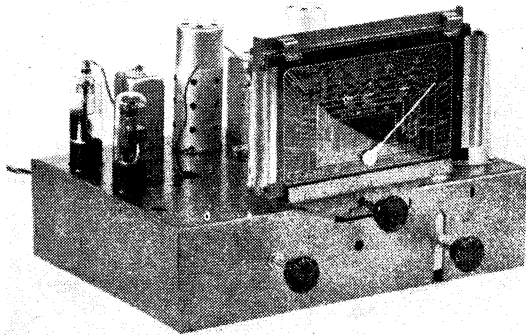


The ECONOMY SIX

battery receiver



A front view of the receiver. Controls are battery switch, tuning dial, wave-change switch, reading from left to right. Note wire for connection to "C" battery.

THIS is a battery receiver which has been designed to give excellent reception on both short waves and the broadcast band, using the new 1.4 volt valves.

We have called it the Economy Six, because it is doubtful if one could build a set of its type to use less battery power and give the same results.

The 1.4 volt valves have been developed for the express purpose of reducing battery drain. Their filaments being of the 1.4 volt type, do not need an accumulator, but can be run from a dry-cell battery. The current consumption of all valves except the output valve is only .05 amps each. The output valve draws 1 amp, so that the total drain on the set in the filament circuit is .35 amps. And this at 1.4 volts.

This is only a little more than three of the standard two volt valves require at two volts, so you can see what we have gained already.

However, the B battery supply for these new valves is, as most people now realise, only 90 volts. At this figure the total drain of the set we have built is about 10 mills on a strong local station, and a couple more on weaker ones. This is a little lower than the average two volt set, which, however, needs 135 volts for

the job, or one 45 volt unit more than the new receiver requires.

The output from the set isn't low, by any means. The output valve we have used has a maximum power delivery of 240 milliwatts. This is a bit lower than the standard two volt output pentode, but no one ever uses such a set at its full output, so that, in effect, we don't lose very much here.

LOWER EFFICIENCY

As we can't get something for nothing, we must admit that these 1.4 volt valves,

WARNING

Under no circumstances must this set be connected directly to a 2-volt accumulator. The valves are made to operate from 1.4 volts, and 2 volts will quickly ruin them. Two-volt accumulators require 2-volt valves, which, however, should not be used in this circuit.

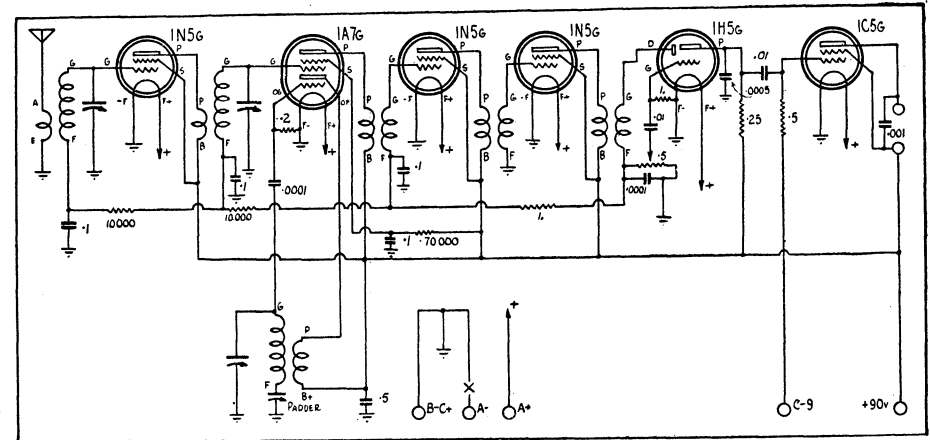
Here is the latest development in battery sets, using the most recent types of valves released in Australia. It has been designed as a bigger type of set which undoubtedly gives you more for the same battery outlay than any other set you could build. Specially meant for the man who wants the best daylight reception consistent with utmost economy. There are no batteries to charge with this set.

stage for stage, are not quite as good as the larger types. The difference, however, is not as much as one would imagine. On the broadcast band it is doubtful whether there is much to be noticed in practice, as again few people ever run their sets at maximum gain.

On short wave, the difference is more marked. We have seen sets in the laboratory, with very carefully made and adjusted coils, which give very good short wave results with a single intermediate stage.

Our experience, however, is that to make a set which we can compare with the "big boys" in the battery world of the past, it is a far better proposition to use two intermediate stages, and avoid the troubles we are liable to meet when trying to get the last ounce from a single stage, as we would probably have to do.

In all our set designs we never lose sight of the fact that the constructor must be given something up his sleeve. When we tell you, therefore, that you will get excellent sensitivity from this set, not only on the broadcast band, but on the short waves, we are only saying something we have found to be the case. We have spent quite a bit of trouble in checking over circuits, and coils, in an endeavor to make sure that the valves



The circuit of the receiver. It is probably the simplest six-valve hook-up you have ever seen.

can be decently operated on short waves. Our experiments have been sufficiently successful for us to release this set, in the belief that it will prove in its own way to be just as reliable and efficient as others which have been so famous in the past.

THE COILS

We would point out at the start that if you build the set with a kit of coils designed for operation with the standard converters, such as the 6A8 or the 1C6, your results will not be as good as those obtained by the use of the specially designed coils not available. The difference lies in the oscillator circuit, and our old friend, oscillator grid current, which is an excellent foot-rule by which to measure the efficiency of the converter. The standard coils will show a tendency to drop out of oscillation at the lower frequency setting of the dial, although they will work quite well with the condensers well out of mesh.

However, this is a point that won't trouble you if you make sure you specify coils made for the 1A7G oscillator. It will work quite well enough with the right coils to give you full speaker reception of all the regular short-wave stations on all the short-wave bands.

On the broadcast wavelengths you will find it an excellent distance-getter. In Sydney, we were playing 3AK, Melbourne, for instance, late at night, with all the punch and clarity one could desire.

THE CIRCUIT

There is one point about these valves which allows for a very simple circuit. That is that the plate and screens of the R-F. amplifiers operate at the same 90 volts. There is no need to provide a special lead to feed the screens, as they all tie back to the same point.

The only exception is the screen of the 1A7G. This requires 45 volts only, and we have obtained this from a dropping resistor and bypass condenser you

will find in the diagram. It would be O.K. to use a tapping to get this voltage, but as it would have to be bypassed anyhow, you would only save a single resistor, and add another lead to the B batteries. The use of the dropping resistor means that as the batteries wear out the voltage will be reduced here in proportion.

We have operated the set quite well on considerably reduced voltage—67½ volts still allows good reception. However, batteries which are down to this mark are due for replacement anyhow, and don't put up with the poorer results just for the sake of keeping the set pegging along for a few weeks more. The difference isn't worth it.

PARTS LIST

- 1 Chassis, 14 x 10 x 3½ inches.
- 1 Dual-wave tuning unit matched for 1A7G valve.
- 3 Special intermediates to suit (460 k.c.)
- 1 Tuning dial to match coils.
- 1 3-gang tuning condenser to suit coils.
- 1 .5 meg. combined volume control and switch.
- 2 1 meg. resistors.
- 1 .5 meg. resistor.
- 1 .25 meg. resistor.
- 1 70,000 ohms resistor.
- 1 10,000 ohms resistor.
- 1 .5 mfd. tubular condenser.
- 4 1 mfd. tubular condensers.
- 2 .01 mfd. mica condensers.
- 1 .0005 mfd. mica condenser.
- 2 .0001 mfd. mica condensers.
- 1 .001 mfd. mica condenser.
- Sockets—6 octal, 2 4-pin.
- Valves—3 1N5G, 1 1H5G, 1 1C5G, 1 1A7G.
- Batteries—2 45-volt Triple Duty types, 1 9-volt C battery, 1 special 1.4-volt A battery.
- 3 Knobs, hook-up wire, solder lugs, etc.

A.V.C.

The circuit uses A.V.C., which controls the first three valves. These are all of the zero-bias types, which means that no bias is needed for them. Again this helps efficiency.

The last I.F. amplifier, in accordance with accepted practice, is not controlled. Often overloading will occur at this valve if it is controlled, because the bias applied will prevent it from adequately handling the considerably amplified signal which appears at its grid. We tried leaving the control off the converter, which we have often advocated, but didn't find any advantage in sensitivity or anything else.

The 1H5G, which is the diode-triode second detector, has only one diode plate. Therefore we are forced to use the simple A.V.C. circuit whether we like it or not. Actually, it works as well as any in levelling out the stations, and that's its main purpose.

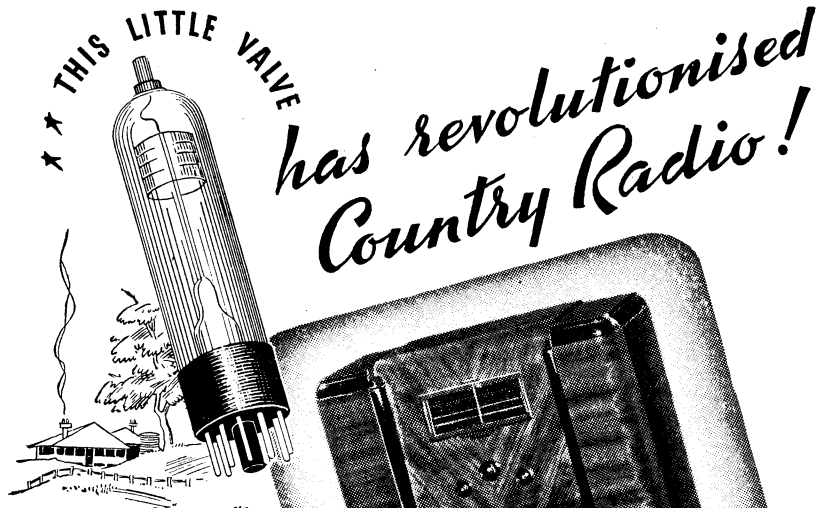
Incidentally, this 1H5G is also a zero bias high-gain triode, so don't think we have made a mistake when you see that there is no bias applied to it. It just seems that everything about this set has conspired to force us to use simple circuits, and in the interests of simplicity we can only register approval on this count, if on no other.

HOOKING UP THE A.V.C.

The special coil assembly is similar to the one used for the Sky-Hound A.C. set, and as far as connections go, it is very convenient. As you will see, there are a couple of terminals on the coil strip which are blank, having no connections made to them from the coils. We have used them to form convenient mounting lugs for some of the components, and they will save you using extra insulated lugs in your efforts to make a good job.

The A.V.C. circuit used employs the series connection, which again we used mainly for convenience.

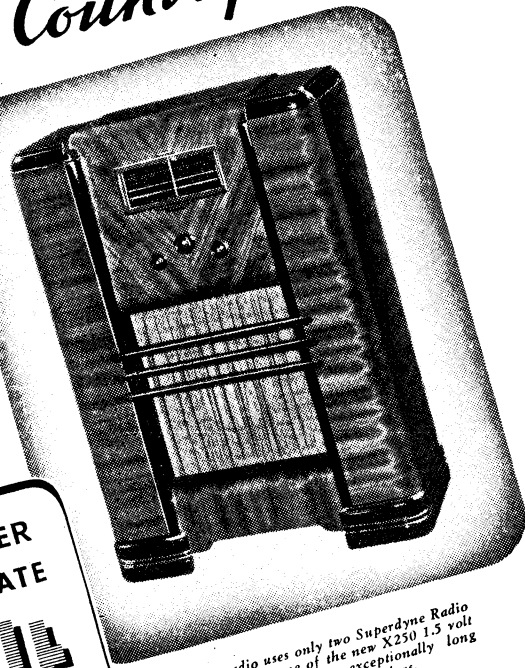
It allows us to bridge the decoupling



The new 1.4 volt valve—newest discovery in the world of radio—has revolutionised country radio set design! Operating on a current consumption equal to that of an ordinary torch bulb, it has enabled Australian manufacturers to produce models for use in country districts that offer almost incredible economy, use fewer "B" batteries, and eliminate re-charging altogether!

Before you buy any new set this year see one of these truly modern receivers in action. . . .

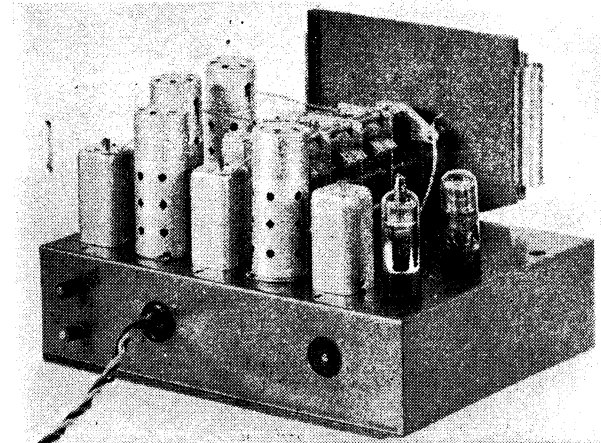
ASK YOUR DEALER
TO DEMONSTRATE
**1.4 Volt
RADIO**



• 1.4 volt radio uses only two Superdyne Radio "B" Batteries and one of the new X250 1.5 volt "A" Batteries that give exceptionally long periods of service with the new valves.

EVER READY
RADIO BATTERIES

• If you have any difficulty in securing complete information on 1.4 volt radio, write to-day to Box 37, Mascot, New South Wales.



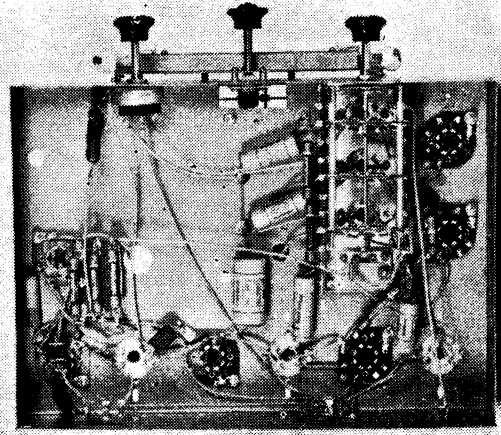
The set from the rear. The battery leads are plugged in their correct socket, the other is for the loud speaker. Note grid leads running over the coils to the connecting lugs of the gang condenser. Also the lead for connection to minus 9 volts of the "C" battery.

restors straight across from one lug to another, and the bypass condensers work connected to the earthing network of the gang condensers. Taking it all round, this coil unit is easier to wire up than any other we have used to date, and you will find the other leads just as convenient. For instance, the oscillator grid condenser will probably bridge straight from the socket to the coil lug without any further leads being connected to it. The R.F. plate and the oscillator plate leads are not more

than about one inch in length. The wiring diagram illustrates the cleanness of connection more than anything else could. As a matter of fact, the whole set took only about one evening to wire up, with the chassis ready cut to fit.

AUDIO SECTION

The audio stage is again quite straightforward, using a simple resistance-coupled circuit. The three resistors,



The wiring is very simple, as shown by this under-chassis photograph. Particularly notice the mounting of the A.V.C. condensers and resistors.

which are mounted on a panel, are the 1 meg. decoupler for the A.V.C. line, the 1 meg. grid leak for the 1H5G, which is earthed at one end, and connected to the grid by a lead through the chassis at the other, and, finally, a 5 meg. grid leak for the output valve.

This valve, the 1C5G, is the bigger of the two pentodes available, and has a 240 milliwatt rating against 100 milliwatts for the smaller job. It requires a bias of 9 volts negative. This is obtained from a 9 volt bias battery, which stands on the top of the chassis. This battery could, of course, be housed in the cabinet with the rest of them, but we have always put it on the chassis where possible, where it is out of the way, and easily connected. We always believe in keeping the leads to the batteries as few as possible—the fewer the leads, the less chance there is of getting them connected the wrong way round.

The positive end of the C battery may be earthed anywhere to the chassis—a solder lug bolted to the frame of the gang condenser is as good a place as any.

VOLUME CONTROL

For convenience sake, we used a combination volume control and filament switch. This saves the necessity for an extra switch, and makes the one control do both jobs. As the volume control is rotated in one direction, the volume is reduced until it is shut off altogether. If the switch is now turned still further round, the switch snaps over, and turns the whole thing off.

If you want to use dial lights, you can use the third hole in the chassis for a switch to cut these off when not required.

If you do use dial lights, make sure they are of the lowest consumption type you can get, because the power they take means so much less life for the A battery. Always turn them off after you have tuned in—make it a strict rule until it becomes habit.

THE BATTERIES

The batteries for this set have been specially developed for the 1.4 volt valves, and there is a cell put up by the Ever Ready Company which will give a long life with them. You should get the best part of 800 hours of life when using a single cell, and on the basis of about three or four hours a day, this is quite a decent period of operation. A single dry cell of the buzzer type is sometimes used, but naturally its life cannot be compared with the bigger job, and it is poor economy to use anything else. Although it is fascinating to hear the set working for quite a few hours off a single 1.5 volt torch battery!

The B batteries may be of the standard type—for economy and long life we suggest the Superdyne type which will be operating well within their capacity. In fact, two of these should just about see the A battery out in hours of running.

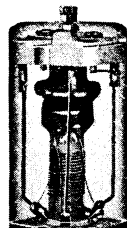
The C battery is just an ordinary light-duty type obtainable everywhere, with a voltage of 9 volts to be had for the asking.

R.C.S. NEW 1939 TROLITUL COILS

SPECIFIED AND RECOMMENDED IN THIS ISSUE

THE SKY HOUND SIX

The R.C.S. Kit for this new set comprises our new 1939 type Trolitul High Q. Coils and Intermediates. The coils which contain necessary B/C and S/W trimmers, together with 3 section wave change switch and padder, are mounted on a rigid steel bracket. The I.F.'s are iron core for better quality, selectivity, and stability under all conditions. **SKY HOUND D/W COIL UNIT £3/3/-** CAT. No. K100. RETAIL PRICE, each 10/6



R.C.S. TROLITUL TUNING COILS

R.C.S. new Trolitul Tuning Coils are highest Q. yet produced. Being wound on and supported by combined Trolitul former and base, they lend themselves to an accuracy and precision hitherto unobtainable, resulting in highest efficiency ever obtained. All coils are suitable for standard type valves.

DUAL WAVE COILS

B/C 1500 to 350 K.C. S/W 16 to 50 metres. Air Core Aerial Coil, 460 K.C. Cat. No. G19. Retail Price, 12/6. Air Core, R.F. Coil, 460 K.C. Cat. No. G30. Retail Price, 12/6. Air Core Oscillator Coil, 460 K.C. Cat. No. G31. Retail Price, 12/6.

BROADCAST COILS

Air Core Aerial Coils, 460 K.C. Cat. No. E282. Retail Price, 3/9 ea. Air Core R.F. Coils, 460 K.C. Cat. No. E283. Retail Price, 3/9 ea. Air Core Oscillator Coils, 460 K.C. Cat. No. E284. Retail Price, 5/9 ea. Iron Core Aerial Coil, 460 K.C. Cat. No. E287. Retail Price, 7/- ea. Iron Core R.F. Coils, 460 K.C. Cat. No. E288. Retail Price, 7/- ea. Iron Core Oscillator Coil, 460 K.C. Cat. No. 280. Retail Price, 7/- ea. Permeability Tuned Aerial Coil, 460 K.C. Cat. No. E279. Retail Price, 7/6 ea. Permeability Tuned R.F. Coil, 460 K.C. Cat. No. E286. Retail Price, 7/6 ea. Permeability Tuned Oscillator Coil, 460 K.C. Cat. No. E281. Retail Price, 7/6 ea.

THE 2 J.U. SUPER SIX

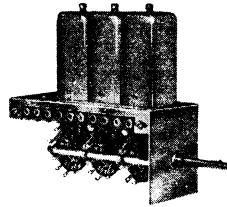
SPECIFY THE NEW R.C.S. MG TYPE MIDGET CONDENSER. They are easy to gang. R.C.S. have designed a new Trolitul Beat Frequency Oscillator Coil to suit this receiver. Highest Q. Coil made. Cat. No. F96. RETAIL PRICE 11/9

LITTLE JIM TUNING COIL

Specially designed for and used in this set. Extremely high gain and selective. "Little Jim's" tuning Coil, Cat. No. K80. RETAIL PRICE, 3/6, Post Paid. "Little Jim's" R.F. Choke, Cat. No. R22. RETAIL PRICE, 9d, Post Paid. "Little Jim's" Filament Transformer, Cat. No. TP3. RETAIL PRICE, 10/6, Post Paid. "Little Jim's" Midget Condenser. Cat. No. CV40. RETAIL PRICE, 5/3.

TROLITUL INTERMEDIATE TRANSFORMERS

The new R.C.S. Trolitul I.F.'s are extremely stable. Due to new method 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, 1st, 460 K.C., sq. can, 3in. x 1 3/4in. Cat. No. IF107. Retail Price, 5/9. Air Core, 2nd, 460 K.C., sq. can, 3in. x 1 3/4in. Cat. No. IF108. Retail Price, 5/9. Iron Core, 1st, 460 K.C. Cat. No. IF109. Retail Price, 10/6. Iron Core, 2nd, 460 K.C., sq. can, 3in. x 1 3/4in. Cat. No. IF110. Retail Price, 10/6.



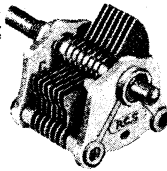
DUAL WAVE UNIT

B/C 1500 to 350 K.C. S/W 16 to 50 Metres. Aerial R.F. and Oscillator 460KC A.C. Cat. No. DW24. Retail Price, 23/3/-.

TROLITUL MIDGET CONDENSERS

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

STAR AND M.C. MIDGETS.		STAR.		M.C.		
Max. Cap. mfd.	Min. Cap. mfd.	Plates.	Cat. No.	Price.	Retail Price.	
10	3	3	CV34	3/-	CV41	6/-
15	3	3	CV35	3/3	CV42	6/6
25	3.5	4	CV36	3/6	CV43	7/-
35	4	5	CV37	3/9	CV44	7/6
50	4	7	CV38	4/3	CV45	8/-
70	5	9	CV39	4/9	CV46	8/6
100	6	14	CV40	5/3	CV47	9/-



Obtainable from your local dealer, or write direct to

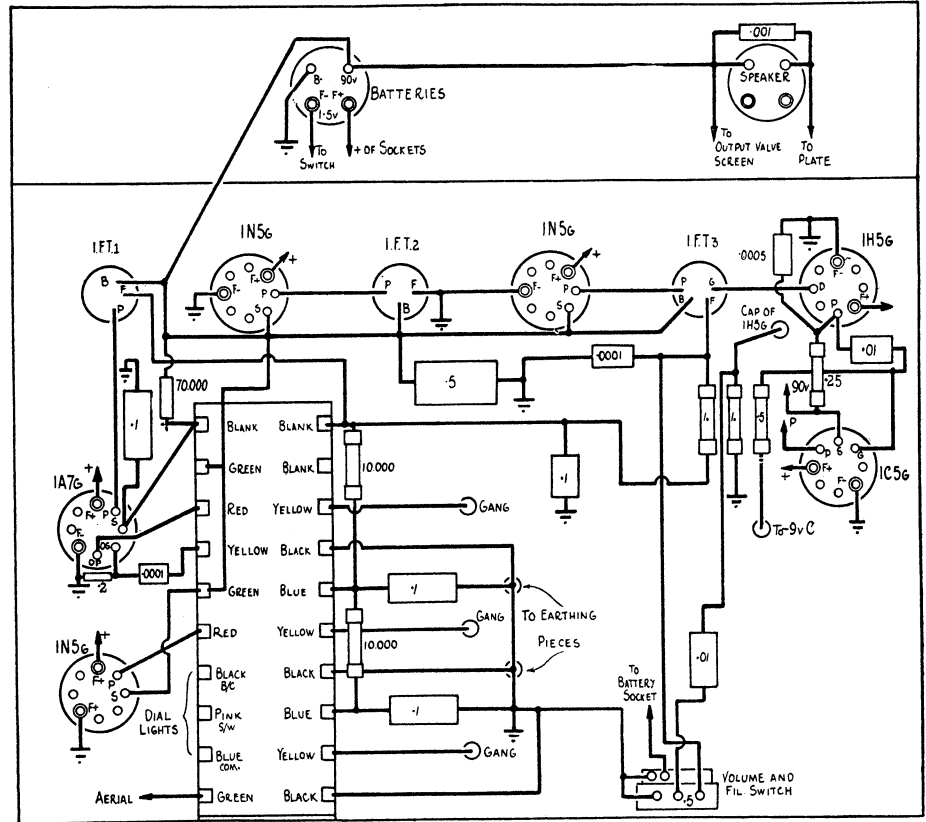
R.C.S. RADIO PTY., LTD.

50 GLEBE STREET, GLEBE. 'Phone, MW2405

POTENTIOMETERS AND RHEOSTATS

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

6 ohm Rheostat	25 amp	Cat. No.	PT10	4/6
10	25 amp	"	PT39	4/6
20	25 amp	"	PT34	4/6
30	25 amp	"	PT16	4/6
400	Potentiometer	30 M/A	PT47	4/6
1000	"	30 M/A	PT19	4/6
2500	"	30 M/A	PT31	4/6
5000	"	30 M/A	PT35	4/6
10000	"	30 M/A	PT53	5/9
15000	"	30 M/A	PT84	6/-
20000	"	15 M/A	PT84	6/-



Here is the wiring diagram, which shows the actual connections for the set.

OPERATION

Putting the set into operation is quite a simple matter. A great help here is using. There are plenty of these, and if you use one, it can assist you materially in lining up.

Having made sure all your connections are correct, connect up the A battery, turn the set on, and in a shaded light, look carefully at the output valve. You should be able to see its filament glowing very dimly. If not, switch off, and see where you have gone wrong. Once having made sure the filaments are alight, naturally, you can't connect the leads already connected to the B battery, and blow the filaments to pieces!

Now hitch up the B batteries (with the speaker plugged in), and tune over the broadcast band. As the coils have been roughly lined at the factory, you are sure to hear something or other. Try to get a station near the bottom end of the dial—say, 2SM, and by ad-

justing the oscillator trimmer for D/C band, steer it until it comes in opposite its dial marking.

Now adjust the other two trimmers until you get this station at its full strength.

Swing your dial to the top end of the band, and find another station here. Don't touch the trimmers on the coil, but, with a small screwdriver, adjust the padding condenser until this station comes opposite its right mark on the dial. This should also be the spot at which it is heard most strongly.

If it isn't, the dial may be out slightly, or you may have it screwed up on the condenser shaft with the condenser plates too far in, or out, of mesh to start with. This is a point which many overlook, but it's worth investigating and experimenting with, if at no point can you get all the stations to hit very closely to their proper markings.

Assuming that all is well, go back to the bottom of the dial, and check on the trimmers once more. Maybe a little touch will be required to peak

them on the nose. For finest adjustment, tune almost to the bottom of the dial, and work either on a faint station or just the noise level of the set, for most volume.

Then, and only then, it is permissible to run over the intermediate trimmers for a very careful check-up. Mark with a pencil line the original position of the screw slot, so that you can come back to it if you require to do so. They will peak very sharply, so be careful over this. Possibly you can bring the gain up quite a bit by the slightest adjustment one way or the other.

But don't start screwing them up all over the place. Once they are all out of line, your only course would be to send them back to the factory for realignment. Not more than about one-eighth of a turn should be needed.

The parts we used in the original, for reference, were—Dial Efcoc, coils R.C.S., resistors I.R.C., condensers T.C.C., speaker Rola, batteries Ever-Ready, gang condenser, Stromberg, valves Brimar.