





WIRELESS WEEKLY

October 26, 1923.

United Radio Products

Transformers

Condensers Verniers

(Self Contained Vernier Dial Assembly)

And other specialties of proven merit will be on Sale at all Radio Supply Houses after November 10th, 1923. United Radio Products in the countries where they are known are the accepted Standard of quality, a distinction gained by their unvarying excellence. Loud, clear signals and no distortion is assured by their use.

Price Lists Now Ready for Dealers and Manufacturers

UNITED DISTRIBUTING CO., Ltd.

(WHOLESALE ONLY)

28 Clarence St., SYDNEY and at 592 Bourke St., MELBOURNE

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AMPLIFYING

World's Leading Transformers stocked by Colville-Moore, Wireless Supplies, Radio House, Radio Co., A. Hordern and Sons, Ramsay Sharp, Universal Electric, Wireless Supplies Ltd., Harry Wiles and all Leading Wireless Stores

Sole Agents for Australia

FOX & MacGILLYCUDDY

DAILY TELEGRAPH BUILDINGS

KING ST., SYDNEY

PHONE CITY 3062

WIRELESS SUPPLIES

2000 ohm Gecophone Receivers
42s. 6d.

6000 ohm Gecophone Receivers
45s.

With Adjustable Head and Ear Pieces.

"R" Type Valves 25s. each.

All types of Marconi and Radiotron Valves in stock. Accumulators, "B" Batteries. See us.

ELECTRICITIES & CO.

80 PITT ST., SYDNEY

OPPOSITE STOCK EXCHANGE

PHONE 84153

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OFFICIAL ORGAN OF THE AUSTRALASIAN RADIO RELAY LEAGUE

Vol. 3.

October 26, 1923.

No. 3

Broadcasting at Last.

Australia's first broadcast station will be in operation in time to broadcast the result of the Melbourne Cup.

Some months ago a small company was formed in Sydney with the intention of opening a broadcast station.

Beset with many difficulties it struggled along against almost overwhelming odds and lack of support from those it was out to help. To-day it has placed a premium on its shares and has decided to accept only a few more shareholders.

Broadcasters (Sydney) Limited has invited the Postmaster-General to officially open its

station during the first week of November, when it will commence a 12-hours a day programme, starting in the morning about 9 a.m. and finishing about 10.30 p.m., with two or three half-hour breaks during the day time.

"Broadcasters" intend giving a free service to the public through all those traders who are shareholders in the Company.

All classes of news sport, market, stock exchange, weather reports, latest cables, etc., will be broadcasted daily at specified times. There will be interesting lectures and talks, interspersed with a number of $\frac{1}{2}$ hour and hour

Roster for Week ending 31st October, 1923

	7.0 to 7.30	7.30 to 8.0	8.0 to 8.30	8.30 to 9.0	9 to 9.30
Thur. Oct. 25	2 HP 350	2 GR		2 FA	
Friday,26	2 HP 350			2 FA	
Saturday, 27..	2 HP 350	2 GR			
Sunday, 28....	7.0 to 8.0 2 HP 350	7.45 to 9.15 2 CM		9.15 to 10 2 GR	
Mon., 29.....	2 HP 350	2 GR		2 FA	
Tuesday, 30..	2 HP 350			2 FA	
Wednes., 31..	2 HP 350	2 GR			

Very few stations are on the Roster this week owing to Trans Pacific Tests.
2 HP will be transmitting continually from 3 to 5 and 7-10 p.m. each day



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Every evening after the necessary reports and intervals of high class concert programmes, news are completed, there will be a musical programme lasting from one and a half to two

hours. Everything possible has been considered, and no item which is of interest to the public will be omitted. Children will be specially catered for.

EXPERIMENTAL STATION 2 H.P.

A Most Successful Test

By permission of Mr. J. Malone, Chief Manager of Telegraphs and Wireless, the address of 2HP experimental station, Mr. W. J. MacLardy, managing editor of Wireless Weekly, was last week transferred to 126/128 Phillip Street, Sydney.

Recently certain prominent men in wireless stated that the position was unsuitable for good transmission. To endeavour to prove that this was erroneous, a temporary aerial was erected and Mr. MacLardy, with the very able assistance of Mr. Raymond Allsop to whom most of the credit of the success of the experiment is due, together with the assistance of Mr. E. Joseph, the well-known wireless expert, and several others, installed a 10 watt experimental set and commenced operations last Friday at 3 o'clock. It was expected owing to the wet and hurry in which the installation was made that good results would not at once be obtained. In this they were wrong. Immediately they asked for reports and gave a telephone number; they were deluged with congratulatory reports. During the afternoon and evening nearly 100 telephone reports were received among them being reports from Newcastle, Medlow Bath and Katoomba.

The telephone of the Daily Guardian Newspaper, who had kindly placed a telephone at their disposal was held up for some time, the whole 7 lines—B7111 to B7117—being engaged by people waiting to

give their reports. In fact the telephone girl threatened to go on strike.

On Saturday the reports were just as good if not better than before.

An amusing incident occurred on Saturday evening, when reports were asked for by telephone. It was found that the telephone operator at the Guardian office was missing. The man sent to take down reports instead of listening in at the switch board, plugged in a number of lines and then commenced the chase. No sooner would he lift a receiver from one machine when another would commence in a different department and he would dash off to that one. When found he was incoherent and in a state of collapse. Mr. Robson was eventually placed at the switchboard and did his utmost to cope with the calls.

A few of the reports received are published here:

Reports on Transmission from 2HP Experimental Station on Friday and Saturday last.

Mr. Scott (Newcastle): Music excellent.

Mr. Forsyth (North Sydney): Modulation perfect.

20B (Enmore): coming through well.

Mr. Perry (Cremorne): Very strong and clear.

C. MacLurean (2CM), Strathfield: Very strong; excellent.

— (Katoomba): Very good; reception and (cut off).

Parsons (Alexandria): Very clear. Gandy (Hurlstone Park): Exceptionally clear.

Walker (Wahronga): Clear and strong on the valve.

Thomas (Leichhardt): Coming in very well.

Carrol (Cremorne): Coming through splendidly; congratulations.

Bourke (Homebush): Crystal set, best reception ever obtained.

2MM (Como): O.K.

2TM (Lidcombe): Splendid.

Scott (Mosman): Splendid.

Dare (Five Dock): Splendid.

Maas (Wallstonecraft): Coming through well.

Petrie (Lane Cove): Engaging tremendously.

2LO (Lane Cove): Excellent.

Williams (Burwood): Clear as a bell; best ever heard.

Keene (Neutral Bay): Absolutely excellent.

M. A. Boyd (Strathfield): Best heard, clear and mod. perfect.

Martin (Medlow Bath): 2 valves and loud speaker, enjoying very much.

Mr. Vox (Leichhardt): Crystal 1 valve filling small room.

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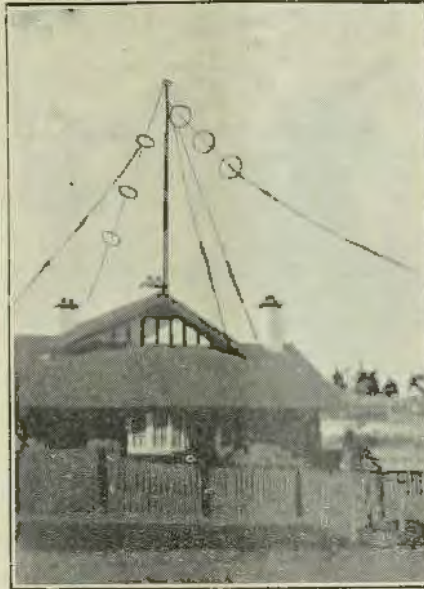
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Learn to Make Your Own.

During the first few weeks when broadcasting commences the Wireless Traders will be unable to cope with the demands for made up sets. We advise all those who wish to be ready to listen in to the opening of the first broadcast station in Australia to go at once to a wireless dealer and if unable to secure a completed set to purchase the parts. Any bona fide trader who advertises in this paper will supply them. Wireless Weekly has for some time past published, and will continue to do so each week, articles under its "Make Your Own" columns, on non regenerative receivers, both crystal and valve, which will be suitable for broadcast reception.

Care must be taken that the sets made will only receive on 350 metres. A variation of 10 per cent. above and below that wave length will be allowed. The set must be enclosed in a box suitable for effective sealing. The Radio Inspector, Macdonell House, Sydney will seal the set on the fee of 2/6 being paid.

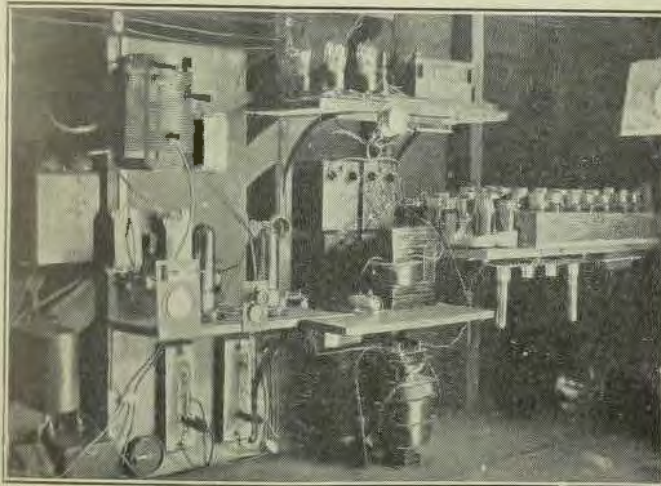
Wireless Weekly will be pleased



The Aerial at 2 CM Station

to give advice to any of its readers. Draw diagram of connections and

give full details. Address "Broadcast Receiver," Box 378, G.P.O., Sydney.



The 100 watt set which is being used in Trans-Pacific Tests. By C. Maclureau, Strathfield

Trans-Pacific Tests.

FIRST SIGNALS FROM AMERICA.

MR. LOVE AND MR. HULL
RECEIVE A MESSAGE.

QGBM. H. K. Love, Melbourne, Australia, Cable. Strongest Station. Best wishes. Radio Journal."

This message was picked up on Sunday night last by Mr. Love and Mr. Hull, in Melbourne. In all they logged 26 American stations.

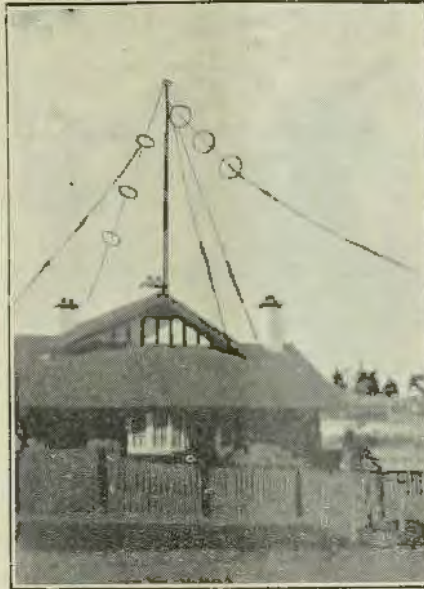
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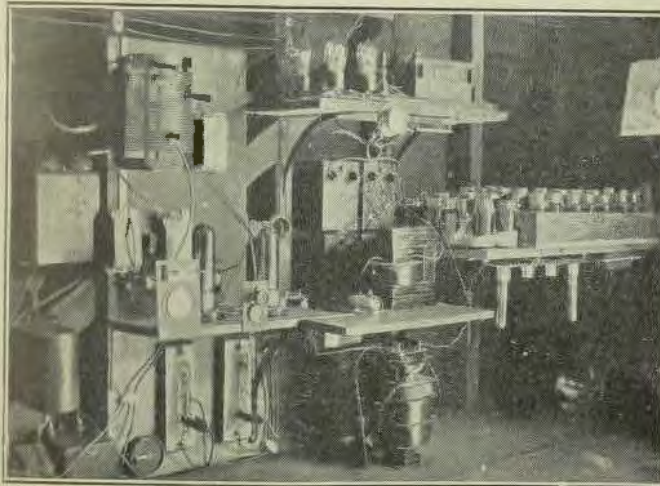


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The Damp Proofing of Coils and Formers

One of the most important factors in the efficiency of a receiver is the proper damp-proofing of the tuner windings and formers, for upon this depends the constancy of the results obtained. Many of those annoying vagaries of fluctuating signal strength of which beginners sometimes complain can be laid at the door of damp in the coils or the tubes upon which they are wound. It is therefore a matter of considerable importance to make a correct choice of an insulating and proofing agent, and to use an effective method of impregnation, writes G. P. K. in "The Wireless World."

Those amateur constructors who can afford to use ebonite tubes for their inductances will find it a fairly simple matter to render their windings damp-proof. The former itself being impervious, all that is necessary is to impregnate the cotton or silk covering of the wire, and shellac varnish is perhaps the most convenient agent. It gives very good results, provided that it is thoroughly dried by baking, and that varnish of good quality is used. This last should be noted; the varnish should be obtained from an electrical firm, and not from an ordinary paint and colour merchant, whose product may have very poor insulating properties.

The necessary baking of the varnished coil should be done about ten minutes after the application of the shellac, and should be carried out in a moderately hot oven. Care must be taken not to overheat the coil, lest the ebonite tube be damaged or the varnish scorched.

Most amateurs, however, regard ebonite tubes as much too expensive for ordinary purposes, and therefore use cardboard ones. The substitution is justifiable, and does not lead to appreciable loss of efficiency if tube and winding are properly impregnated. Shellac is not quite so suitable in this case, since it is difficult to get it to soak well into the cardboard. Paraffin wax is the better material for treating formers of this type, because the tube with the coil upon it can be soaked in a bath of the melted wax until thoroughly impregnated. To obtain the best results with this material there

are one or two points to be noted, however. First, care must be taken not to heat it too fiercely or it may "scorch," or, when melted, boil. Should it be allowed by accident to boil, take it off the fire and keep it away from lights until it has stopped (it gives off considerable quantities of inflammable vapour when boiling). Second, it should be realised that it is possible by means of the wax bath to expel moisture from the cardboard and the covering of the wire and to replace it with wax, provided that the wax is heated to a temperature above the boiling point of water. If it is raised to, say, 130 degrees centigrade the water will be driven out as steam, bubbles of which can be seen rising through the wax. When the bubbles come to an end the process is complete and the coil can be taken out, drained as completely as possible, and put aside to cool.

The careful worker uses a thermometer for these operations, but for the benefit of those who do not possess a suitable centigrade thermometer, and do not care to go to the expense of buying one, it may be as well to explain that the desired end can be attained fairly well by heating wax in some form of double boiler, such as a jam-pot standing in a saucepan. If the outer vessel is filled with very strong brine and kept boiling briskly, a temperature will be reached in the inner one which will be capable of expelling moisture if given time.

The preceding notes have particular reference to single-layer windings, and they should not be applied too literally to all coils. It is very difficult to bake the moisture out of some types of multi-layer coils, such for example as those produced by pile winding, and for these wax bath should be used. In general, the experimenter must use his judgment to decide which is the method best suited to a particular case.

It should be remembered that all the insulating materials used for impregnation purposes have a fairly high dielectric constant, and hence they increase the internal capacity of the coil somewhat. To keep this objectionable increase down as much

as possible be very sparing with your varnish and wax; use only just sufficient varnish to completely impregnate the covering of the wire, and in the case of wax, drain off as much as you can when lifting out the coil.

THE SUPER SET.

A radio set, so delicately tuned that it records the presence of diseases, the feelings of a plant when a leaf is torn, and similar phenomena, is the property of Dr. Albert Abrams, of San Francisco, and is called the Reflexophone. The antenna is a delicate-looking rod and the apparatus includes a magnavox. A number of tests were made, in one of which Dr. Abrams tore the leaf of a nasturtium, whereupon the magnavox recorded a faint squeak. Then a leaf was cut; this apparently did not hurt, for no sound was evolved. Another leaf was first held over a chloroform bottle, then torn, and then cut, again without any sound being registered by the loud-speaker.

THE EXPLANATION.

According to Dr. Abrams, plants broadcast radio-waves; the Reflexophone catches the vibrations from the ether and records them by means of an exceedingly delicate method of tuning. Chloroform influences plants much as it influences human beings, hence the lack of response when the plant had been chloroformed first.

Certain forms of disease were also tested, and when one of these (in a bottle) was placed near the antenna, the horn emitted an audible gurgle.

Its inventor believes that the machine can be developed to the point of diagnosing all diseases, so that a man can "put a penny in the slot" and find out at once what ails him. This Radio M.D., however, would be a complex and cumbersome affair.

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Experimenters !

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WE CAN SUPPLY ALL YOUR REQUIREMENTS

Good Material Yields Good Results

ALL OUR MATERIAL IS GOOD.

Supplementary Price List NOW Ready

Burgin Electric Coy.

Wireless Engineers and Suppliers

1st Floor, Castlereagh House, 391 George Street

Tel. M. 3069

SYDNEY

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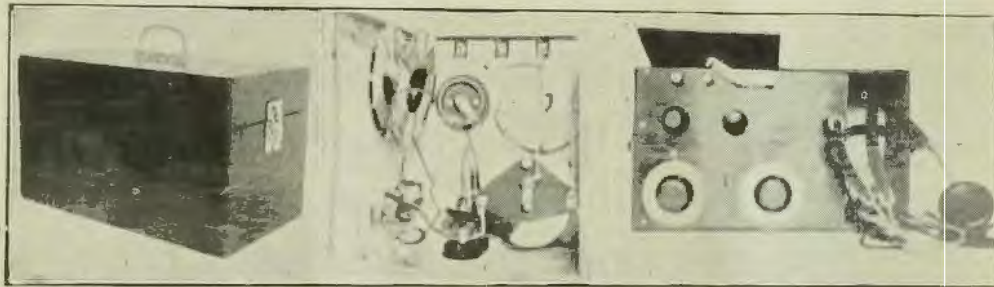
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SYDNEY

MAKE YOUR OWN

A Complete Portable Tube Receiver



The set herein described is a single-tube receiver with provision for carrying every part and accessory within the cabinet itself, including even antenna and counter poise equipment. In short, the degree of portability aimed at is that of an ordinary film camera, while at the same time there has been no attempt to produce a vest pocket apparatus or something to be worn in one's necktie. These novelties make good publicity material but are correspondingly weak in receiving efficiency.

When the case is closed the set may be carried by a handle like an ordinary small satchel. The filament and plate batteries, telephone receivers, tools (pliers and a screw-driver), and wire suitable for a portable antenna, are all in the case and the outfit may be set up in a few minutes for actual receiving. A suitable size of wire for use with portable sets is about No. 24; the writer has had an antenna of this material up for several months during the winter, and it is still aloft and giving service. The total carrying weight of the set is 12 pounds. There is nothing to connect except the antenna. A dry cell tube is of necessity used.

The first four figures show the general appearance of the set. Figure 1 is a photograph of the re-

ceiver with the cover on, ready to be carried. Figure 2 is a view showing the set ready for reception. Figure 3 is an interior view from the back.

The cabinet, as these pictures show, is an affair with two partitions and three compartments, designated as compartments A, B and C respectively. Department A the largest, shown in the photograph of figure 3, houses the receiver proper—that is the tuning equipment. Compartment B is for the batteries, output jack, and telephone condenser. Compartment C holds all the accessories, including the telephones. The panel of the receiver extends over compartments A and B, C being left open. When the set is being carried the open side of compartment C is on top, so that the material placed therein remains in position. The interior of compartment A is made readily accessible by making the top a hinged door for changing coils, etc. The middle compartment holding the batteries is rarely opened; access to it may be had by removing the back of the cabinet and the piece which forms the top of compartments B and C, a screw-driver being necessary for this.

The hook-up used is a simple tickler coil regenerative one, without any particularly novel features. The inductances are in spiderweb form.

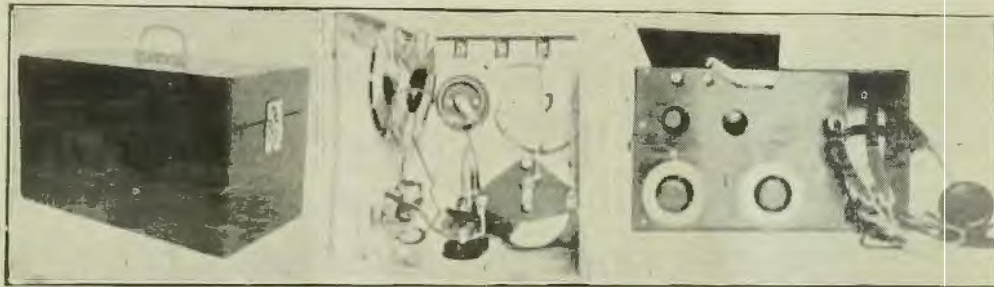
The only novel, though in no way original, feature is the use of three binding posts, with an optional fourth one in case the receiver is shielded, with link jumpers, to allow the antenna tuning condenser to be used in series with the antenna inductance, or in parallel, which properly used, gives a wide wave length range without loss of efficiency. With the antenna connected to post 2 in figure 4, and link 2-3 open, the series connection as shown in figure 5 is obtained. With posts 2 and 3 jumped, and the antenna to 1, the ground, as before, going to post 3, the parallel connection of figure 6 is secured. At the lower wave lengths the series connection is used for sharpness of tuning. At the higher wave lengths the parallel connection may be efficiently employed with a small antenna. Interchangeable inductance coils are used to get away from the energy losses involved in the use of tapped inductances.

The spider web inductances are wound on frames. These may be obtained in 1-16 inch bakelite in most of the large radio supply stores. They are sold wound and unwound; four of the latter "fans," as they are known, should be obtained, one for the tickler and three for antenna inductances.

Winding data for the spirals, and

MAKE YOUR OWN

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Antenna Spiral No. 1 . .	No. 26 D.S.	18	100-280	
Antenna Spiral No. 2 . .	No. 26 D.S.	50	200-470	500-1600
Antenna Spiral No. 3 . .	No. 30 D.S.	80	400-800	1400-2900

The design of the inductances and the effective wave length ranges were determined by trial on two antennas of the size given in the table, but in the one case in a rural location, the height being directly above flat ground, while in the other in-

almost all the capacity out, but it is hardly convenient to work it in this way. One change in design is suggested: If an antenna slightly longer than 80 feet flat-top is available, spiral No. 3 may be wound with No. 30 D.S. wire and a few less turns, and still go up to NAA on 2600 metres and W.S.E.'s are slightly higher. It is always best to use double serving insulation when possible.

The lay-out of the apparatus in compartment A, seen from above, is given in figure 7. This is with a WD-11 or WD-12 tube and has been found to be a suitable position. The receiver is wired with some form of stiff conductor equivalent to No. 10 B. and S., or larger. Bare bus bar wire is recommended. It will be noticed that the parts are so laid out that the tickler coil is the one nearest metal parts and conductors, while the antenna spiral, in which losses must be kept at a minimum, is kept well away from other conductors.

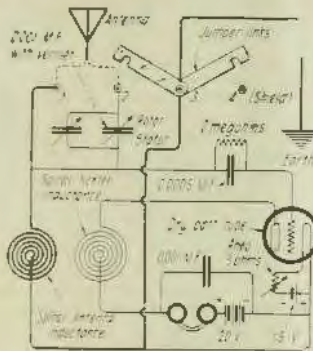


Fig 4
Wiring diagram

since the antenna was stretched some eight feet over an apartment house roof with the set in a top-floor compartment. Larger antennas will give somewhat greater ranges. Spiral No. 1 is used for 200 metre amateur telegraph reception. Spiral No. 2 is connected in series with the condenser for reception from the present order of broadcasting stations (360 and 400 metres), while with the condenser in parallel it is good for 600 metre marine reception, radio compass on 800 metres, and will just reach some of the Navy spark transmitters on 1600 metres. Antenna spiral No. 3 is mainly employed with the parallel connection, and covers WCC, WSE, and NBD around 2000 metres and up, C.W. and spark marine traffic from 1600 to 2200 metres, NAA spark on 2600 metres, and a great number of army forts between 2000 and 3000 metres. The ranges as given are the most effective but are

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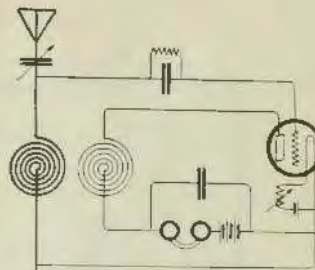


Fig 5
Serial connection of the antenna variable condenser

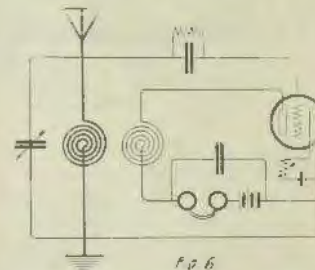


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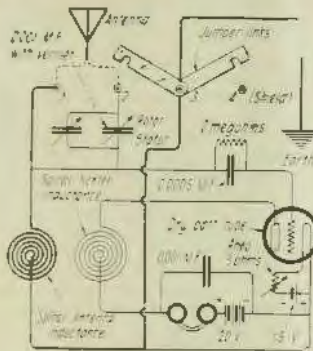
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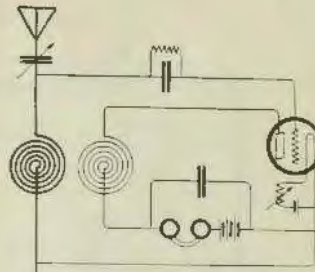


Fig 5 Serial connection of the antenna variable condenser

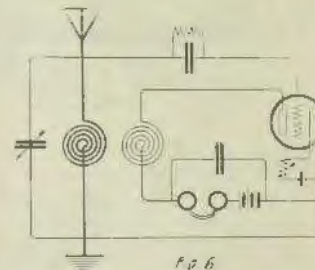


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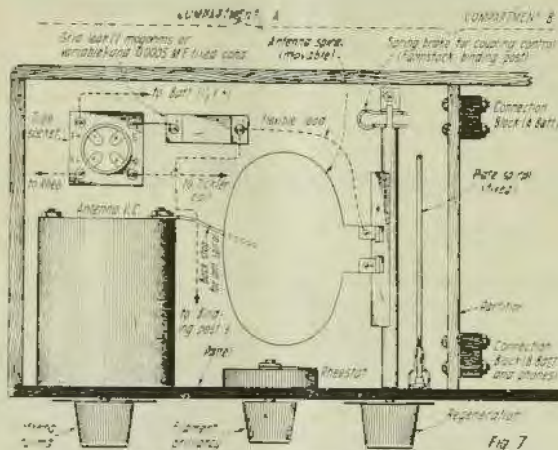


Figure 7.—Horizontal plan view of compartment A

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experienced observers and accordingly the specifications of the receiver are given herein for the use of the amateurs and experimenters.

FIRST BROADCASTING EFFORTS.

The first step towards making radio telephony a public service in Germany was made as far back as 1921, by the German Ministry of Posts, by the introduction of the German Broadcasting Service. The sets which were installed for this purpose, a description of which follows, were on the initiative of the Ministry of Posts, jointly evolved by the three well-known wireless

firms of Telefunken and Huth and Lorenz. It seems that this collaboration produced apparatus which combines simplicity of operation with maximum reliability and permanency of service.

The German Broadcasting Service was inaugurated in August, 1922, and was organised in the same manner as the German telephone service. Subscribers, on payment of a certain annual fee, are furnished with the necessary apparatus, the installation and maintenance of which is done by the Post Office. Such maintenance is made considerably easier by feeding the plate and filament circuits directly from a.c. mains by means of an apparatus especially designed for the purpose instead of using accumulators.

The present subscribers, whose number is approximately 2,000, are recruited from the ranks of bankers, merchants, big trading concerns, etc. The messages are broadcast now by the wireless station of Königswusterhausen (one of the most interesting and many-sided stations of the world, fitted with twelve transmitting plants, each single one of them quite an independent unit), with a power of 10 kW., on a wave length of 4,000 metres, and are chiefly of an economic nature, relating to rates of exchange, exchange quotations of inland and foreign markets, etc. These news items are being collected by the Berlin Telegraph Agency, 'Eildienst G.m.b.H.,' and are then passed on to the Königswusterhausen transmitting station, whence they are broadcast.

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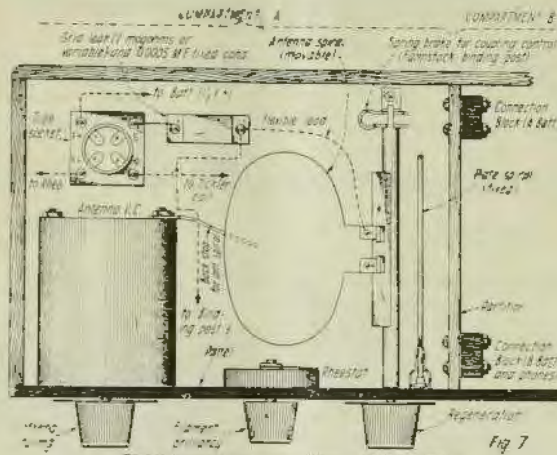


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FOR BROADCASTING.

Designing Simple Crystal Receiver.

The following article will appeal particularly to those readers who are contemplating the construction of their first receiving set.

No doubt many beginners experience some difficulty in deciding what form their first receiving set shall take. The excellent supply of wireless literature now available, whilst invaluable to experimenters who have some little knowledge and experience, often has the defect of confusing a beginner, who, attracted by the general appearance of some set, together with the claims made as to its performance, is tempted to embark upon the construction of a two or even three-valve receiving set.

For a beginner to do this is really only inviting trouble, and, although the constructional details may be given in a perfectly clear manner and all reasonable care be taken to illustrate the various points, I know only too well from past experience that, although many sets are completed and give excellent results almost immediately, quite a number of constructors have an anxious time before the set finally gives satisfaction, due in most cases to lack of knowledge of principles and of the necessary manipulative skill.

Even with a comparative straightforward hobby such as fretwork it is admittedly necessary to spoil a few pieces of wood and break a few saw-blades before even a moderate proficiency is obtained. I would strongly advise anyone taking up wireless telegraphy as a hobby to commence by constructing and experimenting with a simple crystal receiving set, which, in view of the establishment of additional broadcasting and "relay" stations, may have quite a useful practical value quite apart from the instructive and experimenting side of the question.

GENERAL QUESTIONS AFFECTING DESIGN.

Having decided to construct a receiving set employing a crystal detector, the most important point to consider is the wave length range over which it is desired to receive signals. If reception over the broadcast band of wave lengths is desired, the tuning inductance, whatever type it may be, should be capable of adjustment between



Fig. 1.—A "single slide" tuning inductance.

about 300 and about 500 metres when connected to the aerial which, for the purpose of this article, we will consider as standard according to the regulations of the Post Office.

It should be noted that, as the dimensions of the inductance or tuning coil and the number of turns upon it are increased, the efficiency upon the shorter range of wave lengths falls off considerably, owing to the absorbing effects of the unused turns of wire which, in the case of a coil capable of tuning to 2,600 metres but actually adjusted to tune in 2SB on 350 metres (for instance), would comprise about seven-eighths of the coil.

It was this consideration, of course, which led to the introduction of the original "plug in" coils now so extensively used in valve receiving sets. The use of this type of inductance in crystal receiving sets will be referred to later.

To commence with, I strongly recommend the single layer solenoid type of inductance coil, that is, a coil in which the turns of wire are wound side by side in a single layer upon a cylindrical former consisting of an ebonite or wax-impregnated cardboard tube.

Quite apart from the actual method of tuning employed, the dimensions of the coil are determined by the wave length range. For a range of 250 to 600 metres, a tube $2\frac{1}{2}$ in. in diameter by 6 in. long should be closely wound for about 5 in. of its length (approximately 120 to 130 turns) with No. 22 S.W.G. copper wire.

The wire must in all cases be insulated, but the nature of the insulation (i.e., whether enamel or double cotton covering) depends

upon the method employed for varying the number of turns in circuit, enamel covered wire being used where a slider is fitted and cotton-covered wire where tapings are taken to a tuning switch or switches.

SINGLE SLIDE INDUCTANCES.

Fig. 1 shows a simple single-slide tuner consisting of the inductance coil complete upon its former, rigidly fixed between two wooden end supports attached to a wooden baseboard, which, if desired, may be

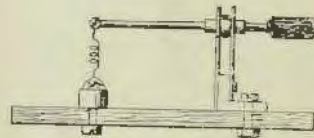


Fig. 2.—A valve-tuner slider.

made wide enough to carry the crystal detector, telephone terminals and telephone condenser. R is a brass rod ($3\frac{1}{16}$ in. or $\frac{1}{2}$ in. square) carrying the slider S, the spring plunger of which makes contact upon the turns of wire. The rod, complete with slider, may be purchased quite cheaply from any wireless dealer. About $\frac{1}{2}$ lb. of wire will be required, and one wax-impregnated cardboard tube. Any odd pieces of board may be used for the baseboard and the two end pieces, so that the total cost of the complete tuning coil is very small.

WINDING THE INDUCTANCE.

The smaller inductance may readily be wound by merely rotating the cardboard tube in the hand and feeding the wire into place, taking care to keep an even tension throughout, otherwise the turns will become displaced. Half an inch from each end of the coil make two small holes with a drill or a large darning needle. Secure the commencing end of the winding and out of the others, leaving several inches of wire projecting for subsequent connection to the aerial

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WIRELESS WEEKLY

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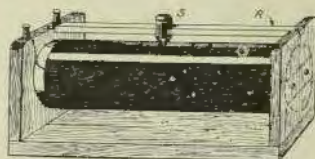


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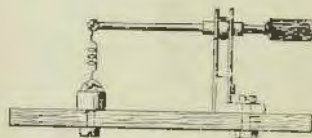
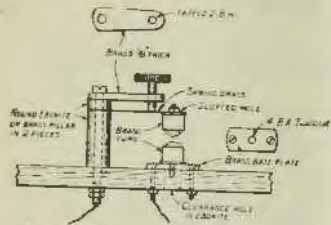


Fig. 2.—A valve-tuner inductor.

made wide enough to carry the crystal detector, telephone terminals and telephone condenser. R is a brass rod (3/16 in. or 1/4 in. square) carrying the slider S, the spring plunger of which makes contact upon the turns of wire. The rod, complete with slider, may be purchased quite cheaply from any wireless dealer. About 1/2 lb. of wire will be required, and one wax-impregnated cardboard tube. Any odd pieces of board may be used for the baseboard and the two end pieces, so that the total cost of the complete tuning coil is very small.

WINDING THE INDUCTANCE.

The smaller inductance may readily be wound by merely rotating the cardboard tube in the hand and feeding the wire into place, taking care to keep an even tension throughout, otherwise the turns will become displaced. Half an inch from each end of the coil make two small holes with a drill or a large darning needle. Secure the commencing end of the winding and out of the others, leaving several inches of wire projecting for subsequent connection to the aerial



terminal and to one side of the crystal detector, as illustrated in the circuit diagram, Fig. 5. The finishing end of the coil is to be similarly secured, but in this case no projecting end of wire is necessary. As soon as the winding is completed, apply two good coats of shellac varnish, allowing time for the first to set thoroughly before applying the second one. Into each end of the cardboard tube a wooden cross-piece is fitted and is secured by means of small brass screws passing through the cardboard. The coil is then secured in place by

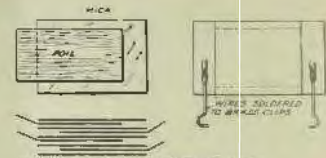
means of brass screws passing through the end pieces, as shown in Fig. 1.

For larger inductances it will be found a great advantage if the tube can be rotated in a lathe or in some simple device to facilitate the winding operation.

Next fit the brass rod and slider into place, cutting small recesses in the top of the end pieces as shown, or merely screwing the rod on to the upper edge. Slip a piece of fine emery cloth beneath the plunger and move the latter (together with the emery) up and down the rod, so as to remove the insulating enamel sufficiently to enable the brass plunger of the slider to make reliable contact upon the turns of wire. Avoid moving insulation unnecessarily or adjacent turns of wire may possibly make contact.

THE DETECTOR AND TELEPHONE CONDENSER.

Figs. 2 and 3 shows the constructional details of a crystal detector suitable for use with any kind of tuner. If preferred a detector may be purchased complete or built up



from the sets of parts now obtainable from wireless dealers. Almost any of the specially prepared crystals and "cat-whiskers" advertised will give excellent results if properly fitted and adjusted. In this connection I much prefer to have the "whisker" attached to the upper arm of a detector of the type shown in Fig. 3, the regular movement and fine adjustment thus obtainable proving very advantageous.

For a two crystal combination suitable for use with the detector shown in Fig. 3, I have never yet found anything to beat really good specimens of zincite (in the upper cup) and bornite. This combination has the additional advantage that

DON'T BE DISAPPOINTED!

If you are building your own set and not getting the best results, perhaps the material is defective. Only apparatus that has been well tested and approved by us is stocked. We are manufacturing a large range of receiving sets to conform with Government Regulations. These range from Crystal Sets to large Cabinets, and all carry our well-known brand "Radico." Have you tried our Radio Frequency Transformers? Perfect reception of those distant stations is assured by using these. A high grade transformer at a very small cost.

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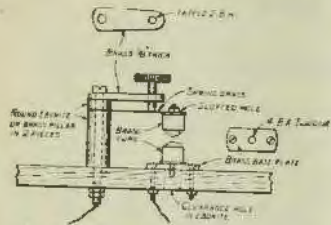


Fig. 2.—A "combination" detector employing two crystals; sometimes called a "perlan" detector.

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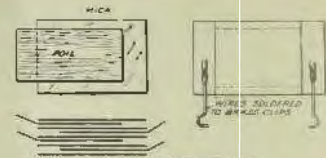


Fig. 3.—The arrangement of parts for making a telephone condenser.

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The small fixed condenser connected across the telephone receivers, as shown in Fig. 5, is not strictly necessary, but as considerable improvement is sometimes effected by its use, one should be made up consisting of four pieces of tinfoil each $\frac{1}{2}$ in. by $\frac{1}{4}$ in., separated by pieces of mica approximately 1-500th of an inch thick, two pieces of foil projecting at one end and two at the other, the actual area of the overlap being $\frac{1}{2}$ in. approximately. Two additional pieces of mica are placed above and below the assembled foils, and the projecting ends are bent over and secured in place by means of two brass strips bent to form clips, to which connecting wires are to be soldered as shown in Fig. 4.

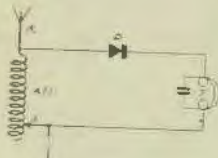


Fig. 4—A simple crystal receiver circuit.

THE COMPLETE SET.

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The advantage of the single-slide inductance is that there is only one tuning adjustment, and, as the slider is slowly moved from one end of the coil to the other, the complete range of wavelength is covered, and any transmission within receiving distance taking place upon a suitable wavelength should most certainly be received. The main disadvantage is that the tuning is not sufficiently selective. This, although a distinct advantage when searching for signals, means that if two stations are transmitting on slightly different wavelengths, one station may interfere considerably with the other.

MARCONI MAKING PROGRESS WITH HIS SHORT WAVES.

About a year ago Senator Marconi reported before a joint meeting of radio and electrical engineering societies, at a meeting in New York City, his interesting and apparently promising experiments in short-wave radio. He showed experimentally how the short waves could be reflected by an "electrical mirror" and sent in any desired direction, like light waves, and how easily they might be ab-

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From a recent interview given by Marconi to the London press it appears that he has been applying himself to the problem with very successful results. Although he did not mention short waves as the means he employed, reading between the lines of his interview we are forced to conclude that such was the case. "We have transmitted messages up to a distance of 2,500 miles, not only with much smaller power, but also far more cheaply than with the ordinary system of long-distance wireless," he said. "To send the message 2,500 miles took less power than the ordinary message from London to Paris. . . ."

Our best wishes are extended to the radio pioneer in this new field he is developing. We should ourselves be doing more, in this country, to open up this unexplored, but very promising, field of radio transmission.

Trimm "Dependable" Radio Head Set 2400 Ohms

EXPERIMENTERS - TRY THIS WONDERFULLY LOW PRICED 'PHONE

Price 32/6 each

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Obtainable from Radio House, 619 George St.; Anthony Hardern & Sons, Ltd., George St.; P. E. O'Sullivan, 296 Pitt St.; Ramsey Sharpe & Co., Ltd., 217 George St.; Radio Co., Ltd., 15 Loftus St.; The Colville-Moore Wireless Supplies, 10 Rowe St.; Wireless Supplies, Ltd., 21 Royal Arcade; Miss F. V. Wallace, 6 Royal Arcade; W. Harry Wiles, 60-62 Goulburn St.; and all Wireless Supply Houses.

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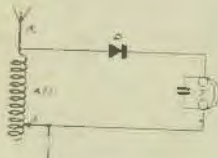


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Some Practical Data on Loop Reception.

(By R. D. Charlesworth, 2CL)

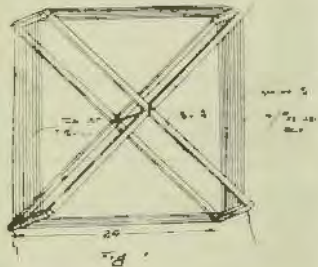
It is a usual fallacy that loop reception is only possible when using a multi-tube receiver employing stages of high-frequency amplification or when using a "super" circuit.

Being interested in long distance reception of experimental transmissions, the writer conducted a series of tests using the outdoor antenna and a receiver consisting of three valves employing low frequency amplification only.

Strong signals were secured in many cases, but static and howling valves were very serious drawbacks to efficient reception—on many nights reception over 500 miles being impossible.

In order to further the tests a loop was constructed 36 in. square. This was very soon reduced to 24 in. square (Fig. 1) for space reasons without any noticeable reduction in range and signal strength.

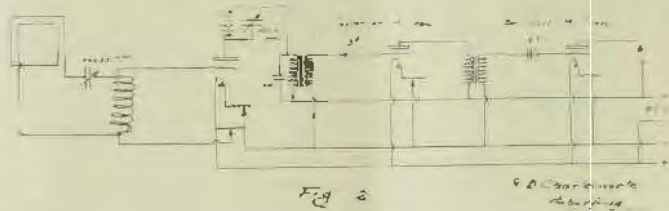
It will be as well to point out here that a great deal of the success ultimately attained was undoubtedly due to proper construction of the loop used.



This type of loop is only slightly directional and easier to use than the "pancake" or flat type.

The usual losses in faulty loop construction being excessive, high frequency resistance and distributed capacity, "Litz" wire was used. This was made up of 16 strands 28 D.C.C. wire, twisted in cable fashion.

Ten turns of this was wrapped round the frame, $\frac{1}{2}$ in. apart, no attempt being made to provide special insulation on the frame, this



not being necessary for indoor use. The circuit used was the same as employed on the antenna tests, namely, detector and two stages of low frequency amplification (Fig. 2). It was found that potentiometer control for grid potential was preferable to the usual condenser and leak, and many combinations of plate battery and grid potentials were tried before good results were obtained.

The receiver being in "good nick," the only difficulty to obtain results was found to be in tuning. This adjustment was most critical,

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RESULTS.

Many of the local radiophones were difficult to tune in, and only one or two were of sufficient strength to operate a loud speaker. Most successful reception was obtained from Mr. MacLureau (2C3L) who could be heard 50 feet away from the phones, using detector and one stage of low frequency amplification.

On one particular occasion recep

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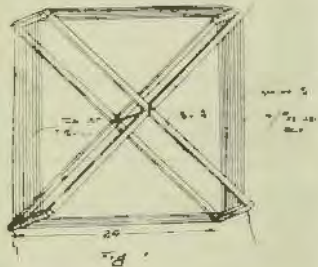
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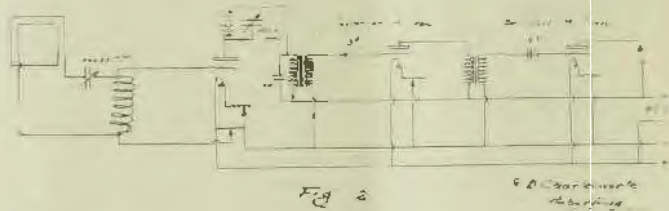
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WIRELESS WEEKLY

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On 200 and 400 metres, long distance reception was a pleasure. 4AA's (New Zealand), C.W. signals could be logged clearly and distinctly, whilst indistinct speech could be faintly heard. 3JA (Melbourne), and 5BY (South Australia), were also logged; as also was 4CW (Brisbane), on 250 metres (a harmonic of his correct wave length).

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WELL DESIGNED AERIAL IS VITAL.

IMPORTANT FACTORS ARE OUTLINED.

Although the receiving sets that are in use among the majority of broadcasting listeners to-day will function fairly on even poorly constructed aerials, it will surely improve matters if the antenna is well designed and the factors which constitute the design are known. The aerial is the source of energy which directly operates the receiver, and it is obvious that if we can increase the amount of energy collected by the antenna, through judicious design, we can thereby also increase the over-all efficiency of the receiver.

There are more factors entering into the problem of constructing a good aerial than one would imagine from a superficial glance at the subject. These factors include height, length, insulation, grounding, material, proximity to other objects, etc., on the requirements of which a brief resume will be given.

Height.—It is a well known fact that the higher above the earth's surface one is the greater is the degree of electrification of the atmosphere, varying with local conditions. By the way of an example an insulated antenna 400 feet high will soon become charged to a potential in the neighbourhood of ten thousand volts. This charge has to leak off in some way and will jump small gaps, such as the sepa-

To be continued next week

How It Feels to Broadcast

I have had six teeth extracted, ear-ache, neuralgia and a couple of carbuncles. I have looped and nose-dived in an aeroplane over New York City and raced in a roaring, death-defying speedster at the rate of 110 miles per hour. Not once, but many times. Sitting at the ringside it has been my function to watch champions fall from cruel killing blows calculated to annihilate anything save a well conditioned youth long trained to assimilate fearful physical punishment, but—I experienced the suprenist thrill of all a few nights ago when I stood before a silent staring diminutive disk at the other end (or was it the other end) of which, a conscienceless announcer explained, sat three or four hundred thousand radio nuts. It was the thrill that comes once in a lifetime. You tell 'em!

In my career as a newspaper cartoonist I have had many thousands of drawings published, but none is so indelibly stamped upon my memory as the first crude humble thing which a beneficent editor had the courage to print. Likewise I shall never forget my initial introduction to that devilish broadcasting instrument which threw me into a panic, the effects of which rise up in the night to cause cold beads of perspiration to moisten my burning pillow.

"Nothing to it at all—it's the cat's eyebrow," I said to my companion on our way to the station; she had broadcast once before, and therefore was a veteran.

"Well, I wouldn't go around boasting about it," she replied. "You've got a thrill coming to you."

"Blah—blah!" I returned, "I've talked before audiences in crowded auditoriums when you had to look 'em in the face. Anybody who has done that can certainly do this stuff when they are seated anywhere from one to one thousand miles out of sight."

"Well, you've got a shock due, that's all," she returned.

And I had. Perhaps fifty persons were in the reception room devoted to the talent. Artists about to broadcast and those who

had finished. Among them was a famous movie star, another a noted concert singer, another a distinguished orator, a full sized band and a miscellaneous flock of musicians. A few invited guests were present, too. All in all, it promised to be a large evening. I began to wonder if I had pulled a "bone" by accepting the request to speak that night. There was still time to withdraw, get a sudden headache or remember a previous appointment. Yes, but the newspapers had announced that I would speak over the radio at 9.30 p.m., and it was then 9.25. Too late to find an "out." Besides, the announcer grabbed me by the sleeve and exclaimed, "all ready." I felt very much the same sensation that a patient must feel when the nurse tells him to get ready for the operating room.

Many of my friends knew that I was elected to say something. Said they'd sure be listening in and all that sort of thing. The consciousness of this struck me like a blow. "This way please," the announcer said quietly, and held a door open, and closed it when I was safely in. In that small but heavily draped awe inspiring room, not more than eight by eight in dimensions, waited six or seven visitors to watch the performance, and perhaps witness my personal debacle.

"Sit down in this chair please," directed the announcer in the tone of the dentist when he says "now open wide." I obeyed implicitly. "I am going to have the Moon Man introduce you first and then I will follow with another introduction. Savy?" I instinctively searched about for a funny-looking Moon Man. Instead I saw a chic young fellow attired in a tuxedo. He was the Moon Man and was going to a dance later, so it seems. For a moment all was quiet. Nothing could be heard except the wild pulsations of my panicky heart against the third rib. Then the announcer's voice shouted "All ready—on." Someone outside threw on a switch and the wire or wireless was open. I remember

Continued on page 17

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To be continued next week

How It Feels to Broadcast

I have had six teeth extracted, ear-ache, neuralgia and a couple of carbuncles. I have looped and nose-dived in an aeroplane over New York City and raced in a roaring, death-defying speedster at the rate of 110 miles per hour. Not once, but many times. Sitting at the ringside it has been my function to watch champions fall from cruel killing blows calculated to annihilate anything save a well conditioned youth long trained to assimilate fearful physical punishment, but—I experienced the suprenist thrill of all a few nights ago when I stood before a silent staring diminutive disk at the other end (or was it the other end) of which, a conscienceless announcer explained, sat three or four hundred thousand radio nuts. It was the thrill that comes once in a lifetime. You tell 'em!

In my career as a newspaper cartoonist I have had many thousands of drawings published, but none is so indelibly stamped upon my memory as the first crude humble thing which a beneficent editor had the courage to print. Likewise I shall never forget my initial introduction to that devilish broadcasting instrument which threw me into a panic, the effects of which rise up in the night to cause cold beads of perspiration to moisten my burning pillow.

"Nothing to it at all—it's the cat's eyebrow," I said to my companion on our way to the station; she had broadcast once before, and therefore was a veteran.

"Well, I wouldn't go around boasting about it," she replied. "You've got a thrill coming to you."

"Blah—blah!" I returned, "I've talked before audiences in crowded auditoriums when you had to look 'em in the face. Anybody who has done that can certainly do this stuff when they are seated anywhere from one to one thousand miles out of sight."

"Well, you've got a shock due, that's all," she returned.

And I had. Perhaps fifty persons were in the reception room devoted to the talent. Artists about to broadcast and those who

had finished. Among them was a famous movie star, another a noted concert singer, another a distinguished orator, a full sized band and a miscellaneous flock of musicians. A few invited guests were present, too. All in all, it promised to be a large evening. I began to wonder if I had pulled a "bone" by accepting the request to speak that night. There was still time to withdraw, get a sudden headache or remember a previous appointment. Yes, but the newspapers had announced that I would speak over the radio at 9.30 p.m., and it was then 9.25. Too late to find an "out." Besides, the announcer grabbed me by the sleeve and exclaimed, "all ready." I felt very much the same sensation that a patient must feel when the nurse tells him to get ready for the operating room.

Many of my friends knew that I was elected to say something. Said they'd sure be listening in and all that sort of thing. The consciousness of this struck me like a blow. "This way please," the announcer said quietly, and held a door open, and closed it when I was safely in. In that small but heavily draped awe inspiring room, not more than eight by eight in dimensions, waited six or seven visitors to watch the performance, and perhaps witness my personal debacle.

"Sit down in this chair please," directed the announcer in the tone of the dentist when he says "now open wide." I obeyed implicitly. "I am going to have the Moon Man introduce you first and then I will follow with another introduction. Savy?" I instinctively searched about for a funny-looking Moon Man. Instead I saw a chic young fellow attired in a tuxedo. He was the Moon Man and was going to a dance later, so it seems. For a moment all was quiet. Nothing could be heard except the wild pulsations of my panicky heart against the third rib. Then the announcer's voice shouted "All ready—on." Someone outside threw on a switch and the wire or wireless was open. I remember

Continued on page 17

known as the "Trimma Dependable."

Those experimenters who have already had an opportunity of testing the now well-known "Professional" headset, speak well of their sensitivity, and Messrs. O. H. O'Brien and Nicholl, of 37-39 Pitt Street, Sydney, who are sole agents for this line, claim that, although the new "Dependable" set has been designed by the "Trimma" engineers primarily to meet the demands of the limited pocket-book, the high standard of construction, generally, has been maintained.

The "Dependables" are wound with 40 gauge enamelled copper wire to a total resistance of 2400 ohms, each layer being carefully separated and insulated from its neighbour, and the ends of the windings soldered to lugs, which also form a minute gap, and serves to protect the receivers from static discharges.

The cases are made of metal, and the magnets, which are shaped from a tungsten steel bar, are practically everlasting, but, most important of all is the diaphragm, which is specially designed to vibrate at a very low natural period, reproducing the voice with correct articulation, and music without distortion.

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The receiver was in charge of Mr. J. N. Bald, who was the originator of the wireless part of the scheme.

The concerts were greatly appreciated by the afflicted ones, some of whom have been bedridden for years, and clearly shows the boon the radio will become to those compelled to spend many a weary day

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Flower day was inaugurated at the suggestion of "The News," the evening paper, recently opened up in Adelaide, and was a wonderful success. It is estimated that twenty tons of flowers were distributed.

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Mr. A. H. Perritt, wireless instructor of the I.C.S., gave a very interesting lecture of batteries. The lecturer started by explaining the action of a simple cell and gave the principle of all types of cells and the action of accumulators. Chemical formula were given to show what takes place in an accumulator when in charged and discharged action.

He explained the action of chemical rectifiers, for half and full wave rectification of alternating

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Members moved a hearty vote of thanks to Mr. Perritt, whose lecture was of great interest to wireless experimenters.

The club meets every Saturday evening at 7.30 p.m., at the club rooms, "Rockleigh," Lang Street, Croydon, and the Hon. Secretary will be pleased to have communications from any one requiring information. All should be addressed to G. Maxwell Cutts, "Carwell," Highbury St., Croydon.

LEICHHARDT AND DISTRICT RADIO SOCIETY.

The 52nd general meeting of the Leichhardt and District Radio Society was held in the Club-room, 176 Johnston St., Annandale, on Tuesday last, at 8 p.m., when the newly elected President, Mr. H. Kirkpatrick, took the chair for the first time.

Several important matters were dealt with, including the matters of

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Rheostats, 30 ohms	0 8 6
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**21 ROYAL ARCADE
SYDNEY.**

a proposed means of identification of communication between amateur stations in various countries as put forward by the American Radio Relay League, and the question of the construction of the Society's receiving set which is to be gone on with immediately, it being expected that it will be ready for use before the middle of next month, perhaps earlier.

It was announced that a lecture would be delivered by Mr. Perritt, of the International Correspondence Schools at the following meeting, and, at the meeting to be held on October 30th, another lecture would be delivered by Mr. Mann. Both lectures promise to be extremely interesting and a good attendance of members is anticipated on each occasion.

Correspondence is invited from persons interested in the activities of the Society, and same should be addressed to the Hon. Secretary, Mr. W. J. Zech, 145 Booth St., Annandale.

The Society meets every Tuesday night at the club-room, 176 Johnston Street, Annandale. Meetings commence at 8 p.m.

How it feels to Broadcast.

(continued from page 13)

vaguely hearing the voice of the Moon Man speaking into that fearful little disc. Like a voice far away in the wilderness I heard my name mentioned. Then he arose and the announcer talked to what seemed to be himself. It was impossible that that silent little instrument was carrying his voice over mountains and states into cities and hamlets, into palatial homes and snug farmhouses buried in the hills.

Many flattering phrases the announcer tossed over the air in his introduction; I didn't know I was so good. I heard him say "famous, well known, distinguished." Then I thought he was talking about someone else. Finally I heard my name paged and then a nudge from him. I was to begin.

The perspiration began to pour in streams from my hand and forehead. It filled my eyes. At first I thought it was because of the heat of the room, but it wasn't. It was simply a good old nervous sweat, the sort you get when passing a country graveyard at midnight. The papers in my hand

shook, for I had taken the precaution of writing my "talk" on foolscap. "Good evening ladies and gentlemen," I managed to blurt (having heard the announcer use that line as a stock phrase). There was no response. Somehow or other one expected an answer. Instead, that mute disc just stared. It seemed so utterly stupid to be talking into that thing-a-ma-jig at the other end of which there was no sign of life. Subconsciously the impression prevailed that I, of all radio broadcasters, was not being heard, that this was the one time the blooming thing was not working. Instead, I was simply chattering to myself. But I continued on, not daring to stop for fear it was working. How utterly cold and dead one's voice seemed in that heavily blanketed little room. But one can get used to anything in time, even hanging, and as I progressed I regained much of my normal composure. So much so in fact that I didn't want to cease. I was like a speaker who becomes so wrapped up in his subject that only an indignant snore apprises him that he was through long before. Glancing hastily at my watch, I found that I had been talking 15 minutes. Outside in an ante room

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MARRICKVILLE AND DISTRICT RADIO CLUB.

At the club's room, in the School of Arts, Illawarra Road, Marrickville, on the 15th instant, a most interesting lecture was given to the above club by Mr. C. H. Gorman, of Trans-Pacific fame.

Mr. Gorman lectured on short wave non-regenerative receivers, starting on a simple non-regenerative circuit, Mr. Gorman drew comparisons with various other types. The principles of reaction were explained in a very lucid manner, and the methods of control were extolled at length. Many circuits were drawn on the blackboard, and their virtues explained, and Mr. Gorman gave a history of his experiences on the Trans-Pacific Tests. Altogether a most enjoyable evening was spent. The secretary wishes to point out that only experimental license holders are eligible for membership to this club. There are a few vacancies at present, and intending members are asked to write or call on A. W. Hemming, 23 Central Avenue, Marrickville.

At the School of Arts, in Illawarra Road, Marrickville, on the 8th instant, the usual meeting of the above club was held. Mr. W. L. Hamilton presided.

To enable Mr. J. W. Robinson, who was the lecturer for the evening, to be back in the city at an early hour, it was agreed to suspend standing orders and request Mr. Robinson to address the club.

The subject of the lecture, "How a Ship's Set Transmits," was handled very well indeed. Mr. Robinson, with the aid of the blackboard, illustrated his subject as he went along.

Beginning with the standard 1½ K.W. Marconi set, the lecturer proceeded to explain the circuits, drew comparisons with the Telefunken set, and explained the advantages of the combined Marconi-Telefunken set.

Mr. Robinson treated his subject so well that after he had answered a few questions and taken his de-

parture, the members of the club unanimously adopted the Oliver Twist tactics of asking for more. The publicity officer was requested to approach Mr. Robinson and invite him along again.

The formal business was then proceeded with.

CORRESPONDENCE.

INTERSTATE REPORTS.

Dear Sir,

As I am a licensed amateur transmitting station in Victoria, I would like to offer the following as a suggestion for your publication.

When the Victorian amateurs are transmitting, we always like to get reports from other States, and if each amateur sent his receiving results to your representative, in each State, for publication, it would give the transmitters some idea of their results.

On repeated occasions I know experimenters who listen to the N.S.W. and S.A. amateurs, and perhaps think nothing more about it, whereas a short report on the test would be of great assistance to the transmitter.—Yours truly,

"3BC"

WIRELESS MUSIC.

IN NEWCASTLE PARKS.

COUNCIL PROPOSALS.

With a view to following up their inquiries into the Council's proposal of installing receiving sets in the parks to receive wireless broadcasting as a method of popularising the Newcastle parks, Mr. Glassop, the Town Clerk, and Mr. Shine, the City Engineer, on Sunday night paid a visit to Mr. N. P. Olsen's wireless station at Waratah, for a practical demonstration and to make further inquiries into their scheme.

During the course of the night's entertainment, Mr. Glassop spoke through the radiophone to all "listeners in" and their friends, congratulating them on the success of their hobby, and outlining roughly the Council's scheme. Mr. Glassop underestimated the number of people listening, when in the course of his speech he asked all those who heard him to ring him by phone, and it was not very long before Mr. Glassop was sincerely sorry that he made this request.

The conditions for the reception of wireless on Sunday night (14th instant) were exceptionally good, the air being absolutely free from

atmospheric disturbances, and every report unanimously described Mr. Glassop's speech, also the music, as perfect.

ILLAWARRA RADIO CLUB.

It is a good thing occasionally to leave the beaten track and relax from the formalities of club-meeting routine, and allow the free and easy spirit to more or less pervade the club-room; formal procedure is apt at times to become a trifle irksome, and a little freedom from "Mr. Chairman's" ruling now and then is a welcome break. This was proved at the last (33rd) general meeting of the club, held at the club room, on the 9th instant, the occasion being an informal "smoke and social evening," which attracted a good attendance of members and visitors. Business formalities were absolutely taboo, and members were free to compare notes and discuss matters wireless and otherwise to their heart's content, as well as to enjoy the music of various kinds which was supplied. The pianola (by kind permission of Host McNeil) was pressed into service, and dispensed some excellent music of popular fancy, Mr. S. Atkinson operating, and Mr. Kirkby also gave several items on the banjo, which were appreciated.

Wireless music was also in evidence, Mr. Smith using his four-valve neodyne receiver, with a magnavox, and Mr. Gorman also having his efficient valve set in operation. Unfortunately, however, B battery trouble militated against the best being got out of the sets, but the results were on the whole very fair. 2GB, Mr. Marks, Rose Bay, very kindly sent the music for the occasion, which was much appreciated.

During the evening those present adjourned to the next room, where a very tastefully arranged supper was laid out by Mrs. McNeil, to which ample justice was done by the members. A hearty vote of thanks was accorded to Mr. and Mrs. McNeil for the trouble they had gone to in the matter.

All present spent an altogether enjoyable evening, and occasions of this kind now and again should prove a both popular and profitable factor in the club's progress.

Several parties from the club have recently had the pleasure (by courtesy of Amalgamated Wireless, Ltd.) of paying visits of inspection to Sydney Radio Station, Pen-

a jazz band was tuning up and waiting its turn. I concluded and for a second waited. No hisses, no applause greeted my weak efforts. I didn't know whether I had "gone over" or not; I still do not know. At any rate the experience has been mine. I shall put it down in the scrap book of thrills.

Good evening ladies and gentlemen.

Quizz Queries and Ready Replies

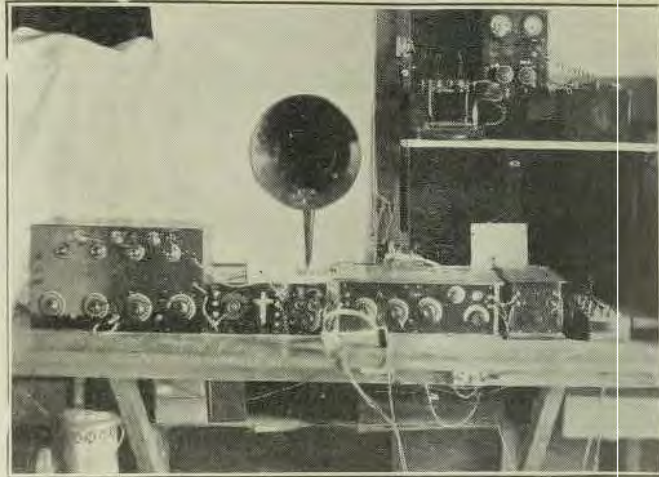
(By I. R. TANNEHILL.)

Useless questions addressed to this department will receive prompt answers as pointed as a jab in the eye with a sharp stick. No attention will be paid to questions not accompanied by money, postage, radio apparatus or snooking tobacco.

Q.: I have an aerial across the back yard, 100 feet long, and a lead-in wire 75 feet to the kitchen, and 40 feet along the wall to the living room. I cannot hear Kansas City, which is 1,000 miles away. Do you think I should move the set nearer the aerial? Faraway.

A.: No, you should move the set nearer to Kansas City.

Q.: Last night I went to my sweetheart's home, with a single tube receiving set and tried to



The Receiving Set used for Long Distance Receiving

make a hit with her father, who is a radio fan. I could get only local stations, and he kicked me out of the house. I am going back tonight. What would you advise to improve receiving conditions? B. V. D.

A.: Try a good geography in parallel with the seat of your trousers.

Q.: What are peepholes for? Curious.

A.: Take our advice and let peepholes alone. Remember the old adage: a sock in the eye is worth two on the foot.

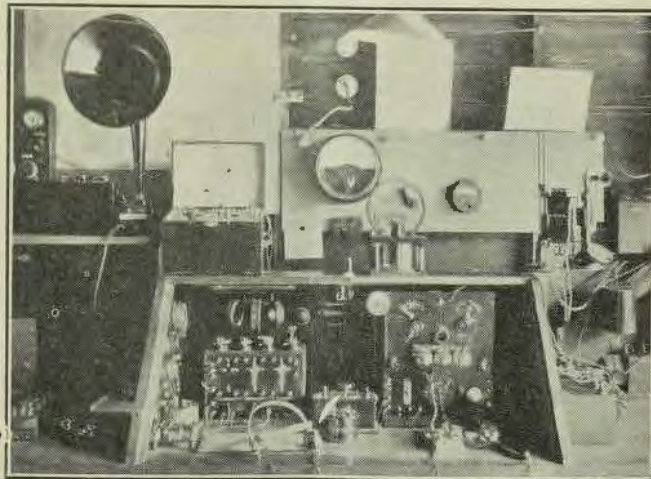
Q.: I cannot get my regenerative receiver to oscillate without wetting my fingers and touching them to the binding post of my condenser. This does not always work. Is there any easier way of bringing about the oscillating condition? Gunchever.

A.: Try throwing a couple of wet towels across your ground clamp.

Q.: I have been using my neighbour's clothes line for an aerial, but never could tune below 400 metres on Mondays. Have found that this is because they hang out his shirt, pair of socks and their sheets on the line every Monday. I want to tune on 360. Worried.

A.: Connect the socks in parallel, the sheets in series and take a lead-in from the fifth button on the bosom of the shirt. If it is a stiff shirt, your tuning will be very selective on 360 metres.

Q.: Last week I began getting signals backward. The station would sign off and then begin the programme. Is it possible that I have reversed my tickler coil, thus getting the back end of the pro-



The Low Power Set used by Mr. MacLurcan for his Sunday Night Concerts

nant Hills, and also to the company's experimental studio, where some very interesting and enlightening hours were spent. Many things of interest were to be seen at both places, and the club acknowledges with thanks the courtesy with which they were received by Mr. Chilton and his staff at VRS, and by Mr. Cookson, at the company's studio, and for the ready and willing manner in which these various gentlemen explained all points of interest.

The committee are still considering ways and means of improving the club sets, and hopes shortly to take some definite steps in this direction.

The next meeting of the club will be held at the club-room, 75 Montgomery Street, Kogarah, on Tuesday, 23rd October, at 8 p.m. There will be a lecture on "Harmonics," by Mr. Watkin Brown, and Mr. S. V. Colville (organising secretary of the Australasian Amateur Radio Relay League), also hopes to be present and give a talk on the League. A cordial invitation is extended to members and others interested, particularly from other clubs, to be present.

All members desiring buzzer practice are asked to take advantage of the class which is now running at the club-room, from 7.30 to 8 o'clock on all the regular meeting nights.

The club wants the support of all local experimenters, and the secretary would be pleased to hear from any such who are not yet members, with a view to their joining up, and he will be pleased to supply any particulars concerning the club. Address: Mr. W. D. Graham, 44 Cameron Street, Rockdale.

KILLARA RADIO CLUB.

The twelfth general meeting of the Killara Radio Club was held on the 12th instant, Dr. Greenwell taking the chair. After the correspondence had been read and received, two lectures were delivered, Mr. Gray talking on "Valves," and Mr. Hurl on "Amplifiers."

A debate between members of the club has been arranged for the next meeting, and any experimenters who would like to come along will be very welcome; the club meets at 8 p.m., in the Congregational Hall, Florence Street, Killara, every second Friday. For enquiries ring 22661.

CONCORD AMATEUR RADIO CLUB.

A general meeting of the Concord Amateur Radio Club was held on the 11th October, 1923, at the residence of Mr. Barker, Wallace Street, Concord. After the minutes of the previous annual meeting had been read and confirmed, and some correspondence read, Mr. H. Taylor gave some very interesting hints on tuners. The management committee had decided to retain the buzzer practice as usual, and a good half hour of this was given to the members.

Listening in was carried out from 8.30 till 9 p.m. The meeting then adjourned.

The club meets weekly (every Thursday, at 7.30 p.m.), at the above address. Concord and district experimenters who do not belong to the club are invited to come along.

All communications should be addressed to W. H. Barker, honorary secretary, "Entipodis," Wallace Street, Concord.

NEW "TRIMM" HEADSET.

Wireless enthusiasts will be glad to learn that there is now available a new grade of "Trimm" headset.

REDUCED PRICES

Valves:	Mullard	. . .	25s.
	Ediswan	. . .	25s.
	Cossor	. . .	25s.
	Phillips	. . .	25s.
	Marconi R	. . .	25s.
	Annaka 2 filament		30s.
	Cunningham 301a		42s. 6d.
Holder:	English	. . .	2s. 6d.
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known as the "Trimma Dependable."

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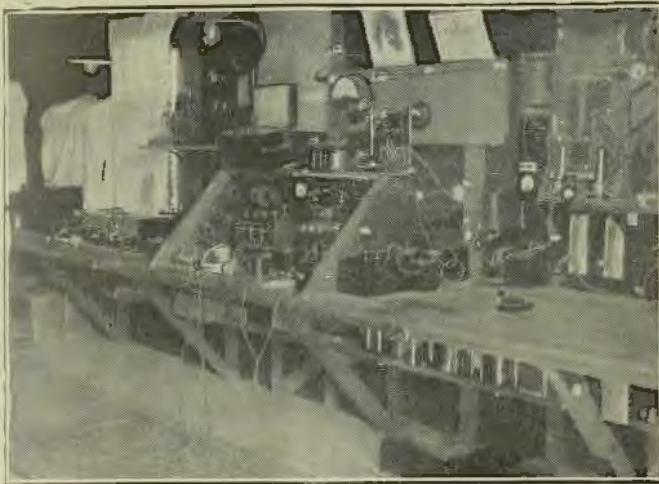
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**21 ROYAL ARCADE
SYDNEY.**



General View of No. 1 Side of 2C MS Wireless Room

genuine in front? Upset.

A.: It is hard to say without seeing your set. Perhaps your aerial and ground leads are interchanged. Try a left handed grid condenser and reverse your "A" battery. If static is hind side before, reverse everything; or maybe your tube backfires.

Q.: I have built a reflex set that the diagram says is portable; one stage audio and one radio. It takes 135 volts on the plate. The storage battery weighs 50 pounds, and the "B" batteries weigh 25 pounds. What do you use in this set to make it portable? Under Weight.

A.: Try a good wheelbarrow in series with the antenna.

Q.: Three times last week white tuning in a faint station my aeriols come down. What can I get to keep them up? Mortified.

A.: Try a good pair of suspenders.

Q.: My sweetheart and I have a receiving set, and he comes down every night to listen in. It has only one tuning dial. Do you think he could do better if he had two dials to turn? Lovestick.

A.: No, sister, the one turn control is the thing.

Q.: I have a detector and two-stage, using the water pipe for a

ground and an outside aerial. What can I do to make this set portable? Carry It.

A.: Mount the receiver on the dashboard of a good motor truck, and load the aerial, house plumbing, batteries, water plug, and about 200 feet of the sewer system in the rear of the truck.

H. F. TRANSFORMERS.

There is no doubt that, where only one stage of H.F. amplification is used for short-wave reception, there is nothing to hold candle to the reactance-capacity method of coupling, which gives longer range and greater signal strength than any other. When, however, the number of H.F. valves is increased, the tuned-anode becomes increasingly difficult to handle, on account of its tendency to fall into self-oscillation.

Two stages can be used by an expert; three make the set so unstable that, unless heavy damping is resorted to, it is almost impossible to use them without the occurrence of frequent and violent oscillation.

Though less efficient, the copper-wound transformer has the advantage of being not so liable to cause trouble. If, however, two or three tuned transformers are used, the tendency of self-oscillation will be marked.

The simplest solution of the difficulty is to use transformers wound, not with copper, but with resist-

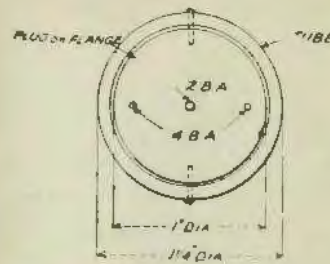


Fig. 7.—Dimensions for end pieces.

ance wire. The introduction of a series resistance into an oscillatory circuit has the effect of flattening out the resonance curve; it also reduces the efficiency of the circuit to some extent owing to the resistance offered to oscillations not in resonance with it, for which in theory there should be an absolutely free path.

At first sight, then, the resistance-wound transformer would seem to entail loss of both selectivity and efficiency in amplification. In practice, however, neither of these effects is noticeable. Neither tuned



Fig. 8.—The complete winding.

anodes nor tuned transformers can be allowed to display their full powers on the multi-valve set. Selectivity is reduced by the necessity for detuning slightly in order to avoid oscillation, and efficiency as regards amplification suffers owing to the damping that must be introduced to control them.

The resistance-wound transformer has an optimum wave length, but as its resonance curve is very flat, there is no marked "peak," and it will work efficiently over a wide band. Since it has practically no tendency towards oscillation, hardly any damping is necessary, so that each transformer can be allowed to give its fullest measure of amplification. Thus, for long-distance reception on the shorter wave lengths three or even four H.F. valves can be used with no great difficulty, potentiometer control being all that is needed.

a proposed means of identification of communication between amateur stations in various countries as put forward by the American Radio Relay League, and the question of the construction of the Society's receiving set which is to be gone on with immediately, it being expected that it will be ready for use before the middle of next month, perhaps earlier.

It was announced that a lecture would be delivered by Mr. Perritt, of the International Correspondence Schools at the following meeting, and, at the meeting to be held on October 30th, another lecture would be delivered by Mr. Mann. Both lectures promise to be extremely interesting and a good attendance of members is anticipated on each occasion.

Correspondence is invited from persons interested in the activities of the Society, and same should be addressed to the Hon. Secretary, Mr. W. J. Zech, 145 Booth St., Annandale.

The Society meets every Tuesday night at the club-room, 176 Johnston Street, Annandale. Meetings commence at 8 p.m.

How it feels to Broadcast.

(continued from page 13)

vaguely hearing the voice of the Moon Man speaking into that fearful little disc. Like a voice far away in the wilderness I heard my name mentioned. Then he arose and the announcer talked to what seemed to be himself. It was impossible that that silent little instrument was carrying his voice over mountains and states into cities and hamlets, into palatial homes and snug farmhouses buried in the hills.

Many flattering phrases the announcer tossed over the air in his introduction; I didn't know I was so good. I heard him say "famous, well known, distinguished." Then I thought he was talking about someone else. Finally I heard my name paged and then a nudge from him. I was to begin.

The perspiration began to pour in streams from my hand and forehead. It filled my eyes. At first I thought it was because of the heat of the room, but it wasn't. It was simply a good old nervous sweat, the sort you get when passing a country graveyard at midnight. The papers in my hand

shook, for I had taken the precaution of writing my "talk" on foolscap. "Good evening ladies and gentlemen," I managed to blurt (having heard the announcer use that line as a stock phrase). There was no response. Somehow or other one expected an answer. Instead, that mute disc just stared. It seemed so utterly stupid to be talking into that thing-a-ma-jig at the other end of which there was no sign of life. Subconsciously the impression prevailed that I, of all radio broadcasters, was not being heard, that this was the one time the blooming thing was not working. Instead, I was simply chattering to myself. But I continued on, not daring to stop for fear it was working. How utterly cold and dead one's voice seemed in that heavily blanketed little room. But one can get used to anything in time, even hanging, and as I progressed I regained much of my normal composure. So much so in fact that I didn't want to cease. I was like a speaker who becomes so wrapped up in his subject that only an indignant snore apprises him that he was through long before. Glancing hastily at my watch, I found that I had been talking 15 minutes. Outside in an ante room

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Dictograph 3000 ohms Head Sets

Their use on any Receiving Set, Crystal Detectors or Valves improves reception immeasurably

57/6 Complete

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Crystal Valves, Dials, Rheostats, Transformers etc.

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1 Door from Pitt Street

The writer does not know of any firm from whom resistance wound transformers can be purchased ready-made, but they are so extremely simple to construct that anyone can make them up at home. The wire used in No. 42 H.B. double silk covered "Eureka," The price, £2/10/- per lb. looks at first formidable, but as it runs something over three miles to the pound, and each transformer for broadcast wave lengths requires only about fifty yards, a single ounce will suffice for making quite a number.

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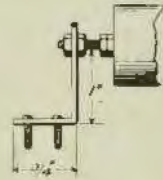


Fig. 9.—Clip for mounting the transformer.

internal diameter of 1 in. Two end pieces are made from 1/2 in. ebonite; it does not matter in the least whether they are made as plugs to fit into the tube, or as flanges fixed to its ends. In either case each must have a central hole to take a 2 B.A. rod, and two others for 4 B.A. screws, or small terminals (see Fig. 7). The end pieces are fixed in position by means of a couple of 4 B.A. screws.

A 5 in. length of 2 B.A. screwed rod is now passed through the central holes in the end pieces and secured in place by means of a nut at each end.

The former can now be mounted in the lathe for winding. If a lathe is not available fix the breast drill in the vice by means of its lug or horizontal handle, and insert one end of the 2 B.A. rod into its chuck.

Attach the end of the reel of wire to one of the screws on the end piece and wind on 250 turns as closely and as evenly as possible. Snip off the wire and attach it to the screw on the far end-piece corresponding to the "in" end on the near one. As this winding will occupy about 2 in., it may be started 1/2 in. from the end of the tube. To prevent the wire slipping, it should be given a thin coat of shellac varnish.

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The projecting ends of the brass rod provide a convenient means of mounting the transformer on the underside of the panel. A pair of clips, as shown in Fig. 9, can be made from sheet brass.

If it is desired to make transformers of various sizes which can be slipped easily into place, the spindle may be removed when the winding has been done and a different mounting made. Fig. 10 shows the details of this.

The windings given have an optimum wave length of about 400 metres; they will deal quite effectively with transmissions on wave lengths from 300 to 500 metres and may be found to cover an even wider band. The following table shows the primary windings necessary for higher wave lengths; the secondary will usually contain about 20 per cent. more. The reader may find that his particular set requires either rather fewer or rather more turns than those given, for much depends upon the capacities existing in the set itself and upon the valves used.

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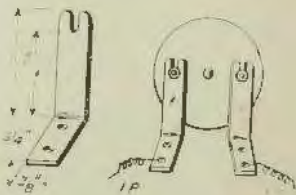
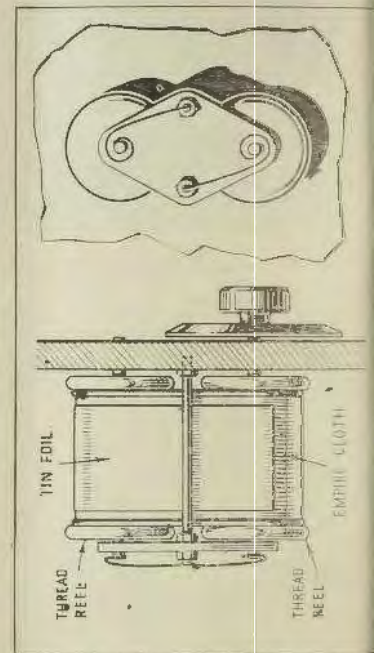


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Published by W. J. Macdardy, of 58 Murdoch St., Crenorne, for the Proprietors, at the offices of Publicity Press Ltd., 33/37 Regent St., Sydney.

a jazz band was tuning up and waiting its turn. I concluded and for a second waited. No hisses, no applause greeted my weak efforts. I didn't know whether I had "gone over" or not; I still do not know. At any rate the experience has been mine. I shall put it down in the scrap book of thrills.

Good evening ladies and gentlemen.

Quizz Queries and Ready Replies

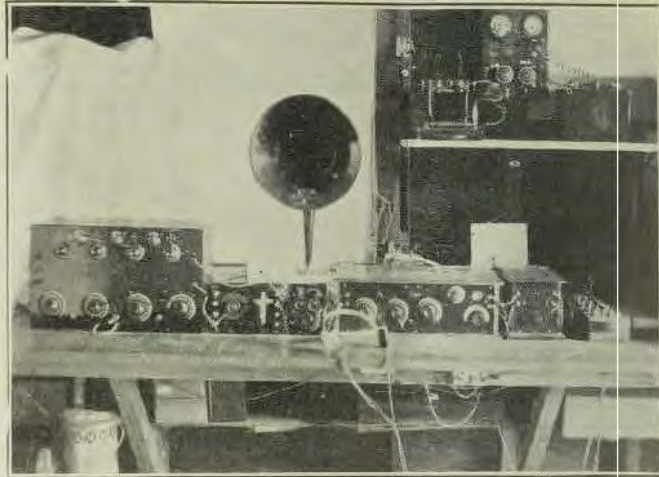
(By J. R. TANNEHILL.)

Useless questions addressed to this department will receive prompt answers as pointed as a jab in the eye with a sharp stick. No attention will be paid to questions not accompanied by money, postage, radio apparatus or snooking tobacco.

Q: I have an aerial across the back yard, 100 feet long, and a lead-in wire 75 feet to the kitchen, and 40 feet along the wall to the living room. I cannot hear Kansas City, which is 1,000 miles away. Do you think I should move the set nearer the aerial? Faraway.

A: No, you should move the set nearer to Kansas City.

Q: Last night I went to my sweetheart's home, with a single tube receiving set and tried to



The Receiving Set used for Long Distance Receiving

make a hit with her father, who is a radio fan. I could get only local stations, and he kicked me out of the house. I am going back tonight. What would you advise to improve receiving conditions? B. V. D.

A: Try a good geography in parallel with the seat of your trousers.

Q: What are peepholes for? Curious.

A: Take our advice and let peepholes alone. Remember the old adage: a sock in the eye is worth two on the foot.

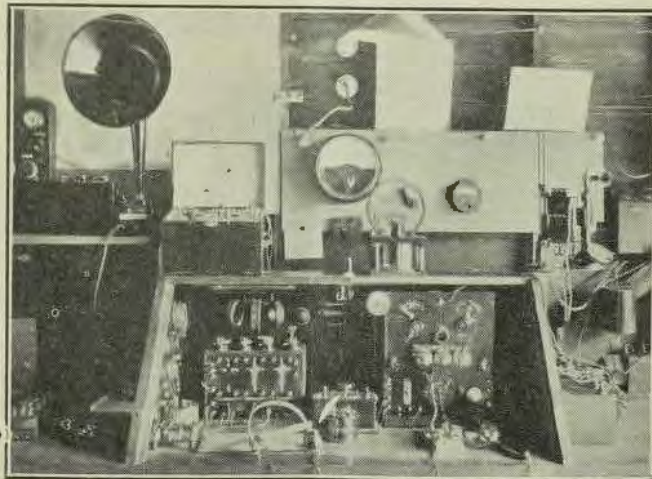
Q: I cannot get my regenerative receiver to oscillate without wetting my fingers and touching them to the binding post of my condenser. This does not always work. Is there any easier way of bringing about the oscillating condition? Gunchever.

A: Try throwing a couple of wet towels across your ground clamp.

Q: I have been using my neighbour's clothes line for an aerial, but never could tune below 400 metres on Mondays. Have found that this is because they hang out his shirt, pair of socks and their sheets on the line every Monday. I want to tune on 360. Worried.

A: Connect the socks in parallel, the sheets in series and take a lead-in from the fifth button on the bosom of the shirt. If it is a stiff shirt, your tuning will be very selective on 360 metres.

Q: Last week I began getting signals backward. The station would sign off and then begin the programme. Is it possible that I have reversed my tickler coil, thus getting the back end of the pro-



The Low Power Set used by Mr. MacLurcan for his Sunday Night Concerts

October 26, 1933

WIRELESS WEEKLY

WIRELESS APPARATUS OF 100% EFFICIENCY

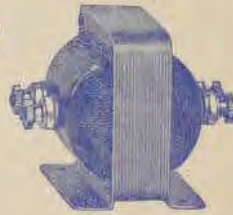
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Moulded Variometer, with Knob and Dial, £2.
Wood Type £1/12/6

Condensers

5 Plate	£0 10 6
13 Plate	0 16 6
23 Plate	1 1 0
43 Plate	1 7 6



Transformers . . . 27/6
Shielded Type . . . 37/6

Knobs and Dials 4 - and 5/6 extra

Col-mo Variable Condensers

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We are now specialising in the ready Assembled Condenser, which is selling at the same price as the previous knock-down prices.

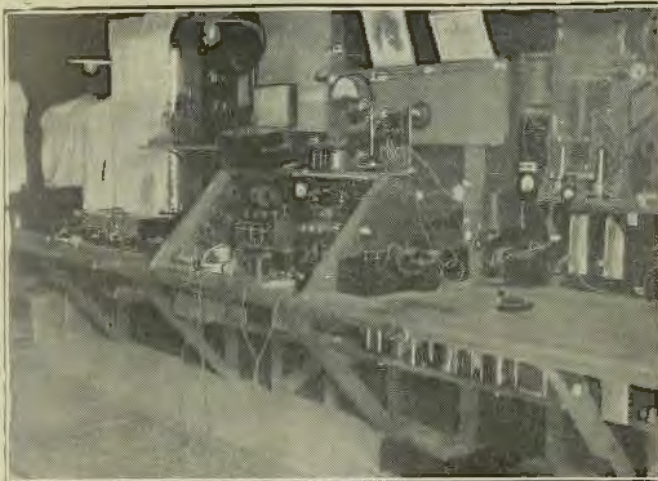
The New Prices of Col-mo Condensers are the Best ever offered

No. Plates	Capacity	K.D.	Assembled
3	.0001	6/6	7/6
5	.0002	7/6	8/6
9	.0003	8/6	10/
17	.0006	11/	12/6
25	.0008	13/6	15/6
35	.001	16/	18/6
.0006	with Vernier adjustment		£1 0 0
.0008	with Vernier adjustment		1 3 0
.001	with Vernier adjustment		1 6 0

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PHONE B2261



General View of No. 1 Side of 2C MS Wireless Room

genuine in front? Upset.

A.: It is hard to say without seeing your set. Perhaps your aerial and ground leads are interchanged. Try a left handed grid condenser and reverse your "A" battery. If static is hind side before, reverse overwinding; or maybe your tube backfires.

Q.: I have built a reflex set that the diagram says is portable; one stage audio and one radio. It takes 135 volts on the plate. The storage battery weighs 50 pounds, and the "B" batteries weigh 25 pounds. What do you use in this set to make it portable? Under Weight.

A.: Try a good wheelbarrow in series with the antenna.

Q.: Three times last week white tuning in a faint station my aeriols come down. What can I get to keep them up? Mortified.

A.: Try a good pair of suspenders.

Q.: My sweetheart and I have a receiving set, and he comes down every night to listen in. It has only one tuning dial. Do you think he could do better if he had two dials to turn? Lovesick.

A.: No, sister, the one turn control is the thing.

Q.: I have a detector and two-stage, using the water pipe for a

ground and an outside aerial. What can I do to make this set portable? Carry It.

A.: Mount the receiver on the dashboard of a good motor truck, and load the aerial, house plumbing, batteries, water plug, and about 200 feet of the sewer system in the rear of the truck.

H. F. TRANSFORMERS.

There is no doubt that, where only one stage of H.F. amplification is used for short-wave reception, there is nothing to hold candle to the reactance-capacity method of coupling, which gives longer range and greater signal strength than any other. When, however, the number of H.F. valves is increased, the tuned-anode becomes increasingly difficult to handle, on account of its tendency to fall into self-oscillation.

Two stages can be used by an expert; three make the set so unstable that, unless heavy damping is resorted to, it is almost impossible to use them without the occurrence of frequent and violent oscillation.

Though less efficient, the copper-wound transformer has the advantage of being not so liable to cause trouble. If, however, two or three tuned transformers are used, the tendency of self-oscillation will be marked.

The simplest solution of the difficulty is to use transformers wound, not with copper, but with resist-

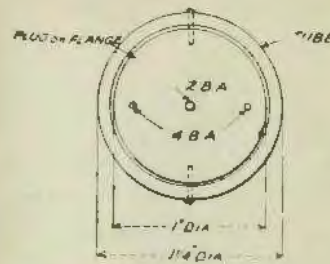


Fig. 7.—Dimensions for end pieces.

ance wire. The introduction of a series resistance into an oscillatory circuit has the effect of flattening out the resonance curve; it also reduces the efficiency of the circuit to some extent owing to the resistance offered to oscillations not in resonance with it, for which in theory there should be an absolutely free path.

At first sight, then, the resistance-wound transformer would seem to entail loss of both selectivity and efficiency in amplification. In practice, however, neither of these effects is noticeable. Neither tuned



Fig. 8.—The complete winding.

anodes nor tuned transformers can be allowed to display their full powers on the multi-valve set. Selectivity is reduced by the necessity for detuning slightly in order to avoid oscillation, and efficiency as regards amplification suffers owing to the damping that must be introduced to control them.

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“LISTEN IN”

WITH A

GECOPHONE

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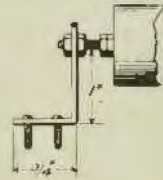


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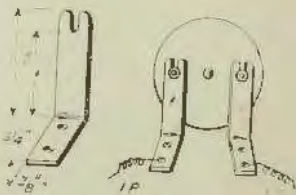
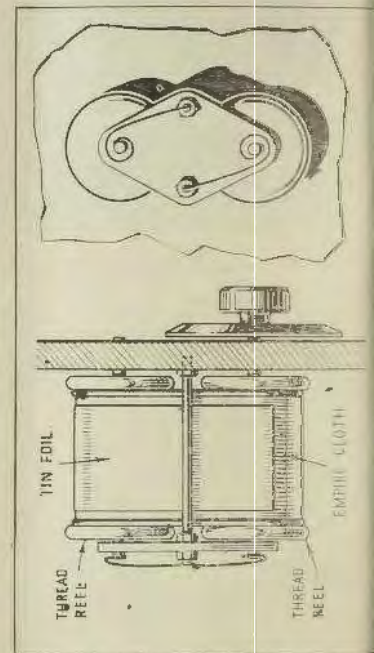


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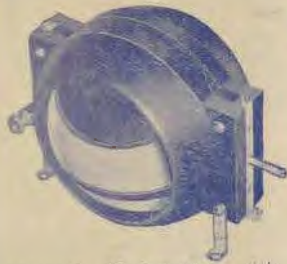
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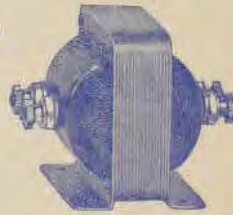
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35	.001	16/	18/6
.0006	with Vernier adjustment		£1 0 0
.0008	with Vernier adjustment		1 3 0
.001	with Vernier adjustment		1 6 0

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