difficult problem, but when you want to keep all wiring as short as possible, avoid any chance of feedback circuits, and keep all grid wires about the same length, it becomes quite a problem.

As will be seen from the photographs we overcame all the obstacles and, although the resultant layout may not look neat, it is most effective and does not foul any of the fundamental rules of correct layout arrangement. Even without valve shields, we did not strike any trouble with instability, although we advise shields as good practice.

Battery Layout

It seems to be general practice to mount speakers on the actual chassis of portable sets, and then fit the batteries in a separate section of the cabinet. To our way of thinking, this is not by any means ideal, especially as often enough the 1.4-volt valves tend towards microphonic troubles, and with the speaker mounted on the chassis there is a direct source of feedback from speaker to valve.

In many cases, too, we notice that the speaker mounts rather unsteadily on a couple of screws, tends to rattle about, and seldom comes up against the inside of the cabinet in such a way as to provide an efficient baffling.

So, with this little set, in accordance with a definite plan to make it faultless, we have mounted the speaker in the bottom section of the cabinet according to console practice, getting a really firm mounting and effective baffling, and entirely eliminating the possibility of microphonic feedback.

Around the back of the speaker we have packed the batteries, forming a sort of acoustic labyrinth, which, if it hasn't actually improved the tone of the set, at least allows the little speaker to work under ideal conditions.

To a big extent this arrangement of speaker and batteries allows such a powerful five-valve set to be fitted into a really snug little cabinet, many cubic inches smaller than the average on the market at present.

Wiring

Wiring is simple on account of the shallow base and the even spacing of the components. Following normal practice, the sockets, coils and intermediates are fitted and then wired according to the picture diagram.

Then the minor components are fitted and this particular job needs more care than usual. With a portable set, the wiring needs to be capable of

(Continued on page 28)

THE XMAS PORTABLE

1—Carrying case, size 12" x 9" x 8" (Western).
1—Base to suit, 8" x 7¼" x 1" (Arcadian).
1—Coil kit, with intermediates and padder (R.C.S., Radiokes).
1—Three-gang condenser (Stromberg G).
1—Dial to suit (R.C.S., Radiokes).

CONDENSERS:
3—.0001 mfd. mica (T.C.C.).
1—.01 mfd. mica (T.C.C.).
1—.02 mfd. tubular (T.C.C.).
2—.05 mfd. tubular (T.C.C.).
1—.1 mfd. tubular (T.C.C.).
1—25 mfd. electrolytic 25 v. (T.C.C.).

RESISTORS:
1—.5 meg. potentiometer with switch (I.R.C.).
1—500 ohm 1-watt (I.R.C.).
1—50,000 ohm 1 watt (I.R.C.).
1—100,000 ohm 1 watt (I.R.C.).
1—200,000 ohm 1 watt (I.R.C.).
1—500,000 ohm 1 watt (I.R.C.).
1—1 meg. 1 watt (I.R.C.).
1—1.75 meg. 1 watt (I.R.C.).
1—10 meg. 1 watt (I.R.C.).

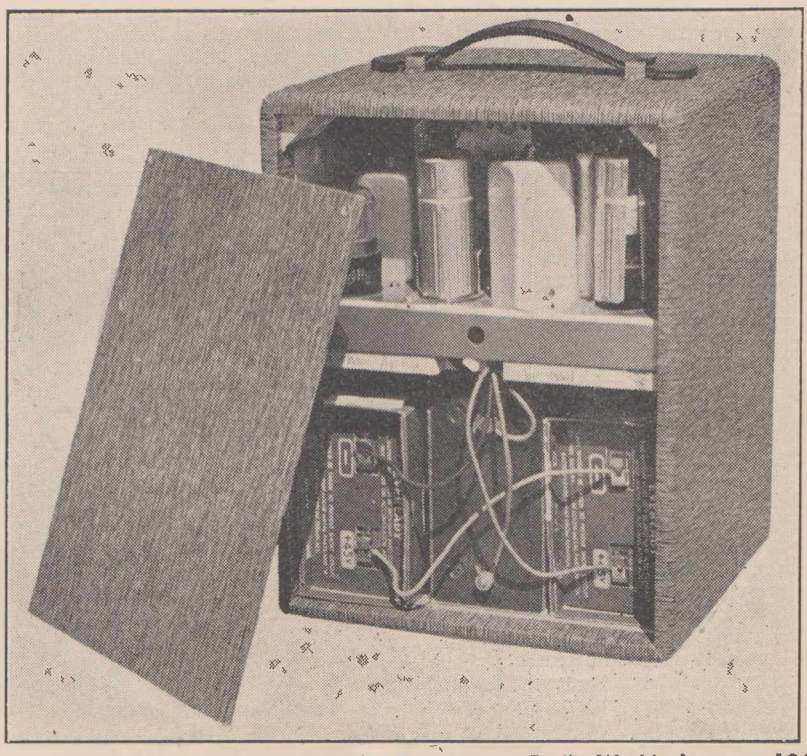
VALVES:
2—1P5GT, 1—1A7GT, 1—1H5GT, 1—1Q5GT.

SPEAKER:
5" Permagnetic high-efficiency type to suit 1Q5GT (Rola, Amplion).

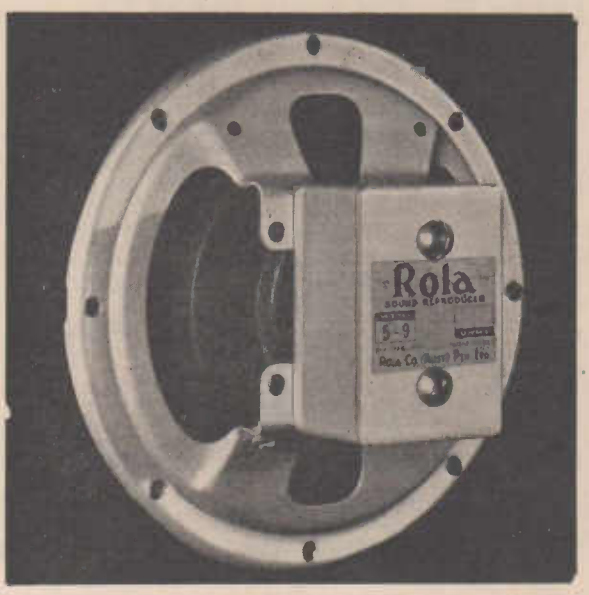
BATTERIES:
2—PR45 "B" batteries, 1—PR8 "A" battery (Eveready).

SUNDRIES:
5—Octal sockets, 4 valve cans, 2 knobs, hookup wire, terminal strips, solder lugs, screws, nuts, etc.

Below — Photograph showing way in which the batteries are fitted.



Number One Speaker for Portable Sets



ROLA 5-9

PERMANENT MAGNET MODEL

Rola 5-9 combines compactness, high quality reproduction and efficiency to a degree not hitherto achieved in small permanent magnet speakers. Although it occupies the barest minimum of space, its unique design features ensure that its accurately assembled components will always remain in their original position.

Rola 5-9 is the only speaker with these outstanding advantages —

Total weight (less transformer) only 16 oz.
Overall diameter ..... 5 inches
Total depth ..... 2⅜ inches

ROLA 5–9 IS EXACTLY THE SPEAKER FOR YOUR ULTRA COMPACT BATTERY RECEIVER

Entirely dust, sand ond grit proof.

Incorporates "Permaflex" spider and an expressly designed cone to give ideal response when used in small cabinets.

Uses the highest grade of alloy in a magnet specifically designed to concentrate the maximum lines of force in the airgap.

Designed for use with Rola compoct "Isocore" transformer (supplied detoched, suitable for chassis mounting).

Effortlessly tokes the full power output of oll standard battery valves.

Covers o wide frequency range and is free from ogjectionable resonances of all descriptions.

"THE VERY BEST RADIO RECEIVERS USE ROLA SOUND REPRODUCERS"

WRITE NOW FOR COMPLETE INFORMATION

Rola Company (Aust.) Pty. Ltd.

The Boulevarde, RICHMOND, E1, Victoria **116 Clarence Street, SYDNEY, N.S.W.**

withstanding infinitely more bumping about than with an ordinary set. Small condensers and resistors cannot be allowed to hang in the wiring to support their own weight on their pigtails. In this matter a half-dozen terminal lugs will be found invaluable. These little terminals, mounted in a piece of insulating material, can be mounted under screw or nuts and then the components soldered to the terminal, thereby stiffening up the wiring and making it sufficiently rigid to withstand an occasional bump or jar.

A portable receiver has to withstand a bit of vibration, too. Even when travelling in a tram or train there is a certain amount of vibration which may tend to loosen nuts. The only sure cure is to fit star lock washers under each nut. These little washers cost only about a shilling a hundred, but they make a certainty of the nuts staying tight, no matter how much vibration.

Connecting Up

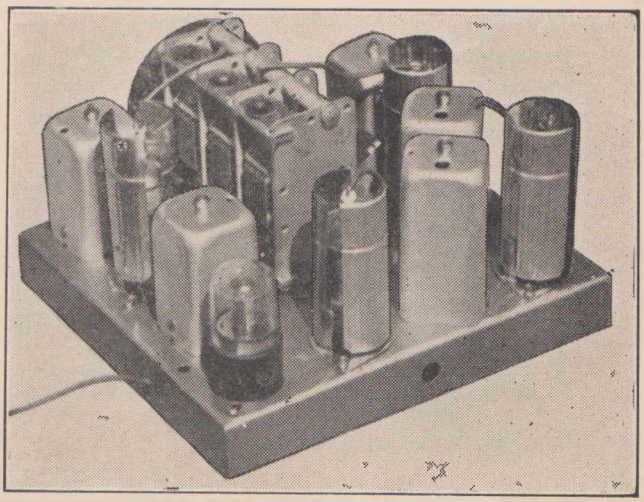
Before mentioning the procedure for aligning this set we think it is as well to mention something of the tragedy of burning out valves. It seems that just about every person who builds a battery set of any kind manages to blow out at least one set of valves.

There is no reason why this should be so, as only elementary care is needed in order to aovid such an unfortunate waste of valuable property. It is only necessary for the filament leads to brush over the terminals of the "B" batteries and the whole set of valves will be ruined in a fraction of a second.

We find it is a good plan to hold both filament leads in one hand while the chassis is being installed and then connect up the filaments first, making sure that these are the filaments by switching on the set and peering into the valves to make sure that the filaments are alight, before connecting up the other wires.

If the filament leads are always connected first and disconnected last, there is less likelihood of an accident, but even so great care should be exercised.

(Continued on page 50)



Rear view o! chassis.

THE "LILLEY" AMPLIFIER

Another circuit from the Amplifier Championship. A special two channel job with push-pull 2A3's in the output.

FINISHING fourth in the final of the Amplifier Championship, was an amplifier entered by Mr. H. J. Lilley, of 12 Holdsworth Avenue, Wollstonecraft.

Two Channels

This amplifier consisted of a two-channel arrangement, one channel being exclusively reserved for re-inforcing the high notes.

The main channel used push-pull 2A3 type triodes, with an audio transformer, a 6F6 pentode, connected as a triode, was used in the driver stage. This valve when operating under such conditions make quite sure that ample drive is available without the slightest chance of overload in that stage. The first valve in the main channel was a 6C6 pentode, giving high gain and, again, ample drive without any chance of overloading.

The Bass Booster

In the plate circuit of this first valve a bass boosting arrangement was introduced and found desirable with certain types of magnetic pick-ups, but was switched out of circuit when using crystal pick-ups. This bass boosting was achieved by using a 50,000 ohm resistor and .01 condenser, as shown in the circuit diagram. It is handy to remember this little tip as it is equally applicable to a number of amplifiers which start off with the 6C6 or 6J7 as a pentode audio amplifier in the first stage.

OSCILLATION CHECK

A simple way to determine whether or not the oscillator in a superheterodyne is functioning is to break the "B+" line to the feedback winding and insert a milliameter. Then short-circuit the winding, and if a change of current takes place it indicates correct operation, or at least that the valve is oscillating.

Screen Feed

It will be noticed that the screen of the 6C6 is fed from a voltage divider consisting of a 200,000 ohm resistor in series with one of 50,000 ohms. General practice locally is to use a dropping resistor of a megohm or a megohm and a half, but we notice that the voltage divider scheme is used quite often by American designers.

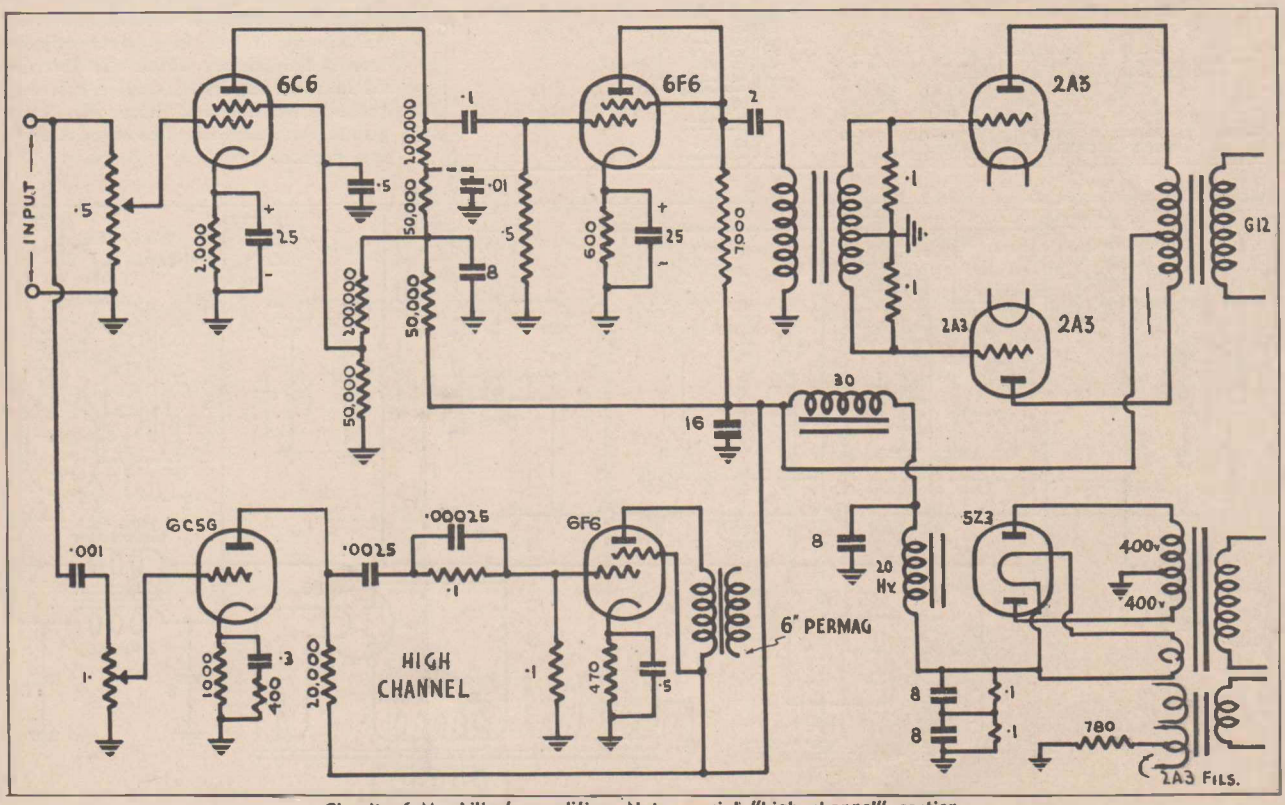
The High Channel

For the high note channel a portion of the output of the pick-up is picked off and passed through a .001 mfd. condenser of the grid of a 6C5G triode first valve in the high channel amplifier. A one-megohm volume control is provided to allow the amount of high note boosting to be regulated. The 6C5G drives a 6F6G pentode output valve with a high note filter in its grid circuit.

A Point Of Interest

A point of interest also, is the way in which the bias resistor of the 6C5G is by-passed with a .3 mfd. condenser, but with a 400 ohm resistor in series with this condenser, so that a form of

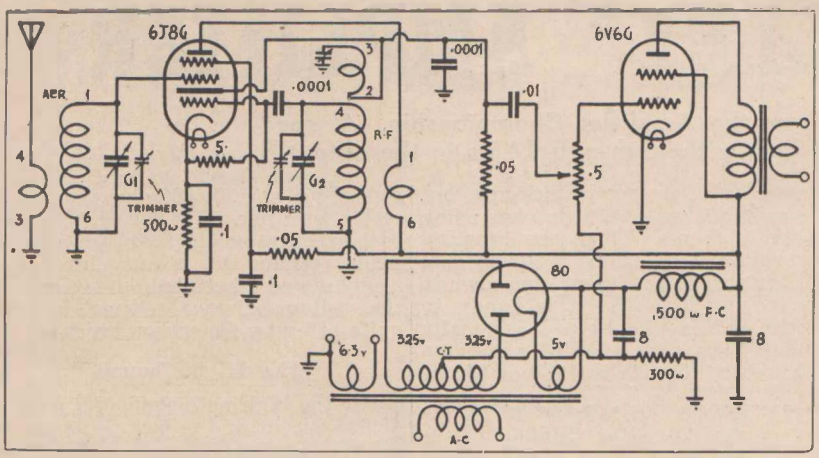
(Continued on page 50)



Circuit of Mr. Lilley's amplifier. Note special "high channel" section.

THE 1940

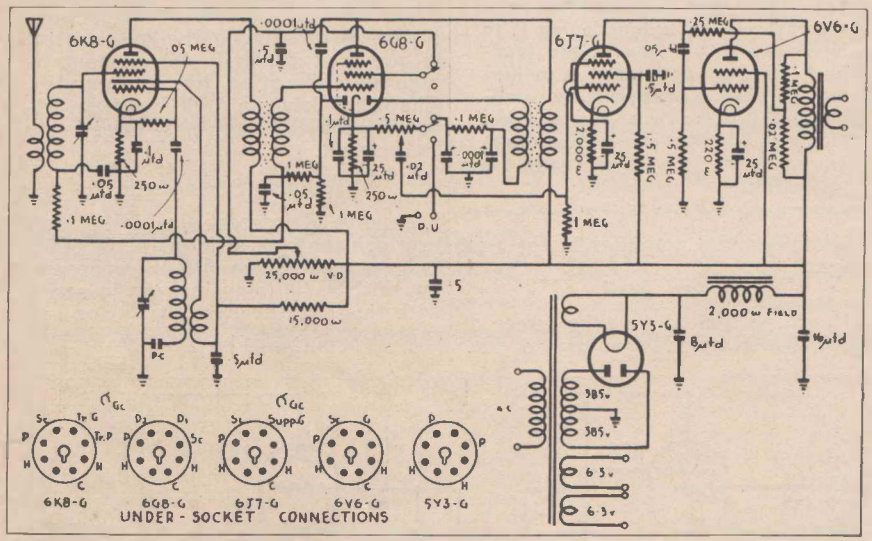
★



"ITSY-BITSY"—

a simple t.r.f. mantel model from our issue of October. It is not such an easy one to get into perfect operating condition with proper stability, but with a little careful attention and patient experimenting it can give remarkable results, considering the cheap cost of a kit of parts.

★ ★ ★



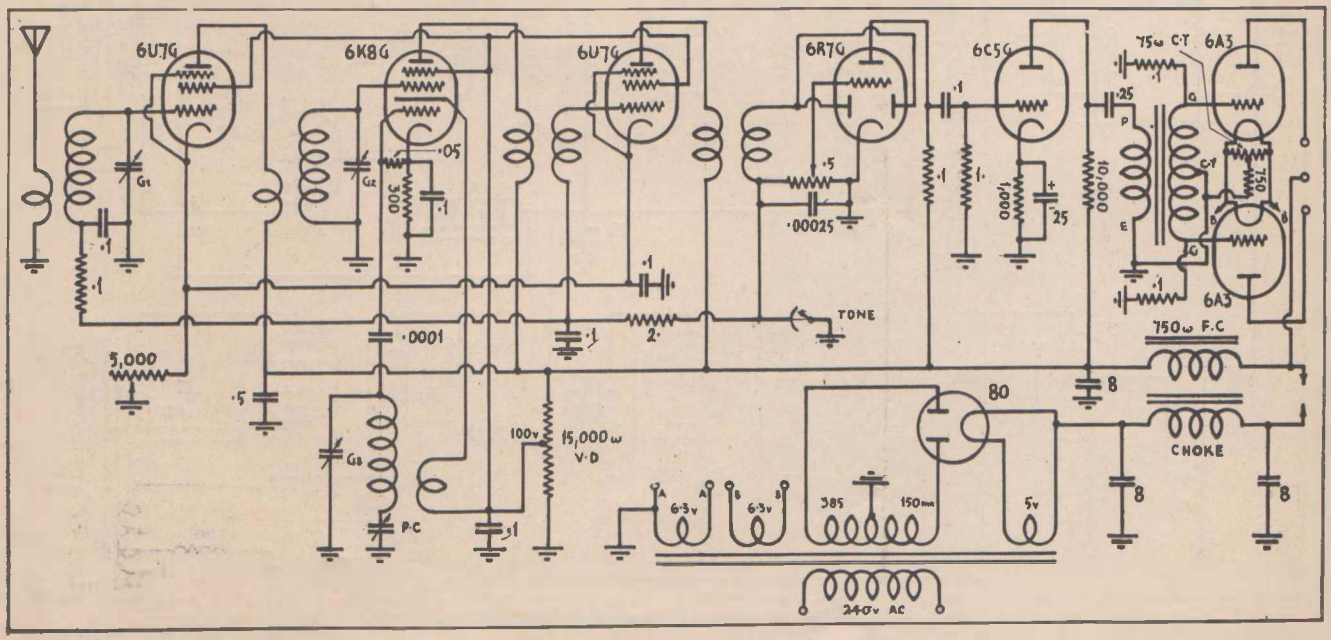
"DAVENTRY" Dual-waver —

from the January issue is a typical example of a thoroughly-engineered circuit for a thoroughly effective type of four-five superhet. Used with any of the modern coil brackets and a pair of good intermediate transformers, the performance leaves nothing to be desired.

★ ★ ★

"DE-LUXE FIDELITY 8"—

a wonderful performer and a set which has plenty of reserve performance even if not in perfect adjustment. This circuit which was described in the May issue, carries a strong recommendation for those who want power, tone and range to an outstanding degree.



CIRCUITS

★

"REINARTZ 3"—

revived for 1940 and adapted to take the latest type volves, the old "Reinartz" made a good comebock and appears to be the most outstanding battery circuit for the season. Compared to some of the more elaborate single-valvers this set gives you much better performance at hardly any extra cost.

★ ★ ★

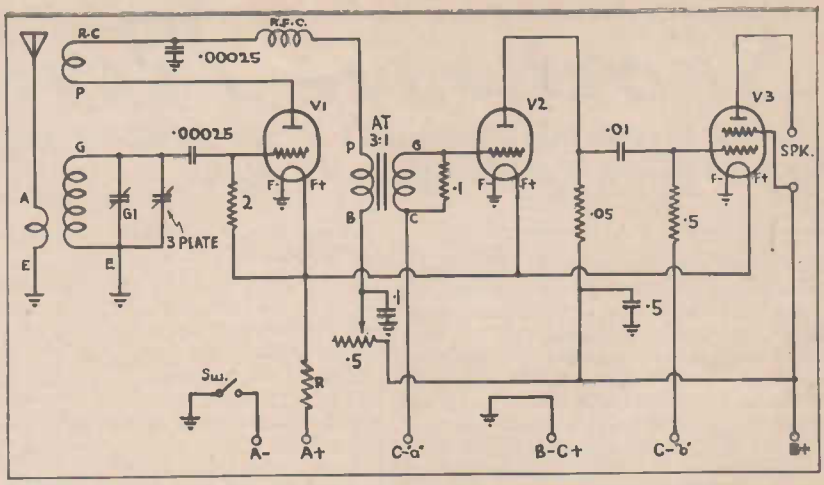
"TIP -TOP"—

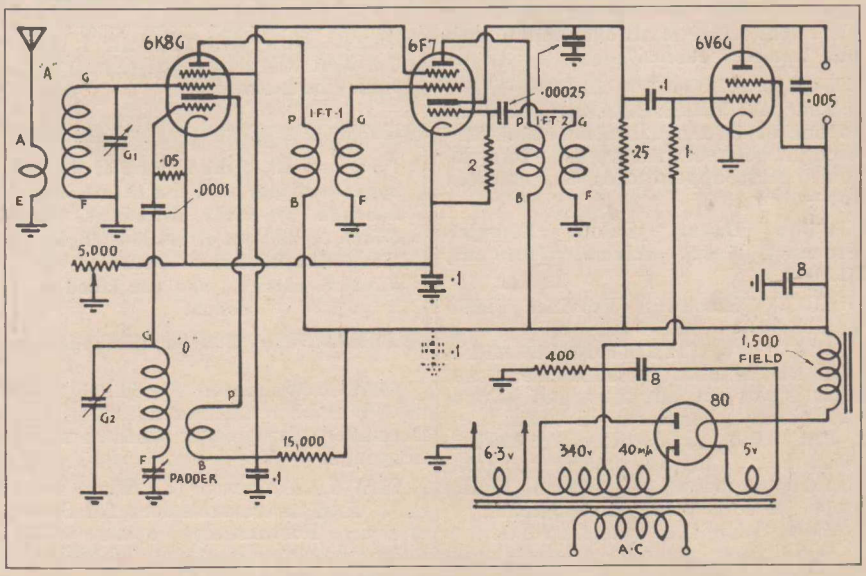
was easily our most successful circuit for the year. Hundreds were built and results completely satisfactory in every case. Originally in the July issue, which sold right out, we had to run a re-print in the December issue to satisfy the demand for copies of this circuit.

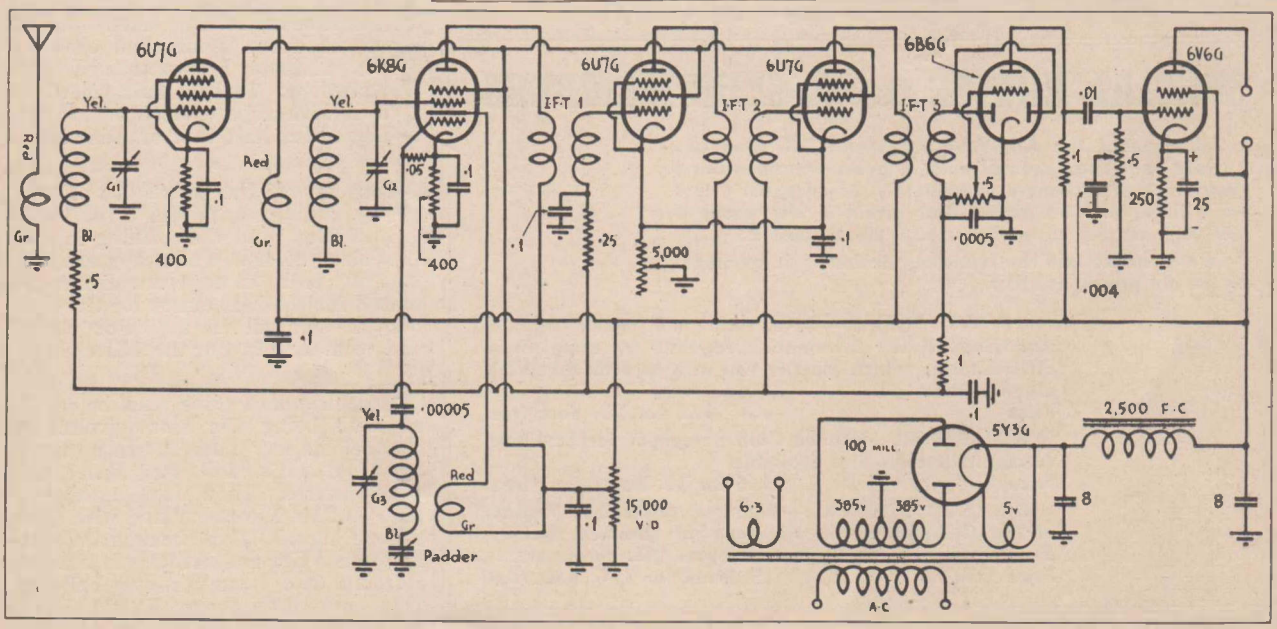
★ ★ ★

"COMMUNICATIONS 9"—

an eloborate circuit for the more advanced set builder — costly to put together, but something quite "super" in the matter of range and selectivity. Two special stages of intermediate are used and a special five-band tuner. Full details were in the February and August issues.







Shortwave Review

CONDUCTED BY
L. J. KEAST

Listen to American Celebrations ★ New Stations ★ Extra Licence Claimed ★ Moscow Shown Up Again.

NOTES FROM MY DIARY—

It is hoped that this issue will be on sale before the holidays, so here is a reminder to listen to the Xmas and New Year's Eve celebrations in the American cites. These festivities which are generally packed full of novelties are sufficiently interesting to keep the American S.W. Stations on the air longer than usual, so if the Xmas dinner has not forced sleep, and the N.Y. eve antics not demanded complete rest "have it all over again with our Yankee cousins."

* * *

The past month has introduced us to one or two new stations and also brought some old timers back into the fold. First appearances are credited to:—

Radio Dakar, Dakar, Senegal, French West Africa (9.40 mc., 31.90 m.).

XGOQ, Szechwan Province (9090 kc., 33 m.).

JVZ, Tokyo (11,815 kc., 25.39 m.).

KZRH, Manila (11,890 kc., 25.23 m). This is not actually new, but is now on regular schedule: 2 till 3 a.m.

PSF, Rio de Janiero (14,690 kc., 20.42 m.). Address reports to Julio Barata, Director of Divisao Radio, Dept. de Impresna y Propoganda.

ZNR, Aden (12,115kc, 24.76m).

While come-backs have been staged by:—

Radio Maroc, Rabat, French Morocco (11,940 kc., 25.13 m.).

TPZ-2, Algiers (8,960 kc., 33.48 m.). Now like his pal, TPZ, of the same town, entertains us daily instead of once a week.

TGWA, Guatemala, (15,170 kc., 19.77 m.). Doubtless finding his "once a week" (heard here on Mondays) was appreciated, is now telling us in Spanish and English daily.

CP-43, Tupiza, Bolivia (15,165 kc., 19.78m). Now on daily till 1 p.m., and if JZK will remain off the air, will probably be heard often.

I am sure all of the readers of these pages will join with me in offering heartfelt sympathy to Dr. K. B. Gaden in the loss of his son, Flight-Lieut. Charles Burton Gaden of the R.A.A.F. abroad,, who was killed in action.

VLW-2, Wanneroo (9,560 kc., 31.38 m). Will be remembered testing last December. See present schedule under Loggings.

VLW-5, Wanneroo (6,180 kc., 48.54 m.). Used in transmissions for South Africa. Fortunately opens after Saigon has gone bye-bye. Schedule on Loggings page.

KGEI, San Francisco, who a little while ago jumped from 31.48 metres to 31.02, with little or no notice, must have decided to go back again to his original wave-length in the afternoon session just as suddenly. Programme sheets for December make no reference to the change, the 3 to 6 p.m. (our time) session being assigned to 31.02 metres.

* * *

While during war time a little extra licence may be claimed even if not granted, I am sure listeners must be, like myself, concerned at the amount of morse that seems to be stealing into the bands we have for so long looked upon as ours. To me, it seemed positively wicked to hear continuous wave on 25.53 metres, particularly at the time the British Broadcasting Corporation were putting over the Pacific News-reel. Then our friends in Ankara seem to be in the thick of it. Turkey on 31.70 metres found this channel hopeless of an evening and reverted to 19.74m., from which we are getting nice signals nightly.

But now on 31.70 metres which for so long has given us such good service in the mornings, Mr. Morse has settled so close as to be a nuisance, while his friend Noise sitting right on top has been decidedly unfair to a faithful transmitter.

* * *

Some idea of the importance attached to Short Wave Broadcasting can be surely found in the fact that Malaga, a little seaside town on the Mediterranean, relying chiefly on the export of wines, fruits and olive oil for its existence, boasts at least three s.w. stations. Truly a fair effort for a town with a population of 180,000, or just about half that of Adelaide.

* * *

You can try the selectivity of your set by tuning in JVZ, Tokyo, 11,815 k.c., 25.39m., and then tuning-in JZJ, 11,800k.c., 25.42m. while they are testing on both these transmitters in search for the best outlet for the coming "Australian Hour." For clarity and volume, I favour the JZJ channel.

* * *

Moscow, who I think must be credited with being the most prolific of channel hunters, have shown up again in an old and seldom used outlet, viz., 49.02 metres. They were here at 10 p.m. on 21st November and with quite a good signal. That weak little voice between VLR and KZRM is another Russian (no! I can't supply call-sign yet) and just above KZRM is, of

course, the one referred to in December issue, while just where, earlier in the night, you have listened to VPD-2, is another Russian. So, the entries are: 9.53m.c., 9.57m.c., and 9.58m.c. Well, maybe one of these days they will consider "peak" has been reached.

If you want to be very precise (and you should) about your reports submitted to Singapore for verification, remember, 9.30 p.m. in Sydney is 6.50 p.m. at the Naval Base. In other words, Singapore is 2 hours and 40 minutes behind Australian Eastern Standard time. Java, Sumatra, and the Dutch East Indies are also on this scale.

* * *

I am sure a large number of listeners will grieve with me in the absence for several weeks of A. G. Macdonell whose commentaries following headline news at 6.30 p.m. have been one of the features of the B.B.C. programmes. He explained on Monday, December 2, that he had been given a special Government job and that he could not combine the two. It is just possible that soon after this appears in print he will be back with us again. He said how he had liked the work and how much he appreciated the numerous letters he had received from all over the world. His concluding remarks were certainly very comforting: ". . . , but I can assure you we are heading for victory. For a few weeks, au revoir."

* * *

Listening to Turkey on Sunday, December 1, our friend in Ankara advised that from next Saturday (Sunday, Dec. 8, in Sydney) our talk will be given an hour earlier, that will be 5.50 a.m. A.E.S.T., and he reminded us that they give news in English twice daily, viz., 9.15 p.m. on 19.74, and 4.15 a.m. on 31.7 metres. Times are A.E.S.T.

* * *

If, during the holidays, you are looking for a little diversion, tune in round about 45.8 metres and you will most likely hear the Airdromes busy. Mascot, Canberra, Kempsey, Essendon, Parafield and Archerfield are all about at times.

Just afraid the chances of determining who my whispering baritone is on 41 metres are likely to be very remote. The noise in the mornings round about that part of the dial being very naughty. You will remember I said this chap plays records for at least a quarter of an hour, announcing each one before he says at 6 a.m. precisely: "That brings us to the end of our programme for to-day. We will be on the air again to-morrow at 11 a.m. This is the —— Broadcasting ——." Then I swear. The reason for the cussing is that I know I will have to wait until the morning and, like Bruce's spider, try again.

To Mr. K. E. F., Petersham: Costa Rica station is in San Jose, pronounced Son Ozay.

XGR—, Shanghai. From the west, I learn about the east, and am told the unknown quantity is S, S for SYDNEY. Well, that's another doll over, and we can now go hunting for those Russians and fix their call signs.

* * *

Mr. Cushen reports having received verifications from:

CXA-19, Montevideo, 11,710k.c., 25.63m.

CKFX, Vancouver, 6080k.c., 49.34m.

WCAB, Philadelphia, 5050k.c.,49.5m.

WNBI, Boundbrook, 11,890k.c., 25.23m.

YV5RM, Caracas, 5010k.c., 59.88m. Mr. Cushen states "This is my first verification back from South America. The card is a four-page folding one, containing many photos of station, Venezuelan Symphony Orchestra, etc. Address is Box 185.

ZBW-3, Hongkong, 9525k.c., 31.49m. "After waiting a year."

Well, good luck, Arthur, that's how albums are filled.

* * *

Here is one worth looking for: **Radio Martinique**, 9705k.c., 30.92m. This West Indies station situated in Forte de France, Martinique, may come into the limelight again. They used to open at 8.30 a.m. with the "Marseillaise."

* * *

I am indebted to Mr. J. C. Linehan, of Adelaide, for the schedules of the Brazilian stations, PSE, 14,935k.c., 20.08m., and PSH, 10,220k.c., 29.35m. Times to follow are A.E.S.T.

PSH, Portugese, Daily, Mondays excepted, from 9 to 10 a.m.; English, Tuesdays, from 11 to 11.30 a.m.; Spanish, Saturdays, from 10 to 10.30 a.m.

PSE, German, Thursdays, from 7 to 7.30 a.m.; Italian, Fridays, from 6 to 6.30 a.m.; French, Sundays, from 6 to 6.30 a.m.

Programmes consist of News and information concerning Brazil, also Brazilian music. The above information came to Mr. Linehan together with a nice card and a number of magazines dealing with Brazil. The appreciation of Mr. Linehan's report is manifest by the fact that the authorities in Rio de Janiero registered the parcel, which measured 15 x 12 inches.

Wall, I guess and calculate there sure will be a swell mail going to South Amurrika.

(Continued on page 40)

STATION PARTICULARS

Under this heading, as space permits, we will give brief details of stations. (See October and December for previous notes.)

AFRICA (continued.)

Belgian Congo —

OPL, Leopoldville (20,040kc, 14.97m): These people are scheduled to be on the air from 3.557 p.m. to 10.15 p.m. This was announced from Daventry some time ago.

I have not heard them on this wave-length, but on what I take to be nearer 14.65 metres, a re-broadcast of the Daventry European service is heard from 8.55 p.m. onwards. Signal is loud but fades very badly. For address of **OPL,** see **OPM,** 29.59m.

Radio Leo, Leopoldville (15,175kc, 19.78m): This station is simply listed in case it should open up again. Previous schedule was 4 to 5 a.m., but it has been withdrawn from Overseas publications and I have no record of its being heard in Australia.

OPM, Leopoldville (10,140kc, 29.59m): Being heard at great strength daily from 4.45 to 5.45 a.m. Station opens with announcement "Ici Radio Conga Belge." Classical records are played after talk in French. The call sign is given quite often and can easily be followed. Signal is very loud and clear. The G.P.O. will accept letters from this territory, so address reports to: The Chief of Radio Communications, Leopoldville, Belgian Congo, Africa.

OQ2AA, Leopoldville (6140kc, 48.86m): Schedule 8.35 to 10 p.m. Even if still operating doubtful if we would hear it as **KZRF** on the same frequency at the same time would swamp them.

At the present time Leopoldville is well in the limelight and worth listening to.

Ethiopia —

12 AA, Addis Ababa (9650kc, 31.09m): This station was missing for a while but appears to be back on old schedule of 1 to 6.30 a.m. Seems best about 5 a.m.

Address reports: C/o E.I.A.R. Addis Ababa, Italian East Africa, or to C/o Ministerro del Marino, Rome, Italy. (The above is given simply to complete details, but as can be understood no mail is accepted at present for either place).

French Morocco:

The following French stations are mentioned for the purpose of record. Mail is not accepted at the G.P.O.

CNP, Casablanca (8795kc, 34.13m): 6 to 7 a.m. was the schedule, but it has not been reported for some time. It may of course have closed down since French capitulation. Casablanca, a seaport is also known as Dar el Baida.)

Radio Maroc III, Rabat (11,940kc, 25.13m): Schedule is believed to be: 6 to 9 a.m. Was missing for a while, but now being heard quite well at 6.30. Programme is of an Arabic nature, with frequent talks in French and Spanish also heard. Uses chimes as interval Signal. "Ici Radio Maroc".

FRENCH WEST AFRICA —

Senegol:

Radio Dakar, Dakar (9405kc, 31.90m): Heard from 6.15 to 7.15 a.m. Weak signal. Man and woman alternate news with bang on gong. As is to be expected remarks are anti De Gaulle. Closses with "Marseillaise".

(The announced frequency is 9408kc, which would make the wave-length 31.88m.)

(Africa will be concluded in next issue.)

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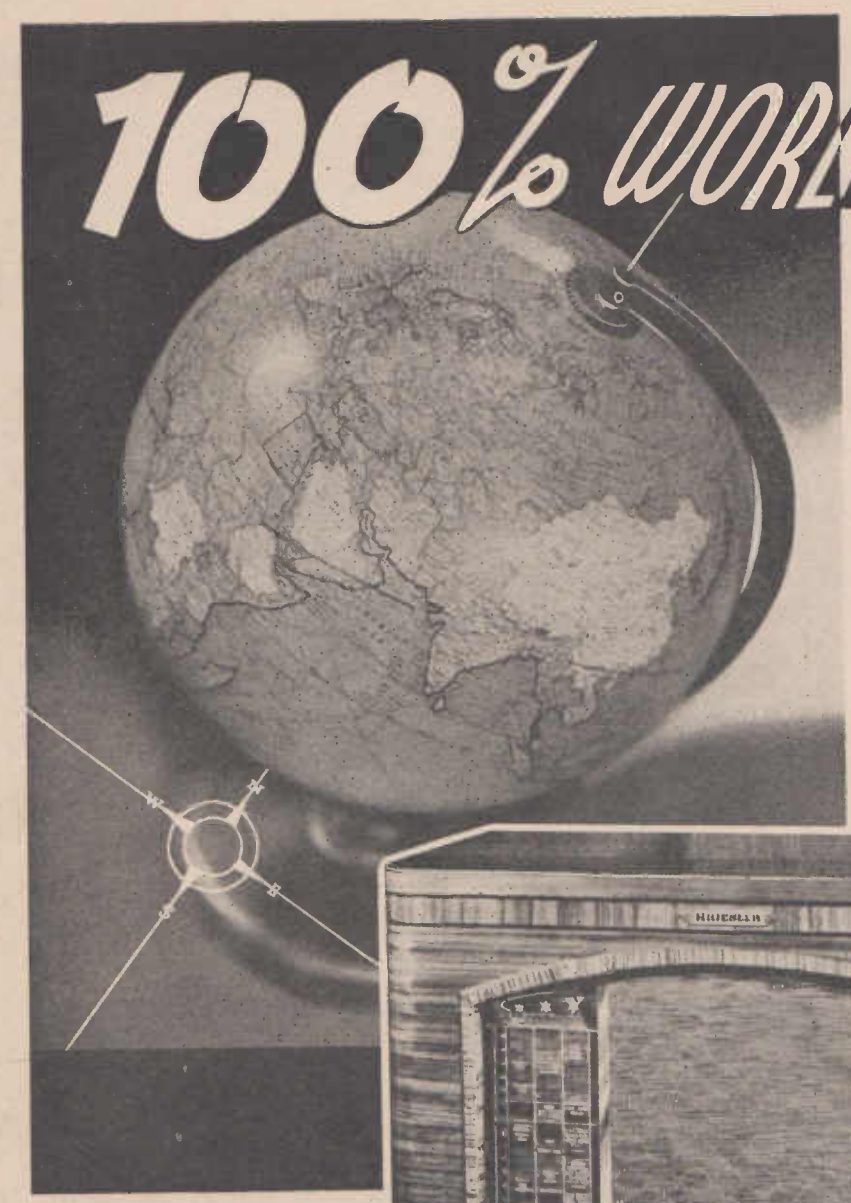

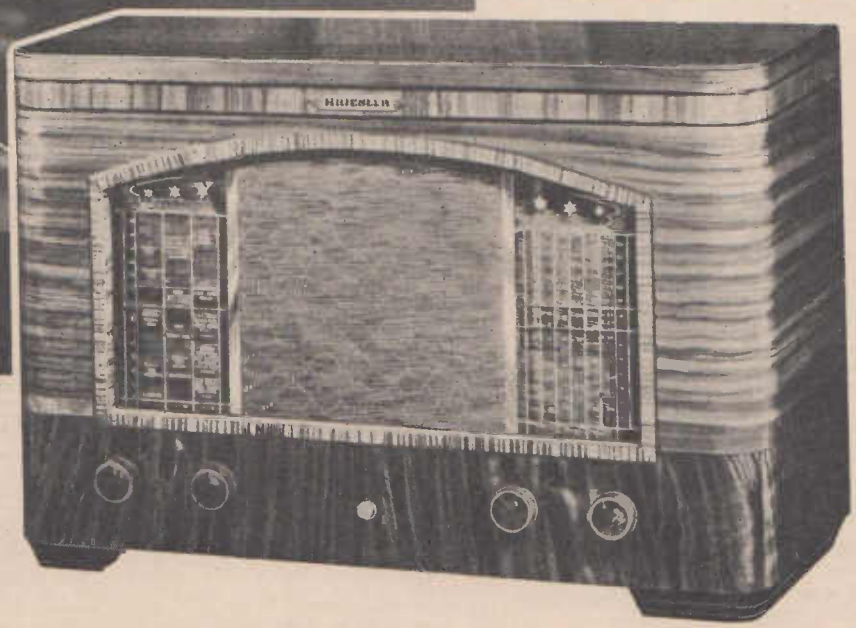

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The MONTH'S LOGGINGS

ALL TIMES ARE AUSTRALIAN EASTERN STANDARD

AUSTRALIA AND OCEANIA

VLQ-8, Sydney (17,800kc, 16.85m): Fair at 4 p.m., but fades badly. (Gandy, N.Z., Taylor). Fair at 7.30 a.m. (Beattie).

VLQ-3, Sydney (15,310kc, 19.59m): Not being used at present.

VLQ-7, Sydney (11,880kc, 25.25m): Good whenever on. (Jennings, Rogers, Knewstubb, Beattie, Taylor, Flegg.) (Great signal at Randwick when giving Trans. VII. to British Isles at 6.25 a.m.—Ed.)

VLQ-2, Sydney (11,870kc, 25.27m): Trans. IV to South East Asia, 11.10 p.m. to 12.45 a.m. Also on **VLW-2**, 31.38m.

VLR-7, Lyndhurst (11,840kc, 25.33m): Very good (Beattie, Taylor, Knewstubb, Cushen). (Excellent in afternoon.—Ed.)

VLW-3, Wanneroo (11,830kc, 25.36m): Good at 6 p.m. (Gandy, Jennings, Beattie, Flegg).

VLQ-5, Sydney (9,680kc, 30.99m): Excellent at night, closes at 11 p.m. (Flegg, Beattie).

VLW-2, Wanneroo (9,650kc, 31.09m): Sometimes very good at night (Keats, Callander). (This transmitter is now on 9,560kc, 31.38m —Ed.)

VLQ, Sydney (9,610kc, 31.21m): Very good at 5.30 p.m. (Gandy, Keats, Flegg, Knewstubb). Poor some afternoons (Beattie).

VLR, Melbourne (9,580kc, 31.32m): Excellent about 11 p.m. (Flegg, Jennings, Keats, Beattie, Gandy, Taylor).

VLW-2, Wanneroo (9,560kc, 31.38m): Good at night from 7 with National Programme (Beattie). (This station which gives National Programme from 7 p.m. changes at 11.10 and with **VLQ-2**, 11,870kc, 25.27m, transmits special programme to South East Asia. News in French at 11.15. Talk in French, 11.30. News in Dutch at 12.15 a.m. Talk in Dutch at 12.30 a.m. Closes at 12.45 a.m.—Ed.)

VLW-5, Wanneroo (6,180kc, 48.54m): Known as Trans. VI in special session for South Africa from 2.55 a.m. till 3.30 a.m. Is also heard on **VLQ-2**, 25.27m.

Fiji:

VPD-2, Suva (9,535kc, 31.46m): Good at 7 p.m. (Flegg, Callander, Taylor, Gandy, Keats, Jennings, Knewstubb). On 29th ult., best I've ever heard it (Fitzgerald). Very good at 7.45 p.m. in Radio News Reel (Beattie).

VPD-4, Suva (14,425kc, 20.80m): R 8 when last heard (Taylor).

New Caledonia:

FK8AA, Noumea (6,120kc, 49.00m): Heard well when closing at 6.30 p.m. (Gandy, N.Z.).

"Radio Pacifique," Noumea (3,896kc, 77.00m): R 5 when on the air last (Taylor). Mr. Cushen, Invercargill, says he heard them testing on 4,050kc, 74.07m.

AFRICA

Algeria:

TPZ, Algiers (12,120kc, 24.75m): Being heard in the mornings parallel with **TPZ-2** from 4 to 7 a.m. Quite a good signal (Nelson, Muller, Rogers).

TPZ-2, Algiers (8,960kc, 33.48m): Listed as Wednesdays only, but now heard daily in same programme as **TPZ**, 4 to 7 a.m. (Nelson, Muller, Rogers, Fitzgerald).

Belgian Congo:

OPM, Leopoldville (10,140kc, 29.59m): Heard at great strength every morning, 5 to 5.45 (Nelson, Linehan, Beattie, Taylor, Fitzgerald, Rogers, Gaden, Cushen).

Egypt:

SUX, Cairo (7,865kc, 38.15m): Heard early in November, but not since (Keats). Generally good till 6.30 a.m. (Nelson). (Quite good at Randwick.—Ed.)

French Equatorial Africa:

FZI, Brazzaville (11,950kc, 25.10m): Heard at R 7 in New Zealand in the mornings (Cushen, Knewstubb). Same here (Fitzgerald, Taylor, Keats, Rogers, Gaden, Linehan, Nelson). (Morse interference occasionally.—Ed.) Not heard at 4 p.m. any more (Gaden).

Morocco:

Radio Maroc III, Rabat (11,940kc, 25.13m): Heard several mornings (Keats, Gaden).

Mozambique:

CR7BE, Lourenco Marques (9,710kc, 30.9m): Heard between 5 and 7 a.m., with news at 5.55. Closes at 7 a.m. week days, but heard them till 8.30 on Sunday, 24th November (Mr. Nelson, Cairns).

Senegal:

FGR (Radio Dakar), Dakar (9,400kc, 31.9m): This was briefly mentioned on page 33 in December issue. Heard from 6.15 to 7.15 a.m., with news in English at 7. Sentiment is definitely anti De Gaulle. Closes with "Marseillaise." Male and female announcers. "Allo, Allo, ici Radio Dakar." News is alternated by man and woman, with bang on gong between items (Nelson, Fitzgerald, Linehan). (Looking up some oversea papers, I find this station has been heard for some time, but Mr. Nelson of Cairns was the first to log it in this country, as far as I know. —Ed.)

Kenya:

VQG3, Nairobi (10,730kc, 27.95m): Very weak, giving same programme as **VQ7LO**. Ed.

VQ7LO, Nairobi (6,083kc, 49.32m): News in English heard at 2.30 and 4 a.m. (Rogers). (Schedule is 2.15 to 5.15 a.m.—Ed.)

CENTRAL AMERICA

Costa Rica:

TIPG, San Jose (9,620kc, 31.19m): Splendid night station. English announcements frequently (Rogers, Nelson, Linehan). (Schedule: 10 p.m. till midnight.—Ed.)

TIEP, San Jose (6,695kc, 44.82m): Only fair when opening at 10 p.m.—Ed.

TIX, San Jose (5,830kc, 51.46m): Very poor quality, too much noise.—Ed.

Guatemala:

TGWA, Guatemala City (15,170kc, 19.77m): Heard till 8.15 a.m. (Nelson). Heard till 9.30 a.m. (Gaden). Appears to be on nearly every morning now (Muller).

TGWA, Gautemala City (9,658kc, 30.58m): Heard with fair signal till closing at 5 p.m. (Knewstubb).

TGWB, Guatemala City (6,480kc, 46.30m): Note change in frequency (Cushen). **Later:** Mr. Cushen has moved them again to 6,475kc, 46.33.

El Salvador:

YSP, San Salvador (10,400kc, 28.55m): Only fair at 11 p.m.—Ed.

Panama:

HP5A, Panama City (11,700kc, 25.64m): Still heard at 10 p.m., but very weak (Nelson).

HP5J, Panama City (9,607kc, 31.22m): Weak at 10 p.m. (Keats, Nelson).

HP5K, Colon (6,005kc, 49.97m): Heard at great strength till 6.30 p.m. giving U.S.A. Elections (Cushen).

NORTH AMERICA

WCBX, New York (17,830kc, 16.81m): R 7 at 11 p.m. (Taylor).

WNBI, Boundbrook (17,780kc, 16.87m): R 7 at 9 a.m. (Taylor). Noisy at 10 a.m. (Gaden). Fair in forenoon (Beattie). Fair at 1 p.m. (Gandy). Hard to hear on opening (Fitzgerald), at 11 p.m. (Very poor at 9 a.m., at Randwick.—Ed.)

WGEA, Schenectady (15,330kc, 19.56m): Very good at 7 a.m. (Nelson, Beattie, Knewstubb). Good at 1.30 p.m. (Taylor).

KGEI, 'Frisco (15,330kc, 19.56m): Can be heard at various times from 9.30 a.m. (Gaden). Heard weakly at 1.30 p.m. (Keats). (Schedule: 9.30 a.m. to 2 p.m.—Ed.)

WCAB, New York (15,270kc, 19.63m): Strong at 7.45 a.m. (Beattie, Nelson, Gaden, Keats, Fitzgerald).

WLWO, Cincinnati (15,250kc, 19.67m): Heard quite well till 8 a.m. (Gaden, Keats, Knewstubb, Fitzgerald).

WPIT, Pittsburg (15,210kc, 19.72m): Fair at 11 p.m. (Taylor, Gandy). Fair in mornings (Beattie, Knewstubb). Heard well at night

(Continued on page 36)

WITH THE REPORTERS

Those who have helped in the "big bag" and for which profound thanks are offered are:

OFFICIAL OBSERVERS

H. A. Callander, Hobart, Tas.
A. T. Cushen, Invercargill, N.Z.
J. C. Linehan, Leabrook, S.A.

AND

A. Beattie, New Lambton, N.S.W.
J. J. Fitzgerald, Aux. Hospital, Randwick.
A. L. Flegg, Melbourne, Vic.
Dr. K. B. Gaden, Wallumbilla, Q.
N. E. Gandy, Wellington, N.Z.
R. Jennings, Wellington, N.Z.
B. W. Keats, Launceston, Tas.
E. Knewstubb, Lyttelton, N.Z.
G. Muller, Newtown, Sydney.
S. I. Nelson, Cairns, Q.
M. Rogers, Hunters Hill, Sydney.
R. Taylor, Mosman, Sydney.

Notes for the February issue will be welcomed by January 10, 1941.

LOGGINGS *(continued)*

but generally overshadowed by swirling noise on PCJ-2 (Nelson).

WRUW, Boston (15,130kc, 19.83m): Fair in mornings (Beattie).

KKZ, Bolinas (13,690kc, 21.9m): Sundays at 2 p.m. (Keats, Taylor).

KKQ, Bolinas (11,950kc, 25.11m): Occasionally heard about 3.30 p.m. on Sundays.

WPIT, Pittsburg (11,870kc, 25.26m): Fair at 8 a.m. (Gaden, Keats, Smith, Linehan, Flegg, Taylor, Cushen). (Schedule: 8 a.m. till 2 p.m.—Ed.)

WCBX, New York (11,830kc, 25.36m): Good in the mornings (Fitzgerald, Rogers, Knewstubb). (Closes at 6.30 a.m. and opens again on 9,650 at 7.—Ed.)

WRUL, Boston (11,790kc, 25.45m): Good in mornings (Flegg, Jennings, Fitzgerald, Gaden, Beattie, Keats, Smith, Knewstubb). Symphonic hour: 7.45 to 8.35 a.m. (Flegg).

WRUW, Boston (11,730kc, 25.58m): Opens at 8.55 a.m. (Flegg).

WLWO, Cincinnati (11,710kc, 25.62m): Fair on opening at 8.55 a.m. (Gaden, Fitzgerald, Jennings, Nelson, Beattie, Flegg, Cushen, Knewstubb).

KGEI, 'Frisco (9,670kc, 31.02m): Weak (Jennings, Gandy, Fitzgerald, Keats, Taylor). Back again on this wave length in afternoon news, just before 6. No good at 4 (Gaden).

WRCA, Boundbrook (9,670kc, 31.02m): Excellent at 3.45 p.m. Closes at 4 (Flegg, Gandy, Beattie, Knewstubb).

WCBX, New York (9,650kc, 31.09m.): Fair (Nelson). (Opens at 7 a.m.—Ed.)

WLWO, Cincinnati (9,590kc, 31.28m): Fair just before closing at 4 p.m. (Keats, Taylor). (Schedule is: 11 a.m. to 4 p.m.—Ed.)

WCAB, Philadelphia (9,590kc, 31.28m): Not being heard at Randwick.

WGEA, Schenectady (9,550kc, 31.41m): Can only just be heard at Randwick, under favourable conditions. Schedule: 9.15 a.m. to 12.15 p.m.

WGEO, Schenectady (9,530kc, 31.48m): Good at 7 a.m. (Keats, Flegg, Fitzgerald, Beattie, Smith, Knewstubb). Good also at 3 p.m. (Knewstubb). (I concur.—Ed.) Schedule: 6 a.m. to 3 p.m.

KGEI, 'Frisco (9,530kc, 31.48m): Fair from 3 to 6 p.m. (Rogers, Fitzgerald, Beattie, Taylor). Best near 6 p.m. (Gaden).

KEI, Bolinas (9,490kc, 31.61m): Heard closing at 3.45 p.m., one Sunday after special programme for Hawaii. Signal R 8 (Nelson, Knewstubb).

WCAB, Philadelphia (6,060kc, 49.5m): R 7 at 5 p.m. (Taylor, Knewstubb).

WRUW, Boston (6,040kc, 49.65m): Good in morning (Jennings). R 6 at 6 p.m. (Taylor).

WCBX, New York (6,170kc, 48.62m): Good when closing at 6 p.m. (Knewstubb).

Mexico:

XEQQ, Mexico City (9,680kc, 30.99m): Fair at 2 p.m. (Gandy, Keats, Knewstubb, Beattie, Cushen). (Heard often till 4.30 or 5 p.m.—Ed.)

XEWW, Mexico City (9,503kc, 31.57m): Strong at 4 p.m. (Gandy, Keats, Beattie, Knewstubb, Bowser, Cushen). Improving each week (Fitzgerald).

SOUTH AMERICA

Brazil:

PSE, Rio de Janiero (14,935kc, 20.08m): Heard well on Thursdays at 7 a.m. (Keats). Schedule: Thursdays, 7 to 7.30 a.m.; Fridays and Sundays, 6 to 6.30 a.m.

PSF, Rio de Janiero (14,690kc, 20.42m): 9 to 10 a.m.

PSH, Rio de Janiero (10,220kc, 29.35m): See reference elsewhere.

PSL, Rio de Janiero (7,955kc, 37.75m): Said to be on the air from 9 to 10 a.m.

Chile:

CB-1180, Santiago (11,945kc, 25.12m): No reports this month. American magazines give schedule as: 3 a.m. to 3 p.m.

CB-1174, Santiago (11,740kc, 25.55m): 9 a.m. to 2 p.m.

CB-1170, Santiago (11,700kc, 25.64m): Heard by Dr. Gaden at 8.15 a.m.

CB-970, Valparaiso (9,720kc, 30.85m): Fair some mornings, poor at night. Closes in afternoon at 3 with "Land of Hope and Glory."

Colombia:

HJFK, Pereira (9,730kc, 30.83m): Hardly audible at night.—Ed.

Ecuador:

HCJB, Quito (12,460kc, 24.08m): Fair in early afternoon (Beattie). Much weaker at noon, now (Cushen).

HCIGQ, Guayaquil (9,170kc, 32.72m): Is anyone hearing this station?

Peru:

OAX4T, Lima (9,562kc, 31.37m): Schedule: 10 to 11 p.m., 2.30 a.m. to 4.30 a.m., 11.30 a.m. to 1.30 p.m.

OAX5C, Ica (9,430kc, 31.82m): Good at 2.30 p.m. (Fitzgerald). (Note, have gone back to the "old spot." As station closes down, announcer says, "hasta manana a las ll y 30 del dia" until to-morrow at 11.30 in the morning.) (Further reference in "Diary."—Ed.)

OAX4G, Lima (6,190kc, 48.47m): Good at 5 p.m. on Sundays (Gandy). Weak in afternoon (Knewstubb). Also special English sessions from 7.30 to 7.55 p.m. (Gandy).

Uruguay:

CXA-19, Montevideo (11,705kc, 25.63m): Heard several times in mornings (Keats, Nelson). (Good at Randwick till about 8 a.m. —Ed.) Received verification to-day (Cushen, 1/12/40).

CXA-8, Montevideo (9,640kc, 31.12m): Another station heard best on the Sabbath. Fair till 4 p.m. as a rule.

CXA-2, Montevideo (9,570kc, 31.55m): "Radio Continental" has two sessions—7 a.m. till 2 p.m. and 11 p.m. till 4 a.m. Heard well sometimes at 7 a.m. The Sunday programme runs till 2.30 p.m. Opens with Rubinstein's "Vals Capricho."

THE EAST

Burma:

XYZ, Rangoon (6,007kc, 49.94m): Good in English news just before midnight (Rogers, Taylor).

China:

XGOX, Chunking (15,190kc, 19.75m): Good in news at 5.30 p.m. (Gaden, Keats, Beattie, Fitzgerald).

FFZ, Shanghai (12,082kc, 24.83m): Good at 10.45 p.m. (Flegg, Gandy, Keats, Jennings, Fitzgerald, Taylor, Knewstubb). Opens at 8 p.m. News, 10 p.m. Closes, 1 a.m.

XGRX, XGRS, Shanghai (11,910kc, 25.15m): Very good at 7.30 p.m. (Gandy, Keats, Smith, Beattie, Taylor, Knewstubb). "The Voice of the Far East" operates: 7 p.m. to 1 a.m. News, 9.15 and 12.15 a.m.

XGOY, Shanghai (11,900kc, 25.21m): Strong nightly (Flegg, Gandy, Keats, Beattie, Fitzgerald, Jennings, Knewstubb). 8 p.m. to 11.55 p.m. News, 8.15 and 10.30 p.m.

XMHA, Shanghai (11,855kc, 25.3m): Fair at 8.15 p.m. (Gandy, Keats, Knewstubb). 8 p.m. to 1 a.m. News, 9 p.m. and 12.15 a.m.

XGOK, Canton (11,605kc, 25.75m): Strong 9 to 11 p.m. (Keats, Fitzgerald, Taylor, Flegg, Smith, Beattie).

XGOY, Chungking (9,620 kc, 31.19m): Opens with news at M/N and closes at 12.40 a.m.

XPSA, Kweiyang (8,540kc, 35.10m): Is anyone hearing these people on this frequency? When on 35.40m schedule was: 5 to 7.30 a.m., and 8.40 p.m. to 2.45 a.m.

XHHB, Shanghai (7,970kc, 37.6m): R 7 at 9 p.m. (Taylor).

SPECIAL NOTICE

The offices of the "Australasian Radio World" will be closed right through the holidays from December 24, 1940, to January 2, 1941.

XPSA, Kweiyang (6,980kc, 42.98m): Getting weaker of a morning (Gaden).

Portuguese China:

CRY-9, Macao (6,080kc, 49.34m): Seldom a good signal although volume is O.K. Heard on Monday nights at 10.

Dutch East Indies:

PMA, Bandoeng (19,380kc, 15.48m): Very good from 10.15 p.m. till closing at 11.15 p.m. (Callander, Fitzgerald, Taylor, Nelson, Keats). Strong, with news in English at 10.45 (Beattie). Fair at 8.30 p.m. (Gandy, N.Z.).

YDC, Bandoeng (15,150kc, 19.8m): Good at 9 a.m. (Flegg). Heard in late afternoon (Nelson). Good at 10 p.m. (Flegg, Callander, Keats, Taylor, Beattie, Cushen, Gandy, Fitzgerald).

PLJ, Bandoeng (14,630kc, 20.51m): Strong at 9 p.m. (Gandy, Keats, Nelson, Beattie, Taylor). Now better than **PMA** (Gaden).

PLP, Bandoeng (11,000kc, 27.27m): Very good nightly (Flegg, Jennings, Keats, Beattie, Taylor, Gandy, Knewstubb). Not heard of a morning now (Gaden).

PMN, Bandoeng (10,260kc, 29.24m): Good nightly (Flegg, Keats, Beattie, Knewstubb). Good at 5.30 a.m. (Flegg, Taylor). Very weak at 6 a.m. (Gaden).

YDB, Surabaya (9,550kc, 31.41m): Being heard in late afternoon (Nelson, Taylor).

YDA, Tandjongpriok (7,250kc, 41.38m): R 8 at night (Taylor).

YDX, Medan, Sumatra (7,220kc, 41.55m): Good round 10 p.m. (Callander, Gandy, (Taylor).

YDE-2, Solo (4,810kc, 62.37m): R 6 at night Taylor).

YDH-4, — (3,320kc, 90.36m): This 30-watt station heard in New Zealand just after M/N. (Cushen).

YDA, Tandjongpriok (3,040kc, 98.68m): R 6 at night (Taylor).

French Indo China:

Radio Saigon, Saigon (11,870kc, 25.47m): Excellent (Flegg, Rogers, Bowser, Jennings, Gandy, Keats, Fitzgerald, Nelson, Beattie, Taylor, Knewstubb). Good, but not as good as 48.54 (Cushen).

Radio Saigon, Saigon (6,180kc, 48.54m): Good (Gandy, Taylor, Rogers, Fitzgerald, Cushen, Knewstubb). Strongest, 49m, at night, and louder than 25.47 (Gaden).

Hong Kong:

ZBW-3, (9,525kc, 31.49m): Fair at night (Gandy, Flegg, Keats, Nelson, Beattie, Taylor, Knewstubb). (Quite a good station, but would like to see them with a little more power. —Ed.)

India:

VUD-3, Delhi (15,290kc, 19.62m): Being heard in afternoons (Smith, W.A.). R 6 (Taylor). (While I missed the call-sign, I am almost certain I heard this station till after 7.30 p.m. the other night. This is a little later; the last schedule I received which gave them as being on the air as follows: Noon-3 p.m., 4 to 7 p.m., 11 p.m. to 5.30 a.m.)

VUD-4, Delhi (11,830kc, 25.36m): Very good at 11 p.m. (Flegg, Gandy, Keats, Fitzgerald, Beattie, Taylor). News at 10.30 p.m.

VUD-2, Delhi (9,590kc, 31.28m): Very good at night (Flegg, Callander, Jennings, Gandy, Keats, Fitzgerald, Beattie, Taylor, Knewstubb). Also gives news at 10.30 p.m.

Japan:

JZK, Tokyo (15,160kc, 19.79m): Strong at 6.30 a.m. (Gandy, Jennings, Taylor). (Unfortunately no date is given by these gentlemen, but as mentioned in December issue, I have not heard **JZK** for a long while. It is to be further regretted the Japanese programme sheet for December has not shown up yet.—Ed.)

JLG-4, Tokyo (15,105kc, 19.86m): Heard between 7 and 8 p.m. (Fitzgerald).

JVH, Tokyo (14,600 kc, 20.55m): Very good at 1 a.m. (Flegg).

JVZ, Tokyo (11,815kc, 25.39m): Heard testing with **JZJ** for Australian channel on 22/11/40, at 8.45 p.m. (Fitzgerald, Rogers, Beattie).

(Continued on page 38)

LOGGINGS *(continued)*

JZJ, Tokyo (11,800kc, 25.42m): Heard testing between 8.30 and 9.25 p.m. (Beattie, Knewstubb, Taylor, Callander, Fitzgerald, Jennings, Gandy, Keats, Flegg, Nelson). (Reports are asked for, and the Japanese Broadcasting Corp. are usually generous in acknowledging reports.—Ed.) Station opens again at 10 p.m. giving news in English at 10.30.

MTCY, Hsinking (11,775kc. 25.48m): Not being heard at present at Randwick.

JVW-3, Tokyo (11,720kc, 25.60m): Very good at night (Flegg, Gandy, Beattie, Keats, Jennings, Knewstubb).

JIB, Taihoku (10,535kc, 28.5m): R 8 at night (Taylor).

JDY, Tokyo (9,920kc, 30.23m): Fair at 9.30 p.m. (Gandy, Taylor).

MTCY, Hsinking (9,545kc, 31.43m): Comes in at great strength around 7.30 a.m. (Nelson).

JZI, Tokyo (9,535kc, 31.46m): Very good at 5.35 p.m. with news in English (Flegg, Taylor, Smith, Beattie, Knewstubb).

JVW, Tokyo (7,257kc, 41.34m): Dr. Gaden says on December 3rd, signal was very weak, and announcer gave wave length as 41.36 metres, but most mornings at Randwick signal is very good in French session which concludes at just on 6 a.m., when a young lady says "Ici Radio Tokyo." After a few French expressions a man announces and then gives news in English. Same programme is on **JLT**.

JLT, Tokyo (6,190kc. 48.47m): Same programme as **JVW** in mornings, 5 to 7. Best after **HVJ** has closed down.

MTCY, Hsinking (6,120kc, 48.98m): Good at 9.30 p.m. (Gandy).

Malaya:

ZHP-1, Singapore (9,700kc, 30.94m): Fair at night (Flegg, Fitzgerald, Nelson, Gandy, Beattie, Taylor). Getting better each week (Keats).

ZHP-3, Singapore (7,250kc, 41.38m): Good (Cushen, Beattie, Taylor, Rogers).

ZHJ, Penang (6,090kc, 49.26m): Fair at night (Callander).

Philippines:

Manila unless otherwise stated.

KZRH (11,890kc, 25.23m): Open at 2 a.m. (Rogers, Jennings).

KZRH (9,640kc, 31.12m): Romps in at night (Callander, Jennings, Gandy, Keats, Flegg, Taylor, Beattie, Knewstubb).

KZRM (9,570kc, 31.35m): Fair at night (Flegg, Jennings, Gandy, Taylor, Keats, Fitzgerald, Knewstubb). (Mr. Beattie considers **KZRM** now better than **KZRH**, but this is not the case at Randwick.—Ed.)

KZIB (9,500kc, 31.58m): Fair at 8.30 p.m. (Gandy, Rogers, Keats, Beattie). Improving (Knewstubb).

KZRF (6,140kc, 48.86m): R 7 (Taylor). Schedule is: 7 p.m. till 3 a.m. Best Philippine at present **KIS**.

KZRC, Cebu (6,100kc, 49.18m): R 7 (Taylor). Heterodyned, otherwise good (Knewstubb).

KZIB (6,055kc, 49.54m): Good but noisy at 8.30 p.m. (Gandy, N.Z., Cushen). (Appears to be better on the new frequency.—Ed.)

Thai:

HS6PJ, Bangkok (19,020kc, 15.72m): Very good Monday nights (Keats). 11 p.m. till 1 a.m.

HSP5, Bangkok (11,715kc, 25.61m): Not as good as Chinese or **FFZ** (Keats, Taylor). Good signals in N.Z. (Cushen).

GREAT BRITAIN

With 19 Transmitters in use Daventry is certainly doing a great job in keeping the Empire not only well informed of what is happening, but in giving us some grand entertainment. (Please don't ring me up at 10 o'clock on a Monday, as I'm listening to Howard Marshall, and from 10.15 to "Hi, Gang.")

If one can make a complaint, it is the regret I have that so often conditions will not permit of the Radio News Reel at 1.30 p.m., and such poor reception frequently at 4.15 p.m. However, from 5 things seem to improve and as we are provided with a special edition of the News Reel to finish off the transmission that so often begins poorly all is forgiven.

An old-timer, **GSO** (15,180kc, 19.76m), has shown up again and although specially intended for the European Service can be heard from 10.15 p.m.

"This is London Calling, Here is the News":

GST (21,550kc, 13.92m): Very good from 8.55 p.m. (Keats, Beattie, Flegg).

GSJ (21,530kc, 13.93m): Excellent at 10 p.m. (Flegg, Gandy, Keats, Beattie, Fitzgerald).

GSH (21,470kc, 13.97m): Very much weaker (Keats, Beattie).

GSV (17,810kc, 16.84m): Excellent at 10 p.m. (Fitzgerald, Beattie).

GSG (17,790kc, 16.86m): Very loud night station (Keats, Flegg, Fitzgerald, Beattie).

GSP (15,310kc, 19.60m): Good at 5 a.m. (Gandy). Good at night (Beattie, Keats).

GSI (15,260kc, 19.66m): Strong at 9.30 p.m. (Gandy, Keats, Beattie).

GSO (15,180kc, 19.76m): Opens up at 10.15 p.m. in European Service.

GSF (15,140kc, 19.82m): Very good at 7.45 p.m. (Flegg, Keats, Beattie). Strongest Transmitter, Daventry (Gaden). (Now a splendid addition to the session from 8.55 p.m. —Ed.)

GSE (11,860kc, 25.29m): Very good at 6 p.m. and 10 p.m. (Flegg, Gandy, Beattie).

GSN (11,820kc, 25.38m): Very good at night (Rogers, Callander, Beattie, Flegg).

GSD (11,750kc, 25.53m): Excellent at 6 p.m. (Flegg, Gandy, Keats, Beattie).

GRX (9,690kc, 30.96m): Very good from 4.30 to 6.30 p.m. (Keats, Beattie, Flegg). (Another of the European Service Stations that gets through. Schedule: 3.30 to 8 p.m. —Ed.)

GRY (9,600kc, 31.25m): Good in early morning (Beattie). **GRY** is meant for special session to Africa, 5.30-8.25 a.m.

GSC (9,580kc, 31.32m): Very good from 4.30 to 6 p.m. (Flegg, Gandy, Keats, Beattie).

GSB (9,510kc, 31.55m): Very good from 4.30 to 6.45 p.m. (Beattie, Gandy, Flegg, Keats). (Station actually opens at 4.10 p.m. —Ed.)

GSW (7,230kc, 41.49m): Fair at 5 a.m. (Gandy).

GRW (6,145kc, 48.82m): Good in mornings.

GSA (6,050kc, 49.59m): Good but noisy at 4.30 a.m. (Gandy).

EUROPE

France:

Paris — (L5,243kc, 19.68m): Fair, early in month, at 1.30 p.m. (Beattie).

Germany:

Source of origin counted as Berlin.

DJH (17,845kc, 16.81m): Excellent at 10 p.m. (Flegg, Keats, Fitzgerald, Beattie).

DJE (17,764kc, 16.89m): Strong at 8.30 p.m. (Gandy, Keats, Fitzgerald, Beattie).

DJR (15,340kc, 19.56m): Very strong at 9 p.m. (Flegg, Jennings, Gandy, Keats). Good at 5 p.m. with news (Beattie).

DJQ (15,280kc, 19.63m): Very strong at 10.30 p.m. (Flegg, Jennings, Keats, Fitzgerald). Good in afternoon with news at 5 (Beattie).

DJB (15,200kc, 19.74m): Good at 6 a.m., also 5.30 p.m. (Gandy, Keats, Beattie).

DJL (15,100kc, 19.85m): Weak at 7 a.m. (Keats, Beattie). (Splendid at 9.30 p.m.—Ed.)

DXH (14,460kc, 20.75m): Good at 7 a.m. (Keats). Strong at 5 p.m. (Gandy).

DJP (11,855kc, 25.31m): Good in afternoon (Callander, Beattie). Excellent at 10 p.m. with news (Flegg).

DJD (11,770kc, 25.49m): Weak at 1 p.m. Fair at 5 (Gandy, Keats).

DXB-2 (11,740kc, 25.5m): Opens every night in parallel with **DJL**, at 11 p.m. (Muller).

DZA (10,087kc, 29.75m): Very strong some mornings at 6 (Gaden).

DZB (10,040kc, 29.86m): Strongest on the air at 6 a.m. (Gaden).

DJX (9,675kc. 31.01m): Fair at 6 a.m., strong at 4 p.m. (Gandy).

DJW (9,650kc, 31.09m): Strong in afternoon (Flegg, Fitzgerald, Jennings). News at 5 p.m. (Beattie).

DXB (9,610kc, 31.22m): Good in afternoon (Flegg, Jennings).

DJA (9,560kc, 31.38m): Very loud at 7 p.m. (Gaden).

DJN (9,540kc, 31.45m): Very loud at 7 p.m. (Gaden).

DXJ (7,240kc, 41.44m): Good at 4 p.m. (Gandy).

DJC (6,020kc, 49.84m): Good at 7 a.m., but noisy, also at 3.30 p.m. (Gandy).

Holland:

PCV, Amsterdam (18,070kc, 16.6m): Good at 11.15 p.m. (Flegg, Callander, Keats, Fitzgerald, Beattie). (Subject to a lot of interference. Ed.)

PCJ-2, Huizen (15,220kc, 19.71m): Good at 11.15 p.m. (Flegg, Keats, Taylor, Beattie, Jennings). News at 9.45 and 10.45 (Beattie).

Italy:

Count location as Rome.

IRW (19,520kc, 15.37m): Very good at night (Fitzgerald, Keats, Beattie). (Opens at 8.30 p.m. News in English at 8.45 p.m.—Ed.)

2RO8 (17,820kc, 16.83m): Weak at 9 p.m. (Gandy, N.Z.). Good at 10 p.m. (Fitzgerald, Beattie, Keats).

2RO20 (17,780kc, 16.87m): Good at 1 p.m. (Gandy, N.Z.). News at 4.30 p.m. (Beattie).

2RO16 (15,300kc, 1961m): From 4.30 p.m. (Flegg, Gandy, Keats). Strong every morning (Beattie). Fades in morning long before 2RO3 and 2RO4 (Gaden).

2RO7 (15,230kc, 19.7m): Good every morning (Beattie).

2RO4 (11,810kc, 25.40m): Good at 12.30 a.m. (Flegg). Good in mornings (Callander, Beattie, Gaden). Strong at 5 p.m. (Keats, Gandy).

2RO3 (9,635kc, 31.15m): Very strong at 4.30 p.m. with news (Flegg, Fitzgerald, Gandy). Loud at 7 a.m. (Keats, Beattie, Gaden).

2RO11 (7,220kc, 41.55m): Good at 7 a.m., but noisy (Gandy). Weakening (Gaden).

Vatican City:

HVJ (15,120kc, 19.84m): R 8 when operating (Taylor).

HVJ (6,190kc, 48.47m): R 6 in morning (Taylor); but weak in morning in N.Z. (Knewstubb).

Portugal:

CSW-6 Lisbon (11,040kc, 27.17m): Very loud at 6 a.m. (Keats, Knewstubb, Fitzgerald). One of my favourites at 6 a.m. (Gaden).

CSW-7, Lisbon (9,740kc, 30.8m): Good at 6.50 a.m. (Gaden, Keats, Fitzgerald, Taylor, Beattie). English announcements at 7 a.m. (Flegg).

Roumania:

Radio Bucharest (9,245kc, 32.45m): Weak at 6.30 a.m. (Keats). (Schedule is: 2 a.m. till 7 a.m., news at 6.45.—Ed.)

Russia:

All taken as "This is Moscow Calling."

RKC (19,500kc, 15.38m): News in English at 9 p.m., very loud (Rogers).

Mr. Keats of Launceston advises he has heard the Moscow transmitters on:—
16.81, 18.61, 19.07, 19.35 metres.

RW96 (15,410kc, 19.47m): Good at 10.30 p.m. (Flegg, Gandy, Keats, Beattie).

RW96 (15,180kc, 19.76m): Good at 5.30 a.m., also at 4.30 p.m. (Gandy, Beattie, Keats, Taylor). (Some overseas journals give the call-sign of this frequency as RKI.—Ed.)

RW96 (14,720kc, 20.38m): Heard the last two Sundays in English at 9.15 p.m. (Taylor, Gandy). Heard at 6 a.m. occasionally (Keats).

— (12,090kc, 24.81m): Heard from 6-7 p.m. just recently with good signal (Smith, W.A.).

RNE (12,000kc, 25.00m): (Callander, Gandy, Keats, Jennings, Beattie, Flegg).

(Continued on page 40)

S.W. *(continued)*

There is no doubt daylight signals are at present exceptionally poor. Even in Queensland, that part of Australia where signals seem to behave for longer periods than in the rest of the Commonwealth, a letter from Dr. Gaden shows that "things ain't what they used ter be." Inter alia, he refers to the 41-metre band which, in December issue I recommended as a matutinal tonic. He says: "Even on the 3rd inst., I found the band bad, JVW, 41.36 metres, it was given as .36 not .34, was only just strong enough at 6 a.m."

Then in telling me KGEI is back again on 31.02 metres in the 3 to 6 p.m. session, he goes on to say, "the 4 o'clock news could not be heard; in fact, it is rare to hear any signals at that hour now, but a spot of news just before closing at 6 can be heard." But, from Dr. Gaden's remarks, I gather the residents of Bananaland have experienced some of the thundery weather similar to that which, down here, interfered with a little exploration I had planned for some of the "weak sisters" off the beaten track. But the weather must be ideal to go hunting — experience has taught me that.

By the way, Dr. Gaden has pointed out the Lisbon station on 27.17 metres is CSW-6, not 5, as shown by me in December issue. (Goodie, goodie, Dr., I suppose there is a reason for the changes; time was when we knew it for years as CSW-2.) He says at 6 a.m. it is much better than any Daventry transmitter at that time.

"PMN is very weak now at 6 a.m., and PLP cannot be heard, but DZB, 29.85 metres, has been the strongest on the air, while DZA, 29.75, has been strong. They are not heard on the same days."

* * *

If seeking a little amusement, and able to keep your temper, tune to DJL, 19.875 metres at 10 p.m. when you will be taken over to Bremen and "Lord Haw Haw" will entertain.

* * *

No doubt the "Niagara" carried a lot of mail pertaining to Short Wave reports that of course never reached their destination. This is what probably happened to Dr. Gaden's letter to O.K. Batista, as he was one of the first to hear COK, and several reports sent along after his have been acknowledged in the manner promised when the station was boosting the eventually successful candidate, Senor Batista, for the Presidency.

* * *

Mr. Linehan, Adelaide, mentions hearing Thailand several times on about 19.4 metres. They have not announced their call-sign but at 9 p.m. they say: "Bangkok! Bangkok!" and then a gong is beaten once.

This will be most likely, HSG-2, Bangkok, 15,530k.c., 19.32m., who very often phone Japan and Europe. They are also heard on HSP, 17,740k.c., 16.91m. calling the same countries.

* * *

Mr. Nelson of Cairns writes that he heard both of the Algerian stations at 6 p.m. Both TPZ, and TPZ-2 closed at 6.15 p.m. Strength was good, TPZ being the stronger but spoiled by morse.

* * *

The number of B.B.C. items heard in the early evening on 31.38 metres would lead one to believe that Daventry was on a new frequency, but it is actually VLW-2, on 9650k.c.

* * *

Mr. Gus Muller, of Newtown, writes that he is hearing a French station on approximately 33.46 metres which appears to open at 5 and closes between 6 and 6.15 p.m. Best period is still 6. General style is similar to OPM, Leopoldville, but more cabaret music is played. One would expect this to be TPZ-2, 8960k.c., 33.48m., but Mr. Muller says its is not Algiers. He says on closing, "Ici Radio . . . Belge" and gives wave length as 33.46 metres.

* * *

Have received a beautifully printed poster from The Broadcasting Corporation of Japan. A Japanese girl is standing in front of a large fan and a caption suggests you listen to Tokyo. A very nice piece of work.

* * *

Mr. Cushen, of Invercargill, says he is hearing a South American on approximately 9.77m.c., which closes at

(Continued on page 47)

LOGGINGS *(continued)*

RNE (11,900kc, 25.21m): R 7 in late afternoon (Taylor).

— (11,750kc, 25.61m): Not heard lately (Gandy).

— (11,640kc, 25.77m): Fair at 9 p.m. (Gandy).

— (9,560kc, 31.36m): Equal to JZJ (Knewstubb, Muller). (Excellent at Randwick about 9.50 p.m.—Ed.)

RW96 (9,520kc, 31.51m): Good at 7.30 (Keats, Beattie).

— (6,720kc, 44.64m): R 6 at night (Taylor). (Unfortunately exact time is not stated, but it will be remembered Mr. Bantow mentioned hearing at 7.30 p.m. what he took to be a Russian.—Ed.)

— (6,120kc, 49.02m): Heard at 10 p.m., 21st November.—Ed.

RV15 (4,250kc, 70.59m): Strong but noisy at 9.30 p.m. (Gandy, Taylor).

Spain:

EAQ, Madrid (9,860kc, 30.43m): Weak at 8 a.m. (Keats).

EAJ-9, Malaga (7,220kc, 41.55m): Good at 6.30 a.m. (Linehan, Taylor).

Radio Espana, San Sebastian (7,210kc, 41.6m): Fair at 6.45 a.m. (Linehan).

Switzerland:

HBH, Geneva (18,480kc, 16.23m): Excellent on a Friday night from 11.45 p.m. till 1.10 a.m. (Gaden, Rogers, Fitzgerald, Taylor).

HBJ, Geneva (14,535kc, 20.65m): First Sunday in the month, 3.45-5.10 p.m.

HBO, Geneva (11,402kc, 26.31m): First Sunday in the month, 3.45-5.10 p.m.

Radio Suisse, Schwarzenburg (11,870kc, 25.28m): Very fine after 10 p.m. (Rogers, Fitzgerald, Beattie, Taylor).

Radio Suisse, Schwarzenburg (6,165kc, 48.66m): Best just after 5 a.m., closes 7.30 a.m. (Fitzgerald, Rogers, Taylor). At 5.30 a.m. was heard giving greetings from persons interned in Italy. (Cushen).

Yugoslavia:

YUF, Belgrade (15,240kc, 19.68m): Good between 5 and 6 p.m. (Keats, Taylor).

YUC, Belgrade (9,505kc, 31.56m): R 7 at 6.30 a.m. (Taylor).

SCANDINAVIA

Norway:

LKQ, Oslo (11,735kc, 25.57m): Good at 7 a.m. (Rogers, Keats).

MISCELLANEOUS

Arabia:

ZNR, Aden (12,110kc, 24.76m): Heard just after 11 p.m. Closes at M/N. See reference elsewhere.

Canada:

CKFX, Vancouver (6,070kc, 49.42m): Good signal in the evening (Cushen). (Unfortunately, Mr. Cushen does not give exact time. Latest schedule I have is: 7-8 a.m., 3-4 p.m., but they are sometimes heard here till 7 p.m. —Ed.)

CJRX, Winnipeg (11,720kc, 25.6m): Received verification this week of report sent 28th July (Gaden).

Greece:

SVJ, Athens (9,825kc, 30.54m): I heard this station once very weakly several weeks ago just after 11.30 p.m. Latest American magazines give frequency at 9,900kc, or wavelength, 30.33 metres. Is anyone hearing this weaker at night.—Ed.)

Turkey:

TAQ, Ankara (15,190kc, 19.74m): Fair at 3.15 most days (Fitzgerald). Heard at 10.15 p.m. giving news (Smith). (Note: News is now given at 9.15 p.m.—Ed.) Fair when closing at 10.30 p.m. (Flegg). Not to be compared with GSF at 10 p.m. (Gaden).

TAP, Ankara (9,465kc, 31.70m): Good at 6 a.m. (Linehan, Beattie, Flegg, Keats, Taylor, Fitzgerald, Knewstubb). (Note: News is now given at 4.15 a.m. and Sunday talk at 5.50 a.m.—Ed.)

WEST INDIES

Cuba:

COGF, Matanzas (11,940kc, 25.13m): R 7 at night (Taylor).

COCQ, Havana (11,570kc, 25.93m): Good from 2 p.m. (Gandy, Nelson). Heard at 10 p.m. (Keats). R 7 at 7.15 a.m. (Taylor).

COHI, Santa Clara (11,500kc, 26.09m): Very good, 11 p.m. (Flegg, Nelson). Good at 7 a.m. (Beattie, Flegg, Knewstubb). Far strength at (Beattie, Flegg, Knewstubb). Fair strength at 5 p.m. (Fitzgerald, Nelson).

COCM, Havana (9,835kc, 30.51m): R 6 (Taylor). (This station is definitely getting weaker of a night.—Ed.)

COCH, Havana (9,440kc, 31.78m): Saturdays and Sundays, fair at 4 p.m. (Gandy, Nelson).

COBC, Havana (9,360kc, 32.04m): Weak late at nights (Keats, Nelson).

COCX, Havana (9,200kc, 32.61m): Fair at 10 p.m. (Keats).

COBZ, Havana (9,030kc, 33.32m): Weak at night (Keats, Taylor).

COCQ, Havana (8,830kc, 33.98m): Not very good now (Keats). Fair at nights (Beattie).

COCO, Havana (8,700kc, 34.48m): Still heard weakly. Best, 11 p.m. Sunday (Keats, Beattie, Taylor).

COCQ, Havana (6,365kc, 47.14m): Strong most nights from 10.30 (Gandy, Jennings, Taylor). Good late afternoons (Knewstubb).

COCW, Havana (6,324kc, 47.4m): Good at 9.30 p.m. (Gandy).

DOBSON'S AMPLIFIER

Handicapped by a slight mis-adjustment, the amplifier entered by Mr. L. S. Dobson, of Hornsby, in the recent Amplifier Championship, failed to give its best performance in the final and was unplaced. Those who heard it win its heat, however, claim that it is capable of remarkable results. In response to many requests we give the circuit details.

AT the Grand Final of the Amplifier Championship there were several disappointments.

One of these was the performance by an amplifier entered by a Mr. Dobson, of Dobson's Radio and Electrical Sales and Service, of Hornsby.

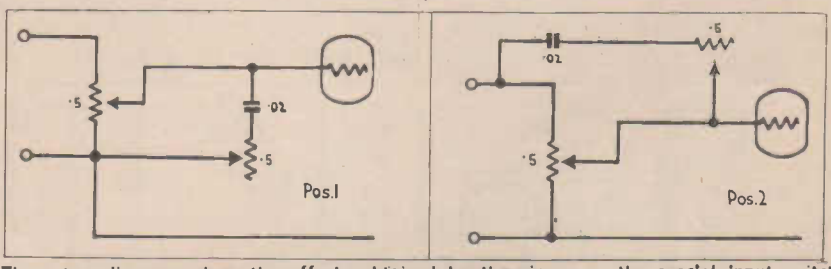
This amplifier put up a truly stunning performance in its heat, which it won with ease, yet in the final, due to the choice of recordings and some other factors, the amplifier failed to give its normal performance and was an "also ran."

We feel, however, that the amplifier itself is a most interesting arrangement and one worthy of further attention.

The amplifier was a direct-coupled push-pull arrangement, taken from an American handbook of several years ago, and as will be noticed from the circuit, it uses the early types of a.c. valves, the 24 and 50 types.

Tone Control

Not the least interesting part of the circuit is the input arrangement which allows a most wide variation of response, allowing either highs or lows to be accentuated or attenuated at will. This input arrangement is equally applicable to any amplifier using a crystal pick-up, and merits attention on that account.



These two diagrams show the effects obtained by throwing over the special input switch which changes the loading and gives complete control over the response.

NEXT YEAR?

Now is the time to start thinking about the next Amplifier Championship. If you have any views on this subject a letter to the Editor will be appreciated.

The Circuit

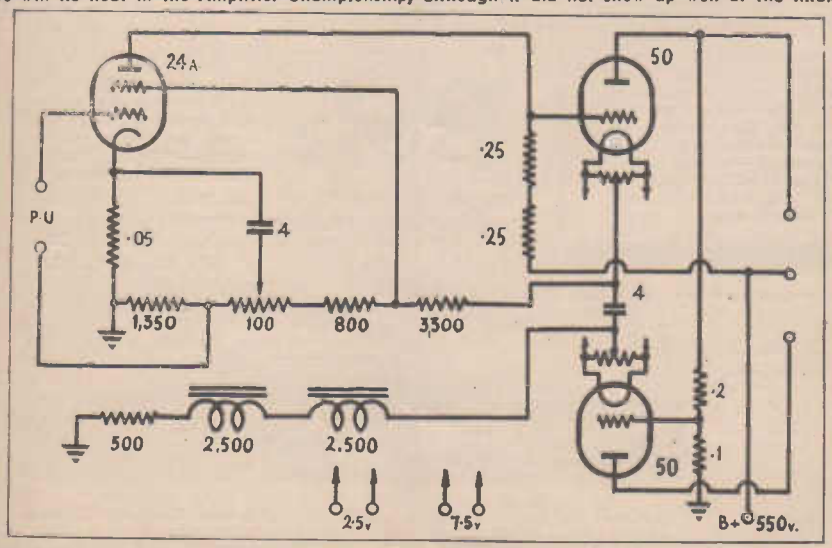
To explain the circuit we suppose that the easiest way is to think of the first stage, which is simply a 24 screen-grid valve direct-coupled into a 50 in conventional Loftin-White practice, as detailed at some length in our article on direct-coupling in the August issue.

Push-pull operation is obtained, however, by putting a couple of resistors across from the plate of the valve to earth. These give a voltage-divider effect, not only in the matter of high tension voltage, but also signal voltage developed.

The grid of the other output valve is therefore attached to the junction of these two resistors, thereby picking up a portion of the signal from the top valve and amplifying it to a proper degree and then handing it on to the loud-speaker correctly out of phase in order to give push-pull operation.

The grid is maintained at a considerable voltage in respect to earth, but the matter of correct bias for the valve is obtained in normal direct-coupled style, by means of a couple of field coils and a resistor in series, fitted in the filament circuit of the second output valve in order to keep it also at a potential above earth.

Circuit diagram of the direct-coupled push-pull (cascaded) amplifier which had no trouble to win its heat in the Amplifier Championship, although it did not show up well at the final.



Pointers

This brings to mind an important point to mention about these "cascade" direct-coupled amplifiers (as we used to call them ten years ago), and that is in the matter of the filament windings on the power transformer. Separate windings are required for the two output valves, and they are centre-tapped separately. The centre taps, however, need to be connected together with a 4 mfd. condenser.

This condenser is most important in practice, although it is a little obscure why this should be so.

The power supply originally used by Mr. Dobson was a large affair, using two 281 type rectifiers and high-voltage paper filter condensers.

Mr. Dobson mentions, however, that

(Continued on next page)

DOBSON'S AMPLIFIER

(continued)

recently he has been using a more modern power unit with a single 5Z3 or 80 rectifier.

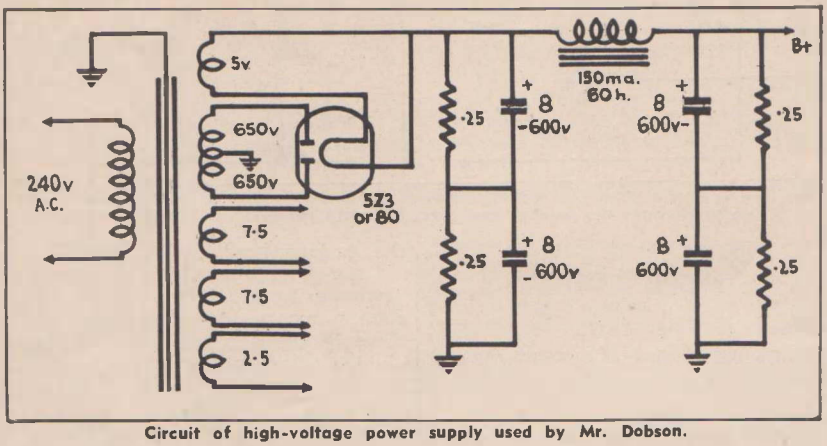
With an 80 type valve the makers' ratings are considerably exceeded, but in practice Mr. Dobson has found that the 80 will stand this overload without distress. In one of these amplifiers which he installed in a cabaret outfit, an 80 type rectifier has seen four years' hard service and is still showing 90% on the valve checker.

Performance

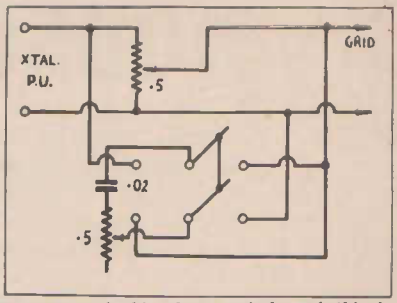
Mr. Dobson has had extensive experience with amplifiers built to this circuit, and in course of working on them he has checked the gain and found it to be 60 db. In other words, a signal of .3 of a volt on the grid of the 24 will give a power output of 10 watts at the speaker.

Equipment

At the contest Mr. Dobson used a Rothermal De Luxe crystal pick-up and a pair of Rola speakers to handle the output. One of these was an 8" unit fitted in a P.M.G. type folded horn, and handled the lows and middle register. The other speaker was a Rola speaker, to handle the highs.



Circuit of high-voltage power supply used by Mr. Dobson.



By using a double throw switch and this input circuit for a crystal pick-up which will allow you almost infinite tonal control.

For Experimenters

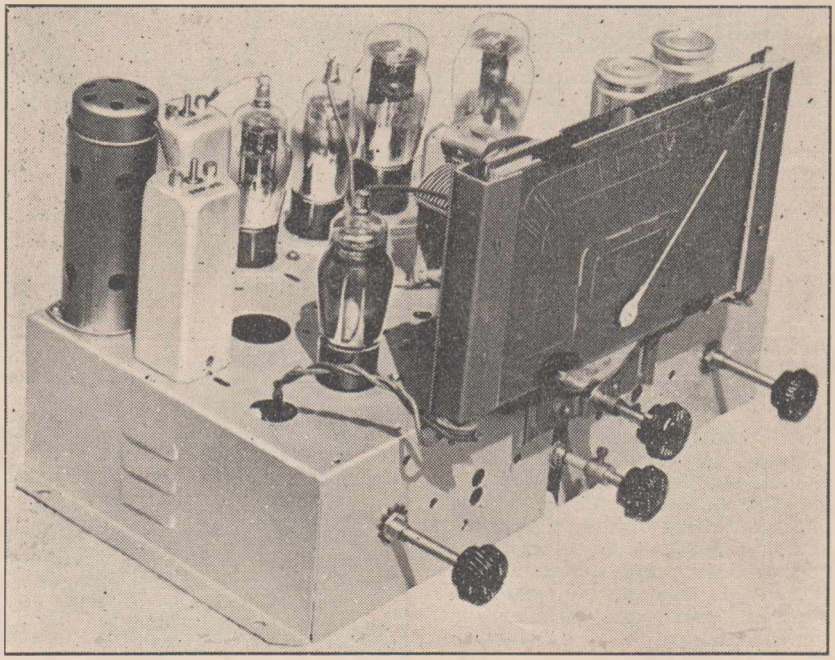
Radio experimenters who like to try various circuits are strongly recommended to see how this circuit works out in practice, but we hesitate to advise novices to start off with it.

Acknowledgement

To Mr. Dobson we must express our appreciation of his kindness in making the circuit details available for our readers. Anyone wanting any further details are advised to contact Mr. Dobson at Coronation Street, Hornsby.

A PUSH-PULL PROPOSITION

By adding a push-pull stage to any ordinary four-five valve receiver you can bring up the standard of performance, with better tone, greater range, more power and less hum, as told in this general article about push-pull as a business proposition.



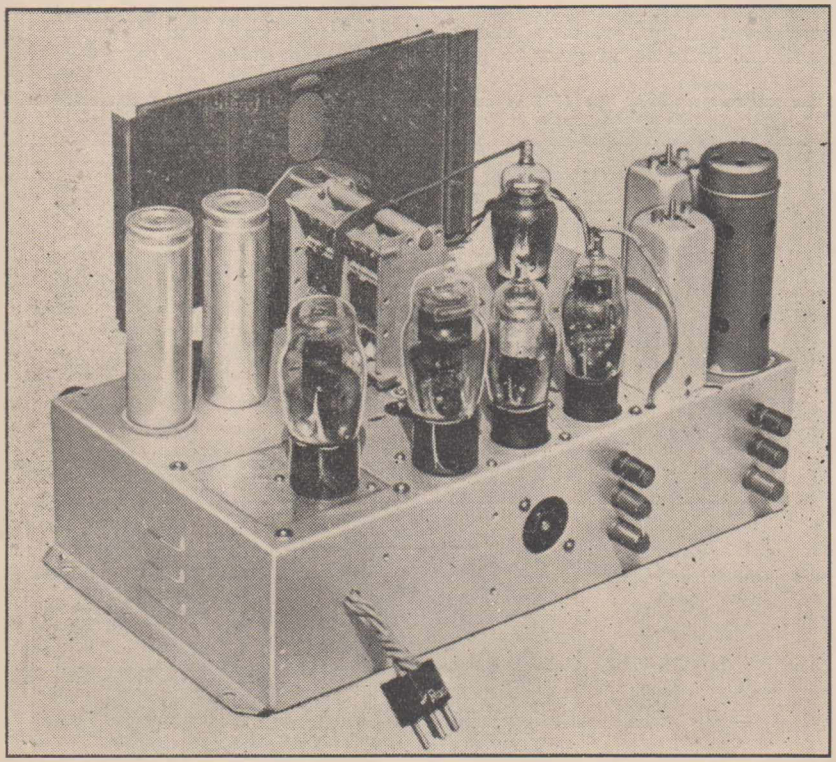
A general view of the converted chassis, which now becomes the tuner unit only.

AT the suggestion of a couple of radio dealers we offer in this article something developed along rather different lines. Normally we have little need to consider the finer points of the commercial side of set building.

Most circuits are designed to give performance and just how much they cost doesn't really concern the designer of the circuit. They are built by enthusiasts of one kind or another, and in most cases a few shillings, either way, doesn't mean a thing.

Day by day it becomes more evident that among our readers we number a group of repair men, radio dealers, and others who build sets to sell for profit.

From the letters they have written we have obtained quite a good idea of their problems and this particular set has been designed for these men. When it comes to a straight-out receiver of the ordinary four-five valve duel-wave class there is little to choose in the way of a circuit.



Rear view of the chassis, showing the short six-wire cable which plugs into the power unit.

DEALERS —

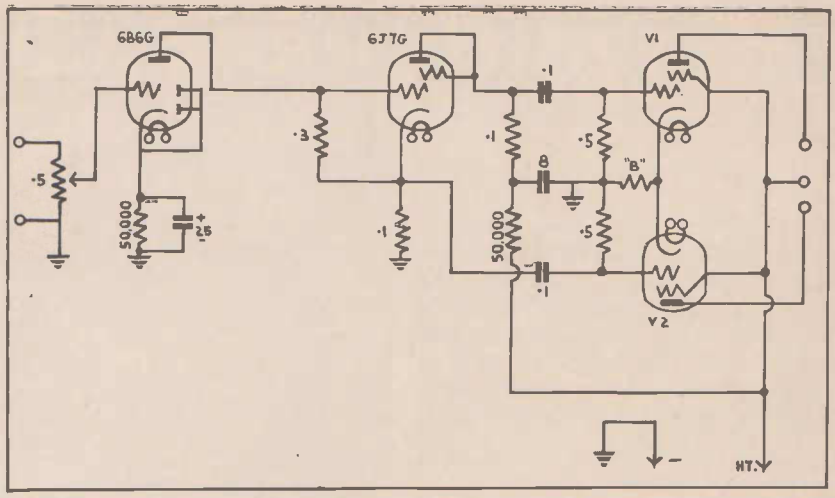
Do you appreciate technical articles written in a more general style, such as this one? If so be sure to let us know so that we can cater for your requirements.

A set such as the "R.W. 13/42," detailed in last month's issue represents all that is desirable in such a receiver.

(Continued on page 44)

PUSH-PULL *(continued)*

When it comes to the matter of finance and profit-making, however, such a set does not lend itself to a big margin. Receivers of the four-five dual-wave type are offered at quite low prices by the big shops and others and there is little chance of getting a firm toehold in that particular market. But, if you can offer a more powerful receiver, with seven valves, push-pull output, infinitely greater range of short-waves, more power output and better tone; well, then you've got something to talk about. You've got a receiver which sells itself at a price five or ten pounds better than the five-valver. Yet, it need not cost much more to build, and therefore presents an infinitely better business proposition for the set builder who does this kind of work.



Another push-pull circuit which is suitable for this type of work. Further details were in the November issue.

The Scheme

The fundamental idea is to take an ordinary four-five type of receiver, and adding a separate power supply unit, with a pair of output valves in push-pull ahead of the original single audio stage. At first thought this might seem like a lot of work, but actually it amounts to only a few minutes work and a few extra components.

There are many ways in which the job can be tackled, and for a typical example we took the original "13/42" chassis which we used in last month's issue. We altered this over to push-pull 45 type valves, with a 6J7G as a triode driver and used a moderately-priced audio transformer. That is the circuit we show, and a highly satisfactory one in every way.

There are many alternative arrangements which offer themselves. The direct-coupled phase changer with a pair of 6V6G beam power valves is one. A straight-phase changer with a pair of 6V6G and feedback is another.

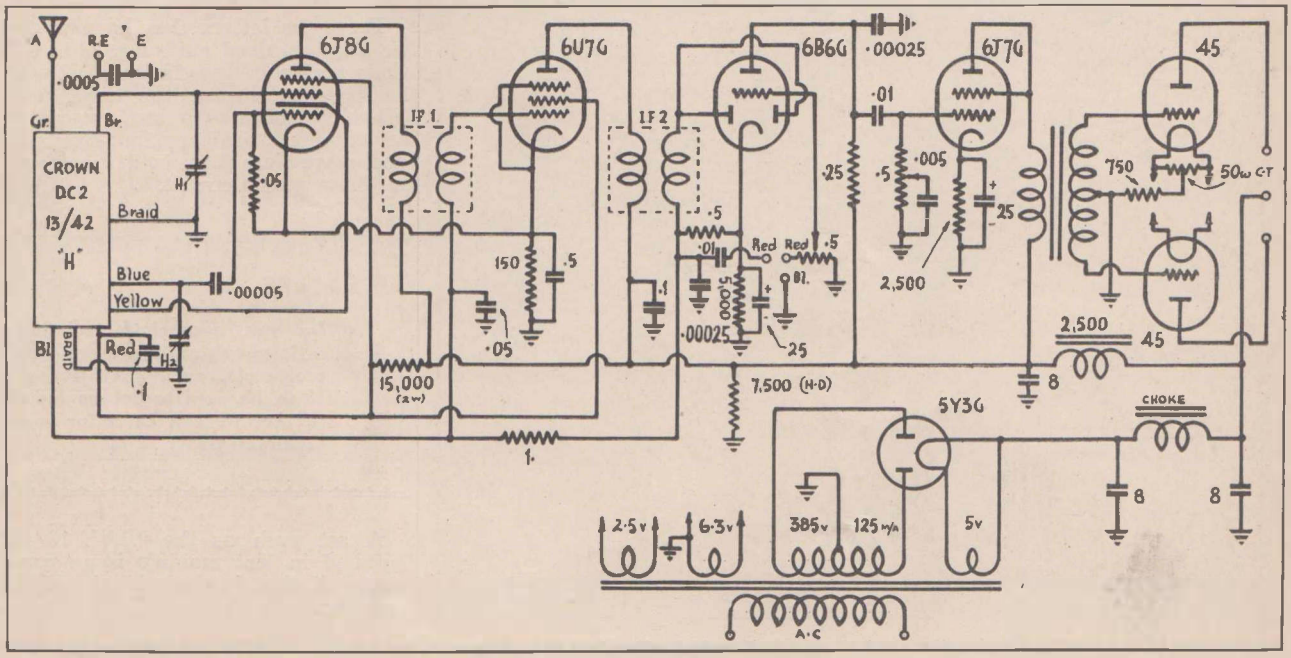
Any of these push-pull arrangements are certain to give vast improvement in power, tone, and also sufficient increase in gain to give a great lift to the short-wave performance.

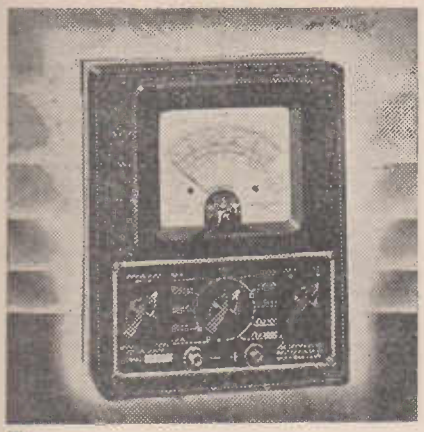
Back to triodes

The move back to the old 45 type triode may come as a shock to those who pursue the modern. The old 45 was introduced way back in the picture, about the time that the first a.c. operated sets became practical. After many years of popularity it was replaced by the 47 pentode for the cheaper sets and by the 2A3 types for the quality sets. To-day the 2A3 is not a commercial proposition but

(Continued on page 46)

Schematic of the circuit. Owing to a slight error the suppressor grid of the 6J7G is not shown, but actually it should be connected to the cathode as usual.





The Symbol of QUALITY Test Equipment!

Always look for the "Palec" brand when buying testing equipment — it ensures that the instrument is designed to meet YOUR requirements and is built to stondards of quality made possible by Polec's precision engineering. Furthermore, it is backed by a policy of technical service that protects your investment and helps you along the path to profitable servicing.

MULTIMETERS TO SUIT EVERY REQUIREMENT

●

VALVE and CIRCUIT TESTERS FOR A.C. and A.C./BATTERY OPERATION

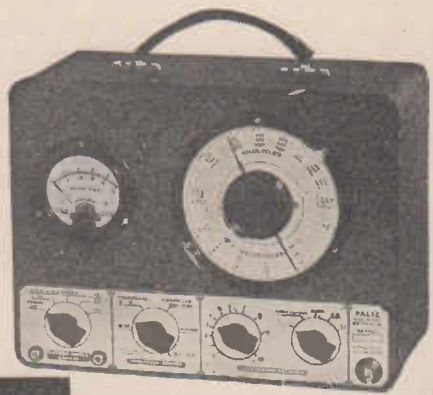
Illustrated are four items from the "Palec" range. Top left is the "M" multimeter, a workshop instrument for D.C. or D.C./A.C. measurements with optional sensitivities of 1,000 o/v and 10,000 o/v. Prices range from £4/15/- to £8/17/-.

Next is the famous Palec "VCT," a valve and circuit tester which is available for either A.C. or A.C./Battery operation. Providing complete circuit testing and "emission" type valve test, the "VCT" lists at £15/10/-, or with built-in vibrator for 6 volt D.C. operation at £17/17/-.

At right is another famous "Palec" product —the "G" series oscillator. Providing six-band coverage with direct-reading calibrations, this instrument offers "signal generator" performance at "test oscillator" cost. Available with or without a built-in output meter, and in types for A.C., A.C./Battery, or dry battery operation. List prices range from £12/5/- to £18/12/6.

Last, but not least, comes the Palec "acorn diode" type vacuum-tube voltmeter which provides discrimination-free measurements over the range from 50 cps. to 50 MC. Complete with valves, this instrument lists at £13/15/-.

Palec's range of testing equipment is all-embracing — whether you wont a miniature meter or a cathode-ray oscillograph, a simple multimeter or a precision signal generator, Palec can meet your requirements at surprisingly low cost. Thousands of rodio technicians throughout Australasia are using Palec instruments, many important radio - electrical manufacturers, Government departments, Universities and laborotories — our files of unsolicited testimonials provide ample evidence of universal satisfaction and demonstrate that "Palec" IS the symbol of Quality Test Equipment.



PRECISION TEST OSCILLATORS AND SIGNAL GENERATORS

●

PRECISION V.T. VOLTMETERS FOR R.F. and A.F.

PATON ELECTRICAL PTY. LTD.

90 VICTORIA ST., ASHFIELD, SYDNEY

Telephones: UA1960-1982

LEADING DISTRIBUTORS ALL STATES

- All prices subject to alteration without notice.
- All instrument prices are plus sales tax.
- Illustrated catalogue available free and post free.

PUSH-PULL *(continued)*

as the 45 is manufactured in our local valve factory, there will be no trouble about stocks or replacements.

The 45 is capable of giving grand performance when used with plenty of high tension voltage. It is one of the most rugged power valves and seems to revel in overload.

PUSH-PULL PROPOSITION — Parts List

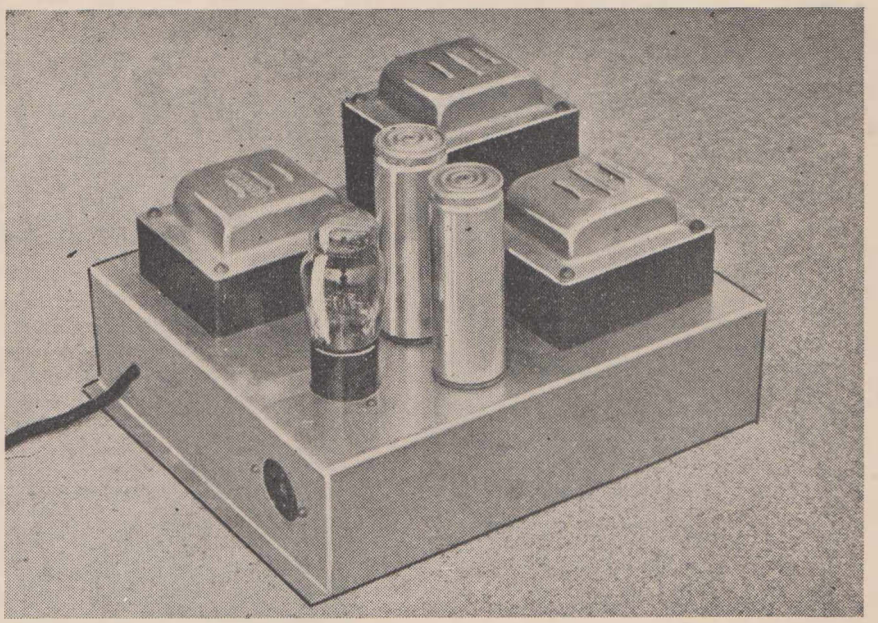
1—Suitable base or pair of bases (Arcadian).
1—Power transformer rated 385 at 125 milliamps with 6.3 and 2.5 volt windings.
1—Filter choke, 125 ma.
1—Coil bracket (Crown DC2H).
1—2-gang Tuning condenser (Stramberg-Carlson type "H").
1—Dial to suit (Crown FD3H).
2—Intermediate transformers (Crown ISP).
1—Audio transformer, push-pull (R.C.S. Radiokes).

RESISTORS:
1—50 ohm centre-tapped (R.C.S. Radiokes).
1—150 ohm wire-wound (R.C.S., Radiokes).
1—750 ohm, 10 watt (I.R.C.)
1—2,500 ohm 1-watt (I.R.C.)
1—5,000 ohm 1-watt (I.R.C.)
1—7,500 ohm heavy duty (see text).
1—15,000 ohm 3-watt (I.R.C.)
1—50,000 ohm 1-watt (I.R.C.)
1—250,000 ohm 1-watt (I.R.C.)
1—500,000 ohm 1-watt (I.R.C.)
1—1 megohm 1-watt (I.R.C.)
2—.5 meg. volume controls (I.R.C.)

CONDENSERS:
1—00005 mfd. mica (T.C.C.)
2—00025 mfd. mica (T.C.C.)
1—0005 mfd. mica (T.C.C.)
1—005 mfd. mica (T.C.C.)
2—01 mfd. mica (T.C.C.)
1—05 mfd. tubular (T.C.C.)
2—.1 mfd. tubular (T.C.C.)
1—.5 mfd. tubular (T.C.C.)
3—8 mfd. 500 v. electrolytics (T.C.C.)
2—25 mfd. 40 v. electrolytics (T.C.C.)

VALVES:
1—6J8G, 1—6U7G, 1—6B6G, 1—6J7G, 1—5Y3G, 2-45. (Radiotron, Mullard, Brimar, Philips).

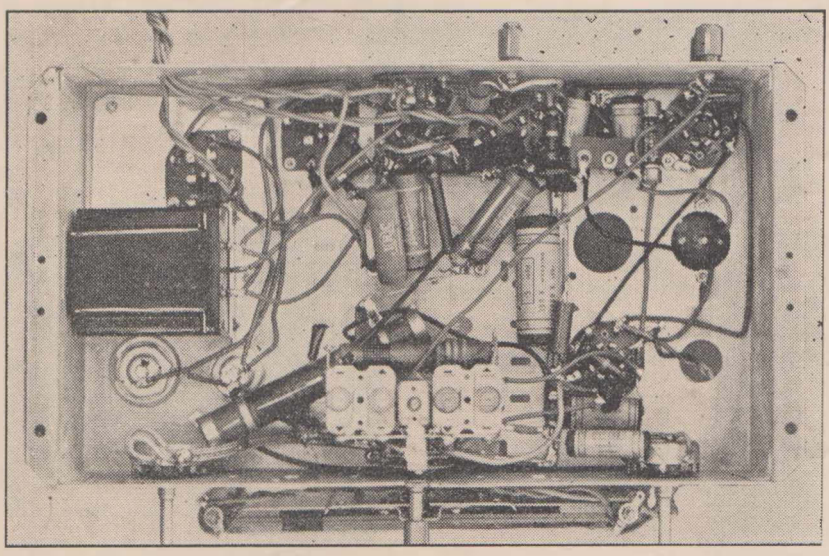
SOCKETS: 5—octal, 2—4-pin, 1—5-pin.
SPEAKER: 2,500 ohm field to suit p/p 45 (Rola, Amplion).
SUNDRIES: Power flex, valve cans, screws, nuts, solder lugs, hook-up wire, etc.



This separate power unit, as detailed in our April issue would be ideal for the completed push-pull set, or a similar but simpler design can be used.

We remember a trip down the South Coast one time with a big power amplifier which was built to take some big 500 volt power valves. One got dropped and so a pair of 45 type valves were borrowed from some local receivers. They operated for many hours with the full 500 volts on their plates, and apart from getting a little hot, did not appear to mind such abuse.

We don't recommend such extremes, of course, merely mentioning the fact to indicate that they can be expected to give plenty of power output, yet reliability, when operating at about 325 on the plate with 60 bias, as they will be if given the full high tension from a 385 volt transformer, rated to supply 125 milliamps.



A photograph of the wiring and component layout.

The tuner

The whole of the tuning end of the circuit, including the detector, follows the same circuit as that of the "13/42" in last month's issue. The back-biassing is short-circuited, however. The connections to the 6V6G are altered around to take the 6J7G as a triode driver. The power transformer is removed from the base and replaced with a sheet of aluminium in which a valve socket is mounted, thereby accommodating the two 45 type output valves.

Instead of the four-pin speaker plug a five-pin is used, so a five-pin socket is fitted.

The power cord is replaced with six-wire hook-up cable, which plugs into the separate power unit.

Separate Power Unit

The use of a separate power unit has been suggested several times in recent issues of "Radio World." Frankly, the scheme does not appear to be popular with our readers so far.

We persist, however.

The separate power supply unit has lots to recommend it and not a single practical drawback. The idea is used with lots of the best receivers in the commercial brands, both here and abroad. It costs little extra, makes construction simpler and can be quite

a help to cut out hum trouble, especially with a set using an audio transformer.

Mounting the Transformer

If an audio transformer is used it will need to be mounted firmly in the base and this may be a bit of a problem with certain types of transformers which are designed to mount on top of a special cut-out in the base.

Making such a cut-out in a steel base is not an easy job for the man who works on the kitchen table. We overcame the problem in the original set by making up an angle bracket by cutting an edge from an old chassis.

This allowed the transformer to be mounted under the base, on its side and with the terminals in a handy position for connecting up.

Field Energising

The matter of providing the field of the speaker with the proper energising current is vitally important, as usual. To arrange this, and at the same time give the output valves the full high tension from the power supply, makes it inconvenient to use the field as a filter and so a separate filter choke is required.

The field can then be used as an additional filtering for the high tension supply to the tuner end of the set, the valves in that end being unable to stand up to the same high tension voltage overload as the output valves.

By this means a voltage drop of about 150 volts can be made in the field, to allow about 250 for the plates of the converter and intermediate valves. Using a 2,500 ohm field coil this calls for a current of 60 milliamperes, which is considerably greater than the normal drain of this end of the set. As a result it becomes necessary to introduce a heavy duty resistor to provide the "bleed" current.

This resistor can be made up by putting in a couple of voltage dividers in parallel. Dividers cost only a couple of shillings and there is no trouble to find room to fit them under the base.

The total drain on the power supply comes up to about 125 milliamps, so a transformer and choke rated to handle this current will be required.

(Continued on page 48)

S.W. *(continued)*

2.30 p.m. Only identification is the squeal of motor-car brakes. This suggests at first blush a Peruvian, as OAX5C, Ica, Peru. "La Ondas de Ica para todo el Pais" (The Waves of Ica for all the Country) amongst a string of advertisements, uses a motor-car horn just before suggesting "compre un Ford" ("buy a Ford") and the sound of a motor-car smash follows, suggesting an insurance policy. But, of course, the same type of advertising may be used anywhere. However, it is worth trying for. Don't forget, 9.77m.c., and closes at 2.30 p.m.

* * *

Received a card from Radio Saigon in reply to my communication of a month or so ago, in which I said I had detected a certain sadness in the voice of our lady announcer. The card says: "The lady in charge of the English Listeners' Mail and News Bulletin has gone for a long holiday trip, so we'll have to wait until she comes back and she will perhaps answer you."

I wonder if she has gone on a vacation, or whether the change in the sentiments expressed had anything to do with it. She was certainly pro-British.

In December issue I mentioned Mr. Bantow, of Edithvale, Vic., reported a station on 6720k.c.. 44.64m., which at 7.30 p.m. he took to be a Russian. This month, Mr. Taylor, of Mosman, has heard them with an R6 signal.

Probably in their hunt for further outlets, Moscow Radio Centre has jumped the frequency so long until recently held by PMH.

I must say how grateful I am to the many who have written in giving me their loggings. This with my own observations has enabled us to produce notes each month that apart from being accurate have been of a most informative nature. The letters of appreciation have made me very happy. So here's to an R9 Q5 Xmas and may you tune in to A Happy and Prosperous New Year.

Airzone Full Range Audio Transformer

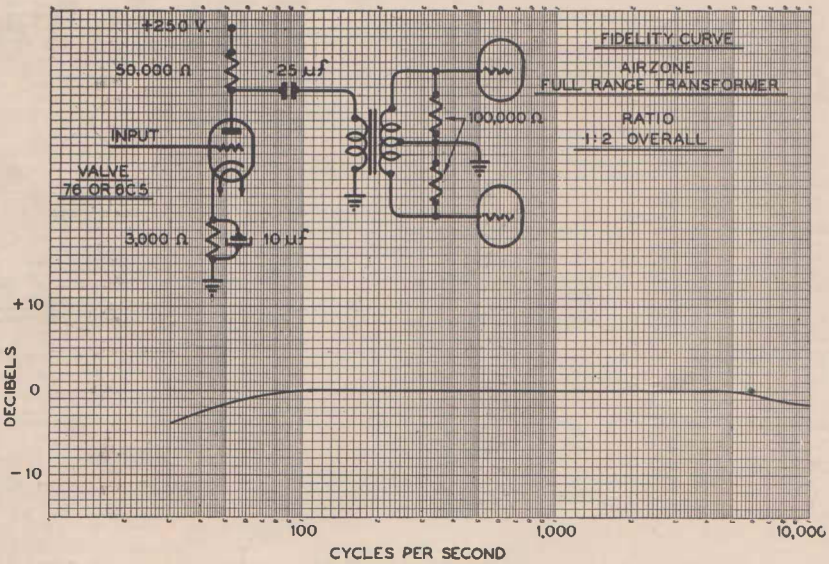
TYPE 312

The Airzone full range, push pull, interstage audio transformer is a super "high quality" transformer of the very latest design and construction.

Construction

The core is of the latest type, high permeability nickel alloy and a special form of winding is employed to give the remarkable frequency response.

The windings are vacuum impregnated and the transformer sealed in the bakelite case with a special compound, rendering it entirely moisture proof, which ensures freedom from breakdown even under severe tropical conditions.



Specifications

Push-Pull, Class A.

Amplification ratio 1 to 2 overall.

Suitable for coupling one plate of 26, 27, 37, 55, 56, 76, 86, 6C5, to push-pull grids type 10, 41, 42, 43, 45, 47, 48, 50, 71A, 2AC, 2A5, 6F6, 6L6.

Connection: The type 312 full range audio transformer is for use only in a circuit having the shunt feed or parallel feed method as shown on the connection diagram.

WARNING: Under no circumstances must Direct Current be passed through the windings.

Designed and Manufactured by **AIRZONE (1931), LTD.** **Camperdown, Sydney, Australia.** **RETAIL PRICE: £3/17/6** **Dealers apply for trade discount.**

PUSH-PULL *(continued)*

Even with a comparatively cheap audio transformer it is possible to get far better quality from a pair of push-pull valves than is likely to be obtained from a single pentide.

Even if the frequency response is not so good the output from the push-pull valves contains less distortion and so it sounds more pleasant to the ear.

By spending a few extra shillings on a really good quality audio transformer it becomes possible to get really fine tonal quality from our push-pull circuit.

Airzone Recommended

Particularly recommended is the Airzone high-frequency audio transformer.

This transformer can hold its own with anything produced in any part of the world, and although one or two circuit amendments are necessary, these can be easily carried out.

The special circuit diagram reproduced on this page shows these amendments in detail. The first requirement is to keep the high tension current of the audio valve from flowing through the primary of the audio transformer. This is done by using a shunt-feed method with a 50,000 ohm feed resistor and a .25 mfd. condenser to couple the transformer primary.

NEXT ISSUE

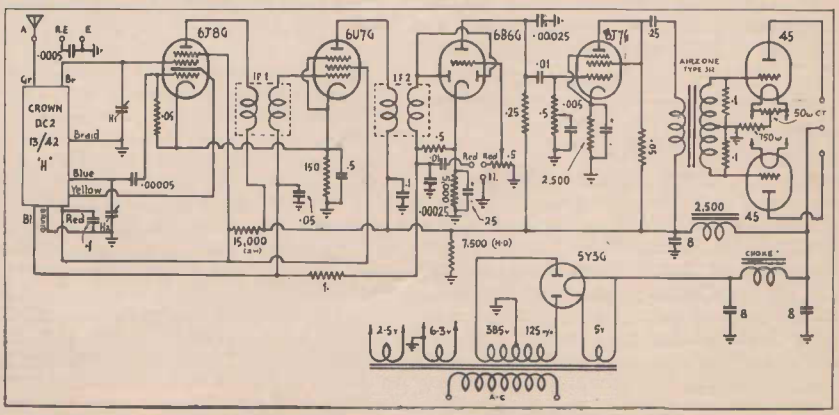
Our next issue will be dated February, and will be on sale February first. We hope to include in the features a detailed description of a new set designed exclusively for short-wave reception.

The only other alteration is to fit a couple of .1 megohm resistors across the secondary halves of the transformer.

Using this transformer in this way the response is as near perfect as is likely to be obtained and the overall tonal quality of the receiver then becomes more a matter of the quality of the loud-speaker used to handle the output.

The Airzone transformer is also ideally suited for our purpose on account of its compact size. It is only a few inches each way and will readily tuck under almost any base, taking up hardly any room at all.

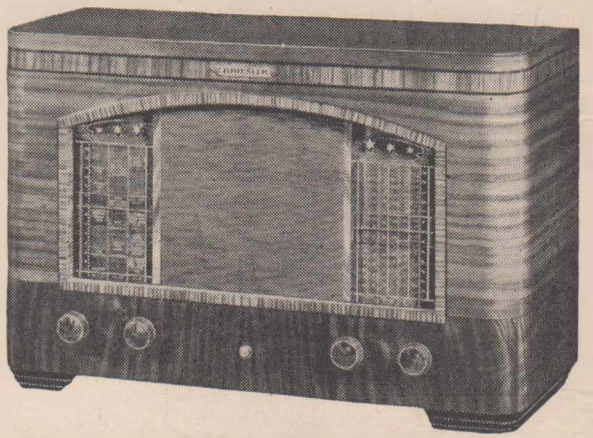
Below: Here is a circuit incorporating the Airzone type 312 high-frequency audio transformer.



SPECIAL SHORT-WAVE SET

LATEST KRIESLER RELEASE

That radio manufacturers are at last appreciating the needs of the enthusiastic short-wave listeners is indicated by the progressive step taken by the Kriesler factory to offer a superlative short-wave set which has been primarily designed to give the utmost in short-wave reception.



Compact enough for easy transport and delivery, yet large enough to allow excellent tonal quality, this table model cabinet houses the new Kriesler XP model.

THE Kriesler Company has long been known as one of the leading manufacturers of better-class commercial receivers. There is great interest, however, in their latest announcement that they are to offer something quite "out of the box" in the shape of a special short-wave receiver.

Short-Wave Only

This receiver has been designed with the express purpose of obtaining the finest possible reception on the short-waves, up to about 225 metres, but not including the rest of the broadcast band.

Known as the new "XP" model this latest Kriesler product is one of the most advanced receiver designs to be released on the Australian market.

The set fairly bristled with novel features and special circuit arrangements which have been introduced to ensure performance which is far beyound that normally obtained with ordinary dual-wave receivers.

Technical Details

For example, on reading over the technical data sheets about this model we notice that there are fifteen tuned circuits, with radio frequency amplification, three stages of intermediate frequency, and four stages of amplified a.v.c. as well as audio a.v.c.

Utmost efficiency is obtained throughout by the use of air-tuned trimmer condensers and iron-cored coils with permeability tuning.

Climatic Precautions

As it is expected that the receiver will be popular in distant locations, and operated at times under the most difficult conditions, every precaution has been taken to make the complete receiver capable of withstanding unlimited humidity, heat or dampness. The speaker is a special tropic-proof job, the chassis is first copper and cadmium plated and then lacquer-sprayed. All tuning coils are triply impregnated with trolitul insulation. Even the cabinet timbers have been specially selected to withstand moisture, humidity and heat.

Tonal Quality

The audio end of the receiver makes use of the famous Kriesler "Mirroscopic" reproduction, embodying an elaborate system of controlled inverse feedback, which can be adjusted to give almost any form of reproduction, stressing highs, lows, or medium register, or any combinations of these. In a nutshell it gives an infinitely variable tone control which can be readily adjusted to suit the particular reception conditions which may be prevailing.

SPECIFICATIONS

KRIESLER SPECIAL XP MODEL

Volves — Seven in all.
Type — Speciol short-wove receiver.
Tuning — From 13 to 225 metres.
Speoker — Ten inch Tropic-proof.
Cobinet — Speciol timber, climatic-treoted.
Chossis — Locquer on codmium on copped ploting.
Coils — Trolitul insuloted.
Models ovoiloble — XP for short woves only, o.c. operoted. XPB for short-wove ond broodcost, olso o.c. operoted and XPV for short-waves only ond operoted from 6 volt occumulotor by vibrotor.
Mokers — Kriesler (Australosio) Pty. Ltd., 43 Alice Street, Newtown, Sydney, N.S.W.

Wave Bands

The wave-lengths covered are from 13 to 225 metres in three bands, but a special job to cover the broadcast band instead of the usual third band can be obtained to order.

Appearance

Unfortunately the photograph on this page does not, by any means, do justice to the appearance of the receiver. Practically the whole of the front of the cabinet is made up of an opening for the dial scales and the speaker. The scales are behind panels of bevelled glass, the speaker behind a screen of thick, but porous cloth. Stars above the dial scales indicate teh band being tuned, each of a different colour.

Dial Scales

A great amount of attention has been paid to the design of the dial scales and they are clearly marked with station call signs and also in wave-length and frequency.

A special venier scale on the extreme right hand side indicator allows accurate re-setting of the dial, so that once a station has been logged and the dial reading noted it is only a matter of a moment to re-set the tuning to again pick-up this station at a later date. Altogether the set is just the thing to appeal to the heart of any real radio enthusiast and we feel sure that it will be widely popular among our many DX Club members and other readers who are interested in overseas short-wave reception.

Further Details

Full technical details, price lists and other information can be obtained free, and post free, from the Kriesler Company at Alice Street, Newtown, or from any Kriesler dealers or distributors.

COUNTRYMAN'S 6
(continued)

Another Design

It is interesting to note that this particular circuit has been designed by our Editor in collaboration with Donald Dove, a practical radio engineer who has had many years experience with radio receivers in a "difficult" country location a couple of hundred miles out of town. Already readers have heard quite a bit about Donald and his practical ideas. In the November issue we gave a circuit of a powerful set designed by this reader. The receiver was designed to give the greatest possible gain, but unfortunately it was found necessary to use non-standard components, for example the gang condenser needs to have four sections. Such condensers are not readily available on the open market.

The design, however, has many points of interest and from the number of letters received it is very obvious that many country readers would like further details.

As a result we are pleased to give some extracts from the last letter from the designer of this set in which he tells of some experiences with the latest job which he has built up to this circuit.

Here is what he says:—

I have been playing about with all types of circuits for weeks but find the original best of all.

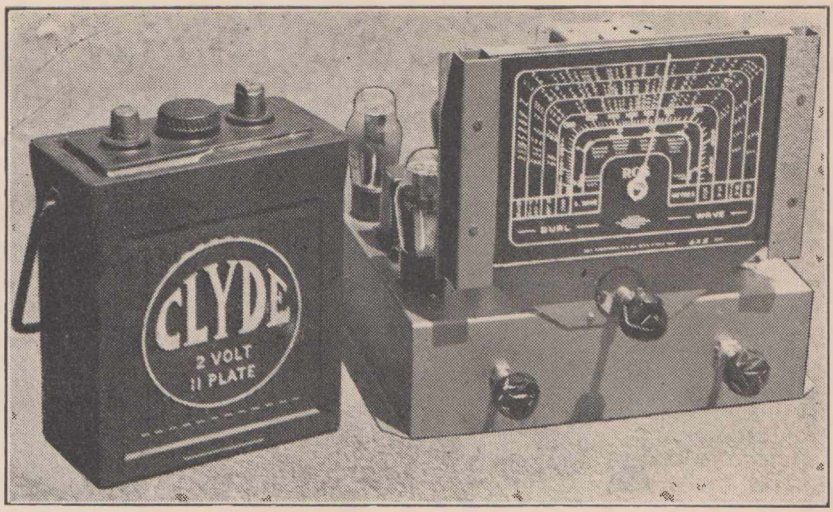
There are a few points which I found most essential for good results.

All plate and B+ leads to R.F., Osc., and I.F. must be shielded and B+ and screen leads need to be by-passed right at the valves and coils. Screen voltage must not exceed 45 volts otherwise oscillation trouble will be encountered.

Another most important point is the kind of padder used. The padders you sent proved absolutely unsuitable. The set going dead above about 2BL and all sorts of noises and whistles over the rest of the dial.

Both padders did exactly the same so I am assuming that both would not be faulty.

(Continued on page 58)



Above: The Countryman's Six shown beside a Clyde type 2VS11 2 volt battery. This is the battery recommended for this receiver.

LILLEY'S AMPLIFIER
(continued)

inverse feedback and tone control is provided in order to get the required cut-off for this channel.

Frequency Cut-Off

This cut-off, by the way, is around 3,500 cycles and as this point is rather critical the values for resistors and condensers should be rigidly adhered to in order to make certain that the cut-off frequency is correct.

Construction

In the construction of the amplifier great attention was paid to the layout to ensure that the power transformer and filter choke were kept as far as possible from the audio transformer as this component is liable to pick-up hum.

Two heavy duty filter chokes are used to filter the high tension supply, again with a view to ensuring an entire absence of any trace of hum. A heavy duty power transformer, with secondary rated to supply 400 volts at 160 milliamps is used and this is kept fully loaded, as the regulation is more likely to be steady when the load is maintained close to the rating of the transformer. Owing to the likelihood of fairly high voltages being developed across the first filter condenser, a pair of 8 mfd. electrolytics are used in series, with resistors across them to ensure an even division of the voltage across them.

The Speaker System

At the contest Mr. Lilley used a speaker system consisting of a Rola G12 permagnetic model for the main amplifier and a 6in. permagnetic speaker for the high notes.

"A tan of punch, with great tone"—says Manager Bob Barron, of Fox and MacGillycuddy, as he tries out his own special version of the Xmas Portable. Alterations include a black leatherette-covered carrying case with chromium-plated fittings, and a special slide-off lid with a pocket for aerial and earth. Iron-cored coils and intermediates give exceptionally high gain.

XMAS PORTABLE
(continued)

The Speaker

As mentioned in last month's issue, there is considerable difference in speaker transormers and speaker types, and when ordering a speaker for this set be sure to specify that you want it for operation with a 1Q5GT output valve.

You will then be supplied with one of the efficient types of baby permagnetic speakers which have been evolved for these valves.

They are capable of making a hundred milliwatts of power output sound like half a watt.

With Loop

No tructural alterations are required in order to use a loop aerial, but of course the ordinary aerial coil unit is replaced by the loop.

Further details about loops and their application to this portable are due for publication in the next issue, on sale February 1st.

A NOVELTY SET

A low cost, battery operated rereiver of unusual design that gives really good results. Featuring special "reflex" circuit.

A circuit of considerable interest to builders of small sets appeared in the November 16 issue of the West Australian magazine "Broadcaster."

The ingenious use of the grids of the valves and the application of a reflex arrangement allows a two-valve circuit to do the same work as would be expected from a three-valve set, but what is more to the point, to operate entirely from a total high tension supply consisting of a single 7½ volt "C" battery.

The high tension current drain is practically zero.

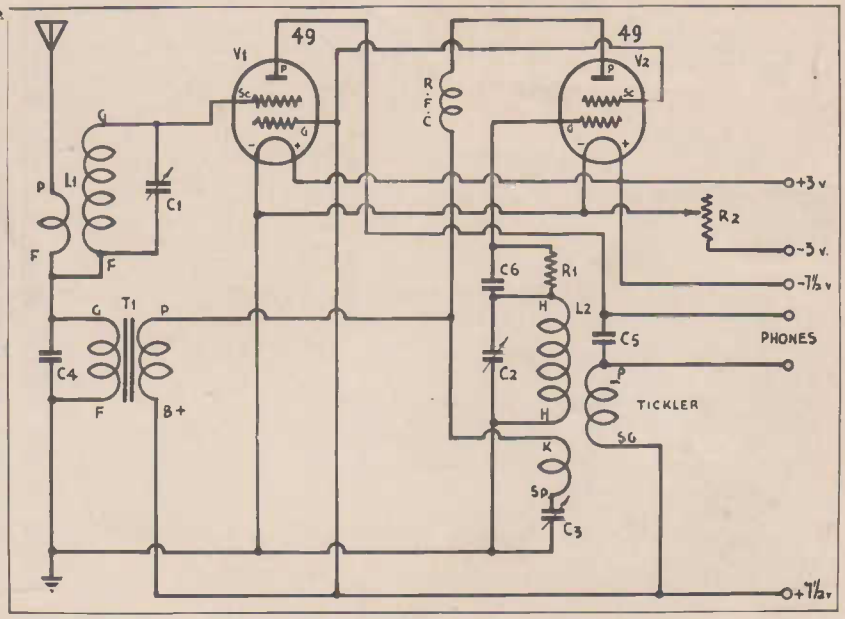
Two '49 Tubes Used

As indicated in the diagram two type '49 tubes are used. Tracing the signals from the antenna through the circuit, they are fed first to the tube V1, which serves as a radio-frequency amplifier, and through the second tube (V2) which acts as a tuned regenerative detector. Finally, by means of a return circuit, they are rerouted through the first tube V1), which then acts as an audio amplifier. In reality, the first tube (V1) is used twice, the second tube (V2) once.

Because of the novel grid hook-up, which is used, three small, inexpensive batteries — two dry cells and one 7½-volt "C" battery — provide the necessary current supply. Connected in series, the three units provide a total of about eleven volts for the plate circuit, while the two dry cells and rheostat provide the two volts required for the parallel-connected tube filaments. Because of this compact power supply, the circuit is particularly well suited to portable use.

Chassis

Since the dimensions of the metal chassis and panel are relatively unimportant, suitable units can be purchased ready-made at most radio-parts supply houses. They should be drilled to take the four sockets, the condenser and resistance-control shafts, the phone-tip jacks, and the two binding-post terminals. Although the chassis and panel shown have a decorative black-crackle finish, this can be omitted, if cost is an important consideration.



A glance at the circuit above shows the unusual design of this receiver.

In assembling the parts, particular attention should be paid to the wiring of the two plug-in-coil sockets. In the diagram, the terminals of the various windings have been lettered to correspond with the conventional arrangement on four-prong and six-prong sockets. Follow them carefully, and check each connection several times to avoid error.

In studying the wiring of the plug-in coil L2, you will note that the primary and tickler windings are reversed. On the particular commercial coils used, it was found that the primary was too close to the secondary to give good results with this circuit. By using the regular tickler as the primary and the regular primary as the tickler, this difficulty was overcome. Since ready-made coils vary somewhat in construction, it will be best to experiment with the connections to the tickler and primary windings. Try first one arrangement and then the other, retaining the hook-up that gives you the best volume and selectivity. By checking the prong wiring on each of the coils, you can quickly determine which prongs serve as connections to the various windings.

NOVELTY SET — Parts List

C1, C2, and C3 —Variable condensers 0.00014 mfd.
C4 — Fixed mica condenser, 0.001 mfd.
C5 — Fixed mica condenser, 0.0005 mfd.
C6 — Fixed mica candenser, 0.00015 mfd.
R1 — Grid leak, 3 meg.
R2 — Filament rheostat, 15 ahm.
T1 — Audio transfarmer, 1/5 ratio.
L1 — Four-prong plug-in cails.
L2 — Six-prang plug-in coils.
RFC — Radio-frequency chake.
Miscellaneous — Twa five-prong sockets, one four-prong socket, ane six-prong socket, four knobs, phone-tip jacks, binding posts, chassis, panel, twa type '49 tubes, tuning dial, batteries, wire, solder lugs, etc.

Grids Important

It is equally important to have the grids to the two tubes wired correctly. In the first tube (V1), the control grid is employed as the screen grid. The wiring to the second tube (V2) is standard.

The coils could be made by the constructor, but unless he happens to have the wire and formers already on hand, it will usually be found cheaper to purchase them complete. Of the three variable condensers used, two (C1 and C2) are employed for tuning. The third (C3) provides regeneration control. In use C1 is the vernier control, since it tunes more broadly than C2. If through some difference in the arrangement of parts or some slight discrepancy in the parts, you find that C1 fails to cover the entire range of C2, increase the value of C1 to 0.00035 mfd., and remove several turns from the secondary windings of the four-

(Continued on page 52)

NOVELTY SET
(continued)

prong plug-in coils (L1).

For best results, care should be exercised in selectng the audio transformer (T1). It should have a one-to-five ratio and be of the fully shielded type. The specifications for the fixed condensers, C4 and C5, likewise are critical and should not be varied more than fifty per cent.

Good Outside Aerial

In tests with the receiver, the greatest volume and selectivity were obtained when the set was used with a good outside antenna, about seventy-five feet in length. If for some reason or other, a shorter antenna must be used, greater volume will be obtained if the lead-in wire is connected directly to the grid of the first tube through a 0.0001 mfd., semi-variable trimmer condenser, and approximately one-third of the turns are removed from the secondary windings of the plug-in coils L1. The exact number of turns can be determined only by experiment, since much will depend upon existing conditions.

Plug-In Coils

As in all receivers of this type, the plug-in coils are one of the most important group of parts in the circuit. To avoid trouble, use high-grade units, making sure that they are designed for use with 0.00014 mfd. tuning condensers If, when you first wire the hook-up, the set fails to operate, check the connections to the coil sockets. Reversed connections to the tickler winding may be causing the trouble. This can be remedied easily, however, simply by switching the wires leading to the tickler-coil prongs at the socket.

Particular attention also should be paid to any connections made to the receiver chassis. For best results, all common-return connections should be made to one soldering lug bolted to the chassis.

BOMBERS USE RADIO

Radio equipment is a valuable part of the load of a modern bomber, or so it seems from the way in which German bombers are fitted up with elaborate radio transmitters and receivers. According to the "Wireless World" (Eng.) an examination of a German machine recently shot down in England, showed that the radio gear weighed 358 lbs.

TWO ATTRACTIVE RECEIVERS

Latest S.T.C. Mantel & Portable Models

SUCCESS in the radio set manufacturing game calls for a number of different attributes. Contributing factors include good business methods, reliable products, sound engineering, and so on.

Public Appeal

Then there is one big factor which means a lot.

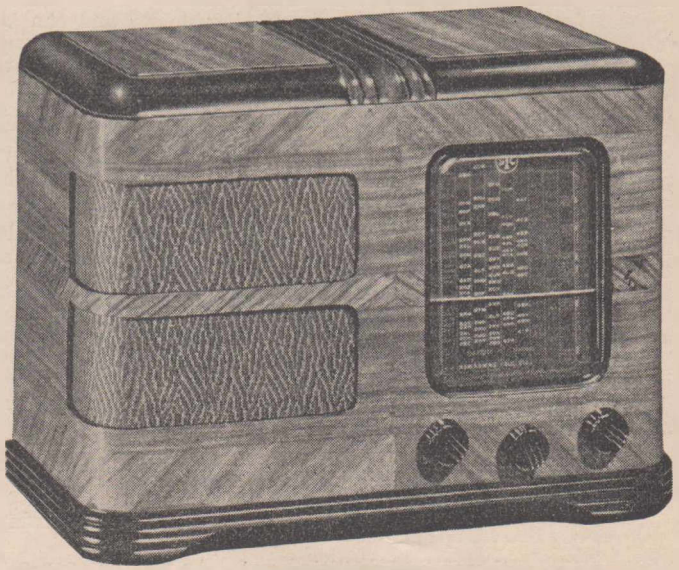
From what we can see of it, one factory seems to have watched the point most closely. We refer to the S.T.C. factory and the point to which we refer is the knowledge of what the public is likely to want, or, in other words, the knowledge of what style and type of set is going to to appeal to the public.

This fact was strongly impressed upon us when we received two new models from S.T.C. for review. One was the new dual-wave mantel model, and the other the new dual-wave portable.

The Mantel Model

The mantel model is a most attractive little set, both as regards appearance and performance.

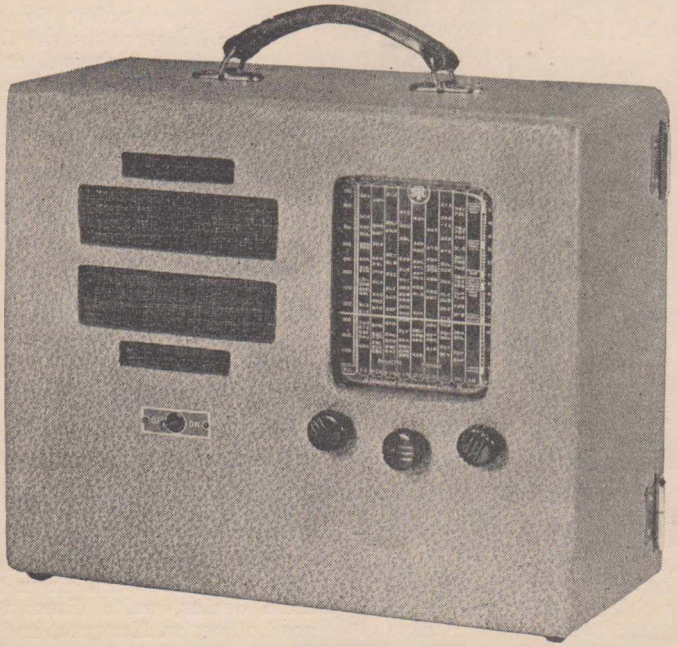
Everybody who has seen this little job has commented on styling, finish and general appearance. And then when they have heard that it is a full-powered five-valve dual-wave chassis with lots of power and range they have remarked "Just the kind of receiver I need."



Right: The latest S.T.C. 5 valve Dual-wave Mantel, housed in a handsome palished cabinet.

The Portable

In its own sphere the portable qualifies for similar applause. Built on rather flat lines, after the shape of a brief case it is much easier to carry than one of the more portly types. Weight has been kept to a minimum, but nothing has been sacrificed, both tone and range being of a high order.



Abave: A dual-wave portable just released by S.T.C. The convenient design of the cabinet allaws far easier carrying.

Short-Wave Reception

A useful feature which is seldom available with portable receivers, is the powerful short-wave reception which is obtainable with the new S.T.C. 550P.

For best results on short-waves an external aerial is desirable, but the design provides for this in a neat way with a short coil of wire with a spring clip which connects on to the top hinge lid.

The bottom hinge lid is used for an earth connection.

The use of the hinges in this way makes a neat job of providing aerial and earth terminals without having unsightly excrescences.

Technical Details

Speaking technically, the new S.T.C. portable (Model 550P) uses five of the latest 1.4 volt valves, with two stages of intermediate frequency amplification.

Specification

The mantel receiver, known as Model 548 uses five valves in all. These are the latest Brimar valves, types 6K8G, 6G8G, 6U7G, 6V6G and 5Y4G. The short-wave band which is covered runs from 13.5 to 43 metres.

Each of these receivers represents the last word in its particular type and we can give them both the strongest possible recommendation.

TRADE PARADE

FAN DISC LOCKING WASHERS NOW AVAILABLE IN SYDNEY.

Supplies of the famous Fan Disc Locking Washers have now arrived in Sydney from the Birmingham manufacturers. This exclusive and patented principle of overlapping teeth provides the most efficient and inexpensive vibration-proof fastening available. The fan-shaped overlapping teeth cannot be flattened out under pressure and the specially tempered and hardened High Carbon Steel, of which they are made, ensures that the edges bite into the surface of the material when the nut is screwed down. Perfect and permanent safety against accidental loosening of the nut or bolt is thus assured.

Some features of the Fan Disc Locking Washer are:—

It is simple and convenient to use, as it need only be placed under the nut and the latter tightened up; is most efficient for smooth working and holding power and can be used over and over again; is manufactured in all standard sizes and for all threads, both right and left hand; is compact and light; is absolutely dependable even when used on rough surfaces and rough nuts; last, but not least, damage to threads is impossible.

Fan Disc Locking Washers are made to fit Standard Whitworth, B.A. and S.A.E. Bolts, Nuts and Round Head Screws, in sizes ranging from 1-8in. to 1¼in.

More information about this most perfect lock washer made, is obtainable from the Australian distributors, Amplion (Asia.) Pty. Ltd., 382 Kent Street, Sydney.

CITY STORE'S ENTRY INTO MANUFACTURING TRADE

Since the outbreak of hostilities on the continent, just over a year ago Levenson's Radio Store have been manufacturing a great deal of morse equipment in their own workshop for the shortage of overseas productions. This Australian industry is now in full swing and Levenson's are proud to announce that pracically every morse unit sold by them is of Australian manufacture and constructed of Australian raw materials.

The quality is at last paralell to the imported line if not better. A complete range is stocked by Levenson's, ready for the Xmas Rush period.

These include complete morse sets in a host of different hook-up such as Key or Buzzer, Key Buzzer and Light, etc.

Keys and Buzzers may be obtained in many different grades from the inexpensive Boy Scout type to the professional P.M.G. model.

A host of articles suitable for Xmas and New Year gifts are available at Levenson's Radio Store. Call in and see their large ranges of stocks at their premises at 226 Pitt Street, Sydney.

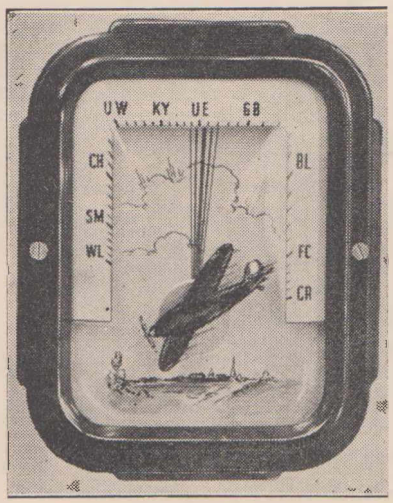
★ ★

SPITFIRE DIAL

Something new and different is the "Spitfire" dial, which has just been released by Arcadian Radio Pty. Ltd.

Having had many years of experience in metal work in the production of radio bases, it is only natural that the new dial is an excellent example of good workmanship and clever design.

As will be seen a "Spitfire" figures on the dial, with a searchlight beam acting as station indicator.



★ ★

FREE — SEND FOR YOURS

Listing more than 600 valve types, together with all relevant technical information, the new Philips valve booklet should prove of great interest and value to all radio enthusiasts.

The booklet, which comprises 95 octavo pages, bound in an attractive 3-colour cover, strikes a new note in valve characteristics, which have usually appeared in chart form. This year Philips have changed the style, and the familiar wall-chart is now displaced by a handsome book.

All the features usually provided on the chart have been retained together with a wealth of information concerning all types of valves and photo cells, including special applications, while one section is devoted to cathode-ray tubes.

In compiling this book Philips have endeavoured to provide technical details of all types of valves from Australian, American and Contintenal sources; and it is doubtful if a more comprehensive reference has ever appeared in the one publication.

A clear index makes the finding of any valve-type technical details an easy matter. As well, ample space has been left between the various types so that the information is legible and easy to read. We noticed in perusing the pages that a characteristic not usually listed (the grid plate capacitance of all valve-types where this figure is important) has been included with the other characteristics.

A further section is devoted to outline drawings, and socket connections, and we doubt if there is any other information that could have been included to make this booklet any more complete.

To sum up, here is a worthwhile publication which should be in the hands of every radio engineer, dealer, service-man and technician.

Ample supplies are available, but early application is advised. If supplies are unavailable from you local radio dealer, write direct to Philips head office, cr. Margaret and Clarence Street, Sydney, enclosing a 2d stamp to cover postage.

Special Laboratory Service for Readers

SOMETHING quite unique in the technical magazine line, is the labatory service which is available to all readers of the "Australian Radio World."

This service is essentially practical, not academic. The bench is equipped with useful testing equipment, consisting of Palec instruments.

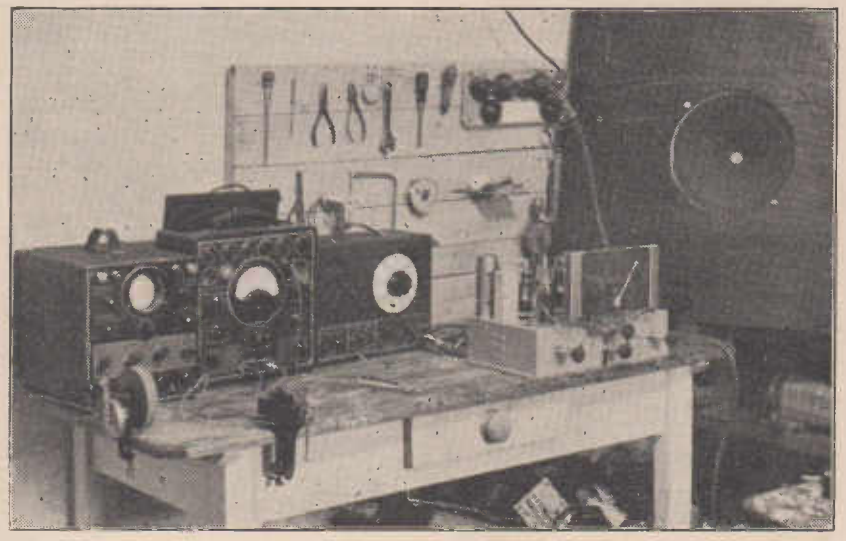
There is the usual valve and circuit tester (VTC), an all-wave oscillator, and the latest addition, a Palec oscilloscope.

With this equipment all minor worries can be speedily dealt with.

The service available to readers is essentially one of help, and not of carrying out workk such as re-wiring, re-building or even aligning.

Any receivers submitted for inspection are examined and a report is issued suggesting what steps should be taken to ensure normal performance.

A nominal fee of 2/6 is charged for this service, which takes about 24 hours. Sets left at our Reservior Street office any day can be picked up the following day. Primarily the service is intended to help builders of sets described in our columns, but this rule is not rigidly enforced and we notice that often enough help is given to straighten out sets built to circuits from overseas and other technical and popular journals, and also factory-built sets which are proving troublesome.



Receivers forwarded from distant listeners are assured of the same attention as those brought into the office personally. Sets will be un-packed and re-packed free of charge, but, of course, no freights will be paid by us.

LEVENSON'S WIRELESS

Wholesale, Retail. **Wholesale, Retail.**

Games, Hobbies, Novelties, and Slot Machine Specialists.

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Everything from A to Z in Radio at Sane Profit Prices.
'Phones: M 2525 and M 2526-7. Goods forwarded C.O.D. Post or Rail. (C.O.D. Mail within N.S.W. only. Not Interstate). We welcome Prepaid Telegrams and Long-Distance 'Phone Calls.

Listen in comfort. Rubber HEADPHONE PADS give a new thrill to listening. Priced 2/6 per pair.

BOOKS FOR ALL

Tricks with Cards, 1/6; Fifty Best Card Tricks, 2/-; 100 More Tricks to Do, 2/-; The Best Tricks, 2/-; Simplified Conjuring, 2/-; New and Easy Magic, 2/-; Paper Magic, 2/-; Humorous Stories and Recitations, 3/6; Tea-Cup Fortune Telling, 3/6; Model Steamers and Motor Boats, 3/11; The Book of Mystery and Magic, 1/6; Dreams and Omens, 1/6; Popular Card Games, 1/6; Fifty Best Conjuring Books, 1/6; 1000 Conundrums, 1/6; The New Model Aeroplane Manual, 6/11. BOOKS — Model Engineer Series 1/6 each: Electric Bell and Alarms; Model Steam Turbines; A Small Electric Light Plant; Model Steamer Building; Simple Mechanical Working Models.

RADIO SNAPS TO CLEAR — Radiokes straight-vision back-panel Dial, 27/6. NOW, 5/-. Radiokes Travelling Spotlight back panel Dial, 19/6. NOW, 4/-.

B.G.E. Table Type Microphone, highly recommended for amateur or professional use. Built-in Transformer and Battery, with volume control incorporated. Just plug into pick-up terminals of any set or amplifier. 39/6.

CRYSTAL SETS AND CRYSTALS Famous All-Station Model. Charts 6d. All Parts 25/-. Built 35/-, in Cabinet 45/-. Phones 12/6. Aerial—Earth 2/6. CRYSTALS A.1. Semi Fixed, 2/6. "Tec" Fixed Crystal 2/6. Liontron 5/6. Lion Micro 5/6. Refills 2/6. Red Diamond 4/6.

New 1940 — 4 Valve Battery Operated Portable Radio. £15/15/- value, £11/10/- cash. £9/19/6 well-known radio mantel model midget. Our price £8/10/- cash.

COSMOCORD CRYSTAL TYPE BRITISH BUILT AND DESIGNED GRAMOPHONE PICK-UP DE LUXE, with volume control built in as illustrated, 59/6.

AMPLION British built Gramo-Radio Pick-up with volume control. Moulded bakelite tone arm. List Price 37/6 Now 32/6. Dealers write for wholesale price.

S.T.C. English Headphones, 4000 ohms, 32/6; Acme 59/9.

Heavy-duty ELECTRIC 240 a.c. GRAMOPHONE MOTORS, complete, 50/-.

De luxe Super Safe English Bakelite Bell Type Lightning Arresters, for in or outdoor use, 6/6.

Cutting Needles 2/-. Play Back Needles 3/6, 4/3 pkt.

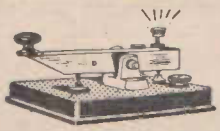
Hand - holding MICROPHONE. Batteryless; plugs into pick-up terminals of any set, 22/6.

RADIO PUBLICATIONS

Learn Morse, 1/-. Radio Dictionary, 1/-. Beginners' Radio Book, 1/-. Everyman's Radio Book, 5/6. The Television and Short-wave Handbook, 5/6; Sixty Tested Wireless Circuits, 6/6; The Book of Practical Television, 8/6; The Wireless Constructor's Encyclopaedia, 7/6.

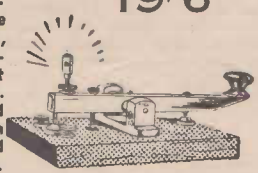
USEFUL XMAS AND NEW YEAR PRESENTS — 5-cell Focussing Torches, 8/6; Extendable 2-3 cell Focussing, dimming and variable, light, nickelled, highest grade Torch, 10/6; Fountain pen-size nickelled Torch, 2/6; Electric Hair Brushes, military type, 12/6; Dressing-table Pattern, 15/-; Fancy2-color Writing Pencil, 5/9; Ball-bearing all-steel Skates, 15/11; Children's all-metal Road Skates, 5/11.

Pilot single drum Dials, 1/6; 17-plate Midget Condensers, 1/9; English .0005 Variable Condensers, 6/9; Blue Spot and other high-grade Cone Speaker units, less than half price, 10/6, 12/- and 15/-.



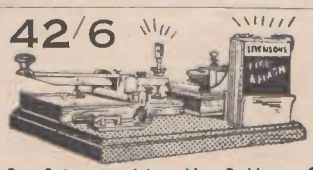
No. 1. — Adjustable Morse Code Key, with long or short tapper arms, splendidly made and finished. Strong reliable heavy plated fittings mounted on bakelite moulded base, 12/6. P.M.G. Type Sounders 35/-.

19/6

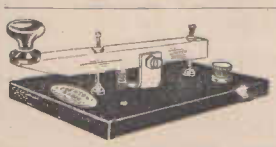


No. 2.—P.M.G. Type adjustable Morse Code Key, strong and reliable; will last a lifetime. Heavy plated fittings on thick solid wooden base. Perfect action.

42/6

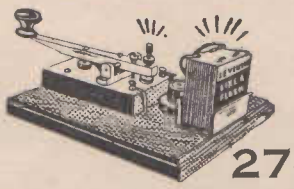


No. 3.—Set comprising No. 2 Morse Code Key P.M.G. Type, with light. Professional De Luxe Buzzer Battery. Throw-over Switch for buzzer or light. Use as required. Mounted on baseboard. Complete.



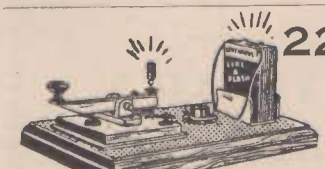
7/11

No. 4.—Junior de luxe Morse Code Key, Chromed fittings on wood base, adjustable all ways.



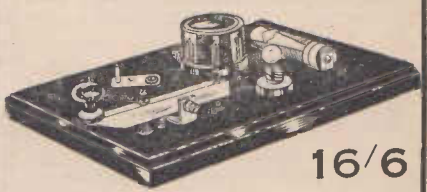
27/6

No. 5.—Outfit comprises the P.M.G. No. 2 Morse Code Key, with adjustable buzzer and battery all mounted on a stained baseboard, ready for immediate operation. Battery included.



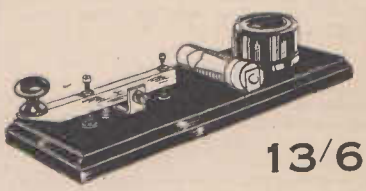
22/6

No. 6.—A real good little outfit which incorporates the No. 1 adjustable Morse Code Key, in moulded bakelite base, with a smart little adjustable buzzer all complete to operate. Junior model, 12/6.



16/6

No. 7.—Junior de luxe Morse Code Set, Key Buzzer and Light with throw-over switch, all mounted on wooden base, complete with Battery.



13/6

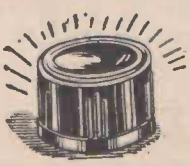
No. 8.—Junior de luxe Morse Code Key and Buzzer on wooden base, complete with Battery.

HIGH GRADE BUZZERS

No. 1. — "Like-a-Flash" adjustable Buzzer. 4/6. Bakelite Case High Pitched.

No. 2 — Bakelite Cased adjustable High Pitched Buzzer. Price, 5/6.

No. 3. — Buzzer, Metal Cased High Pitched adjustable. Price, 4/9.



Not Illustrated, Special High Pitched Adjustable Professional Buzzers—High Tone 15/-.

SPEEDY QUERY SERVICE

Conducted under the personal supervision of A. G. HULL

K.S.H. (Maroubra) has a receiver of well-known make, which he claims to have had to several different service men for attention but without obtaining satisfaction.

A.—We can only suggest that you take the receiver direct to the manufacturers, who maintain a service department, where the mechanics are certain to have had a lot of experience with similar sets. The original circ should be in a position to give you guaranteed results. Glad to know you appreciate the short-cuits should be available to them and they wave section.

* * *

W.J. (Munbinia, W.A.) is a new subscriber who appears to be satisfied with things as they are.

A.—Glad to hear from you. You can rest assured about both matters of editorial policy which you mention. We have not the slightest intention of introducing any new features which are not associated with technical radio and we do have in mind to continue to devote attention to the designs for battery receivers.

* * *

S.R. (Orange) makes some remarks about battery valves and their performance from a point of view of reliability in service.

A.—There doesn't seems to be any doubt about the battery valves giving more trouble than those designed for a.c. use. This is not a matter which can be readily remedied. The actual manufacture of the valves calls for dealing with different problems. With the battery valves it is essential to keep the filament wattage at a minimum, thereby calling for the use of fine filaments. With the a.c. valves it is possible to employ rugged heaters, as current consumption is not a problem. Generally speaking the lower the filament current and voltage the more likelihood of unreliability. The 2-volt series appear to be more reliable than the 1.4 volt range and are to be preferred for ordinary household receivers.

* * *

G.R.W. (Newcastle) wants articles on the use of the oscilloscope.

A.—We readily agree that practically every radio dealer would own and operate an oscilloscope if he knew how, but most people are a little afraid of something they don't know much about. We agree that the time is now ripe for articles on the subject and will see what can be done for the new year. Most dealers have a good multi-meter and an oscillator and the cathode-ray oscilloscope is logically the next step.

* * *

C.A. (Petersham) enquires about sales tax.

A.—Apparently we were badly mis-informed in this respect, and later rulings were quite definite to the effect that the full fifteen per cent is applicable to radio component parts as well as complete receivers. Sorry, but you know these things will happen even in the best regulated families.

* * *

T.R.L. (Parramatta) wants to know where he can get a guide to socket connections.

A.—Practically every valve distributor issues a valve data chart, quite free, and we thought that by now every one of our readers would have one or more of these. They are invaluable to anybody doing radio work. You should be able to get one through the radio dealer who supplies your parts, but if any difficulty just drop a note to any of the distributors. You can get their addresses from their advertisements. The latest release of a valve chart is by Philips and it is a fine booklet. Make a point of getting one and you will find it a great assistance.

Can You Answer This One?

The following letter was received from one of our readers:

"Could you please answer this query for me as it is most remarkable. I have a 1937, 5v., Bandmaster Battery radio and I also have a B.T.H. magnetic pick-up and when I plug in to the pick-up terminals it acts quite nicely, yet when I hook a crystal microphone up it won't work, yet plugged in to the aerial and earth terminal it works splendidly. Why is this?"

ERIC GRAHAM
C/o. Post Office
Macksville

Super-signal (Campsie) is interested in crystal filters for i.f. stages.

A.—Frankly we haven't done much practical experimenting with crystal filter intermediates, apart from using the National H.R.O. which we brought back from the States a few years ago. With this job the crystal filter was only used for the reception of difficult signals in the code and was not used when speech or any form of telephony was being received. It is simple enough to get a high degree of selectivity with two stages of i.f. amplification using ordinary transformers and in most cases further selectivity could not be used to advantage for ordinary short-wave broadcast reception.

* * *

P.B.C. (Brisbane, Q.) has built an a.c. set which fails to give any signals at all, although the wiring has been checked several times.

A.—Sorry, but there is little we can suggest in a case like this except to flip the valve caps and by this means try to localise the fault. If the detector grid cap causes a loud hum in the speaker you will know that the audio end is alright. Recently we inspected a set which had similar symptoms to those mentioned by you and we found that the screen clip on the voltage divider was not making proper contact to the winding, although tight. That will give you some idea of the sort of trouble which can be most elusive if you work without meters.

* * *

L.R.D. (Homebush) wants a circuit for a small amplifier.

A.—We did not know that the valve shortage was so acute, and thought that you would not have any difficulty in getting a 6A3. Under the circumstances we can only suggest that you use the 6V6G beam power valve in the output, with or without inverse feedback. If you use feedback you will use a screen-grid driver, but if no feedback a 6J7G with plate and screen tied to form a triode. A suitable circuit would be the one in the June and July issues, which although designed for a 6L6G will take a 6V6G equally well without ony alteration.

* * *

R.H. (Enfield) suggests a broadcast band DX club.

A.—The present club is an All-wave All-World Club, so you really don't need a new club. All that is required is a little cultivation of the broadcast bond section. This has been tried a couple of times but reports received seem to indicate that not many members are able to receive Europeans on the broadcast band, as you ore doing at present. Why not let us have a full article on the subject, how when and where you are getting these stations and it should arouse the kind of interest which should develop this section of the Club. Glad to know that you are using a World Standard as designed by our Mr. Hull.

* * *

H.L. (Stawell, Vic.) enquires about the tuning condenser capacity necessary for the "Reinartz 3".

A.—The value is not critical and any ordinary tuning condenser with a capacity of between .00035 and .0005 mfds. should be suitable. The condenser which you have on hand, having about 21 plates, should be suitable.

QUERIES *(continued)*

W.A. (Bathurst) wants a valve data chart.

A.—The latest chart to be issued is by Philips and takes the form of a book of about a hundred pages. It is available free (postage 2d) by writing to Philips Lamps, C/r. Margaret and Clarence Streets, Sydney. No radio enthusiast should be without it. As a handy guide to valve socket connections you might prefer the Mullord chart, available from Mullard Co., 371 Kent Street, Sydney. We suggest you get them both.

* * *

W.A. (Paddington) has a young son about to enter the radio industry.

A.—Undoubtedly there is a bright future for radio, but your boy will want to be sure that he makes a big effort to get ahead of the rest. If he goes into a factory and then just plays about he will undoubtedly end up by being fired out at the age of about 18 or 20 without good prospects. But if he studies and pays keen attention to the job he may get a chance to get ahead, into the development laboratory or some other specialised department, and make a good job for himself for life. Undoubtedly his evenings should be spent at the Technical School or studying.

* * *

T.F.K. (Cremorne) is in toruble with noise from an electric motor in a near-by garage.

A.—There is no easy way of handling the trouble from your end. A condenser fitted to the motor would be the simplest and most effective way of dealing with it. A little persuasian should be sufficient to get the man to have a condenser fitted. Cost should be well under ten bob. The use of an outdoor aerial, as high as possible and as far away from the direction of the motor should be a bit of a help and should make it possible for you to get the strong local stations without the noise being too bad.

* * *

Tex (Marrickville) enquires about binders for valve data sheets.

A.—Yes, we understand that you can get a neat binder, with ring clips for these data sheets, from the Amalgamated Wireless Valve Company, 47 York Street. The price is 3/- for the binder only or 5/- for the binder complete with all current data sheets. We are not offering a binder for our issues this year, owing to paper shortages, etc. Some of the old ones are still available, the dates being wrong, of course, and the size the large one.

B.H. (Rockhamptan) wants details af a set or of the necessary coils for tuning up to 1,000 metres.

A.—Your best plan would be to send 6d for the February, 1939 back issue. It contains full details of the construction of a set tuning from 9 to 2,000 metres, with full coil winding data. The coils are also applicable to simpler sets such as one or two valvers.

* * *

S.P.S. (Yass) says he has located an outcrop of silver ore, but as it is not in a workable location he would like to trace the running of the lade.

A.—We have seen plenty of articles about treasure finders and devices for locating metals, but we have not had any practical experience with them. We notice that they are used by the Water Board for tracing pipes and it would seem like a suitable idea for your purpose. As soon as we get a bit of time we will look up one of the American magazines and post it to you for a loan so that you can get an idea of the type of equipment needed.

* * *

N.S.P. (Adelaide, S.A.) wants articles on the construction of test equipment for dealer use.

A.—Although we haven't had so many of these articles recently, there was a time when we covered these items quite fully. We shouldn't have the slightest trouble in going through our back numbers and picking out a set of issues which would give you full instructions for setting up a dandy laboratory full of test equipment. There would be about a dozen issues in all, available at 6d. each. post free.

* * *

W.A.D. (Bankstown) wants ta knaw the correct voltage for energising a Rola G12 speaker.

A.—It won't make any difference whether you work the field into the circuit or use a separate rectifier for it. As the field coil of your speaker is 3,500 ohms you will need to have a drop of about 250 volts across it, meaning a required current of about 70 milliamps. This will give you agout 17 watts of energising, which is ample. You could work the speaker on less, even down to 10 watts, but we suggest 17. If you have a separate power transformer, get one made to order to supply 250 volts at 80 milliamps. No filter choke will be needed but an 8 mfd. (500v.) electrolytic condenser will be needed, connected across the field with due regard to polarity.

* * *

W.W. Cairns, Q.) is in trouble with dial markings.

A.—If you are quite sure that the coils are of "H" type, the gang is a genuine Stromberg-Carlson "H" type and the dial was made by the coil people to suit, there is no reason why you should not obtain perfect dial tracking. Fram your remarks we assume that you have not altered the setting of the oscillator trimmer. Generally speaking this is not necessary but in your case we suggest that you ease it out a turn or two then start all over again with the alignment process, also bringing out the padder adjustment a turn or two. Once you get the spacing right you can easily re-set the needle or re-set the rial on the condenser shaft.

REPLY SERVICE

During the haliday periad there may be some delay in answering reply-by-mail queries. Every effart will be made, however, ta maintain the efficiency of the service as far as possible.

CLASSIFIED ADVERTISEMENTS

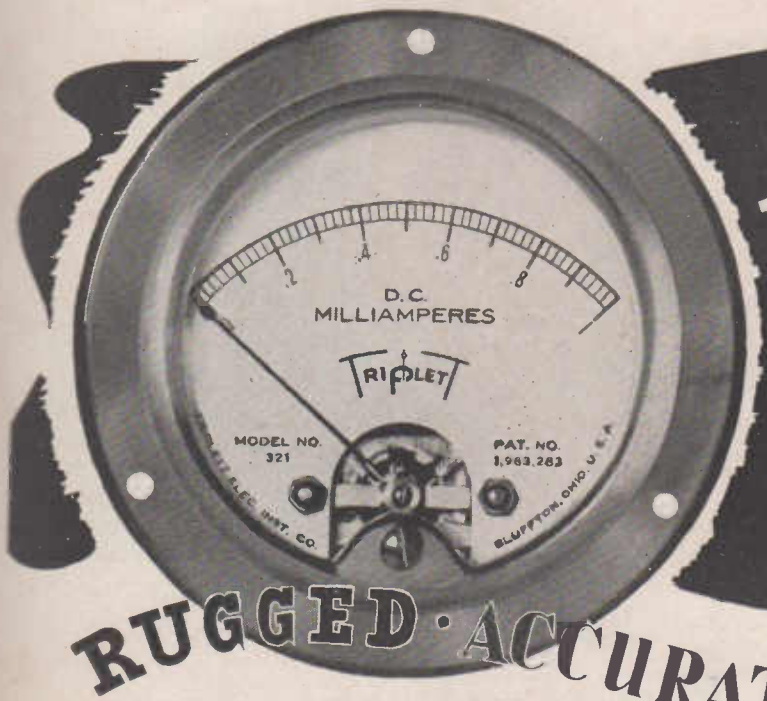
COUNTRYMAN'S SIX *(continued)*

On fitting the older type of padder everything was lovely.

I had to apply a fixed bias of 1½v. to the 2nd I.F. to get stability; connecting A.V.C. caused distortion on strong stations.

Most important of all is the form of Volume Control used. I started off with the conventional type but for some reason beyond me the results were rotten, tone was bad and I could get very little volume before bad distortion appeared. The curing of this had me worried for a long time, I did everything possible to eliminate the distortion without success. On changing over to the type of Volume Control shown everything was quite O.K. You will notice I have used a B217 as driver valve in place of the 30 as I wanted all the gain possible in the audio to counteract a little the high noise level.

As far as tone goes the 25S is a far better value than the 1K6, but I had to use the 1K6 for the same reason, to get more gain. Nothing less than a .003 Condenser across the output of the 19 is any good, any value under that allows harmonic distortion. I think I have now told you everything about the job.



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Precision Built INSTRUMENTS

RUGGED · ACCURATE · DURABLE

Model 321 D.C., actual size

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Triplett instruments have established a new standard of quality in the field. Precision accuracy at low cost, simplicity with extreme ruggedness and bridge type construction are features that evidence the most approved engineering practice.

Magnets of laminated construction have each lamination exactly gauged after hardening, thus assuring accurate printed scale characteristics. This is one reason accuracy of scales, when not hand-drawn, can be as low as 1%.

Triplett's exclusive method of maintaining absolute uniform pole piece accuracy supplants the more expensive milled soft iron type, and is far superior to those formed of saft iran. Cast magnets of cobalt and other alloys are used in some of the larger and mare sensitive Triplett instruments and relays.

D.C. Instruments are the D'Arsonval type with an extra light moving cail and reinforced parts. A.C. instruments are the movable iron repulsion type; are air damped and have light moving parts. Both A.C. and D.C. have selected sapphire jewel bearings and highly polished pivots; white enamelled metal dials and moulded zero adjusters. Accuracy within 2% except rectifier type instruments which carry a 5% guarantee. Instruments supplied with painter stops.

THERMO AMMETER

High Frequency Accuracy 2%

Triplett Thermo Ammeters correspond in size, etc., to corresponding D.C. models. All have moulded cases. Have external couples which withstand 50% overload connected to meter with 2-foot leads. Couples are easily replaced when necessary. Internal couples to order. External couples only, for any model.

The Model 321, 3-inch dial, illustrated above, is available in 5 and 2 inch dials designated Models 521 and 221.

Typical "321" ranges are: 0-1, 0-10, 0-50, 0-100, 0-250, 0-500, 0-1000 Milliamperes.

529-D.C. 539-A.C.

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Right now, as I write this advertisement, I'm amazed at the ever-increasing number of remarkable opportunities that exist for ambitious men. Many, many times this month even, factories, radio stores — all sections of the industry, have been in touch with me concerning good jobs open. I haven't been able to fill all their demands — jobs, good jobs actually exceed the trained men able to fill them.

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Yes! Right away, in the privacy of your own home, and in your own spare time, you can commence your Radio Career. Whether you possess certain Radio knowledge or not, I can turn you into a competent Radio man, capable of filling and holding a good job.

EARN WHILE YOU EARN!

I will show you how to earn good spare time money even while you are training AT HOME for a Radio career. Many A.R.C. Students earn £3 and up to £6 per week at spare time work. This is in addition to their regular employment.

COSTS LITTLE . . .

Think of this — for a few pence per day — actually less than many fellows spend in tobacco, you can prepare yourself for a GOOD PAY POSITION IN RADIO. Take the first step NOW! Send in TO-DAY for my big free book, "Careers in Radio and Television"— it tells you the steps you should take to enter the Radio business — steps YOU YOURSELF can take immediately! Send Coupon NOW!

HERE'S PROOF!

FROM A LAD JUST LEFT SCHOOL.

"I wish to thank you now for having given me such a thorough tuition last year. I was earning 16/- per week, in June I was getting 22/3 per week, in November I got 31/- per week, and this month I have got a rise to £2/3/- per week, so the course has paid for itself."

W.A.B., Ryde

"I am writing to let you know that I, who took your service engineering course, am now in camp wiah the 1st Corps H.Q. Sigs. of the 2nd A.I.F. I am a radio maintenance man and instrument (radio) mechanic. Because of the training I received from you I am able to take my ploce as engineer in a wireless station or mobile van radio station. Because of the training I have had I am able to pass tests set by the instructors where many fail, and it will probably mean two or three stripes for me as N.C.O. in charge of full transmitting equipment."

C.T.S., Melbourne.

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