

WIRELESS WEEKLY

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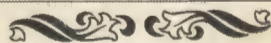
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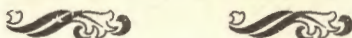
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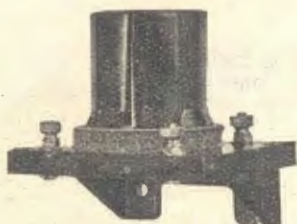
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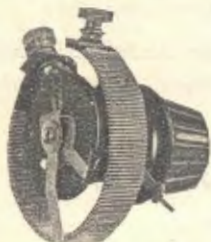


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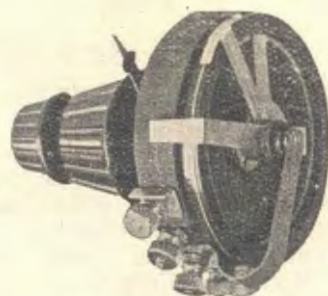
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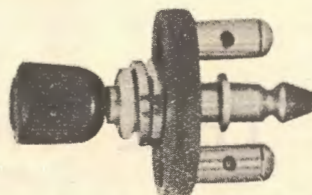


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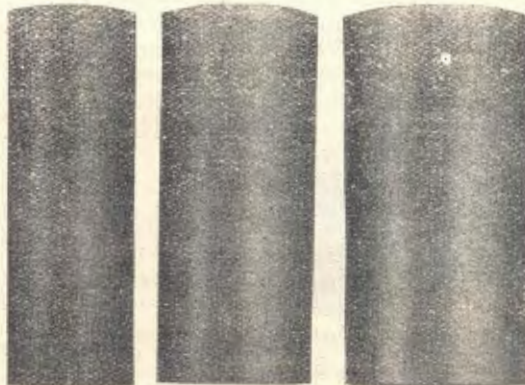


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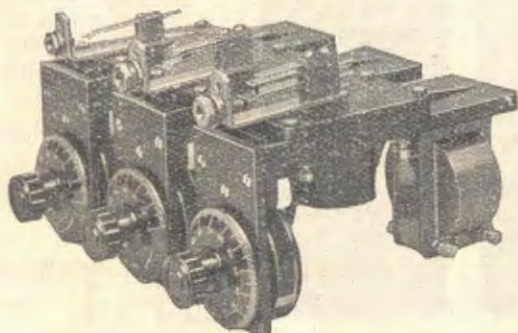
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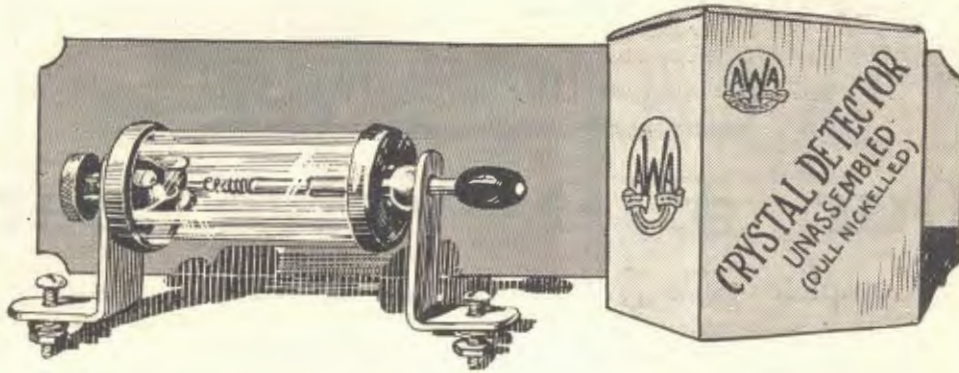
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Official Organ of the New South Wales Division of the Wireless Institute of Australia.

VOL. 4. No. 18.

AUGUST 15th, 1924

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EDITOR:
A. W. WATT

The Editor will be glad to consider Technical and Topical Articles of interest to Australian Experimenters. All Manuscripts and Illustrations are sent at the Author's risk, and although the greatest care will be taken to return unsuitable matter (if accompanied by stamps), the Editor cannot accept responsibility for its safe return. Contributions should be addressed to the Editor, "Wireless Weekly," 33/37 Regent Street, Sydney, N.S.W.

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Except in the case of subscribers, all Technical Questions, or those entailing research work or drawings, must be accompanied by a postal note or stamps to the value of 1/-.

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Advertising Rates may be had on application to the Advertising Manager. Copy must be in the hands of the Editor by the Friday preceding each issue. If copy is not received in time, the previous week's advertisement will be repeated.

All accounts should be made payable to Publicity Press Ltd., 33/37 Regent St., Sydney

Editorial

THE WIRELESS INSTITUTE.

"Wireless Weekly" is now the official organ of the N.S.W. Division of The Wireless Institute of Australia, with which are affiliated the leading Radio Societies and the Australasian Radio Relay League.

Needless to say, we appreciate the confidence which has been reposed in this journal, and in thanking the members of the organizations mentioned above, we want to again assure them that the policy of "Wireless Weekly" is first and foremost "For the Benefit of Experimenters." Any matter which has for its object the advancement of the Experimental movement, or the consolidation of the interests of Experimenters throughout Australia will have our whole-hearted support.

An Anomaly

Last Winter, according to the Radio Editor of the Chicago American, the city of Chicago was visited by a terrific blizzard, which not only seriously hampered—in fact, practically put out of action—the steamer traffic on the Lakes, but also completely isolated the city telegraphically from other points of the United States.

For 48 hours every telegraph line leading out of this big city was unworkable. Had it not been for wireless, Chicago would have been down and out—or at least, so far as outside communication was concerned.

The Civic Authorities, completely up against a situation which was both novel and serious, appealed to the Broadcasting Stations and to the AMATEUR TRANSMITTERS to help them out over this trying period. It is upon record that the amateurs, mainly composed of members of the American Radio Relay League rendered such material and valuable service in maintaining wireless communication with the outside world that they earned the heartfelt thanks of the whole community.

Following upon this, the United States Government is now finalizing arrangements for the establishment of a network of wireless transmitting stations throughout the whole country and it is significant that the American Radio Relay League—which has a membership of over 16,000—has appointed a committee to go into the question of co-operating with the Mili-

tary and the Telegraph Companies.

According to official statements, the Government fully realizes that, in times of national extremity, the amateurs can provide a vital means of linking up the whole of the states of the Union by Wireless, and the intention to take this fact into immediate and serious consideration is shown by the putting into effect of the scheme for perfecting wireless communication.

In America, it seems, the importance of having always prepared, a highly efficient amateur organisation, which can be relied upon in emergencies, is realized, and the fact that the newspapers heartily endorse the elevation of amateurs to such an important position, and that the Government renders every assistance and encouragement to amateurs is very gratifying indeed. Australian Experimenters must indeed be proud to know that their American cousins are so well catered for—and at the same time, it must serve to bring into the full light of day the invidious position of our own Experimenters in their relation to the present Government Regulations.

Where is the far-sighted policy of a Government, which deliberately places crippling restrictions upon the activities of Experimental transmitters, who, if granted reasonable facilities, could, within a few months, perfect a chain of intercommunication stations linking up continuously every State in the Commonwealth? Jealously fearful of any encroachment upon its own notoriously inefficient telegraph and telephone system the Government lays down a definite line of demarcation over which the Experimenter must not step—and which effectually puts the lid upon any attempt at constructive work. Clause 118 of the Wireless Telegraphy Regulations says pompously "The use of licensed experimental stations shall be restricted to investigations, research, or instructional purposes in Wireless telegraphy or telephony." One can imagine such a Clause being lifted straight from the German Wireless Regulations. What scope is there for the amateur transmitters if they must abide by such hidebound, conservative regulations such as this and other clauses contained in this remarkable product of the brains of non-wireless politicians?

Did those who framed these Regulations give one single thought to the untold possibilities of wireless in Australia, or were they simply concerned with seeing that Broadcasting Com-

panies secured their revenue? Did they realise that, in hampering the movements of amateur transmitters, they were deliberately stifling an earnest, enthusiastic body of workers, who, for no monetary gain whatever—in fact, entirely at their own expense—could, if given a little encouragement, quickly establish and perfect a chain of relay stations which, in an emergency could be relied upon to maintain continuous communication?

The object of the present Regulations affecting transmitters seems to be to ensure that their stations shall not enter into competition with Government telegraph services—although the Experimenter is concerned with any telegraphic matter not bound up with the Experimental movement. The Government would be amply protected in this direction by Experimenters themselves—for the reason that the bulk of Experimenters, who are naturally proud of the movement of which they are part and parcel, would not tolerate any one member infringing the rules, written and unwritten, governing Experimenters. This has been demonstrated in the past.

Nobody could object to the Clause prohibiting transmitters from communicating with commercial stations. The interests of both lie widely apart, although, in passing, it is worthy of comment that, just as the amateur made commercial broadcasting possible, so has he demonstrated what can be done in the way of Inter-State wireless communication—a phase which it is almost unnecessary to remark has scarcely received consideration, either by the Government, or by any commercial organisation. A well-known University professor, returning from an expedition into Central Australia, during which he closely studied outback conditions, stated that every back-country homestead should have a wireless telephonic means of communication. While, as was mentioned before, the amateur is not concerned with commercial wireless, there is no doubt that his efforts have paved the way to the exploitation by commercialism in this direction.

To say that nothing but research work must be carried on by experimental transmitters is as ridiculous as it is unnecessary. What else but research work is it when we find a man spending hours and hours trying to push the minimum of power over the maximum distance? Yet the Government, all-wise religiously keeps a close check on the messages passed back and forth by Experimenters, for fear that some-

thing may be said which should really be sent by Government telegraph or cable.

Strictly speaking, if the Government Regulations were rigidly adhered to, then the activities of so valuable a body as the Radio Relay League would be simply stifled altogether. As it is, we have to thank nothing but official ignorance and blindness, for the fact that the Australian Radio Relay League has to date been unable to accomplish the object for which it was formed. Co-operation is very difficult to achieve if the transmitter is to be continually on guard lest he unwittingly give utterance to something which may be a contravention of some utterly senseless regulation.

The further we examine the unsatisfactory position in Australia, the more we realise the urgent necessity of an entire revision of the Regulations governing transmitters. Absolute freedom is not essential nor advisable, but every encouragement should be given them to carry out exhaustive experiments in the direction of providing a chain of intercommunication stations, which at short notice, could be taken over by the Military or the Naval Services and used to advantage.

Does the Defence Dept. realize the incalculable advantage it would be to have a highly efficient, well-drilled body of amateurs, ready, at any time of national danger, to use their stations as unbreakable lines of communication? Or does officialism merely see as far as the end of its nose?

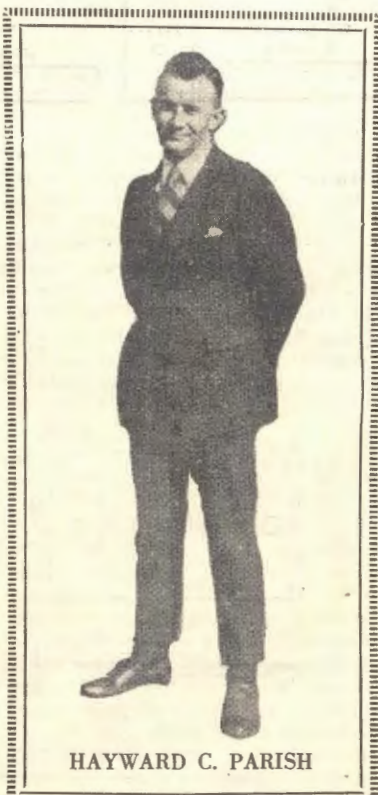
There is much talk of the building of cruisers and of aeroplanes. Here, already fully equipped, Australia has a valuable asset in a body of well trained wireless enthusiasts who from the very outset, short visioned officialdom has trod upon and hampered in every conceivable way.

Encouragement is the only thing necessary; no outlay is required on the part of the Government. Commonsense is seldom attributed to the Government, but in this case it is to be hoped that there will rise from slumber some official who has sufficient vision and understanding to appreciate the fact that the Government are simply harassing and discouraging a movement which, if nursed a little, must develop into a vital and dependable asset to Australia.

THE WENTWORTH RADIO CLUB.

Last Wednesday evening we were the guest of the Wentworth Radio Club, which meets in the operating room of 2YI, Phil Nolan.

Nowhere, more than at this gathering, have we been so impressed with the friendly and helpful spirit existing amongst experimenters. There was an entire absence of any formality, and the genial goodfellowship evidenced between the members present was distinctly refreshing. The social side was entirely up to standard—in fact, we feel impelled to say that if the business of the club is always as ably conducted as the social side, then the club will go a mighty long way. The fact that the finances of the club are in a very healthy condition is a very fair indication of the able management which has been responsible for placing the Wentworth Club up among the leaders, and which, by-the-way, was responsible for affording us one of the most pleasant and cheery evenings we have spent for a very long time.



HAYWARD C. PARISH

MR. HAYWARD C. PARISH.

General Sales Manager, Radio Division, Harrington's Ltd.

Hayward C. Parish will be better known to readers of "Wireless Weekly" as "The Little American," under which name articles on the modern types of American receivers were published.

A native of Pasadena, California, Mr. Parish served during the war as pilot in the American Air Service, where he did much valuable work in the improvement of aeroplane wireless transmission and reception. Later, he was actively concerned with the opening up of those highly efficient Pacific Coast Broadcasting Stations.

Early this year the well-known Gilfillan Bros. Inc. (Los Angeles manufacturers of high-grade wireless apparatus) secured the services of Mr. Parish, and, realising that a vast field was opening up in Australia, sent him to establish the Gilfillan products, which are now incorporated in many types of high-class receivers manufactured in Australia.

In Mr. Parish one finds that very rare person—a technical expert, and a far-seeing, typically progressive business man combined. Secured by Harrington's Ltd. some weeks ago as General Sales Manager, Radio Division, Mr. Parish has already covered a great deal of ground in organising a sales force throughout the whole of Australia for marketing Gilfillan products. Possessed of that indefinable quality of tact, together with courtesy and patience, his personality is such that it is almost unnecessary to predict that Mr. Parish is due to go a long way.



48 Somerset Avenue,
Cumberland, S.A.
July 26th., 1924.

The Editor "Wireless Weekly"

Dear Sir,—

I would be pleased if you would ask all experimenters who have heard my transmissions from June 20th to July 20th to communicate with me. These tests were carried out by the

Continued on page 47

The Construction of Wireless Components

From "The Broadcaster."

FULL DETAILS AND WORKING DIAGRAMS FOR THE CONSTRUCTION OF CRYSTAL DETECTORS, FIXED CONDENSERS AND POTENTIOMETERS.

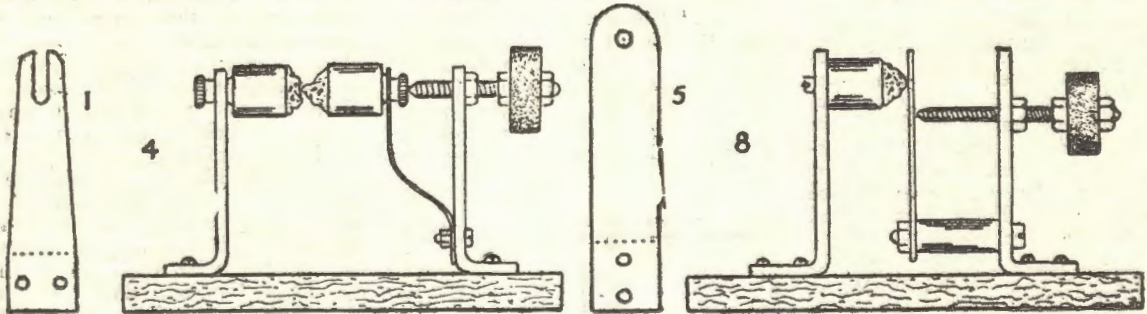
CRYSTAL DETECTORS.

EXPERTS have prophesied the return of the crystal and its ultimate triumph over the valve. There is not the least doubt that for good clear signals without distortion there is nothing to equal a well adjusted crystal as a rectifier. The success of a crystal detector depends upon the robustness of design and simplicity of operation.

ports for the detector. Obtain two crystal cups, remove the screws and fit a small terminal to each as shown in the sectional view, Fig. 3. See that the terminal shanks slide freely in the slots and mount the two crystals in the cups with "Woods' metal." The usual arrangement is a point of copper pyrites or bornite to a flat surface of a piece of zincite.

right hand terminal shank (Fig.4) it should be cut off flush with the terminal nut.

The detector may now be screwed down to any suitable base, or it can be mounted direct on a panel. The crystals should be just separated when the detector screw is not touching the terminal. Either crystal cup can be revolved or moved up or down by slacking back



When once it is set it should not be affected by vibration.

The Perikon detector shown in the photograph and in Figs. 1 to 4 is a very sturdy little instrument, quite capable of fulfilling these requirements; it is easily made and works well without an applied potential.

From a piece of sheet brass $\frac{1}{8}$ in. in thickness cut out two pieces, each $2\frac{1}{2}$ in. by $\frac{1}{2}$ in.

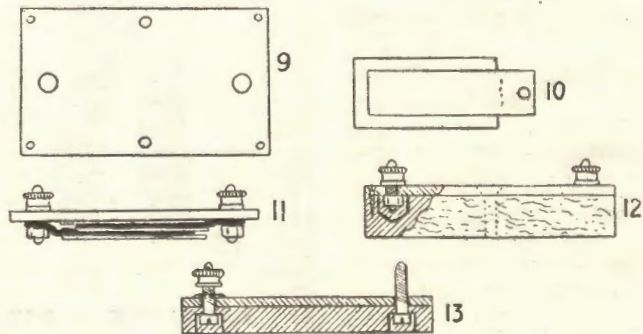
One piece is shaped, drilled and slotted as shown in Fig. 1 and the other as shown in Fig. 2. The holes at the bottom of each are drilled to take small woodscrews, the other holes in Fig. 2 are for small bolts and the large hole at the top should be slightly larger than the diameter of a piece of 2 B.A. screwed rod.

From a sheet of good spring brass cut out piece identical to Fig. 1, and bend it to shape shown in Fig. 4. Bend the other two pieces of brass to right angles at the dotted lines, about $\frac{1}{2}$ in. from the ends, so that they form the two main sup-

Over the large hole in Fig. 2 solder a 2 B.A. nut previously filled with red lead or clay to prevent the solder adhering to the threads. From a length of 2 B.A. screwed rod cut off $1\frac{1}{2}$ in., round off one end with a file and by means of two nuts fit a small wooden or ebonite disc to the other end. Attach the slotted spring brass strip to the support containing the nut and place the detector screw in position. Should there be a projecting end to the

the terminal nut, and the pressure of one crystal against the other (on which depends the success of this type of detector) is controlled by the detector screw. A connection is made from each main support.

A very simple and efficient carborundum detector shown in Fig. 8 consists of a thin steel strip making contact with a point of a piece of carborundum. This type of detector has a reputation for reliability, but the crystals usually re-



quire a potential, and as this must be variable the use of a potentiometer is involved, thus making matters somewhat complicated. The general construction of the detector is similar to the Perikon detector just described.

One of the supports (Fig. 5) carries the crystal cup and the other (Fig. 6) the detector screw and a thin steel plate (Fig. 7) about $\frac{3}{8}$ in. wide, made from a piece of clock spring.

This is attached to the support by a bolt and a short length of brass tube as shown in Fig. 8. To drill the hole in the steel strip first soften it by placing the end in a gas flame until it becomes a dull red, then allow it to cool. To harden it again, it should be heated as before and plunged into cold water. Finally, clean the strip thoroughly with fine sandpaper. A connection is taken from each support, to which small terminals can be fitted if desired.

FIXED CONDENSERS.

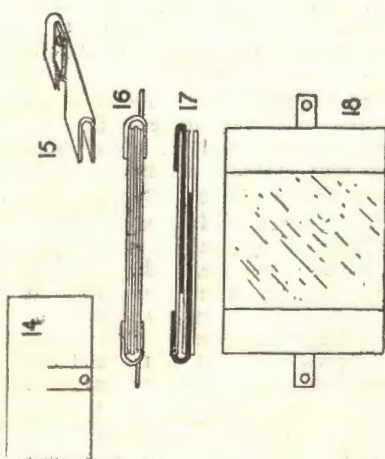
Small fixed condensers are chiefly used as by-pass condensers and grid condensers. The by-pass condenser is employed in a circuit containing an impedance or resistance to assist the passage of high frequency currents. Such a condenser, having a value of 0.001 to 0.003 microfarads (mfd.) would be used as a 'phone condenser connected in shunt to the 'phones or as a by-pass across the two primary terminals of a low frequency intervalve transformer. A very simple way of explaining its use is to say that what the gasbag is to the gas engine the 'phone condenser is to the 'phones. In the case of the gasbag there is always an accumulated supply of energy available for the engine; similarly, the 'phone condenser feeds the 'phones.

The value of a grid condenser is best determined by experiment, and it is more critical in a rectifying circuit than in a circuit used to couple one valve to another. The usual value lies round about 0.002 mfd. For grid condensers, copper foil and mica are used; tin foil and waxed paper usually being confined to by-pass condensers. In practice, however, there is no hard and fast rule concerning the use of either. The copper foil and mica are usually more convenient to handle, the foil being mechanically strong and easily attached to the terminals.

A condenser having a large cap-

acity (2 or 3 mfd.) would necessarily be built up with tin foil and thin waxed paper, otherwise it would be an expensive proposition, and its bulky appearance would not be admired. Such condensers (sometimes called "Mansbridge" condensers) can be purchased very cheaply.

The construction of a small fixed condenser is a fairly simple matter. Cut out a piece of sheet ebonite about $3\frac{1}{2}$ in. by $2\frac{1}{2}$ in. by $\frac{1}{8}$ in. in thickness, and drill eight holes, as shown in Fig. 9. The small hole in each corner should be drilled and countersunk to take small brass



screws. The two largest holes accommodate two terminals, and the other two holes are countersunk to take brass screws about $1\frac{1}{4}$ in. in length. The following table will determine the size and number of foils required:—

Approximate value in mfd.	No. of foils.	Size of foils.
0.001 ..	7 ..	2 in. by 1 in.
0.002 ..	14 ..	2 in. by 1 in.
0.003 ..	21 ..	2 in. by 1 in.
0.0001 ..	2 ..	$\frac{3}{4}$ in. by $\frac{3}{4}$ in.
0.0003 ..	5 ..	$\frac{3}{4}$ in. by $\frac{3}{4}$ in.
0.0005 ..	3 ..	2 in. by 1 in.

In each case the overlap of the mica or waxed paper (which is called the dielectric) should not be less than $\frac{1}{4}$ in., i.e., if the foil is 2 in. by 1 in. then the dielectric should be $2\frac{1}{4}$ in. by $1\frac{1}{4}$ in., thus allowing $\frac{1}{4}$ in. overlap all round the foil.

An example of this is shown in Fig. 10. The hole in the end of the foil is made large enough to slip over the shank of the terminal.

The method of assembling the

condenser is as follows: Remove the nuts and washers from the two terminals, push the terminals through the holes provided in the ebonite and turn the ebonite over, top side downwards, taking care that the terminals do not fall out. Place one piece of mica on the ebonite. Next place one foil in position with the hole engaging one of the terminal shanks. Then cover this with another piece of mica and place another foil in position, this time with the hole engaging the opposite terminal shank. Continue this operation until all the foils have been alternated, then hold the condenser firmly between the thumb and fingers, see that all the foils and pieces of mica are in perfect alignment, and replace the nuts and washers. Fig. 11 illustrates the general arrangement of a two-foil condenser, the thick black lines indicating the foils.

Obtain a piece of good hard dry wood about $\frac{3}{4}$ in. thick by about 4 in. by 3 in., and with a small gouge or chisel carve out two recesses to accommodate the terminal nuts. (See part sectional view, Fig. 12.) At the same time chip away a rectangular recess so that when the condenser is placed in position the ebonite will fit flush to the wooden block.

Fasten the condenser to the block by means of four small screws, and with a fine saw cut away the edges of the block flush with the ebonite. The edges of the condenser should then be sealed with hot paraffin wax. The holes for the holding down screws may now be drilled through the block and the edges of the block should afterwards be smoothed with glasspaper and given about three coats of shellac varnish.

If it is desired to use an ebonite base a different style of terminal will be required and the holes in the base should be recessed from underneath, as shown in Fig. 13.

Another method of constructing a fixed condenser (particularly a grid condenser for use inside a cabinet) is shown in Figs. 14 to 18. Cut out two pieces of soft sheet brass, each $1\frac{1}{2}$ in. by $\frac{3}{8}$ in., and with a pair of tin snips or strong scissors cut two nicks in the position shown in Fig. 14. The hole should be drilled large enough to take a small screw or terminal. Bend each piece to the shape indicated in Fig. 15.

(Continued on Page 20.)

An Interview

With Z. J. Jacobs

Director of the Claravox Radio Co.

"Mr. Jacobs, I wonder if you would mind telling me something about this competition you are running for amateurs who build the best 'Crystal Receiving Sets'? Are you really going to give away two seventy-five guinea Claravox, four-valve radio receiving sets?"

"Yes, we are going to give away two of these machines. One for Class 'A'—amateurs 18 years and under, and one for Class 'B'—amateurs who are over 18 years of age.

"And are there many people interested? Have you had many entrants?"

"Yes, there are quite a number of people interested. I'm really astounded at the enthusiasm displayed for wireless by people of all ages. We already have a large number of entrants, and each day brings more and more people to our offices, anxious to enter the competition."

"Do all those people buy radio parts?"

"Oh, yes; that's one of the rules of the competition. All parts, with the exception of the cabinet, which goes into a competitor's receiving set, must be purchased from us."

"At that rate your stock of parts won't last long."

"Well, to tell the truth, even though we do carry a fairly large stock, some of our lines were sold out. Fortunately, we were able to replenish our stocks almost immediately, as we have shipments arriving nearly every day. We probably have one of the largest and most comprehensive stocks of radio parts in Sydney."

"Now, just what do you mean by that? I thought you only supplied parts for crystal sets."

"Why, no! Please get that impression right out of your mind. Our valve set parts are equally as well stocked and fully as comprehensive as

our crystal parts. This includes loud speakers, head-phones, batteries, bakelite, all Gilfillan radio products; in fact, anything and everything that is required to build any kind of radio receiving set. Our trade in valve parts is very large, indeed."

"Your quarters here are quite attractive, much more attractive than the ordinary shop. And yet I don't suppose your expenses are heavy. Your prices must be fairly keen."

"Fairly keen!!! My word!! They're like a razor edge, and all quality products, too. You see, a shop fronting on almost any street would cost, at the very least, say twenty-five or thirty-five pounds weekly. We save a great portion of that rental, and our clients get the benefit in buying a better grade of part at lower cost."

"These beautiful Claravox sets around me, are they all your own make?"

"Yes; we believe that anything bearing our name should incorporate the very best of material and the highest standard of craftsmanship. It makes no difference whether it's one of our 35-guinea, 65-guinea, or one of our 75-guinea valve sets, they're all the same except in size. Moreover, all of our sets are constructed right here. We save outside factory costs. Naturally this means a saving to our clients. The sets are direct from the manufacturer to the consumer."

"When would it be possible to hear one of your Claravox sets?"

"Any evening from eight to nine o'clock, or even later, we give free radio concerts."

"If I am not getting too personal, Mr. Jacobs, do you sell many of these beautiful sets?"

"Yes; most people like the good things of life, and when they see the Claravox—its beauty of finish, they are immediately impressed. When they

hear the wonderful, clear, lifelike tones, they are at once imbued with a desire to own one."

"Judging from external appearances and from the workmanship of the Claravox sets I see around me, I should say that your prices seem very reasonable."

"Yes, we consider that these sets are very reasonably priced; moreover, even though a large number of our machines are sold for cash, a good percentage are acquired on our deferred payment plan. This plan gets away from financial worry—a big outlay at the start—and as our terms are very liberal it permits of our clients having a wireless set of excellent quality installed in their homes at a very moderate initial outlay and small weekly payments. Of course, this courtesy is only extended to people of responsibility."

"Did I understand you to say that you installed the Claravox in your clients' homes?"

"Oh, yes; in the city and suburbs. We instal the machine in the home and instruct the buyer how to use it—the Claravox is very simple to operate. This installation is all part of our service; we do not charge for it."

"By-the-way, some time ago I mentioned your very attractive quarters. Do you have any difficulty in getting the public to come up here?"

"Oh, my, no! You see, we are very centrally situated. We are only one door from Park Street, in Adams Chambers, 195 Elizabeth Street, facing Hyde Park. There's an automatic lift for the convenience of the public and a splendid locality for the reception of radio messages. The public seems to be rather attracted by the exclusive atmosphere of our offices, and they are always assured of a cordial reception."

ROMANCE

Romance did not pass away with the Bushrangers and the Stage Coach. No, Romance is with us — so the world still smiles. Could anything be more romantic than the fact that you can sit in your own drawing-room and hear the great Artistes of Australia performing hundreds of miles away. We hardly think so. Get a COL-MO Wireless Receiving Set now—it is the Gateway to Romance.

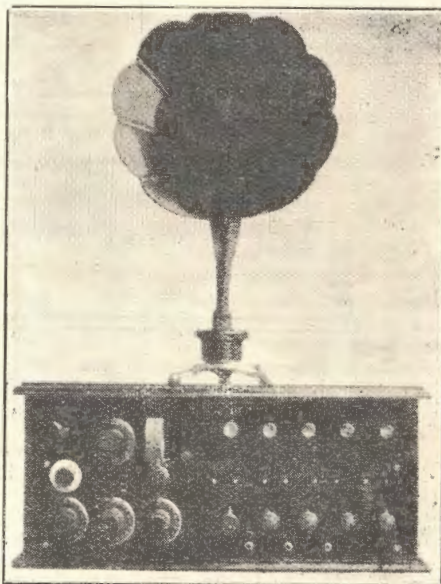
COL-MO RADIO RECEIVER

Here is the ideal Radio Receiver for country residents.

The COL-MO Radio Receiver as illustrated, complete with five valves and Amplion Loud Speaker cost only £65.

The COL-MO Radio Receiver similar to above, but having only three valves and complete with Amplion Loud Speaker, cost £40

Both the above sets are capable of tuning in to all Australian Stations. Country and Interstate Orders receive prompt and careful attention.



The COL-MO Long Distance Receiver.

For VOLUME without distortion

If your problem is one of getting greater VOLUME and clearer tones, your present set may be capable of giving you what you want. The solution of your problem may be in the 'PHONES. Due to a critical balancing of magnetic values, the achievement of radio engineers who have SPECIALISED on the subject of acoustics, the COL-MO Phones insure extreme sensitiveness, maximum VOLUME and the utmost in tone purity.

MELLO PHONES, 4000 ohms, complete 25/-
 COL-MO PHONE, 4000 ohms, specially recommended . . . 32/6

VARIO COUPLERS

Capable of tuning in from 150 to 1500 metres 30/-

MARCO SUPPLIES.

A large shipment of Marco goods has just arrived.

COLVILLE - MOORE

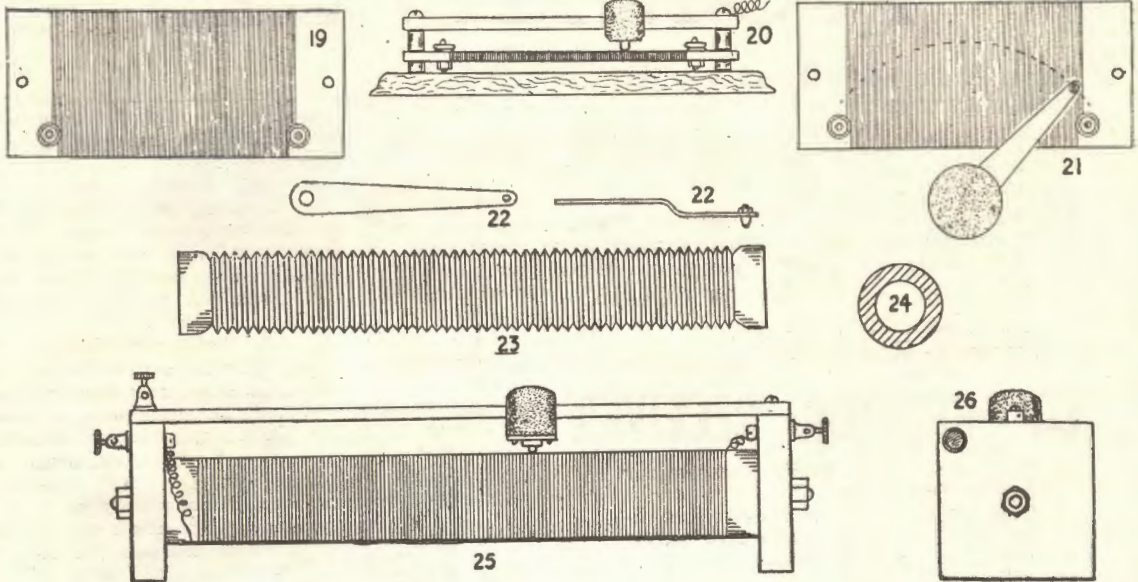
WIRELESS SUPPLIES LIMITED

10 ROWE STREET (HOTEL AUSTRALIA) SYDNEY

(Continued from Page 17.)
The foils should be cut long enough to allow about $\frac{1}{4}$ in. to overlap at one end of the mica, as shown in Fig. 17, where the thick

ebonite about 7 in. long by 2 in. wide, drill a hole at each end to take a fairly long wood-screw and attach two terminals in the position shown in Fig. 19. Wind a few

made from any metal, ebonite, or fibre tubing, or they can be built up from ordinary spacer washers. The terminal nuts should just clear the baseboard, the length of the



black line represents the foils.
Three foils will be required for a good all round grid condenser, each $1\frac{1}{2}$ in. by 1 in., and the five pieces of mica should be about $1\frac{1}{4}$ in. long and 1 in. wide. When assembled attach one brass clip to each end and squeeze them carefully in the vice until they are tight enough to make good contact with the projecting ends of the foil. (See Fig. 16.) Fig. 18 shows a top view of the completed condenser. Connections are made from the projecting lugs on the brass clips.

POTENTIOMETERS.

Potentiometers, or variable resistances, are used as a means of controlling the grid potential in a valve circuit or for adjusting certain types of crystal detectors to the best point of rectification. For general purposes the resistance should be approximately 400 ohms. If No. 36 "Eureka" resistance wire is used, .25 yards will equal about 370 ohms, and this amount is usually sufficient. A simple and efficient instrument is shown in Fig. 20.

Obtain a piece of $\frac{1}{4}$ in. sheet

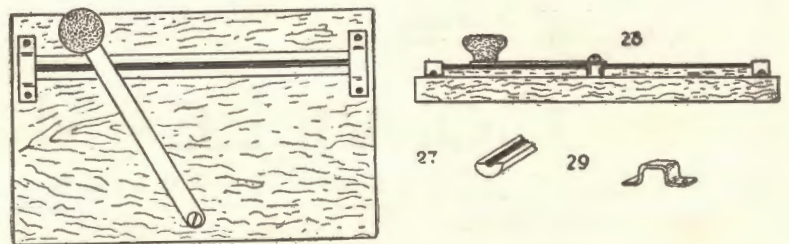
turns of the wire under one of the terminals, clamp it tightly in position and commence the winding. The turns of wire should be as near as possible to each other without touching, and if desired small nicks can be cut along each edge of the ebonite by means of a fret-saw. The other end of the winding is attached to the other terminal and the whole of the winding should be given at least two coats of thick shellac varnish.

Obtain a small inductance slider and rod and drill a hole in each end of the rod to correspond with the size and distance of the holes in the ebonite. The distance pieces between the baseboard and ebonite and the ebonite and rod can be

upper distance piece being determined by the size of the slider.

The general arrangement of the potentiometer is shown in the side view, Fig. 20. The baseboard should be slightly larger than the ebonite and not less than $\frac{1}{4}$ in. in thickness. If desired, small bolts can be used in place of wood screws. Electrical connections are made from one end of the rod and from the terminals. The shellac should be allowed to dry hard before attempting to use the instrument. The path traced by the slider contact should not, of course, be varnished.

An alternative method of arranging the sliding contact is shown in Fig. 21, where a switch arm and



knob are employed instead of slider and rod. Fig. 22 indicates the shape of the switch arm, which is made of spring brass and fitted with a small contact stud previously rounded off with a file. A piece of single flex soldered to the switch arm may be connected to a third terminal or taken direct to any desired position.

The potentiometer shown in Fig. 25 will no doubt appeal to those who are fortunate enough to possess a screw-cutting lathe, and who take a pride in the appearance of their instruments. Besides having a very commercial appearance this type of potentiometer is extremely efficient, and if the right tools are available its construction is a very simple matter.

A fine thread is cut along a piece of ebonite tubing, which should be about 9in. long and about 1in. in diameter. (See Fig. 23 and 24.) The wire is carefully wound in the thread, leaving about 4 in. at each end for connecting up purposes. Two end supports are cut from $\frac{3}{4}$ or $\frac{1}{2}$ in. sheet ebonite each about 2 in. by 2 in., according to the size of tube used. A small terminal is fitted in one corner of each, to which is connected the ends of the winding as shown in Fig. 25.

A length of screwed rod and two nuts are all that is necessary to mount the coil, the general arrangement being clearly indicated in the illustration. The addition of a slider and rod now completes the instrument, one end of the rod being attached by a screw and the other end by a third terminal from which a connection is made. Fig. 26 shows an end view of the potentiometer, which is the right-hand end of Fig. 25.

A GRAPHITE POTENTIOMETER.

The resistance element employed in a graphite potentiometer is an ordinary "H" lead pencil prepared in the following manner: The pencil is soaked in boiling water until the gum dissolves and permits one half of the wooden casing to be removed, leaving the lead firmly imbedded in the other half. This should be done with a very thin knife. If the lead is broken it is useless and another pencil should be prepared.

The half of the pencil containing the lead is placed on a suitable base-board and secured, lead uppermost, with two metal clips. (Fig. 29) A small wad of tin-foil is placed between the underside of each clip and the lead. When fastening down the clips great care should be taken not to crack the lead. The edges of the spring brass arm should be smoothed off so that it will not cut into the lead, and it should be set at a suitable radius to permit a contact with any part of the lead. A small knob is provided at one end, the other end being attached to the base by means of a wood screw and spacer washer. (See Figs. 27 and 28.) Connections are taken from the clips and switch arm. The graphite has a negligible inductance, and in some cases this is an advantage over the wire-wound element.

Graphite potentiometers are recommended by many firms, and the instrument described above will give very efficient results and will compare favourably with any such instrument on the market.

SOUTH AUSTRALIAN NOTES.

From Our Special Correspondent.

ALTHOUGH broadcasting has not yet begun in Adelaide, the dealers are having a busy time, and there is a large demand for complete sets and for component parts.

One firm, Messrs. Paroso Ltd., are equipping a large factory for the manufacture of radio sets and instruments, and they state that when their factory begins operations they will be able to supply radio instruments at a much lower price than the imported articles.

SOMETHING NEW.

A new circuit invented by Mr. Harry Kauper, using two valves and a crystal, is causing a great stir among experimenters here, and a competition has been arranged by the Adelaide Radio Company and a prize offered for the best set using this circuit. The circuit has already been tried out by a number of experimenters, and the results obtained are astonishing, 2FC and 2BL being brought in on the loud speaker without using any aerial whatever.

Mr. J. Ingoldby, of McLaren Vale, reports having heard KGO on a Federal five valve set on Sunday, July 6th. He heard music, followed by the announcement, "Pacific Coast Station [static intervened], Hotel St. Francis, San Francisco."

GOOD RESULTS.

Mr. Martin Cash, of Kalka Station, West Coast, has been doing good work. Although 400 miles west of Adelaide, he has had Farmer's and Broadcasters Ltd. on a two valve set, having added two more stages of AF. He is able to get 2FC on the loud speaker.

Mr. Cash has heard quite a number of interstate amateurs, including 4AA (N.Z.), 3BD, 3RY, 3GR, 2VI, and the South Australian transmitters.

EXPERIMENTERS' VIEWS.

Experimental transmitters have been keeping rather quiet here during the last couple of weeks, and those who have purchased broadcasting receiving licenses have had very little to listen to.

The new regulations, so far as broadcasting is concerned, are looked on very favourably, but the experimental part of it is not at all likely to suit the experimenter, as many genuine ex-

(Continued on Page 27, Col. 3.)

VALUES OF VARIABLE CONDENSERS.

The following guide will be handy to keep for reference.

Approx. Value in Microfarads.	Fixed Plates.	Moving Plates.	Total number of Plates.
.0015	43	42	85
.001	29	28	57
.00075	22	21	43
.0005	15	14	29
.0003	10	9	19
.0002	7	6	13
.0001	4	3	7

Commonsense Talks

THE CRYSTAL SET

By F. Basil Cooke, F.R.A.S.

IT was the intention of the writer this week to consider the neutrodyne, but owing to numerous requests it has been decided at the eleventh hour to say a few words with relation to the crystal set.

First, one naturally hears of crystal and valve sets, and wonders what is the difference between them. In order to explain this, let us very briefly consider what brings the music and speech to our aerial.

We have all seen a still pond of water, and dropped a stone in it and seen the waves caused. The stone upsets the stillness of the water at the point where it was dropped in, and this disturbance travels outwards in ever widening circles in the form of waves. If now there was a tiny boat in the pond, when the waves came up to the boat it would detect these waves by rocking up and down.

Leaving this for a moment, let us consider why the day is bright and the night dark. We all know the day is bright because the sun is shining. What, now, brings the light from the sun to us? There must be something, and this something we call the ether. Scientists have discovered that light travels from the source to the eye in waves of ether. The bright body causes the ether to vibrate, and the waves travel outward just as the waves travelled out on the pond, only in the case of light the waves are very small and travel at the rate of seven to eight times round the world in one second.

If two waves are being sent out, and one wave is a little longer than the other, then we say it causes the sensation of a different color to the first one. The only difference between different colors is the difference in their wavelengths. The wavelengths of the different colors is extremely small, being in the region of only a few hundred thousandths of an inch.

If the wavelength of a wave was still much smaller, we would have X-rays. If, however, these ether waves were comparatively very large, being measured in many feet, then we have wireless waves, and the only difference between wireless waves and light and X-rays is in their wavelength.

Each different class of wave needs a different method of detection. In the case of X-rays we use a chemical

means such as a photographic plate. For light we use our eyes. For wireless waves we use our ears. In this latter case, however, before we can hear these waves, which are really electrical in character, we have to transform them from electrical or ether waves into an electric current of such a nature that it will operate a telephone receiver or loud speaker, as the case might be.

Just as in light we have different colors, so with wireless waves we have each different wavelength performing differently to the others under certain circumstances.

Suppose, in the case of light, we look through a piece of red glass at a white light; then the red glass will only allow those waves whose wavelength corresponds to the color red to pass through, excluding all others.

In wireless, instead of the glass we use a coil of wire and that mysterious thing called a condenser, and by arranging these two components we can allow any particular wavelength to pass through, excluding all others. In this way, if several sending stations are sending out together, we can select the one we desire and eliminate the others. This process is called "Tuning." After selecting one particular wave, we have still to turn it into the required electric current which is going to work our telephone receiver.

Many years ago it was discovered that certain mineral crystals such as lead sulphide (galena), iron pyrites, molybdenite, etc., had the property of allowing an electric current to readily pass through them in one direction, but if the current were reversed the crystal would offer very great resistance. This, then, can be used for converting an alternating current into an impulsive direct current.

The telephone receiver will readily respond to impulsive direct currents, but will not respond to alternating currents if the alternations are beyond a certain number per second (called the frequency).

The wireless wave is an alternating current of extremely great frequency. If, now, we interpose a crystal and pair of telephone receivers, we find the following: The crystal rectifies the rapidly alternating current in the

aerial, converting it into impulsive direct current, which operates the telephone receivers, which in their turn enable the human ear to hear the message.

We now have all the elements necessary. The aerial which catches the passing wave conducting it to a coil of wire, which can be so adjusted as to only allow the desired wave to pass through. This selected wave passes into the crystal, where it is rectified, and thence to the telephone receivers, which in their turn affect the human ear. Hence the crystal receiving set.

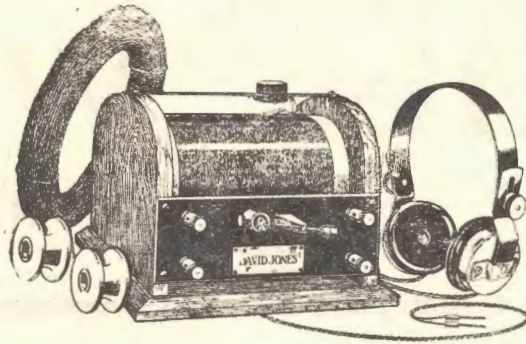
There is a good deal of controversy as to the correct design for a crystal set. The preponderance of experience has shown us that simplicity of design with minimum controls serves best. The number of turns of wire, the arrangement of the slider which selects the correct number of turns for tuning, the crystal, and crystal detector, and last, but by no means least, the phones used. All have to be carefully thought out.

There seems to be some dispute as to whether the loose coupler or the single coil single slider set is the more efficient. Actually there is very little difference between the relative efficiency of the two, providing both have been correctly designed. The loose coupler is much more difficult to operate and needs a variable condenser for efficient operation. In this way it becomes much more costly, in addition to which a correctly designed loose coupler has never yet made its appearance. It has one virtue in that it is more selective than the single slider type, but the extra cost and extra difficulty in tuning, coupled with the difficulty of correct design, throws the preponderance of favor for the single slider variety.

Next week it is proposed to simply explain the action of the valve, and thus see the difference between the valve and crystal receiving sets.

QUESTIONS AND ANSWERS.

(Gadzooks, Melbourne). It would be possible but would give very little volume. What we recommend for that purpose is the S.T. 100 receiver described in "Wireless Weekly" March 7th.



David Jones' announce

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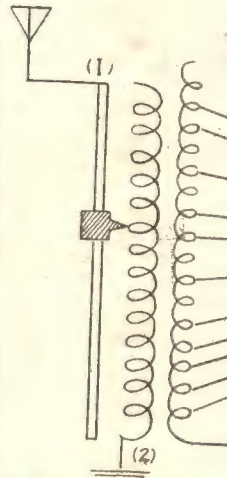
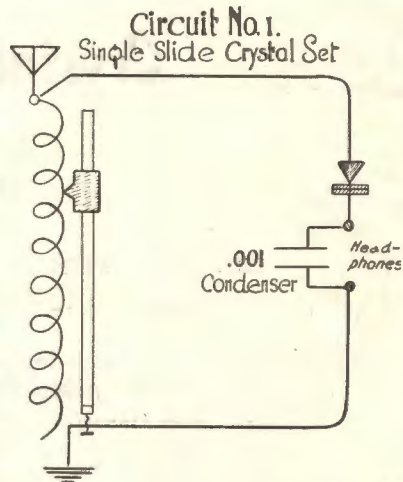
SINGLE SLIDE CRYSTAL SET

150 to 1200 Meters

1 Impregnated C.B. Tube	0	0	6
2 Maple Ends	0	2	0
4ozs. 24 Enamel Wire	0	1	1
1 N.P. Slider and Bar	0	2	6
2 N.P. Terminals, Aerial and Earth	0	0	8
1 N.P. Detector Unit	0	3	3
1 Guaranteed Crystal	0	1	0
2 Extra Phone Terminals	0	0	8
1 piece Ebonite	0	1	6
1 Phone Condenser	0	1	6
Aerial Equipment	0	7	0
			<hr/>
			£1 1 8

DOUBLE SLIDE CRYSTAL SET

Similar parts as Single Slide Set	1	2	2
Additional Part: 1 N.P. Slider	0	2	6
			<hr/>
			£1 4 8



RADIO HEAD SETS.

Mel. Single Hand Type	0	18	6
Mello 4000 ohms	1	5	0
Picco 4000 ohms.	1	5	0
Frost 2000 ohms	1	12	6
Trimm's Dependable	1	12	6
Siemens' 4000 ohms	1	12	6
New System's 4000 ohms	1	15	0
Frost 3000 ohms	1	17	6
Baldwin Single Unit	1	17	6
Radiola 4000 ohms	1	6	0
Brandes' Matched Tone	2	0	0
Dictograph, 3000 ohms	2	6	0
Western Electric 4000 ohm	2	0	0
Sterling 4000 ohms	2	0	0
Trimm's Professional	2	5	0
Western Electric 8000 ohms	2	5	0
Nutmeg 3000 ohms	2	10	0
Baldwin, with Mica Diaphragm	4	0	0
Brown's 4000 ohms	5	5	0
Brown's 8000 ohms, adjustable dia- phragm	5	15	0

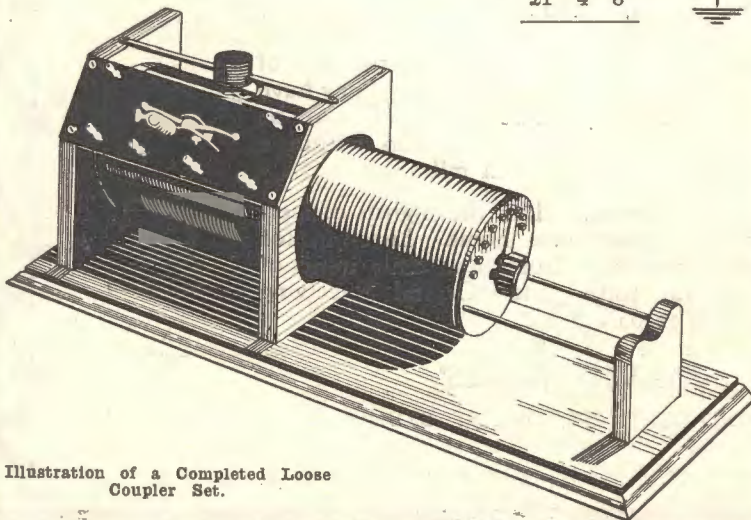


Illustration of a Completed Loose Coupler Set.

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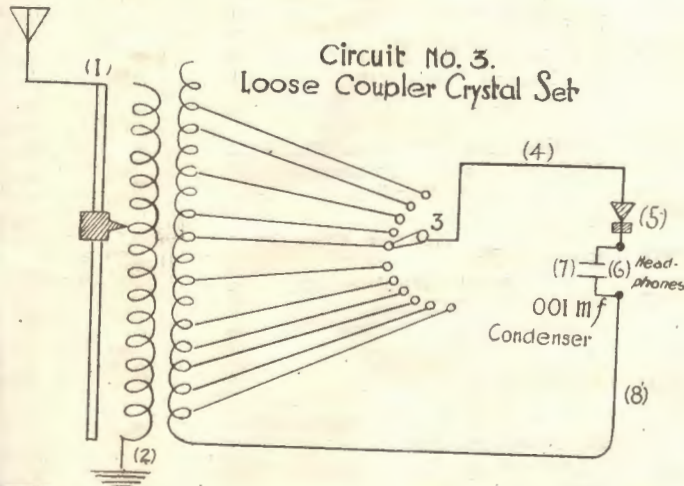
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LOOSE COUPLER CRYSTAL SET

150 to 1200 Meters



1 pair Cardboard Tubes	0	1	0
1 Set Maple Ends	0	2	6
1 Maple Base Board	0	4	0
8ozs. 24 Enamel Wire	0	2	1
1 N.P. Slider and Bar	0	2	6
10 N.P. Contact Studs	0	1	1
2 N.P. Switch Stops	0	0	4
1 N.P. Inductance Switch	0	2	0
1 piece Ebonite	0	1	6
1 N.P. Detector Unit	0	3	3
1 Guaranteed Crystal	0	1	0
1 each Aerial and Earth Terminals..	0	0	8
2 Extra Phone Terminals	0	0	8
1 Phone Condenser	0	1	6
2 Secondary Rods	0	1	6
1 Slider Support	0	0	4
1 yard Flexible	0	0	3
Aerial Equipment	0	7	5

£1 13 7

SETS.	0	18	6
...	1	5	0
...	1	5	0
...	1	12	6
...	1	12	6
...	1	12	6
...	1	15	0
...	1	17	6
...	1	17	6
...	1	6	0
...	2	0	0
...	2	6	0
...	2	0	0
...	2	1	0
...	2	5	0
...	2	5	0
...	2	10	0
...	4	0	0
...	5	5	0
...	5	15	0

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 3AF—A. F. Bent, 14 Coronation St., Geelong W., 198.
 3AG—A. F. Gurr, 224 McKillop St., Geelong East, 154.
 3AJ—E. Salamy, Timor st., Warrnambool, 180.
 3AP—R. D. Morris, 61 Bealiba Rd., Caulfield, 225.
 3AM—G. A. Dohrmann, 2 Hope-toun Av., Canterbury, 224.
 3AU—A. A. Milligan, 117 Autumn St., Geelong W., 168.
 3AY—W. W. Jenvey, 12 Lord St., E. Caulfield, 210.
 3BC—Brighton Sec. W.I.A., (R. P. Whalley), Wilson Hall, 200.
 3BD—E. H. Cox, 5 Gibson St., Elsternwick, 236.
 3BG—L. Osborne, Terang, 250.
 3BH—C. R. Whitelaw, Mooroolbark, 226.
 3BK—W. H. Cumming, 57 Kooyong Rd., Armadale, 171.
 3BL—J. C. Fitchett, Salisbury St., Balwyn, 201.
 3BM—H. K. Love, Ferncroft Av., E. Malvern, 239.
 3BP—J. H. Hood, 6 Alexander St., St. Kilda, 18.
 3BQ—W. F. M. Howden, Hill St., Box Hill, 185.
 3BU—D. A. Connelly, Balaclava Rd., E. St. Kilda, 238.
 3BY—H. Holst, 27 Bambra Rd., Caulfield, 215.
 3CA—W. A. Dorward, 44 Orlando St., Hampton, 170.
 3CB—W. F. Sievers, 30 Lensney St., E. Richmond, 175.
 3CC—University, University of Melbourne,
 3CD—Corbett Derham & Co., Ltd., (R. F. Hall) Lonsdale St., Melbourne, 182.
 3CH—F. W. Clarke, 165 Cardigan St., Carlton, 235.
 3CJ—C. W. Jamieson, 21 Carlisle Av., E. St. Kilda, 153.
 3CP—C. H. Philpot, 36 Melbourne Rd., Nth. Geelong, 175.
 3CZ—H. B. Mitchell, 22 Normanby Rd., Elwood, 205.
 3BB—W. D. Hobart Duff, 27 Westgarth St., E. Malvern, 190.
 3DD—L. F. G. Osborne, Darling Rd., E. Malvern, 205.

3DF—F. B. Short, 2 Mozart St., St. Kilda, 175.
 3DL—L. C. Falls, North Road, Caulfield, 196.
 3DM—J. Chambers & Co., 57 Simpson St., E. Melbourne, 375.
 3DP—N. Culliver, 57 Simpson St., E. Melbourne, 375.
 3DV—H. S. Beattie, 1 Bishop St., Box Hill, 229.
 3DX—J. R. Van Booth, Wattle-tree Rd., E. Malvern, 193.
 3EC—Y.M.C.A. W'less Club, cr. Short and High Sts., Bendigo, 200.
 3EF—H. W. Maddick, Spray St., Elwood, 228.
 3EL—N. J. Boyd, 100 Orrong Rd., Elsternwick, 233.
 3EM—H. W. Doudney, 7 Dickens St., Balaclava, 204.
 3EN—A. B. Lepnard, Box 26 P.O., Drouin, Vic., 174.
 3EP—J. Givens, 10 Logan St., Canterbury, 150.
 3ER—E. R. Rivers, "Kanouena," St. Kinnord St., Essendon, 173.
 3FA—F. Abrahams, c/o Mrs. Solomon, Murphy St., South Yarra, 180.
 3FH—R. F. Hall, Glindabourn Av., Toorak, 225.
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 3GH—W. M. Hale, "Ben Nevis" Harvey St., Anglesea, 250.
 3GI—F. G. Cresswell, 2 Balmoral Av., East Kew, 290.
 3HB—Sunshine Radio Club, Hampshire Rd., Sunshine (H. S. Bird), 165.
 3HE—F. Kruger, Camp St., Charlton, 200.
 3HH—F. H. Maughan, 15 Staniland Av., Malvern, 190.
 3HJ—O. D. Johnson, 18 Boundary Rd., Surrey Hills, 250.
 3HL—A. F. Hutchings, "Bryn Avon," Callawadda, via Stawell, 250.
 3HQ—E. J. Good, "Rock Grove" Private Mail, Glen Rowan, 150.
 3II—G. T. Miles, Highfield Rd., E. Camberwell, 179.
 3JD—J. E. Dane, Wahroonga, Toorak Rd., Hawthorn, 210.
 3JH—F. H. J. Holland, "Cost-wold" St. Kinnord St., Essendon,
 3JI—H. W. Garrett, 315 Whitehorse Rd., Box Hill, 160.

3JM—R. W. Bryson, 149 Eglinton St., Kew, 217.
 3JP—H. Mitchell, Kean St., Caulfield, 220.
 3JR—W. J. Dunstan, 7 Cameron St., Ballarat E., 200.
 3JU—R. A. Hull, 38 Charnwood Rd., St. Kilda, 234.
 3JZ—R. P. Whalley, 4 Bridge St., Sandringham, 210.
 3KF—D. J. Harkin, 58 Hardiman St., Kensington, Vic., 166.
 3KS—D. M. McDonald, 182 Stephen St., Yarraville, 160.
 3KT—L. M. Secombe, 9 Bayview Terrace, Ascot Vale, 175.
 3LF—L. R. Freestone, "Olwyn" 504 Brougham St., Ballarat, 215.
 3LM—Malvern Sec. W.I.A., 16 Sutherland Road, Armidale, (J. B. Masters.) 210.
 3LO—L. P. Moore, "Avalon," Park St., Seymour, 240.
 3LQ—W. E. Downing, Hopkins House, Hopkins River, Warrnambool, 200.
 3LS—R. T. Busch, 30 Wordsworth St., Moonee Ponds, 210.
 3LW—C. Hiam, 222 Carlisle St., St. Kilda, 232.
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 3NN—H. R. Brown, Yanac, Victoria, 240.
 3NS—Norris & Skelly, 211-213 Elizabeth St., Melbourne, (J. Muir), 190.
 3OK—W. H. Conry, 32 Irving Av., Armadale, 236.
 3OT—R. M. Cameron, "Manuka" Cooma Crescent Malvern, 156.
 3PO—A. H. Roberts, 103 Bent St., Northcote, 190.
 3PR—H. H. Blackman, 44 Osborne Av., E. Malvern, 240.
 3PS—V. L. Smyth, McIver St., Bendigo, 162.
 3QW—J. A. Muir, 10 Young St., Brighton, 195.
 3RF—C. H. Cordingby, 77 Bank St., S. Ascot Vale, 250.
 3RG—S. G. Humberg, Waverley Rd., E. Malvern, 197.

- 3EP—R. L. Payne, Retreat Rd., Newtown, 180.
 3RY—W. A. G. Wilson, 300 Dana St., Ballarat, 230.
 3SJ—S. J. Mitchell, 5 Brandon St., Brighton, 188.
 3SK—O. Short, 10 Redan St., St. Kilda, 159.
 3SL—L. W. Southwell, c/o Mrs. Neal, High St., Seymour, 187.
 3SM—A. H. Gay, Warragul, 227.
 3SW—S. W. Gadsden, 5 Miller Grove, Kew, 177.
 3TK—T. W. Kinsella, Mayo Park, Lybeck, 220.
 3TM—A. H. Buck, 759 Glenhuntingly Rd., Glenhuntingly, 150.
 3TU—R. C. Beckie, "Clifton," Bamfield St., Sandringham, 175.
 3UI—R. M. Dalton, San Metco Av., Mildura, 250.
 3UX—G. W. Steane, Earle St., Mont Albert, 231.
 3UZ—O. J. Nilson, 332 Flinders St., (Special), 350.
 3VR—R. N. Abbott, St. Elmo Rd., Alphington, 202.
 3VS—O. J. Philpot, 26 Lumeah Rd., Caulfield, 218.
 3WS—W. N. Sweeney, 125 George St., E. Melbourne, 180.
 3WT—W. L. Tresidder, 13 Nettle St., Bendigo, 190.
 3XC—Xavier College, Kew, Victoria, (Rev. P. J. Baker), 240.
 3XF—M. Chaffer, 41 Norwood Cres., Moonee Ponds, 200.
 3XN—W. G. Leaney, 12 Henry St., Northcote, 150.
 3XO—F. J. Adams, 42 Bay St., Brighton, 181.
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 3XZ—T. F. Gibbons, 31 Foley St., Kew, 169.
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 3YW—J. M. Edgar, 12 Henry St., East Geelong, 230.
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 3YZ—A. McKeown, 54 Yarra St., Alphington, 190.
 3ZA.—W. F. Bardin, 226 Station St., N. Carlton, 221.
 3ZC—H. E. E. Brock, 8 Ngarveno, St., Moonee Ponds, 221.
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 3ZJ—C. L. Lempriere, Terrara Rd., Vermont, 225.
 3ZI—K. H. Barbour, 1 Irving Av., Armidale, 200.
 3ZK—F. R. Bradley, Beach Crescent, Sandringham, 220.
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 3ZM—C. Owen, 22 Kendall St., St. Kilda, 230.
 3ZN—M. S. Israel, 13 Dandenong Rd., Malvern, 250.
 3ZO—E. N. Johnston, 105 Moora-bool St., Geelong, 250.
 3ZP—H. A. George, 195 Ballarat Rd., Footscray, 192.
 3ZS—G. McMahon, Edinburgh St., Diamond Creek, 240.
 3ZR—S. L. Snaith, 1 Byron St., Footscray, 175.

Continued from page 21

perimenters will have to be satisfied with a broadcasting license, and some of these experimenters have been at the game for many years before broadcasting was thought of, before telephony was even thought of.

The restrictions placed on the experimenter are grossly unjust, and it is to be hoped that experimenters as a body will protest.

TO THE PUBLIC

Kilbourne & Clark Mfg. Co. radio parts are presented you as quality merchandise backed up by this firm with a full guarantee. They are in no way competitive with low priced, inefficient apparatus that is at present glutting the radio market. K & C parts are designed by engineers who have followed the progress and development of radio for many years, even before many companies now manufacturing radio equipment were heard of. From the beginning K & C has given attention to correct design and efficiency of its radio apparatus rather than to quantity manufacture of lower priced and less efficient parts. K. & C equipment is in the main handled and recommended by dealers who are competent radio men, or who have real radio men in their employ. These men know radio and that is why you find K & C parts chosen here. It is this class of trade that the Kilbourne & Clark Mfg. Co. desires, this, and that of the experimenter and radio fan who places positive quality and performance above uncertain performance and indifferent quality. Without correctly designed apparatus with strictest consideration for low capacities, lowest possible losses, proper inductance as well as high class construction, the user finds that he does not obtain all from his circuit that he had anticipated. This is gradually coming to be realised more and more as less efficient equipment is being substituted with K & C.

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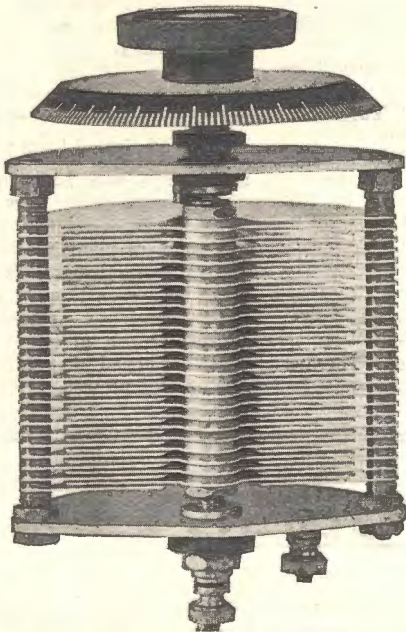
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ORMOND VARIABLE CONDENSERS

.001 ..	14/-
.0005 ..	10/6
.0003 ..	10/-
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Complete with Knob and dial.

Insulators, Egg Type small 2½d. each
 Lead In Tubes—Ebonite with brass rod enclosed and terminals—9 inches long 1/9; 15 inches long 3/8; 18 inches long 4/-
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 Hellesons tapped with wander plugs. 60 volt, 18/-; 45 volt, 13/6; 36 volt, 11/6.
 Crystals—Nudite, Hertzite and others as shipments allow 1/6



Fixed Condensers as illustrated Ebonite with mica dielectric, .001, .002, .0005, .0002

1/8

Crystal Detectors.

Glass barrel type mounted on Ebonite
 Vertical 3/6
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 Buzzers—Nickel plated high tone . . . 4/3
 Ebonite cut to any size in 1/8, 3/16, 1/4 and 3/8 thickness 5/6 lb.

Valve Sockets.

English Standard 1/- & 1/8
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 Well finished bakelite with terminals marked 3/-

Two Coil Holders.

with cam vernier adjustment . . . 16/-

Switches.

Single pole Double Throw mounted on Ebonite 10 Amps. 4/6
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Terminals.

All shapes and styles—Ebonite or brass 2½d and 3d.

MAIL ORDERS OVER £1 POST FREE.

WRITE FOR FREE PRICE LIST.

COMPLETE SATISFACTION GUARANTEED.

Western Australian Notes

From our Special Correspondent.

THE two-valve "Mulgaphone" wireless receiving set as supplied by the Westralian Farmers to their subscribers appears to be a very efficient instrument. Many reports have appeared from country subscribers to the effect that 2FC is being received nightly. To quote from the letter of Mr. R. H. Ellson, Wickiepin, W.A.: "Last night (Sunday) I took the set out about 15 miles, and heard a sermon and closing hymn from 2FC with perfect clearness." Another country resident hears 2BL also, but has not had this reception confirmed yet.

* * * *

An amateur on far-away Rottneest Island, way over the other side of Australia, is doing some good work with two valves. Queensland Radio, Singapore, Rangoon and the Dutch stations come in well, and upon recently adding a further valve he gets Farmers Ltd., 2FC, Sydney, on the loud speaker, which is home-made, merely consisting of a gramophone horn with a length of rubber hose attached, pressed up to a single ear-piece. On the 25th July he was listening to Farmers, and heard the announcer say that he was connecting up with the Theatre Royal. He enjoyed the programme dispensed, and says that the applause was particularly distinct.

* * * *

As proof of the popularity of "Wireless Weekly" in the Western State, I might mention that on the day the book comes out weekly there is a large number of prospective readers waiting outside the main bookstall. This, of course, is entirely apart from the activities of the other bookstalls in Perth.

* * * *

In keeping with the amateur movement on foot throughout the whole of the Commonwealth, to unite all the radio bodies into one powerful concern, a committee was formed here in W.A. some months ago, named the Committee of Affiliated Radio Societies of W.A. It is a similar Institute to which, I believe, has been established in N.S.W. All the wireless societies in the country, metropolitan

and suburban area have affiliated with the Wireless Institute (W.A. Division), and have formed an individual body under the above heading. The first meeting was held recently at the Central Fire Station, Perth. Many matters were discussed, chief among them being as to whether broadcast listeners should be admitted to the wireless societies, this question being submitted to all of the attending delegates for discussion at the individual clubs. At a recent meeting of the Subiaco Radio Society a proposal was put forward that it would be in order to admit broadcast listeners if their receiving apparatus had been constructed by themselves.

* * * *

"Eat to radio" is the slogan of the Cabin Tea Rooms. It will be remembered that some mention was made of this concern some weeks ago. Since then the management have installed four loud speakers at various points around the hall, each gracefully standing beside a bowl of flowers.

* * * *

Passers by the Westralian Farmer's buildings in Wellington Street have noticed a man slung away up the tall mast. He is insulating the guys. 6WF will be attaining 5kw in about two months' time.

* * * *

Wireless dances are all the rage at 6WF now. In the company's social hall, situated just below the broadcasting rooms, the employees enjoy the music being radiated above by means of a Magnavox loud-speaking equipment and frame aerial for reception.

* * * *

The latest institution to be equipped with radio apparatus is the Old Men's Home, overlooking the Swan River, about a mile from the city. The set was installed through the generosity of members of Tattersall's Club. We wonder if the old chaps enjoy Aunt Pat when she gives her little talk to children every night?

* * * *

The next Wireless Convention (1925) is to be held in this State (W.A.). Schemes are already being put forward for the entertainment of

the visiting delegates. It is argued that, in view of the splendid success of the recent radio social and supper, something even greater will be assured if all the clubs unite. A word about the recent social which was held at the Westralian Farmer's buildings will prove interesting. It is understood that the number present exceeded the American radio supper by 41, was greater than the London event, and was certainly the most successful of its kind ever held in the Commonwealth. The chairman of the organising committee, Mr. Phipps, is to be congratulated.

* * * *

Radio licenses, including dealers' licenses, and broadcasting licenses are now obtainable throughout the whole of this State from all the post offices in the suburban, metropolitan and country districts.

THE QUEENSLAND WIRELESS EXHIBITION.

QUEENSLAND is holding its first Wireless Exhibition this month. It is being held under the control of the Queensland Division of the Wireless Institute of Australia, from the 11th to the 16th of August. The purpose of the Exhibition is threefold. First is the desire to give amateurs the opportunity of showing their skill by entering for the various competitions, details of which we give below. Secondly, the radio dealers will have an exhibition of the latest improvements in the wireless world; and last, but not least, it is the intention of the Institute to found a Radio Laboratory. They hope to receive the necessary support at the Exhibition to enable them to form the nucleus of a fund for this purpose. The hon. organising secretary is to be congratulated on the complete preliminary arrangements, and it is felt that the Exhibition will be well supported by both the amateur experimenter and the general public.

This Exhibition is being held during the course of the Brisbane Centenary Celebrations and the Royal National Association's Annual Show; therefore, it will give country visitors an opportunity of inspecting radio sets and obtaining expert advice on the installing of them.

The Institute, through the courtesy of Amalgamated Wireless Ltd. in loaning a $\frac{1}{2}$ k.w. transmitter, intend broadcasting musical programmes during the morning, afternoon and evening ses-

(Continued on Page 32.)

30.T. VICTORIA

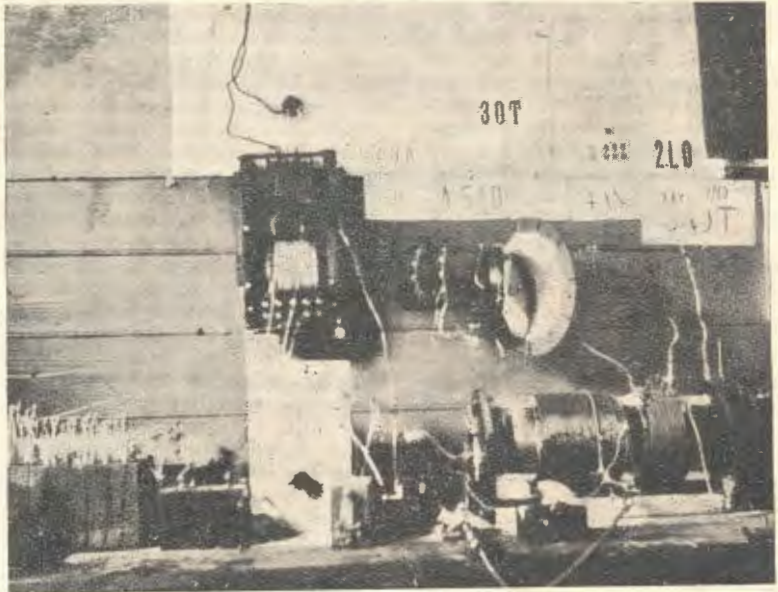
The experimental transmitting and receiving station 30.T. Victoria, is situated at Coonil Crescent, Malvern. Practically the whole of the apparatus was designed and constructed by its operator and owner R. M. Cameron.

A four-wire cage aerial is suspended from a 50 foot mast at the lead-in end and the free end is about 20 feet high. A four-wire flat top counterpoise 90 feet long and 10 feet high, is used instead of an earth, because of the dryness of the soil.

Owing to an unsuitable transmitting valve, no appreciable radiation could be obtained until another tube was procured at the end of April, of this year, but the set now radiates about 650 milliamps using an input of 5 watts.

Details of the transmitter may be of interest to those contemplating the installation of a medium-powered C.W. and phone transmitter.

The equipment is essentially of the "junk heap" type as alterations are constantly being made to



the connections and different circuits are tried.

After a considerable amount of experimenting the popular Meissner, or 3 coil circuit was found to be the most efficient.

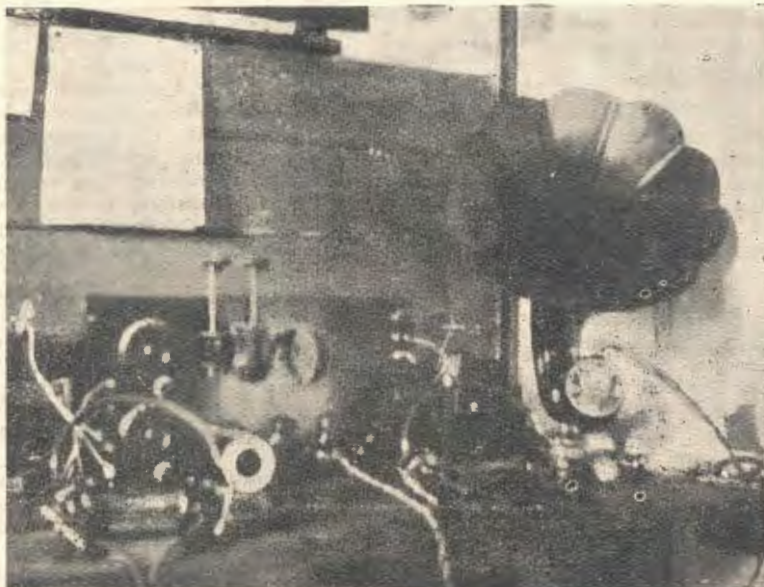
Spider-web coils were also found to be slightly superior to cylindrical coils and give more efficient coupling.

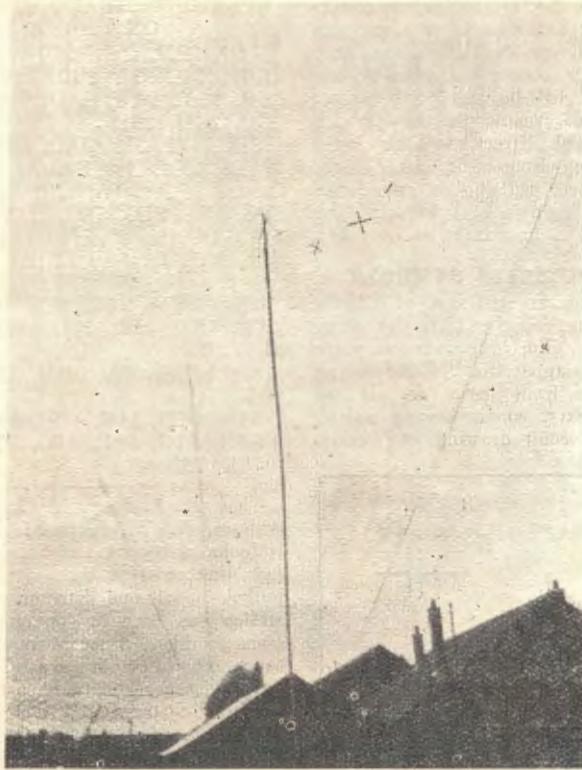
The aerial coil consists of 10 turns of 18 D.C.C. on a 4 inch centre. The plate coil has 30 turns of the same wire on the same sized former and is tuned to resonance with the aerial circuit by means of a .0005 variable condenser.

On the other side of the aerial coil, a grid coil of 20 turns on a 3 inch diameter spider-web is tuned by a .0003 condenser.

A grid condenser having mica insulation and a capacity of .002 mfd is shunted by a resistance of 800 ohms.

The valve and rheostat are housed in a small panel with terminals projecting so that quick changes in connections may be effected.





AERIAL AT 3 O.T.

Power is obtained from the 200 volt A.C. mains, after passing through a home-made transformer and rectifier, giving voltages of 100-900, in 75 volt steps. The "growl" from the rectifiers is smoothed out by a small iron core choke and about 20 mfd of paper condensers placed in parallel across the H.T. D.C.

Owing to college QRM, 30T is not often in the ether, but since the

new transmitting valve has been obtained, a fair amount of D.X. work has been done in the time available. Among the stations worked are 7 BK, 2BK, 2YI, 2LO, 4AN, 2BB, 2AY, 2ZZ, 2DS, and 7OM.

The last two stations reported telephony Q.S.A. 7OM was using only one valve on his receiver, but owing to strong Q.R.M. could not distinguish the words. Absorption modulation is invariably used, and

gives very fair modulation considering its simplicity.

A two valve set using one stage of tuned anode radio frequency and regenerative detector is generally used. By means of a jack, an extra valve may be used as an audio frequency amplifier but it is seldom necessary to employ it on any long distance signals.

All Australian districts have been received on 2 valves and also a number of New Zealand and American amateur stations on low wave lengths. 30T. would be pleased to receive reports from interstate stations hearing his signs.

All cards answered or your own card back.

PICTURE PUZZLE COMPETITION.

The correct answer to the Picture Puzzle Competition was "An enlargement of a piece of N.H.M. supersensitive Galena."

1st Prize: Miss C. de Medici, 137 Maribyrnong Road, Ascot Vale, Vic.

Other prize-winners:—

Mr. Wm. Hamilton, Sydney.
Mr. G. M. Cutts, "Carwell," Highbury Street, Croydon.

Master Francis Moloney, 4 Brisbane Street, Sydney.

Mr. L. V. G. Todd, Tamworth, N.S.W.

Master Stanley Thompson, Marriickville.

Mr. C. Lukeman, 14 Queen Street, Croydon.

Mr. S. H. Christie, Oatley, N.S.W.

Mr. E. Wiedel, "Maida Vale," 830 Old South Head Road, Rose Bay.

Mr. R. Kellett, Boundary Road, North Parramatta.

Mr. A. W. Gill, "Illaroo," Green-gate Road, Killara.

Roster for Week ending 20th August, 1924

	7.30 to 8.0	8.0 to 8.30	8.30 to 9.0	9 to 9.30	9.30 to 10	10 to 10.30
Thur, Aug. 14	2 RA 2 GR	2 IJ 2 JM	2 YI	2UW	2 YG 2VM	2 ZG
Friday,15	2 IJ 2 GR	"	"	ZN "	2 ZZ	"
Saturday, 16	2 RA 2 GR	2 IJ	"	" "	" "	"
Sunday, . 17	2 RA 2 GR	"	"	" "	" "	"
Mon., 18	2 RA 2 GR	2 IJ	"	" "	" "	"
Tues., ,, 19	2 IJ	"	"	" "	" "	"
Wednes., .. 20	2 RA 2 GR	2 IJ	"	" "	" "	"

From 6.55 p.m. until 7 p.m. every Saturday and Sunday, time Signals are sent by 2MU on a wave-length of 200 metres

(Continued from Page 29.)

sions of the Exhibition, thus allowing visitors and others who have never heard a radio concert an excellent opportunity for doing so.

The broadcasting will be done from the new transmitting station of the Institute on top of the "Courier" building. The aerial is of the "sausage" type, and is attached between the high chimney stack and a 50 ft. pole.

Listeners-in are certainly going to have a great time, and it is anticipated the accumulator charging stations and "B" battery retailers will have a busy time.

A full report of the Exhibition, together with a list of prize-winners, will be published in a future edition of "Wireless Weekly."

THE FOLLOWING IS THE PRIZE SCHEDULE:—

Class 1.—A Piece of Apparatus. 1st prize, £1/1/-.

Class 2.—Best Crystal Set. 1st prize, £1/11/6; 2nd prize, 10/6.

Class 3.—Best Set Employing Valves. 1st prize, £2/2/-; 2nd prize, £1/1/-.

Class 4.—Best Complete Station. 1st prize, £2/2/-; 2nd prize, £1/1/-.

QUEENSLAND NOTES.

From Our Special Correspondent.

MR. J. W. DAVIDSON, Commissioner for Railways, is installing a receiving set. This is being assembled by one of our leading amateurs, Mr. C. Daley, and we wish the Commissioner the best results.

Wireless amateurs are anxiously waiting for the Wireless Exhibition week, when the Wireless Institute intends broadcasting morning, afternoon and evening. The new aerial on the roof of the "Courier" building looks very imposing, and this particular week will be a "radio heaven" for the Brisbane amateurs.

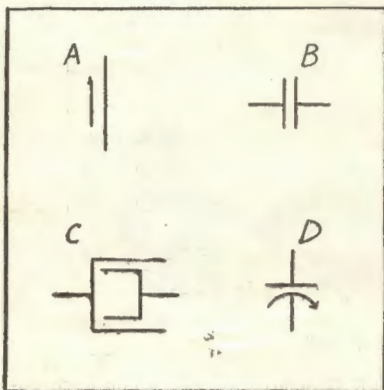
S.A. Notes the week before last mentioned that a South Australian beginner intends trying a "Super-Iodine" circuit. One Queensland amateur must already be working on this, as one of our largest radio stores had a customer the other day who inquired for "some Iodine crystals." As the salesman did not catch the word "Iodine," he displayed an assortment of wireless crystals, but, of course, could not sell them as a substitute.

Mr. U. B. Harper has again taken over the hon. secretaryship of the Radio Society of Queensland, and we wish him every success.

The Radio Society of Queensland is holding an exhibition of wireless sets and parts during the Exhibition, and, as this will include individual work by members, will be well worth a visit. The society's rooms in the Trades Hall, Edward Street, will be open each evening from 8 to 10 o'clock, when members will be in attendance to receive visitors and explain the various articles on exhibition.

NEW WIRELESS SYMBOLS.

The American Institute of Radio Engineers has approved of the signs shown below, illustrating various parts of wireless apparatus. These signs will be used from now on. It has been customary, when showing a battery in a circuit drawing, to mark



both the positive and negative with the conventional signs. Henceforth, these plus and minus signs will be discontinued, and the positive and negative ends will be illustrated only by strokes, as shown in Fig. A, in which the small stroke on the left represents the negative and the long stroke the positive.

Fig. B shows the illustration to be used for showing fixed condensers under 1MF capacity, while fixed condensers over 1MF are to be drawn as shown in Fig. C. The conventional variable condenser sign is to be replaced by that of Fig. D, in which the moving plates are denoted by the curved arrow.

The signs mentioned have been approved and adopted by the American Radio-Relay League.

D.X. COLUMN, OPEN TO ALL GENUINE DX'ERS.

W. T. Doran, Pohlman St., Kyneton, Vic., sends his list of loggings on the stage tuned radio and Detector, from June 6th to June 26th.

STATIONS HEARD WORKING ON PHONE.

2BQ, 2BM, 2YG, 2UW, 2CR, 2FP, 2ER, 2GO, 2YI, 2ED, 2SX, 2HM, 2GR, 2CM, 2AW, 2YD, 2HY, 2YA, 2GQ, 2GM, 2BF.

3BU, 3XL, 3LF, 3XO, 3RY, 3CI.

4YA, 1YA, New Zealand.

5AD, 5FT, 5WA, 5RB, 5CM, 5HR, 5BG, 5WL, 5LG, 5WJ, 5LO, 5AH.

K.G.O. after 6 p.m., on 20th, 23rd, 25th, 26th, July, also 27th.

ON C.W.

2KC, 2BM, 2AL, 2YI, 2CI, 2AW, 2XA, 2KD, 2LO, 2GQ, 2BR, 2KC, 2LF, 2BK.

3LO, 3BU, 3BD, 3BM, 3LF, 3LM, 3OT.

4AA, 4KM, 4AK, 4CM, 4AC, 4IA.

5AD, 5AG, 5AC, 4BG, 5LO.

7BK, 7BN.

Thos. R. Anthony, 12 Chestnut Rd., Auburn, N.S.W., drops his list along. It looks pretty good to us, because he says that most of the stations were pulled in or one detector valve. His station has been in operation about eight months. Since he mentions that some experimenters are doubtful of his D.X. reception, perhaps this report will tend to dispel any doubt.

N.S.W.:—2HM, 2GQ, 2CR, 2YA, 2RJ, 2SO.

Victoria:—3BD, 3BU, 3JU, 3BM, 3JH, 3CB, 3HL, 3HB, 3EF, 3JM, 3ZL, 3BQ, 3AL, 3BH, 3SM, 3NS.

South Australia:—5BQ, 5DO, 5DN, 5ST.

New Zealand:—3AD, 2AC, 2AD, 2AQ, 2YA, 4AA, 1AO, 4AD.

Queensland:—4EG, 4EG, 4CK.

FOLLOWING IS A LIST OF STATIONS HEARD ON C.W. ONLY.

U.S.A.:—6CGW (2ft. from phones), CW.

Victoria:—3AF, 3CA, 3LS, 3GQ, 3DM, 3SW, 3AB, 3EW, 3FA, 3GB, 3HH, 3SX, 3SM, 3OM, 3XF.

J. W. Young, Pymble N.S.W., lodged the stations mentioned below, on Sunday, July 20th, between 9.30 and 10.30 p.m. Mr. Young uses a one valve receiver, his aerial being about 40 ft. above the counterpoise.

N.S.W.:—2CB, 2GQ, 2HM, (all on 'phone).

Queensland.—4IA, 4AN, 4EG 'phone).

N.Z.—4AA, 4AD.

Tasmania.—7AA, 7BK.

Victoria.—3AP, 3OT, 3OE, 3XF, 3ZR, 3LS, 3HL, 3BD.

All the above stations were logged, using two pairs of 'phones in series.

Tasmania:—7BH.

South Australia:—5LO, 5AA.

K.G.O. can be heard any night he is going, on one valve. All the above were quite Q.S.A. on one tube.

3BD. is audible 25ft. from phones on two tubes; likewise 3LS, this of course on I.C.W. 2HM, 2GQ, 2CR, and 2RJ may be heard 6ft. from phones on 2 valves. This is on phone, not C.W.X. I.Y.A. is also loud speaker strength.

K.G.O. has been heard for the last two months or so, and at times is very loud on 2 valves, and quite comfortable on one

IS THIS A RECORD?

Last week we published a brief report of the reception of K.G.O. on a SINGLE VALVE by Charles Walker, Clifton, Q. Here is a copy of his letter to the United Company, giving fuller details of what seems extraordinary D.X. reception. Some weeks ago, Mr. Gotting, of Braemar, N.S.W., reported logging K.G.O. on one valve, but not the dull emitter type.

Clifton,
Queensland,
29th July, 1924.

United Distributors Co.,
28 Clarence Street,
Sydney, N.S.W.

Dear Sirs,—

This is to confirm the telegram sent you yesterday re the logging of K.G.O. on one of your well known 'Home Assembly Sets' (Single U.V. 199 Valve) which I purchased from you some weeks ago. It is only recently that I could procure a U.V. 199 Valve to work this set. On the 25th inst., to be correct, was the first time that I tried the set and I was so satisfied with the results last Saturday night that I decided to try for K.G.O. the following Sunday 26th inst. I have been logging K.G.O. with a three valve Armstrong Circuit for some many weeks past, but as I did not have the above set in my possession last Sunday I decided to try the little U.V. 199 set out.

At 5.15 Sunday evening I started tuning for that distant station K.G.O. with my pocket set (as it seems alongside of other sets). At 5.30 I was on to a weak but clear carrier wave, and at 5.45 and after many hair-breadth adjustments and much patience, I was listening to that familiar jazz music of K.G.O. After a minute the announcement K.G.O.

Continued on page 48

MICK SIMMONS LTD.

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We hold large stocks of all radio and wireless accessories. To one who is purchasing apparatus to construct his own set, an inspection of our fine range will prove of value.

Complete parts to construct a Single Slider Crystal Set, 21/1; Loose Coupler Crystal Set, 31/8.

N.P. Crystal Detector, 2/9; Brass Crystal Detectors, 2/6; Galena, 1/- and 1/6; Q.S.A., 1/6.

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Sterling, 4000 ohms	£2 4 0
Trimm's Dependable	1 12 6
Trimm's Professional	2 5 0
New System's 4000 ohms	1 15 0
Radiola	1 10 0

Complete Crystal Sets, ready for reception of music, £3/3/- and £5.

Valve Sets from £12/10/- upwards.

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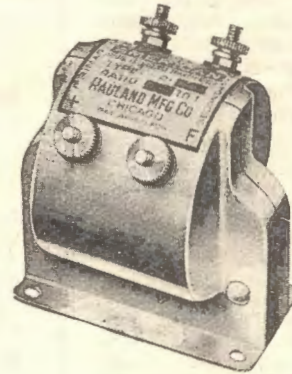
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To Wireless Traders and Others

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"ALL-AMERICAN" Amplifying Transformers— Every "All-American" Transformer is guaranteed to be electrically and mechanically perfect. "All-American" amplifying transformers are designed to give maximum volume, with clear, pure, and distortionless tone. Being quiet in operation and free from extraneous noises, music and speech, from distant broadcasting stations, can be reproduced through good loud speakers with wonderful exactness. Electrically correct, splendid examples of high-class workmanship, from the best materials built by experts, rigidly inspected, and given exhaustive tests before leaving factory.



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1 Base Board	2 6
8 ozs. 24 Enamel Wire	2 9
1 N.P. Slider and Bar	2 6
12 N.P. Contact Studs	1 0
2 N.P. Switch Stops	0 4
1 N.P. Inductance Switch	2 0
1 piece Ebonite	1 6
1 N.P. Detector Unit	3 3
1 Guaranteed Crystal	1 6
1 each Aerial and Earth Termin- als	0 10
1 Phone Condenser	2 0
2 Secondary Rods	1 6
1 Slider Support	0 4
1 yard Flexible	0 3
Aerial Equipment	7 6
	<hr/>
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4 ozs. 24 Enamel Wire	1 6
1 N.P. Slider and Bar	2 6
2 N.P. Terminals, Aerial and Earth	0 8
1 N.P. Detector Unit	3 3
1 Guaranteed Crystal	1 0
2 Extra Phone Terminals	0 8
1 piece Ebonite	1 6
1 Phone Condenser	2 0
Aerial Equipment	7 0

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Efficient Short Wave Reception

By W. A. Stewart.

This is the first of a series of articles dealing fully with the construction and operation of low-loss, short-wave receivers. The reception of short waves is at present affording the more advanced type of experimenter a wide field for exploration. For months Mr. Stewart has been carrying out exhaustive tests in this direction. The results of his experiments will be shown in these articles.

BY short waves I mean those below 250 metres. Although our regulations state that the amateur band of wavelengths is from 125 to 250 metres, I intend to describe gear capable of going down quite a lot below this, as there are plenty of N.Z. and U.S.A. stations working on a hundred metres and less.

I can see no reason why some of the stronger U.S.A. stations should not be heard here, as there is very little Q.R.M. on the lower wavelengths at present.

The U.S.A. Navy Department and also the French authorities are arranging for some high-powered low-wavelength transmissions, in some cases going down as far as 25 metres. Times of Transmission, Power, Wavelength, etc., will be published later.

Having said that, let us go back to the actual reception of short wave signals. Before discussing the set itself, I don't think a word about the aerial system will be amiss, as it is obvious that to hook-up an efficient receiver to a poor aerial is absurd.

In designing an aerial for ultra short wave reception, attention to detail is important, the most important being height and insulation.

It has been proved conclusively that for short wave work a single wire "L" aerial about 80 to 100 ft. long, well insulated, and securely supported on masts up to 60 ft. in height, is ideal.

A long aerial causes broad tuning, and this must be avoided at all costs, as selectivity must be one of the features of a short wave station. Again, if the masts are very high all the length will be on the lead-in, which is detrimental to efficiency.

Taken all round, a single wire 70 ft. long and 40 ft. high will be ideal.

With regard to the conductor itself, a solid wire is preferable to a stranded one, although many seem to think that stranded aerial wire is more efficient. Tests, however, prove this to be incorrect.

I think it is the aim of every receiving amateur to eventually operate a transmitter, and if a transmitter is being thought about it would be a good idea to erect an aerial suitable for both.

When discussing transmitting aeriels, I don't think there is any doubt that a cage aerial is on its own. A nine-inch cage with a tapered lead-in is hard to beat. Here, again, insulation is very important, and only the best should be used. Large, well-glazed strain type are about the best that can be obtained at present, and they can be used liberally.

Remember to put more insulation at the free end, as it is here that the potential is greatest. If the aerial is higher at one end than the other, make the free end the highest, and keep the potential up in the air as much as possible.

A counterpoise is also essential for efficient transmission, and can be often used to advantage on a receiver.

This consists of a network of wires below the aerial, and insulated from it and the earth.

As many wires as possible should be used, and they should extend in all directions. It should be kept at one height off the ground. Usually, about 10 ft. is advisable, as this permits people to walk under it.

The lead-in from the counterpoise should be a cage, also.

It is not much use putting up an efficient aerial and then using a poor earth. Usually a wire is run to the good old standby, the water-pipe; a clamp is put round, and there you are—or at least you're not,—a water-pipe is not by any means the most desirable method of earthing, and, where possible, buried earth should be used. This should take the place of a number of metal plates driven into the ground in a wide circle. A lead should be soldered to each plate,

joined in the centre, and a cage lead-in taken to the set. This helps to cut down the resistance to earth. A point to be remembered in connection with aerial and earth system is, *Solder all your joints.* If you don't, they soon corrode, and all your work is gone for nothing. A moist spot should be chosen for the buried earth, and a few buckets of water poured on occasionally will not do any harm.

A few more points concerning aeriels and counterpoises.

If your free end of the aerial must be fastened to a tree, leave plenty of rope so that the aerial clears the branches by at least 10 ft. Also see that the insulators are good. Trees are detrimental to reception or transmission, and where possible should be avoided. Houses, sheds, shrubs, hedges, etc., should be kept away from the counterpoise, and more efficiency will be obtained if the ground under the aerial is covered by the one class of foliage.

Keep the lead-in away from the side of the house.

The guys should be split up with insulators every 10 ft., as this prevents absorption of energy. Care should be taken to see that the aerial cannot swing about too much, as a swinging aerial causes the wavelength to change, and on short waves this makes the signals difficult to read. A good quality aerial earthing switch of a good carrying capacity should be fitted for earthing the aerial when not in use.

The lead-in should come through a well-insulated ebonite or porcelain tube, and a small tin core should be off any water which may run down the lead-in.

Inside the "shack" take the lead from the aerial and earth to a D.P.D.T. switch, so that two sets may be used, or else a receiver and a transmitter. Mount the aerial and earth terminals on a strip of Bakelite, and you are now ready to hook on an efficient receiver.

In summing up:—

Make the aerial high, but not too long (70 ft. is ample).

Pay attention to the insulation.

Support the aerial strongly to prevent swinging. Keep it away from trees, buildings, etc.

Insulate the guys from the masts, and keep earth lead-in dry.

Provide an efficient earth system.

The next article in this series will follow next week, and will show details of a short wave receiver.

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Three Valve Signal Set For Suitable Slogan

Example: "CULLEN CAN COMPETE"

Each entry from city or suburban readers to be accompanied by one of my cash dockets for any value Country readers --- no restriction whatsoever; post them in. Envelopes to be endorsed "Competition." The decision of the Editor of this Journal to be final. Entries close on August 22nd. Results in "Wireless Weekly," August 29th.

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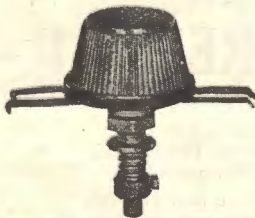
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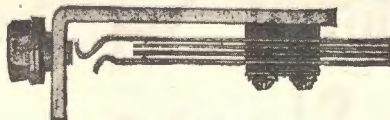
Framingham Potentiometer.



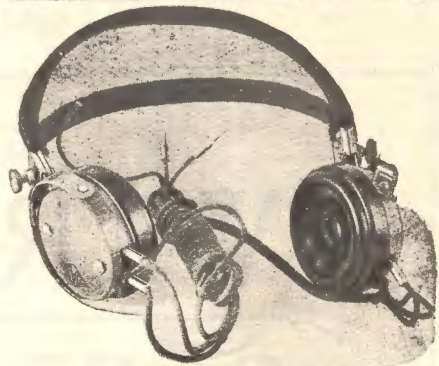
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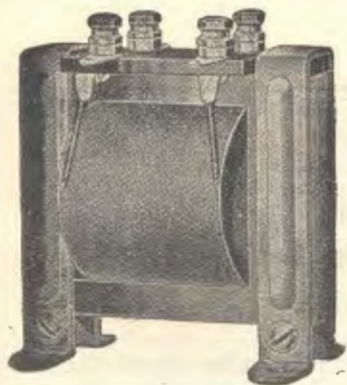
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"No. 41" JEFFERSON
AMPLIFYING TRANSFORMER

UR REASONS WHY!

1st.

A Jefferson is scientific-ly designed.

2nd.

The windings are careful-ly calculated to produce 100 per cent. amplification —they are not built up to a ratio.

3rd.

The Jefferson line embrac-es a variety of amplifiers to meet every demand — six Audio and two Radio Frequency types.

4th.

As pioneer transformer manufacturers, Jefferson Engineers designed audio amplifiers long before Ra-dio reached its present popularity. You will ap-preciate Jefferson's extra years of experience.

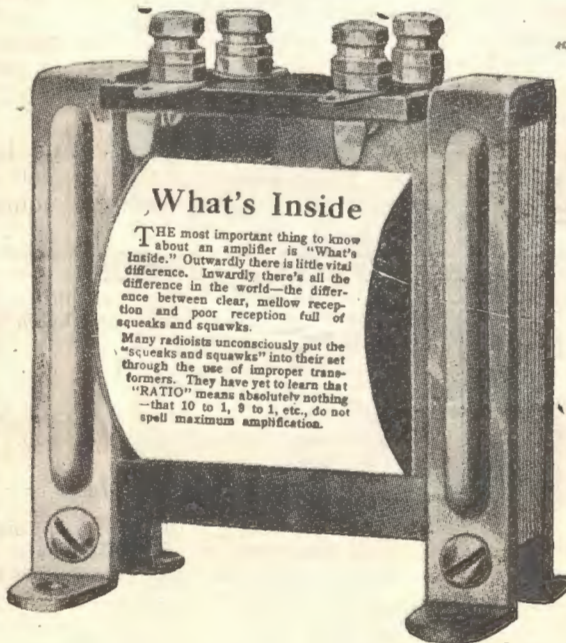
The Vital Spot In the Radio Set

is the transformer. The advantages of using JEFFERSON TRANSFORMERS are acknowledged by hundreds of thousands of users the world over.

Stability of operation; Freedom from Distortion; Maximum Amplification! Those are the character-istics demanded of transformers, and they are the qualities which have made JEFFERSON TRANSFORMERS the most popular among exper-imenters!



Introducing Jefferson "STAR"
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What's Inside

THE most important thing to know about an amplifier is "What's Inside." Outwardly there is little visual difference. Inwardly there's all the difference in the world—the difference between clear, mellow reception and poor reception full of squeaks and squawks.

Many radioists unconsciously put the "squeaks and squawks" into their set through the use of improper transformers. They have yet to learn that "RATIO" means absolutely nothing—that 10 to 1, 8 to 1, etc., do not spell maximum amplification.

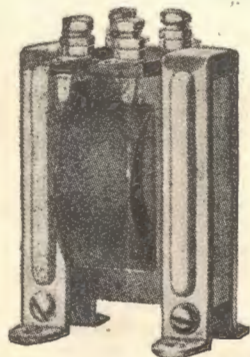
Buy an Amplifier

For what it will do—
The Service it will
render—

The tone and volume
it will produce—

Results Count!

You introduce 100 per cent scientific efficiency into your set when you instal



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stocked by Colville-Moore, Radio House, Radio Co., A. Hordern and Sons, Ramsay Sharp, Universal Electric, Wireless Supplies Ltd., Harry Wiles, David Jones Ltd., Mark Foy's Ltd, Homecrafts, Melbourne; J. C. Price, Brisbane; Adelaide Radio Co.; Burgin Electric Co., Harringtons Ltd., Norris and Skelby, Melbourne; and all Leading Wireless Stores throughout Australia.



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WHY shouldn't you be as particular about small parts as WE are ?

YOU depend on them to help your larger instruments.

YOU expect small parts to preserve the energy that reaches your set.

SO why shouldn't YOU be as particular about their quality as WE are?

WE think no accessory too unimportant to build as carefully as we make fine optical instruments. All the craftsmanship we have developed in 44 years of precision work, we put into every MAR-CO small radio part.

Then we put them into the unmistakable MAR-CO packages, so that if you are as particular as we are, you can easily get the "leak-proof" service we build into them.

Simply say "MAR-CO" . . . and insist on seeing the MAR-CO package . . . when you want plugs, jacks, switches, grid-leaks, vernier condensers, and other small parts.



SERIES PARALLEL SWITCH—

For panel mounting. Only one drilling necessary. Insulated with hard rubber. Bakelite knob. Metal parts nickelled. PRICE:—

Series Parallel Switch 8/9



MARCO D.P.D.T.—

For panel mounting. Only one drilling necessary. Insulated with hard rubber. Bakelite knob. Metal parts nickelled. PRICE:—

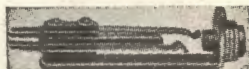
Double Pole, Double Throw 8/9



INDUCTANCE SWITCH—

For panel mounting. Only one drilling necessary. Insulated with hard rubber. Bakelite knob. Metal parts nickelled. Ratchet stop on switch arm. PRICE:—

- 5 Point Switch 7/-
- 7 Point Switch 8/9
- 9 Point Switch 8/9
- 11 Point Switch 10/6



MARCO JACKS—

These Jacks are highly nickelled and insulated. Contacts are sterling silver. Extra washers allow wide range of panel adjustment. Construction makes short circuit impossible. PRICE:—

- Open Circuit 2/6
- Closed Circuit 2/9
- Double Circuit 3/6
- Single Filament 3/9
- Double Filament 4/3

Mar-Co Products obtainable at: Ramsay, Sharp Ltd.; Colville Moore Wireless Supplies Ltd.; Burgin Electric Co., Harringtons Ltd.; Farmers' Ltd.; W. Harry Wiles; Smith's Radio Store; The Radio Co.; Mark Foy's Ltd.; David Jones Ltd.; N. P. Olsen, Newcastle; J. C. Price, Brisbane.

Trade inquiries from: Keith Stokes, 27 King St., Sydney.



THE LEICHHARDT AND DISTRICT RADIO SOCIETY.

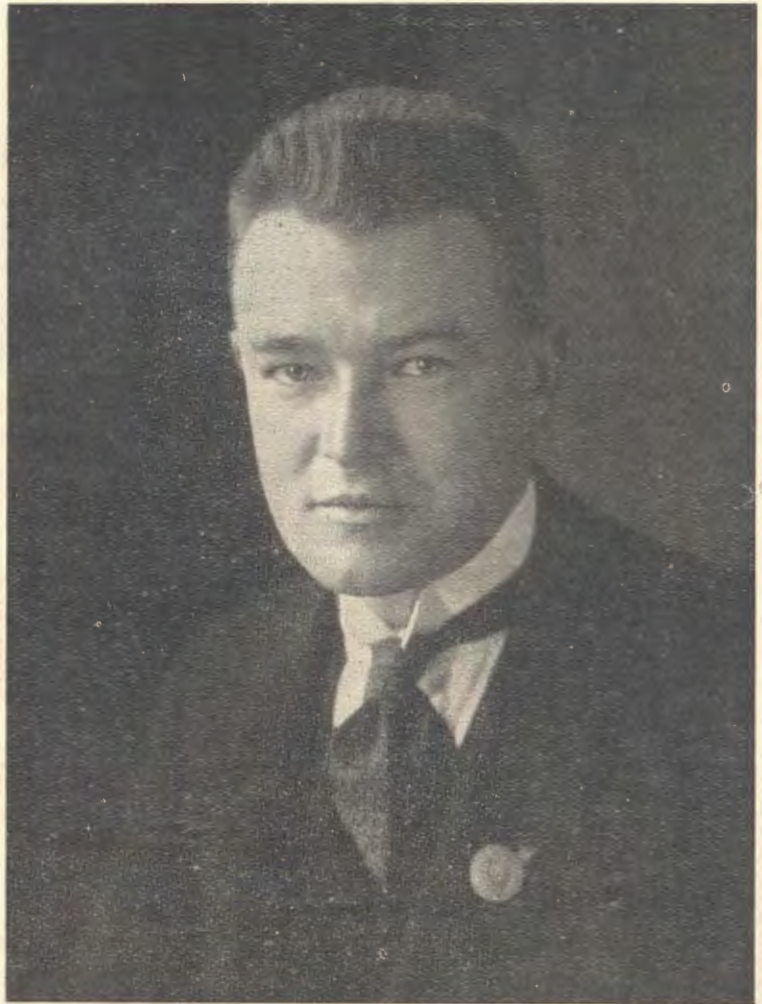
The membership of the Leichardt creased to the extent of six on Tuesday, August 5, when the 22nd Monthly Business Meeting was held at the club-room, 176 Johnston Street, Annandale.

The attendance of members was all that could be desired, and in addition to the election of the new members just referred to several important matters were dealt with. Amongst other things, it was decided to make an alteration in the new syllabus, particulars of which were published in these columns last issue. As a result the Exhibition of members' apparatus set down for August 19th has been postponed until September 16th., and the Debate fixed for the latter date will now be held on August 19th instead. This arrangement will thus enable members more time to prepare apparatus for exhibition than would otherwise have been the case.

The subject for discussion at the debate to be held at the 94th general meeting to be held next Tuesday night will be "Dull Emitter Valves versus Other Types," and it is anticipated that a very lively and interesting discussion will ensue. Members are expected to roll up in good force to hear the views of both the "Ayes" and "Noes".

At the following meeting the second lecture of the new syllabus will be delivered by Mr. F. Thompson, who will deal with "Tuning Elements," and on September 2nd the 23rd monthly business meeting will be held, when it is anticipated that a further batch of applications for membership will be ready to be dealt with.

Persons interested in wireless communication in any or all of its phases are invited to communicate with the Society with a view to enrolment in its rapidly increasing membership, and letters should be addressed to the Hon. Secretary, Mr. W. J. Zech, 145 Booth Street, Annandale.



MAJOR EDGAR H. BOOTH, M.C.

ANOTHER CLUB.

Sydney University has, under the guiding hand of Major Edgar H. Booth M.C., B.S.C., Senior Lecturer in Physics, organised a Wireless Club.

The objects of the club, as set out in the Union "Recorder," are: to have the subject of wireless explained, and to have at the disposal of members apparatus with which they might familiarise themselves before purchasing any for their home use.

That commonsense was exercised when forming the club is shown by the fact that membership will probably be divided into two sections—those who merely wished to learn how to build and set up a receiver, and those who have leanings towards the

the "Experimenter."

We wish the University Radio Club every success.

NORTHERN SUBURBS RADIO SOCIETY.

The last meeting of this society was held on Tuesday, August 5th, at 8 p.m., in the Gordon Public School.

The minutes of the previous meeting were read and confirmed, and final arrangements made regarding the demonstration to be given to the scholars of the above school on Saturday, 9th.

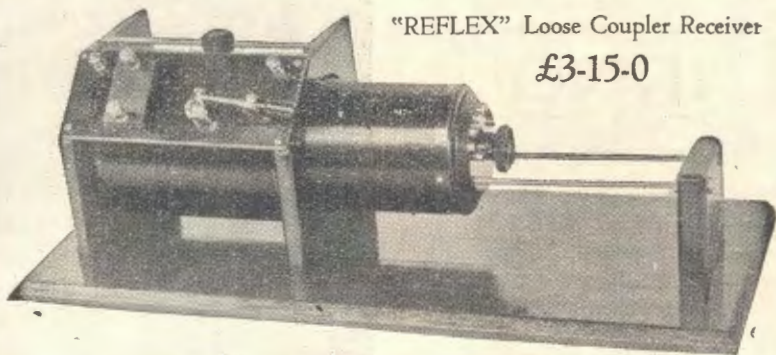
A short lecture was then delivered by Mr. Gray on "Tuning Apparatus," after which Mr. Lindsay said a few words regarding low loss circuits.

The Secretary then said a few words about the new regulations and their
(Continued on Page 44.)

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LINE
PEERLESS
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2000 Ohms.

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"REFLEX" Loose Coupler Receiver
£3-15-0

Complete Set of Parts to make the above Set 36/6
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SAMARAI, NEW GUINEA LISTENS IN TO FARMERS ON A "VOLMAX" SET.

Recently the whole white populace of Samarai, the small island township to the south east point of New Guinea, listened in to a Wednesday evening dance transmitted by 2 FC. The demonstration was given by Mr. Treacy of Dalgetty's motor dept. Sydney (who was on a visit to the Islands) on a "Volmax" five valve receiver supplied by Messrs Wireless Supplies Ltd., of 21 Royal Arcade, Sydney.

This was the first opportunity the residents of this lonely island have had to get a taste of what radio broadcasting was like, and the set behaved admirably despite tropical conditions, giving full volume on a "Magnavox" loud speaker. Amongst those present were the Resident Magistrate, and other officials, and altogether was a huge success. This merely goes to show what properly designed and built Radio Broadcast apparatus can do.

Little Willie pointed at his sister's sweetheart, Mr. Jones.

"Mr. Jones kicked me yesterday," he snarled, "but I got even with him, you bet your life. I mixed up quinine with my sister's face powder."—
"Los Angeles Times."

A well-brought-up little Episcopalian was turning the pages of the Prayer Book during the morning service, just as the first lesson was announced. "Mother," she whispered presently, "which is the gossip for to-day?"—
"Book of Smiles."

Wireless Institute of Australia

New South Wales Division

New South Wales Division.

The next meeting of the New South Wales Division of the Wireless Institute will be held at the Royal Society's Rooms, 5 Elizabeth Street, Sydney, on Tuesday, the 19th August, when Mr. Phil. Renshaw will deliver his paper on "Spark Coil, Valve Transmitters." This paper will be eagerly looked forward to by members, as the subject is one of absorbing interest, and it is confidently anticipated that a good roll-up will be seen on that occasion.

RADIO RELAY LEAGUE.

In connection with the Radio Relay League, it should be pointed out that membership is open to all members of the Wireless Institute and affiliated clubs without extra fee. All members of these bodies automatically become members of the Radio Relay League, but it is essential for the organisation that every member should register with the traffic manager, Mr. Phil. Nolan (2YI), Box 3120, G.P.O., Sydney, stating which night and between what hours they are willing to do relay work only. This is necessary so that a schedule of times can be made out, having at least one relay station working every night. It is the aim of the organisation to make arrangements so that messages may be relayed and the

answer received the same night, but, of course, this will take time to arrange; but much help can be given to the organisers by each individual transmitter forwarding the above particulars. Even one hour a week will be sufficient if no more can be managed, but it is essential that this hour should be given regularly and without fail. Particulars of stations in other States who can work with New South Wales transmitters are also required. Interstate readers please note. As a preliminary arrangement, the official station of the League (2YI) will transmit messages every Friday night between the hours of 10 and 11 p.m., on a wave-length of 210 metres and a nominal input of 10 watts. It is desired that interstate transmitters endeavour to pick up these messages and get into communication with 2YI. Now that the organisation of the League is beginning to take a definite shape, it is confidently expected that every transmitter will put his shoulder to the wheel and do whatever he can to forward the interests of the League, and there is no doubt that by co-operation in this manner much useful and interesting work can be accomplished.

A. H. PERRETT,
Publicity Officer.

(Continued from Page 40.)

effect on the experimenter, after which the meeting adjourned.

Next meeting is on Tuesday, August 19th, when a lecture will be delivered on "Detector Units." Anyone interested is invited to attend. Full particulars from the secretary, R. Primmer, Gordon Road, Gordon.

WIRELESS INSTITUTE. S.A. DIVISION.—Junior Section.

The monthly meeting of the Junior Section was arranged to be held on Wednesday, July 23rd, at the Adelaide University, but only eight members turned up, and none of these were juniors; so, at the invitation of the chairman (Mr. R. B. Caldwell), those present journeyed out to Mr. Caldwell's residence at North Unley, where a very enjoyable evening was spent looking over his station and trying out his new set, which employs the Kauper circuit, a number of items being received on the loud speaker.

THE NORTHBRIDGE RADIO CLUB.

The usual weekly meeting was held on Wednesday, 6th inst., at the clubroom, "Hoylake," Sailor Bay Road, Northbridge.

After considerable discussion as to the best method to prevent interest from lagging, it was unanimously decided that before obtaining the services of outside lecturers the members should be afforded an opportunity of airing their knowledge or ignorance in short lectures. Thus, any individual misconceptions could be advantageously corrected.

On completion of the business portion of the meeting Messrs. Macklin and Bassett dealt with "Tuning" and "Valve Detectors" generally, and answered innumerable questions.

The club is making steady progress. Any inquiries regarding membership may be obtained from Hon. Sec. A. Cameron, "Ogilvie," Clanwilliam Street, Chatswood.

THE STRATHFIELD AND DISTRICT RADIO CLUB.

The usual weekly gathering was held at the clubroom on Thursday night last, when Mr. Jacob, our president, gave us some clever hints on the ST 100 circuit, and demonstrated clearly how this set acts.

A short address followed by the assistant secretary, Mr. T. Harris, on "How to get KGO on One Valve." Mr. Harris, together with his brother, is without doubt one of the foremost long-distance music and morse catchers in the State. His log-book would open the eyes of many. Shipping and land stations 2000 miles or less are never logged, as he can get them any night on one valve. Mr. Harris is preparing a brief log of his records for publication in "Wireless Weekly" at an early date.

Mr. Hodgson, our treasurer, then described the P1 circuit thoroughly for the benefit of the members who were not familiar with it, dealing with his subject very well.

Mr. Jack Rourke then gave a lecture on the "Elements of Electricity," and gave the younger members a very good idea of the action of electricity.

Preliminary arrangements are now nearing completion for the grand concert which is to be held at Burwood School of Arts on Monday, Sept. 15th. A monster programme has been arranged, and the concert committee guarantee that there won't be a dull moment during the evening.

Any person interested in the activities of the club is invited to call at the clubroom any Thursday night, at the corner of Albert Road and Duke Street, Strathfield, and a welcome is assured.

If there is anything that you want to know, how to make a set or what set would be suitable, call next Thursday night at the clubroom, and we will give you whatever help is in our power.

The secretary, Mr. M. Wraxall, lives at "Almor," Long Street, South Strathfield, and will gladly answer any inquiries as to membership, etc.

Passenger: "I say, driver, what is the average life of a locomotive?"

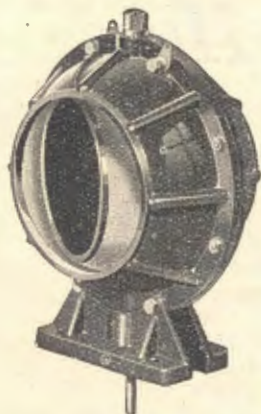
Driver: "Oh, about thirty years, sir."

"I should think such a tough-looking thing would last longer than that."

"Well, perhaps it would, sir, if it didn't smoke so much."—"Southern California Wampus."

GILFILLAN

Radio Parts

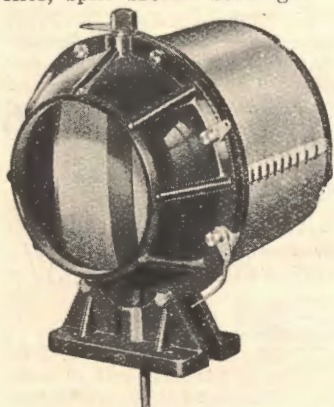


VARIOMETER R 100

Embodying the highest electrical efficiency. Moulded brown bakelite, split bronze bearings.

*Arrived on the R.M.S. Tahiti
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Book your orders now as the supply is limited



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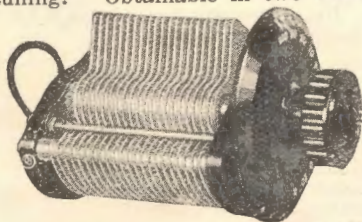
The finest that can be produced. Moulded brown bakelite, split bronze bearings; winding tapped at 15 points for very close tuning. Obtainable in two sizes.

The following houses in Australia are a few of the progressive dealers stocking

GILFILLAN PRODUCTS

BRISBANE ELECTRIC CO., Brisbane.
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COLVILLE-MOORE, Sydney.
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And many others.



R 350

These condensers are of new design, are equipped with heavy moulded bakelite end plates, are rigidly braced and will not warp out of shape. The metal plates are of scientific design and occupy centre of space at all positions.

Murdoch's Famous Hats

— Cover Australia! —

FROM Cape York to the Capital—from Cape Solitary to the wave-swept shores of the west—wherever you find men looking out complacently on life—be sure it is from under a **Murdoch Hat.**

Quite natural, too! While man exercises his gifts in discernment of worth and good judgment in values—his choice of head-wear will unerringly lead him to—**MURDOCH'S.**

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No. 1.—Murdoch's "Nail Curl"—

FASHIONED FROM PURE FUR FELT OF SURPASSING MERIT, with the favoured Silk-bound edges and loose Side Bow, and featuring the new "Nail Curl" Brim; perfectly flat, with a neat curl at extreme edge. Popular tone shades include Slate, Grey, Drab, Fawn and Myrtle Green. Sizes: 6½ to 7¼. Usual Guinea value elsewhere. **MURDOCH'S PRICE** **16/6**
Super Quality 25/-



No. 2.

No. 2.—Murdoch's Popular "Prince"—
Made from Pure Fur Felt of splendid quality. This popular style is made with wide Silk Bindings. Colours: Fawn, Brown, Light, Mid, or Dark Greys. Sizes: 6½ to 7½. **MURDOCH'S PRICE** **25/-**



No. 3.

No. 3.—Murdoch's New Style.—
A SMART FASHION HAT IN GREAT DEMAND. Fancy Black Band, with two Silvery Stripes; self or contrast bindings. Medium width. Semi-flat-set Brim, Bound Edge. Colors: Black, Dark Grey, Light Grey. Sizes 6½ to 7¼ **21/-**



No. 4.

No. 4.—Murdoch's Famous Velour—
A FAULTLESS HAT WITH A BEAUTIFUL RICH VELVET FINISH, Cut-edge Brim and Silk Head-lining. Colours include: Fawn, Brown, Dark Grey, Slate, Light Grey, Black and Natural. Sizes: 6½ to 7½. Splendid Value **30/-**

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When writing kindly mention "Wireless Weekly," and state size and colour desired.

"THE WORLD'S LARGEST MEN'S & BOYS' WEAR STORE"

(Continued from Page 15.)

kind permission of the Controller of Wireless during the above dates. I was working as 5LO., Murray Bridge. Possibly you will be able to do this through the medium of your valuable paper of which I have been a reader from the first publication.

I am,

Yours Faithfully,
WILLIAM H. BARBER,
(Late 5L.O.)

CAN ANYBODY ASSIST?

"Tiverton,"

132 Cardigan St.,
Stanmore.

3rd. August, 1924.

The Editor, "Wireless Weekly,"

Dear Sir,—

About a month ago I had just completed a one valve "regen" set with an unusual hook up, and was twiddling the knobs when I heard speech. I just had time to hear the speaker mention bullocks—the number I think was 27—when 2B.L. butted in and jammed him out. I tuned into Broadcasters and when the item was finished, I returned to the "speaker." He was still on the bullocks. Then 2B.L. again drowned him out. I failed to get him again. The voice was far away, but clear and I concluded that it was

probably a lecture.

If any of your readers happened to be listening in at that time on that wavelength and located the station, I would be gratified to learn of it through your columns.

Yours hopefully,
F. FEARN.

Wireless Apparatus

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OPEN TILL 0.30 FRIDAY NIGHT

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Illustrations

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Catalogue and valuable information on

WIRELESS MODEL ENGINEERING,
ELECTRICITY, TELEPHONY, FRET-
WORK, MODEL AEROPLANES, ETC.

Covers complete ELECTRICAL AND
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Apparatus required is illustrated and its use
fully explained.

The Radio Section is exceptionally complete,
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Send in 60. STAMPS

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"RAMSAY" RADIO SUPPLIES

You cannot buy better :: Everything for the Amateur

- Maple Base Boards 3/3
- Maple Loose Coupler Ends, Set of 4, 2/6
- Contact Stops, N.P., per doz. 1/-
- Contact Studs, N.P., per doz. 1/-
- Runner Rods 10d.
- Sliding Contacts, brass 1/6
- Sliding Contacts, N.P., 2/3
- Crystal Detectors, Mounted 3/3
- Crystal Detectors, N.P., unassembled 3/-
- Crystal Detectors, glass enclosed, mounted, 5/6
- Crystal Detectors, glass enclosed, unmounted, 4/2.
- SPDT Knife Switches on Porcelain Base, 2/9
- DPDT Knife Switches, on Porcelain Base, 4/6
- Valve Sockets, R Type 2/6

- Valve Sockets, Radiotron Type, 4/-
- Dry Cell Valves, 1½ volt 27/6
- Jefferson Transformers, No. 41 30/-
- Jefferson Transformers, Star 25/-
- Murdoch 3,000 Head Phones 30/-
- Murdoch, 2000 Head Phones 25/-
- Winding Wires, all sizes in stock.
- Aerial Wire, 3/20 2/9 per 100ft.
- 43 Variable Condensers 18/6
- Primary Tubes Wound 3/6
- Secondary Tubes, Wound and Tapped 6/-
- Crystal Receivers, Panel Mounted £2/5/-
- Single Valve £7

Write for Catalogue, W 16.

RAMSAY SHARP & COMPANY, LIMITED
RADIO ENGINEERS 217 GEORGE STREET, SYDNEY.

(Continued from Page 33.)

Oakland, California, Broadcasting music, by Henry Halstead's Orchestra, from the garden roof or room of the Hotel St. Francis, San Francisco. Every word could be heard quite clearly except the roof or room, I am not sure of that word.

At 6 p.m. I closed down and disconnected everything, and started to retune, (after adding an extra set of headphones), for another Radio friend who happened to be on the scene at the time. By 6.10 we were both listening to K.G.O. better than we had done before the retuning, and from 6.10 until the signing off "Good-Morning," at 7.0 local time we got everything perfect. The clearness of the music and speech was extraordinary, being much better in quality than that received with the bigger sets.

To-night, at 6.45 to 7.20, 1YA, New Zealand, came in very clear and of fair strength. Using two pairs of Trimm's Phones on the above set, I can also get the two broadcasting stations and many amateurs from N.S.W. I am going to arrange with a Melbourne low powered transmitter for a mid-night test with the Home Assembly Set on Phone.

I would advise anyone trying D.X. work with the above set to first of all have a very efficient Aerial and Earthing System, to have plenty of patience, and to do some very-very fine tuning. The results will be surprising.

I intend to try "The Home Assembly" on quite a lot of D.X. work and will let you know the results from time to time.

Yours faithfully,

(Signed) CHARLES WALKER.

P.S.: We, the following, were present and heard the above tests carried out and can vouch for the above as being quite correct.

(Signed) A. MUIR.

M. A. WALKER.

AN APOLOGY.

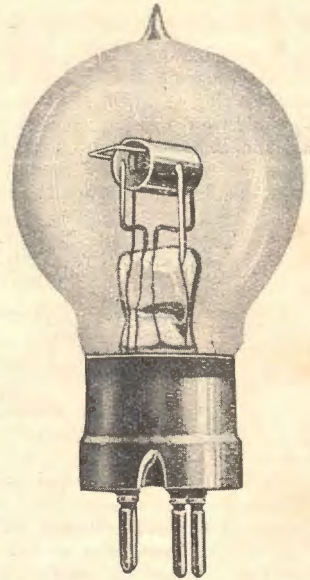
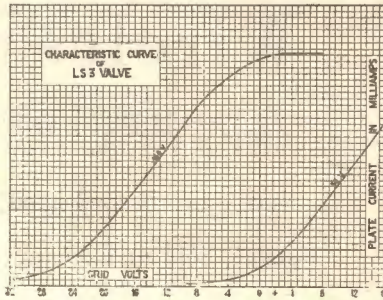
We regret very much that, through a printer's error, the continuation of "Insulator's" article, "A Three Coil Standard Regenerative Receiver," which appeared on pages 16 and 17, was not completed.

The continuation from page 17 last week appears in this column.

(Continued from last week.)

It certainly seems to be that lately, and, really, Mrs. Insulator tells me her cocoa bill has gone up recently, and that it is almost impossible to

L.S. 3 Valve



L.S.3 VALVE.

The L.S.3 is a low frequency amplifying valve designed for loud speaker work.


The straightness of the grid voltage-plate current characteristic enables the valve to give distortionless amplification. This valve serves the same purpose as the L.S.2, and is suitable for use in the last stage of multi-valve low frequency amplifier. The L.S.3, however, works with a plate voltage of the same order as the ordinary R type, thus making a separate high tension battery unnecessary, and is suitable, therefore, in the final stage of amplifiers using R type valves in the initial stages.

Filament


Type.	Battery Voltage.	F'ment Term. Volts.	F'ment Amps.	Anode Volts.	Overall Length.	Diam. of Bulb.	Socket Type.
L.S.3	6	4.0	0.65	70-100	110m/m	54m.m	"R"

keep up the supply of Saos and cheese, and cake, etc. Oh! do you know that Mrs. Insulator wanted me to consent to her having the shingle or bob hair cut? Of course, I wouldn't consent. Oh, no! Thinking to beat me badly, she complained about the discomfort of wearing headphones. I won, but it cost me a set of New Systems ladies' headphones. Happiness again, and no shingle, shangle business, thank goodness.

Blue prints—oh, please let me whisper these words. I am still blue printing for the last set. By the time this is published all will have their supplies, and I will be prepared to offer blue prints for this week's set; but the price this time will be 1/1 each for Figures 2 and 3.

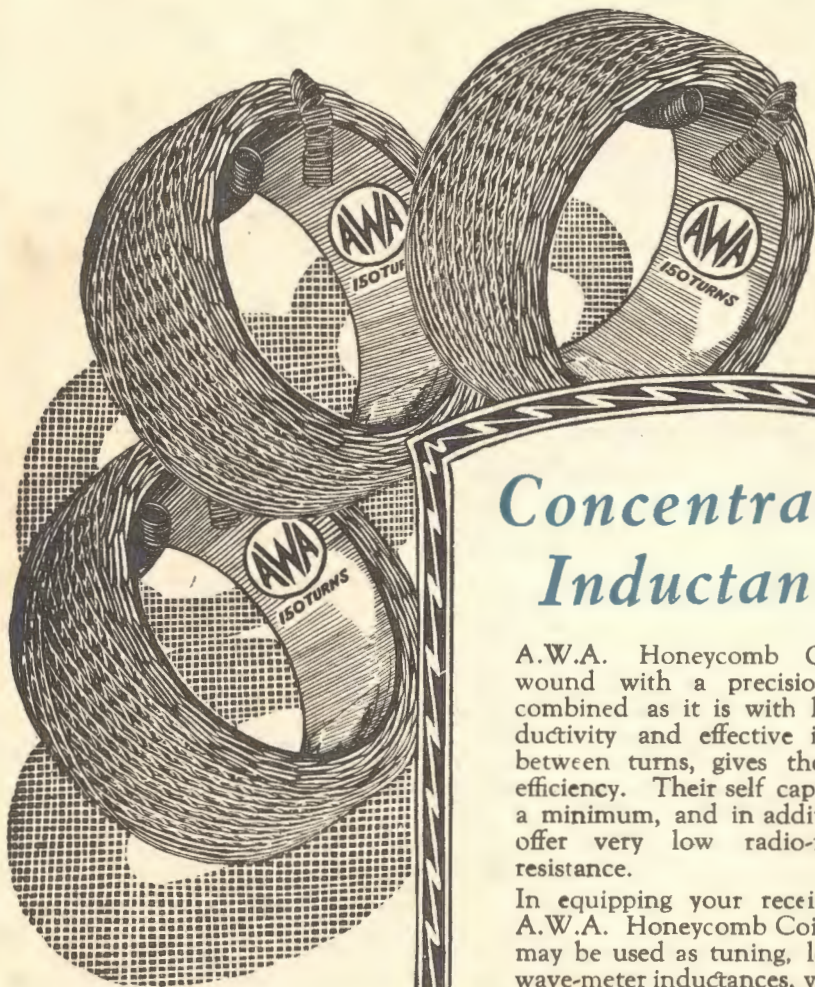


The mild epidemic of 'flu has, unfortunately, laid "Insulator" low for a few days. His article, therefore, will not appear until next week.



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