Wireless Weekly
The Hundred Per Cent Australian Radio Journal
Vol. 3
No. 3
Oct. 26th 1923
3d
Registered at the General Post Office Sydney for transmission by post as a newspaper
SPECIAL FEATURE
This Week: Broadcasting at Last
Broadcasting at Last
United Radio Products

Transformers
Condensers Verniers
(Self Contained Vernier Dial Assembly)

And other specialties of proven merit will lie 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

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 VICK EXCHANGE PHONE 34434

THE JEFFERSON
AMPLIFYING

FOX & MacGILLYCUDDY
DAILY TELEGRAPH BUILDINGS
KING ST., SYDNEY PHONE CITY 3062
United Radio Products

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ELECTRICITIES & CO.
80 PITT ST., SYDNEY
OPPOSITE STOCK EXCHANGE PHONE 34553

AMPLIFYING


Solo Agents for Australia
FOX & MacGILL CYDDY
DAILY TELEGRAPH BUILDINGS
KING ST., SYDNEY PHONE CITY 3062
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 operating a broadcast station.

Despite many difficulties it struggled along against almost overwhelming odds and lack of support from those it was out to help. Today 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 24-hour 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 broadcast daily at specified times. There will be interesting lectures and talks, interspersed with a number of 1½ hour and hour-

Roster for Week ending 31st October, 1923

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<th>Time</th>
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Very few stations are on the Roster this week owing to Trans Pacific Tests.

2 HP will be transmitting continually from 5 to 5 and 7 to 10 p.m. each day.
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. Despite many difficulties, it struggled along against almost overwhelming odds and lack of support from those it was out to help. Today 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-hour 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 1½ hour and hour-long features.

Roster for Week ending 31st October, 1923

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<th>Day</th>
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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.
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.

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**A Most Successful Test**

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By permission of Mr. J. Malone, Chief Manager of Telegraphs and Wireless, the address of 2HP experimental station, Mr. W. J. Macleod, managing editor of Wireless Weekly, was last week transferred to 195-128 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. Macleod, with the very able assistance of Mr. Raymond Allgood, to whom most of the credit of the success of the experiment is due, together with the assistance of Mr. R. 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, Mollina 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 of lines...R7111 in R7117—being engaged by people wanting to give their reports. In fact the telephone girl threatened to go on strike if.

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 men sent to take down reports instead of listening at the switch board, plugged in a number of lines and then commenced the chance. No sound would he lift a receiver from one machine when another would commence in a different department and he would call off to that one. When found he was irrelevant and in a state of collapse. Mr. Robin 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):**
Musical perfect.

**Mr. Farquhar (North Sydney):** Modulation perfect.

**2HR (Ramsey):** coming through well.

**Mr. Perry (Cooma):** Very strong and clear.

**C. Ashby (2CM):** Strathfield: Very strong; excellent.

(Rustenhart): Very good reception and (cut off).


Gandy (Harlond Park): Exceptionally clear.

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

Thomas (Leichhardt): Coming in very well.

Carrel (Cooma): Coming through splendidly congratulations.

Hawke (Maiwarra): Crystal set, best reception ever obtained.

2MM (Cooma): O.K.

27M (Lithome): Splendid.

Scott (Mooamoo): Splendid.

Dore (Ferry Dock): Splendid.

Man (Wallarton): Coming through well.

Patrick (Lake Cade): Favouring transmarine.

2LO (Lake Cade): Excellent.

Williams (Harlond): Clear as a bell, best ever heard.

Eskrue (Neutral Bay): Absolutely excellent.

M. A. Bond (Strathfield): Heat board, clear and most perfect.

Martin (Mellon Bath): 2 valv2s and loud speaker, enjoying very much.

Mr. Von (Leichhardt): Crystal 3 valve filling small room.

2MM (Cooma): Single valve, most very good.

Mr. Scott (Newcastle): Everything perfect; most excellent.

All the above reports were by telephone. Excellent country reports are now arriving and are too late for this issue.
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.

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A Most Successful Test

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The telephone of the Daily Guardian, Newcastle, who had previously a telephone of their disposal was held up for some time, the whole line being engaged by people wanting to give their reports. In fact the telephone girl threatened to go on strike if the reports were not taken. 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 men sent to take down reports instead of listening to the switch board, plugging in a number of lines and then commenced the chance. 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 inebriated and in a state of collapse. Mr. Robeson 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 and clear. 2HP (London); Modulation perfect.
Mr. Farquhar (North Sydney); Modulation perfect.
Mr. Perry (Cremorne); Very strong and clear.
C. MacDonnell (SCM); Strathfield; Very strong; excellent.

Katoomba: Very good reception and (was off).
Parsons (antipodean); Very clear.
Gandy (Hurlstone Park); Exceptionally clear.
Walker (Wooloomooloo); Clear and strong on the wave.
Thomas (Leichhardt); Coming in very well.
Carrel (Cremorne); Coming through splendidly congratulations.
Bosuke (Homebush); Crystal clear, best reception ever obtained.
2MM (Cooma); O.K.
27M (Lidcombe); Splendid.
Scott (Moonee); Splendid.
Dore (Fernwood); Splendid.
Maw (Wollstonecraft); Coming through well.
Pettie (Lane Cove); Engaging transmission.
2LO (Lane Cove); Excellent.
Williams (Harmonic); Clear as a bell; best ever heard.
Eskola (Neutral Bay); Absolutely excellent.
M. A. Boyd (Stratfield); Beat board, clear and mod. perfect.
Martin (Mellon Bath); 2 valves and loud speaker, enjoying very much.
Mr. Voel (Leichhardt); Crystal clear; valve filling small room.
2MM (Cooma); Single valve, mod. very good.
Mr. Scott (Newcastle); Every note perfect; mod. excellent.

All the above reports were by telephone. Excellent country reports are now arriving but are too late for this issue.
Learn to Make Your Own.

During the first few weeks when broadcasting commenced 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 they need. This trader who advertised 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" column, 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 500 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, Mail-Bag House, Sydney, will seal the set on the 5 cc of 2 s being paid.

Wireless Weekly will be pleased to give advice to any of its readers. Draw diagram of connections and give full details. Address "Broadcast Receiver," Box 578, G.P.O., Sydney.

Trans-Pacific Tests.

FIRST SIGNALS FROM AMERICA.

MR. LOVE AND MR. HULL RECEIVE A MESSAGE.


This message was picked up on Sunday night last by Mr. Love and Mr. Hull, in Melbourne. In all they logged 20 American stations.

Well done, Melbourne.
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 they require. The 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" column, 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 340 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, Macquarie House, Sydney will send the set on the fee of 7/- being paid.

Wireless Weekly will be pleased 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.

Trans-Pacific Tests.

FIRST SIGNALS FROM AMERICA.

MR. LOVE AND MR. HULL RECEIVE A MESSAGE.


This message was picked up on Sunday night last by Mr. Love and Mr. Hull, in Melbourne. In all they logged 20 American stations. Well done, Melbourne.

The 100 watt set which is being used in Trans-Pacific Tests.
By C. Machover, Strathfield.
The wireless weekly: the hundred per cent Australian radio journal

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 inner windings and formers, for upon this depends the constancy of the results obtained. Many of these manufacture vague phrases 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 J. K. in "The Wireless World."

The amateur constructors who care to use these tubes for their apparatus 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 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 overhear the coil, lest the shellac tube be damaged or the varnish scorched. Most amateurs, however, regard shellac tubes as much too expensive for ordinary purposes, and therefore use cardboard ones. The substitution is inexpensive, and does not lead to appreciable loss of efficiency if take 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. First, care must be taken not to heat it too severely or it may "soften" or, when melted, boil. Should it be allowed by accident to boil, take it off the Gee and keep it away from lights until it has stopped its giving off considerable quantities of inflammable vapour when boiling. Second, it should be realized 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, the moisture 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, dried as completely as possible, and put into the case.

The careful maker uses a thermometer for these operations, but for the benefit of those who do not possess a suitable condensate 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, work as a plum pudding in a saucepan. If the water 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 liberally to all coils. It is very difficult to take 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 it is 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 renders the presence of diseases, the feelings of a plant when a leaf is torn, and similar phenomena, is the property of the Albert Abrahams, of San Francisco, and is called the "Psychophone." The apparatus is a delicate-looking red and the apparatus includes a magneto. A number of tests were made in one of which Dr. Abrahams tore the leaf of a nasturtium, whereupon the magneto recorded a faint signal. Then a leaf was cut; this apparently did not hurt, for no sound was evolved. Another leaf was first held over a chlorophyll bottle, then torn, and then cut, again without any sound being registered by the loudspeaker.

The Explanation

According to Dr. Abrahams, plants broadcast radio waves; the Redwood clears the other and records them by means of an exceedingly delicate method of tuning. Chlorophyl in these plants much as it influences human beings, hence the lack of response when the plant had been chlorophylled first.

Certain forms of disease were also tested, and when one of these (in a boat) 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 "get a proxy in the slot" and find out at once what ails him. This Radio MD, however, would be a complex and cumbersome affair.

The wireless weekly: the hundred per cent Australian radio journal

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National Library of Australia
One of the most important factors in the efficiency of a receiver is the proper damp-proofing of the inner windings and formers, for upon this depends the constancy of the results obtained. Many of these vexing 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 imprregnation, writes Dr. P. H. in "The Wireless World."

These amateur constructors who can afford to use chinite tubes for their inductances will find it a fairly simple matter to render their windings damp-proof. The former itself being impermeable, 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 or shellac 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 overhear the coil, lest the asbestos tube be damaged or the varnish scorched.

Most amateurs, however, regard asbestos 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 taken and winding are properly impregnated. Shellac is quite as 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 melted wax until thoroughly impregnated. To obtain the best results with this material there

THE DAMP PROOFING OF COILS AND FORMERS

...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, draw off as much as you can when setting out the coil.

THE SUPER SET.

A radio set, so delicately tuned that it records the presence of disease, the feelings of a plant when a leaf is torn, and similar phenomena, is the property of the Albert Abrahn, of San Francisco, and is called the Reflexograph. The apparatus is a delicate-looking real and the apparatus includes a magnifying A number of tests were made in one of which Dr. Abrahm tore the leaf of a peachtree, whereunto the magnifier recorded a faint signal. Then a leaf was cut, this apparently did not hurt, for an sound was evolved. Another leaf was first held over a chloroform bottle, then torn, and again without any sound being registered by the ear-speaker.

THE EXPLANATION.

According to Dr. Abrahms, plants broadcast radio waves; the Reflexograph catches the vibrations, the signal, and records them by means of an exceedingly delicate method of tuning. Chlorophyll in the leaves of plants influences human beings, hence the lack of response when the plant had been chloromorphed first.

Certain forms of disease were also tested, and when one of these (in a bottle) was placed near the antenna, it was easily emitted an audible gurgle. His inventors believes that the machine can be developed to the point of diagnosing all diseases, so that a man can "get a proxy in the slot" and find out at once what ails him. This Radio MEM is hoped to be a complex and some humane affair.
Experimenters!

Visit our NEW WIRELESS SALES DEPT., and see for yourself the large range, quality, and prices of our Stocks.

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
Experimenters!

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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 necessary within the cabinet itself, including even antenna and connecting 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 matter but are correspondingly weak in receiving efficiency.

When the case is closed the set may be carried by a handle like an ordinary small suitcase. The filament and plate batteries, telephone receivers, tools (screw and a screw-driver), and wire suitable for a portable antenna, are all in the case and the unit 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 afloat 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 receiver 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 is the largest, shown in the photograph of figure 1, because the receiver proper—that is the tuning equipment. Department B is for the batteries, output jack, and telephone-converter. Compartment C holds all the necessary, 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 easily accessible by making the top a hinged door for changing coils, etc. The middle compartment holding the batteries is hinged open; 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 thicker or 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 inductances, or in parallel, which properly used, gives a wide wave length range without loss of efficiency. With the antenna connected as post 2 in figure 4, and link C open, the series connection as shown in figure 5 is obtained. With posts 2 and C and A jumped, and the antenna in, 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 shortness of tuning. At the higher wave lengths the parallel connection may be efficiently employed with a small antenna. Interchangeable inductances are used to get away from the energy losses involved in the use of tuned inductances.

The spider web inductances are wound on frames. These may be obtained in 1-1/2 inch bobbins 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 higher and three for antenna inductances.

Winding data for the spirals, and
MAKE YOUR OWN

A Complete Portable Tube Receiver

The set herein described is a single-tube receiver with provision for carrying every part and necessary within the cabinet itself, including even antenna and current-pulse equipment. In short, the degree of portability aimed at is that of an ordinary film camera, while at the same time there has been an 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 wallet. The filament and plate batteries, telephone receivers, tubes (phono and a screw-driver), and wire suitable for a portable antenna, are all in the case and the set may be set up in a few minutes for actual working. 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 weeks during the winter, and it is still alight 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 3 is a photograph of the receiver with the cover on, ready to be carried. Figure 4 is a view showing the set ready for reception. Figure 3 is an interior view from the back.

The cabinet, as these photots 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 lamp, and telephone-condenser. Compartment C holds all the necessary, including the telephone. 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 metal plate behind remains in position. The interior of compartment A is made readily accessible by moving the top a hinged door for changing cells, etc. The middle compartment holding the batteries is hinged open; 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 thicker coil regeneration one, without any particularly novel features. The inductances are in spider-web form. The only novel, though in no way original, feature is the use of three binding posts, with an additional 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 inductances, or in parallel, which properly used, gives a wide wave band range without loss of efficiency. With the antenna connected as in figure 5 in figure 4, and link C 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 inductances are used to get away from the using inductances involved in the use of tapped inductances.

The spider-web inductances are wound on frames. These may be obtained in 1", 1½", or 2" 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 thicker and three for antenna inductances.

Winding data for the spirals, and...
The design of the inductances and the effective wave length 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 end, but it is hardly convenient to work 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 long turns, and still go up to NAA on 2000 metres and W.S.E. 4 are slightly higher. It is always best to use double covering insulation when possible.

The layout of the apparatus in compartment A, seen from above, is given in figure 7. This is with a WD-12 or WD-12 tube and has been found to be a suitable position. The receiver is wired with some form of self-condenser equivalent to No. 16 B. and S., or larger. Bare tag wire is recommended. It will be noticed that the parts are so laid out that the flexible coil in the case were not metal parts and condensers, while the antenna spiral, in which losses must be kept at a minimum, is kept well away from other conductors.

This set was designed for mobile reception, and accordingly tests were made at Riverview, L.L., using an aerial consisting of a single No. 24 wire strung between two trees. The dimensions of the antenna are given in the wave length range table above. This type of antenna is highly suitable for a portable set; a few hundred feet of it may be carried on a speed in compartment C of the set, and suspended between lengths of each cord drawn up into trees. A counterpoise of the same material is used. In the tests that have been made so far no attempt was made to cover extraordinary distances. On 200 metres telegraph stations were heard at night in every district except the Sixth and Seventh, only a slight amount of listening being done. It was found that R.I.R. could be relied on with an uncertainty varying from just audible to a comfortable loudness, at night, with about similar results on

WGY (150 miles) and the New York City stations. On 906 metres and higher waves the only testing done was in the daytime. Excellent signals were heard from N.A.M.'s C.W. on 900 metres (400 miles), and all the various army and coast stations within 300 miles, working on wave lengths between 1800 and 3000 metres.

BOOKS ON WIRELESS

Experimental Wireless Construction.—By A. Morgan. Price, 12/6 postid.

Single Valve Receiving Sets: How to Make Them.—By W. Price. 2/6 postid.

Lessons in Wireless Telegraphy.—By A. Morgan. Price, 12/6 postid.

A.B.C. of Wireless.—A Popular Explanation by P. Harris. Price, 1/6 postid.

N.S.W. Bookstall Co. Ltd

70 George Street, City
October 26, 1923.

Wireless Weekly

wire length range which may be altered to suit the actual limits which may be expected with a small single wire transceiver; spiral No. 3, for example, antenna, are given in the table below and automatically go down to 500 metres.

- Wire
- 50
- 1 100-280
- 2 200-270
- 3 300-270
- 4 400-270
- 5 500-270

The results of the investigations and the effective wire ranges determined by trial on two antennas only are given in the table, but in the case of a single wire antenna, the length being directly above flat ground, while in the other cases, 10, 20, and 30 feet, respectively, were used for the antenna, the results were almost identical.

The layout of the apparatus in compartment A, shown above, is given in figure 7. This is with a WD-2 or WD-12 tube and has been found to be a suitable position. The receiver is wired with some form of shield-insulator equivalent to No. 16, 18, or 20 gauge wire. The small size of the coils is recommended. It will be noticed that the parts are so laid out that the flexible coil in the case were not metal parts and conductors, while the antenna spiral, in which losses must be kept to a minimum, is kept well away from other conductors.

This set was designed for mobile reception, and accordingly tests were made at Riverhead, L.I., using an aerial consisting of a single No. 24 wire about 20 feet in length. The dimensions of the wave length range table above show this type of antenna is highly suitable for a portable set; a small hundred foot of it may be carried on a speed in compartment C of the set, and suspended between lengths of each cord drawn up into trees. A counterpoise of the same material is used. In the tests that have been made so far no attempt was made to cover extraordinary distances, on 200 metre telegraph stations were heard at night in every district except the Sixth and Seventh, only a slight amount of lightning being done. It was found that RKA could be read on with an intimate varying from just audible to a comfortable loudness, at night, with about similar results on

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26 George Street, Sydney.
so good on both spark and C.W. on this small antenna, that it was evident very good night range could be secured. In New York the receiver was tested for taking an broadcast stations, and no difficulty was experienced in holding W2X, 100 miles, on 410 metres, to W2Z, radiating locally on 460 metres. The local broadcasters all came in satisfactorily, and with one step of audio frequency amplification were good for head-speaker reception in a small room, with set alone, and ordinary telephones, the speech could usually be heard some four feet away. The results of the tests were considered satisfactory by several experienced observers and we feel they are a great encouragement to the W7F, 100 miles, on 410 metres, to W2Z, radiating locally on 460 metres. The local broadcasters all came in satisfactorily, and with one step of audio frequency amplification were good for head-speaker reception in a small room, with set alone, and ordinary telephones, the speech could usually be heard some four feet away. The results of the tests were considered satisfactory by several experienced observers and we feel they are a great encouragement to the

FIRST BROADCASTING EFFORTS

The first step towards making radio telephony a public service in Germany was made as far back as 1921, by the Imperial 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 at the initiative of the Imperial Ministry of Posts, jointly created by the three well-known wireless firms of Telefunken and Huth and Loewe. It seems that this collaboration produced apparatus which combined simplicity of installation with maximum reliability and permanency of service.

The German Broadcasting Service was inaugurated in August, 1926, and was organized in the same manner as the German telephone service. Subscribers, at 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 held to be comparatively easier by building the plate and filament circuits directly from a 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 trade 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 100 kW., on a wave length of 4,400 metres, and are chiefly of an commerce nature, relating to rates of exchange, exchange quotations of inland and foreign markets, etc. These same items are being carried by the Berlin Telegraph Agency, "Königswusterhausen," and are then passed on to the Königswusterhausen transmitting station, whence they are broadcasted.

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garage to house, etc. Two phones with instructions.

2/6
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.

To many beginners experiencing some difficulty in deciding what form their first receiving set should take, the present strong impetus wireless literature now available, which is inevitable to experimenters also because little knowledge and experience, is often the result 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 strong diagram straightforward building such as described is absolutely necessary to spoil a few pieces of wood and break a few wire stands before even a moderate proficiency is obtained. I would strongly advise anyone taking up wireless telegraphy as a hobby to construct and experiment with a simple crystal receiving set, which in view of the establishment of additional broadcast and "relay" stations, may serve 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 decide is the wave length over which it is desired to receive signals. If reception over the broadcast band of wave lengths desired, the tuning inductance, whatever type it may be, should be capable of adjustment between about 200 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 inductance 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 2500 metres but actually adjusted to tune to 2000 or 3000 metres, etc., 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 enamel 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 oblong 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 2½ in. in diameter and 4 in. long should be closely wound for about 6 in. of its length (approximately 120 to 130 turns) with No. 22 AWG, copper wire.

The wire must in all cases be insulated, but the nature of the insulation (i.e. whether canvas or double cotton covering) depends upon the method employed for varying the number of turns in respect, enameled-covered wire being used where a slider is fitted, and covered wire where tunings are taken to a tuning switch or switches.

SINGLE SLIDE INDUCTANCES.

Fig. 1 shows a simple single slide tuning consisting of the inductance coil complete upon its former, rigidity being obtained between two wooden end supports attached to a wooden baseboard, which, if desired, may be made wide enough to carry the crystal detector, telephone terminals and telephone condenser. It is a brass rod (½ in. or 1 in. square) carrying the slider, the spring plunger of which makes contact upon the turns of wire. The end complete with slider, may be purchased quite cheaply from any wireless dealer. About 1 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 burning 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.
October 26, 1925

WIRELESS WEEKLY

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 should take. The wealth of advice and information available in wireless literature is so extensive that a beginner, who, being attracted by the general appearance of some set, together with the obvious reasons 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 at first, it is not 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 straightforward and well built set, such as described, it is undoubtedly necessary to spend a few pence on wood and a few simple tools before even a moderate producer 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, in view of the establishment of additional broadcasting and "relay" stations, may save 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 observe is the wavelength over which it is desired to receive signals. If reception over the broadcast band of wavelengths in desired, the tuning inductance whatever type it may be should be capable of adjustment between about 800 and about 5000 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, however, that the distance of the inductance from the 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 5000 metres but actually adjusted to tune to 2000 or 3500 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 split coil 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 almost or wax impregnated cardboard tube.

Quite apart from the method of tuning employed, difficulty of the coil is determined by the wave length range. For a range of 250 to 650 metres, a tube 2½ in. in diameter by 6 in. long should be closely wound for about 8 in. of its length (approximately 120 to 150 turns) with No. 22 AWG, copper wire.

The wire must in all cases be insulated, but the nature of the insulation (i.e., whether cotton or double cotton covering) depends upon the method employed for varying the number of turns in circuit, stranded covered wire being used where a slider is fitted and covered wire where stoppers are taken to a tuning switch or variable.

SINGLE SLIDE INDUCTANCES.

Fig. 1 shows a simple single-slate tuning condenser 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 made wide enough to carry the crystal detector, telephone terminals and telephone condenser. It is a brass rod (½ in. by 1 in. square) carrying the slider S, the spring plunger of which is pressed upon the turns of wire. The end complete with slider, may be purchased quite cheaply from any wireless dealer. About 1 lb. of wire will be required, and one unporgregated 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 darting needle. Secure the commencing end of the winding and run the wire through one of the others, leaving several inches of wire protruding for subsequent connection to the aerial.
terminal end and two sides 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 protecting 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. Note each end of the cardboard tube a wooden case 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 holder 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 cotton cloth beneath the plunger and move the latter (together with the enemy) 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 using lacquers incompletely 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 receiver. 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. 5, the regular movement and fine adjustment thus obtained proving very advantageous.

For a two crystal combination suitable for use with the detector shown in Fig. 5, I have never yet found anything to beat really good specimens of minium (in the upper chip) and berill. This combination has the additional advantage that

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**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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It works quite well without any applied potential. The small fixed condenser connected across the telephone receiver, as shown in Fig. 3, is not strictly necessary, but an considerable improvement is sometimes effected by its use, one should be made up consisting of four pieces of tinfoil each 1 in. by 2 in., separated by pieces of wood approximately 1 in. thick, two pieces of foil projecting at one end and two at the other, the actual area of the overlap being 3 in., approximately.

Two additional pieces of wood are placed above and below the mentioned foil, and the projecting ends are bent over and secured in place by means of two brass strips bent to form clips, in which connecting wires are to be soldered as shown in Fig. 4.

THE COMPLETE SET.
The complete layout arrangement of the simple receiver employing a system of the metallic, A.T.H. the tuning adjustment, and, as the signal 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 variable 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 said in no delib­
erate direction, like light waves, and how easily they might be absorbed. There was nothing new in these special experiments, Marconi having done exactly similar ones in his laboratory thirty-five years previously, but the experiments did indicate to the large and enthusiastic audience how Marconi’s laboratory experiments on short waves might be turned to practical use. It was evident to every one that if radio waves could be confined to one direction, instead of spreading out in all directions, much less power would be required and much interference would surely be eliminated.

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 for much longer 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 this radio pioneer in this new field he is developing. We should not have him here engaged in this country, in open up this unexplored, but very promising, field of radio transmission.

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37 Pitt Street, Sydney.
October 26, 1923.

The wireless weekly: the hundred per cent Australian radio journal

WIRELESS WEEKLY

It works quite well without any applied potential. The small fixed condenser connected across the telephone receivers, as shown in Fig. 5, is not strictly necessary, but an considerable improvement is sometimes effected by its use, one should be made of consisting of four pieces of tin foil each 3 in. by 3 in., separated by pieces of wax approximately 1/50th of an inch thick, two pieces of foil projecting at one end and two at the other, the central area of the overlap being 3 in., approximately. Two additional pieces of wax are placed above and below the metallic foil, and the projecting ends are bent over and secured in place by means of two brass strips heat to form clips, in which connecting wires are to be soldered as shown in Fig. 4.

ADVANTAGES OF THE TIN-Foil CONDENSER

The advantage of the single-sided condenser is that there is only one tuning adjustment, and, as the slit or is slowly moved from one end of the coil to the other, the complete range of wavelength is covered, and any transmissions within receiving distance taking place upon a variable 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.

MOTOR 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 absorbed. There was nothing new in these special experiments, Hertz having done exactly similar ones in his laboratory thirty-five years previously, but the experiments did indicate to the large and enthusiastic audience how Hertz's laboratory experiments on short waves might be turned to practical use. It was evident to every one that if radio waves could be confined to one direction, instead of spreading out in all directions, much less power would be required and much interference would surely be eliminated.

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Our best wishes are extended to the radio pioneers in this new field he is developing. We should never cease doing more in this country, to open up this unexplored, but very promising field of radio transmission.

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SOLE AUSTRALIAN AGENTS -

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37 PITT STREET, SYDNEY.
Some Practical Data on Loop Reception.

By R. D. Charlesworth, 2CL

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

Being interested in long distance reception of experimental transmitters, 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 300 miles being impossible.

In order to further the tests a loop was constructed 35 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 loops in early form construction being excessive, high frequency resistances and transformer coupling, the 'Liona' wire was used. This was made up of 16 strands 25 D.C.W. wire, twisted in cable fashion.

Ten turns of this was wrapped round the frame, 2 ft. apart, an 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 potential meter control for grid potentials 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 neck', the only difficulty to obtain results was found to be in tuning. This adjustment was most critical, and Verrier control was essential. Quantity effects were also evolved in handling the loop.

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. McPherson (2KD), who could be heard 50 feet away from the phones, using detector and one stage of low frequency amplification.

In one particular reception...
Some Practical Data on Loop Reception.

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 "twin" circuit.

Being interested in long distance reception of experimental transmitters, 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 hooting signals were very serious drawbacks to efficient reception—many nights reception over 300 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 "parabolic" or flat type.

The usual looses in early form construction being excessive, high frequency resistances and dielectrics employed "Like' wire was used. This was made up of 36 strands 10 L.U.G. wire, twisted in cable fashion.

Ten turns of this was wrapped round the frame, 6 in. apart, an attempt being made to provide special insulation to 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 potential meter control for grid potential was preferable to the usual condenser and lead, and many combinations of plate battery and grid potentials were tried before good results were obtained.

The receiver being in "good work," the only difficulty to obtain results was found to be in tuning.

This adjustment was most critical, and Versatile control was essential. Capacity effects were also solved in handling the loop.

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. MacFarland (20/6) who could be heard 50 feet away from the phone, using detector and one stage of low frequency amplification.

In one particular Duncan recep...
How It Feels to Broadcast

I have had six teeth extracted, earache, headaches and a couple of hangovers. I have hoped and now lived in an aeroplane over New York City and rushed in a coating, billowing sweater at the rate of 110 miles per hour. Not bad, but many times, sitting at the ringside it has been my function to watch champions fall from aerial leading those calculated to translate anything save a well conditioned youth long trained to minimize funereal physical punishment—but I experienced the supreme thrill of all a few nights ago when I stood before a silent staring disinterested disk at the other end (or was it the other end) of which a conscientious announcer explained, sat three or four hundred thousand radio units. It was the thrill that comes once in a lifetime. You tell real

VITAL

IMPORTANT FACTORS ARE OUTLINED

Although the receiving sets that are in use among the majority of broadcasting listeners to-day will function badly on even partly uncorrected aerials, it will surely improve matter to the antenna be well aligned and the factors which constitute the design are known. There is the source of energy which directly operates the receive and it is obvious that if we can increase the amount of energy collected by the antenna, through judicious design, we can therefore also increase the overall 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 length, height, location, ground

I have no idea which of the antennas was chosen for this broadcast, it could be any one, or none. It is my hope that the reader will find some, and use them to improve his own broadcast reception.

October 29, 1923

To be continued next week.

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nla.obj-628050965
National Library of Australia
How It Feels to Broadcast

I have had six teeth extracted, car-a-chore, rheum-gits, and a couple of appendicectomies. I have helped and once dined in an aeroplane over New York City and even in a coaching, seat-backing speedboat at the rate of 110 miles per hour. Not bad, but many times, sitting at the ringside has been my function to watch champeons fall from armed backing calculated to dilate anything save a well conditioned vocal chord long trained to accomplish fanciful physical punishment, but—I experienced the supreme thrill of all a few nights ago when I stood before a silent staring disinterested dish at the other end (or was it the other end) of which a costumelss announcer explained, sat three or four hundred thousand radio nuts. It was the thrill that comes once in a lifetime. You tell real

In my career as a newspaper editor I have had many thousands of drawings published, but none so indelibly stamped upon my memory as the first crude halftone 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 to the night to cause cold beads of perspiration to moisten my burning pillow.

"Nothing to it at all—it's the man'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. Articles about to broadcast and those who had finished. Among them was a famous movie star, another a noted concert singer, another a distinguished music critic, another a miscellaneous flock of muses.

A few invited guests were present, too. All is reserved to be a large evening. I began to wonder if I had pulled a "fool," by accepting the request to speak that night. There was all time to withdraw, get a sudden headache or remember a previous appointment. Yet, 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 man sensation that a patient must feel when the nurse tells him to get ready for the operating room.

My wife was present and said they'd sure be listening in and that all such things. The somethingness 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 crowded and inspiring box, not more than eight by eight by six in dimensions, waited six or seven visitors to watch the performance, and perhaps witness my personal debacle.

"Sit down in this circle please," directed the announcer in the tone of the dentist when he says "now open wide." I nodded indifferently. "I am going to have the Moon Man introduce you first and then I will follow with another introduction. Say!" I instinctively searched about for a funny looking Moon Man. Instead I saw a side young fellow attired in a tuxedo. He was the Moon Man and was going to dance later, as it seemed. For a moment all was quiet. Nothing could be heard except the wild pulsations of my pulseless heart against the third rib. Then the announcer's voice shouldered "All ready—on." Someone turned the switch over and the wire or wireless was open. I remember..."
known as the "'Trimm Dependable'."

These experiments who have already had an opportunity of testing the new well-known "'Profess sound\"' headedset, speak well of their sensitivity, and Messrs. D. H. M. 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 "'Trimm' engineers primarily to meet the demands of the limited pocket-book, the high standard of construction, generally, has been maintained.

The "'Dependable"' are wound with 40 gauge stranded copper wire to a total resistance of 3,000 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 serve 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 made without distortion.

FLOWER DAY IN ADELAIDE.

Thursday, October 11, was a day set apart for the collection and distribution of flowers among the various hospitals and philanthropical institutions.

Orders were received to have bunches of flowers at various points in the city, and from these they were distributed to the various institutions benefiting.

A feature of the day was the arrangement of wireless concerts, given in turn to the inmates of the Adelaide, the Methodist Memorial and the Children's Hospitals. The musical items were broadcasted from the stations of Mr. F. E. Karr, 2BD, of St. Peters, and Mr. V. L. Williamson, 3AE, of Kent Town.

The receiver was in charge of Mr. J. N. Reid, 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 hospitalised for years, and clearly shows the beam the radio will become to those compelled to spend many a weary day in hospitals and other such institutions.

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.

CHRYSLER RADIO CLUB.

On Saturday, October 13th, the above club had a visit from four representatives of the International Correspondence Schools.

Mr. A. H. Perritt, wireless instructor of the I.C.S., gave a very interesting lecture on batteries. The lecture started by explaining the action of a simple cell and gave the principle of all types of cells and the action of accumulators. Theoretical formulas 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 currents, also the mercury arc, magnetic rectifier and motor generator were explained.

Manxers 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, "'Backleigh'\", Long 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, "'Currek'\", Highbury St., Croydon.

LEICESTER AND DISTRICT RADIO SOCIETY.

The 52nd general meeting of the Leicesters and District Radio Society was held in the Club-room, 172 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 See ""VOLMAX First\"" the MARK of QUALITY

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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 asked the announcement talked to what seemed to be himself. It was impossible that that small instrument was carrying his voice over mountains and states into cities and hamlets, into pastoral homes and once farmhouses buried in the hills. Many flattering phrases the announcement passed over the air in his introduction. I didn't know I was so good. I heard my own famous, well known, Ndeleleluk. Then I thought he was talking about someone else. Finally I heard my name passed and then a reply from him, I was to begin. The perspiration began to pour in streams from my head 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, and I had taken the precaution of writing my "talk" on foolscap. "Good evening ladies and gentlemen," I managed to blurt (having heard the announcement one that line as a stock phrase). There was no response. Somewhat or other one expected an answer. Instead, that voice died just started. It seemed an utterly simple to be talking into that something at the other end at which there was an end of life. Subsequently the dawningimplausibilities 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 stuttering to myself. But I continued on, not daring to stop for fear it was working. Now utterly cold and dead one's voice seemed in that heavily blanketed little room. But one did 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 muse appeases him that he was through long before. "Standing lightly by my watch, I found that I had been talking 15 minutes. Outside in an inner room

QUALITY RADIO SUPPLIES

Dictograph 3000 ohms Head Sets
Their use on any Receiving Set, Crystal Detectors or Valves improves reception immeasurably

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Also Baldwins, Western Electric, F.M.C., Tronix, Manhattan, etc., stocked

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W. HARRY WILES

Radio Depot, 60-62 Goulburn Street, Sydney

1 Door from Pitt Street

October 26, 1923

WIRELESS WEEKLY
WIRELESS WEEKLY

October 26, 1925

NOW ROUND THE CLUB

MARRICKVILLE AND DISTRICT RADIO CLUB.

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

Mr. Perkins lectured on short wave and regenerative receivers starting on a single non-regenerative five circuit, Mr. Perkins drew comparisons with various other types. The principles of operation were explained in a very lucid manner, and the methods of control were described at length. Many circuits were drawn on the blackboard, and their action explained. Mr. Perkins 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 licence 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. Himmig, 28 Central Avenue, Marrickville.

At the School of Arts, in Illawarra Road, Marrickville, on the 18th inst., the meeting of the above club was held, Mr. W. L. Howland in the chair.

To enable 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 black board, illustrated his subject as he went along.

Beginning with the standard R.W.C. 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 took his de-
n just band was tuning up and
waiting its turn. I concluded
and for a second waited. No losses, no
apparatus moved, my weak effort.
I didn’t know whether I had “game
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 gentle
men.

Qasar Queries and Ready
Replies
(By L. B. Tannehill.)
Useful questions addressed to
this department will receive prompt
answers as pointed as a jab in the
eye with a sharp stick. No at
tion will be paid to questions not
accompanied by money, postage,
radio apparatus or smoking tu
ness.
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 1,800 miles away.
Do you think I should move the set
nearer the metal? Saraway.
A: No, you should move the set
near to Kansas City.
Q: Last night I went to my
sweetheart’s home, with a single
tube receiving set and tried to
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 to
night. What would you advise to
improve receiving conditions? B.
W. D.
A: Try a good phonograph in
parallel with the set of your tran
nors.

The Receiving Set used for Long Distance Receiving.

Q: What are perpendic
Eurious.
A: Take our advice and let prop
holes alone. Remember the old
adage: a lack in the eye is worth
two on the foot.
Q: I cannot get my regenerative
receiver to oscillate without wet
ning my fingers and touching them
to the binding post of my condens
er. Does this always work.
Is there any easier way of bringing
about oscillation? Time-honored.
A: Try throwing a couple of wet
hams across your ground damp.

Q: I have been using my neigh
bor’s clothes line for an aerial,
but never could tune below 300
metres on Mondays. Have found
that this is because they hang out
his shirt, pair of socks and their
shoes on the line every Monday.
I want to tune on 360. Worried.
A: Connect the clothes in parallel,
the shorts in series and take a lead
in from the fifth button on the
shirt. If it is a stiff shirt, your tuning will be very
affected on 360 metres.

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

The Low-Power Set used by Mr. Macfarlane for his Sunday Night Concerts.
Wireless Weekly

October 26, 1923.

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 one 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. B. Grahame, 44 Cameron Street, Rockdale.

KILLARA RADIO CLUB

The twelfth general meeting of the Killara Radio Club was held on the 12th instant, Mr. Greenwell taking the chair. After the correspondence had been read and received, two lectures were delivered, Mr. Greenwell 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 2061.

Reduced Prices

Valves: Mullard 25s., Edsman 25s., Conson 25s., Phillips 25s., Marconi R 25s., Annika 2 filament 30s., Cunningham 30/1a 42s. 6d., Holders: English 2s. 6d., American 4s. & 5s. 6d.

Radio House

619 George St., Sydney

Members of Broadcasters (Sydney) Ltd.

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, William Street, Concord. After the minutes of the previous meetng meeting had been read and confirmed, and some correspondence read, Mr. H. Taylor gave some very interesting hints on transceivers. 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, “Emerald,” William Street, Concord.

New “Trimm” Headset

Wireless enthusiasts will be glad to learn that there is now available a new grade of “Trimm” headset.
known as the "Triumph Dependable."  

Those experimenters who have already had an opportunity of testing the new well-known "Professor sound" headset, speak well of their sensitivity, and Messrs. C. H. O'Brien and Nicholl, of 35-39 Pitt Street, Sydney, who are sole agents for this line, claim that, although the new "Dependable" set has been designed by the "Triumph" engineers primarily to meet the demands of the limited pocket-book, the high standard of construction, generally, has been maintained.  

The "Dependable" are made with 40 gauge enameled copper wire for a total resistance of 2500 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 serve to protect the receivers from static discharge.  

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.

FLOWER DAY IN ADELAIDE  

Thursday, October 11, was a day set apart for the collection and distribution of flowers among the various hospitals and philanthropical institutions.  

Germs were requested to leave bunches of flowers at various depots in the city, and from these they were distributed to the various institutions benefiting.  

A feature of the day was the arrangement of wireless concerts, given in turn to the inmates of the Adelaide, The Methodist Memorial and the Children's Hospitals. The musical items were broadcasted from the stations of Mr. F. E. Karr, E.D., of St. Peter, and Mr. E. L. Williamson, 3.M.E., of Kent Town.  

The receiver was in charge of Mr. J. N. Reid, 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 in hospitals and other such institutions.  

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.

COYHON RADIO CLUB  

On Saturday, October 13th, the above club held a visit from four representatives of the International Correspondence Schools.  

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

He explained the action of chemical cells, for half and full wave rectification of alternating currents, also the mercury arc, magnetic rectifier and motor generator were explained.  

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

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

LEICHHURT AND DISTRICT RADIO SOCIETY  

The 32nd general meeting of the Leichhardt and District Radio Society was held in the Club-room, 177 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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Variometers, large, 850 metres .................................................. 83 p.  
Variometers, small, 350 metres .................................................. 83 p.  
Varielectors, large, 1600 metres .................................................. 84 p.  
Varielectors, small, 850 metres .................................................. 84 p.  
Detector units, with grid coupler ............................................... 122 p.  
Rheostats, 10 ohms ................................................................. 0 x 6  
Rheostats, 4 ohms, with resistor ............................................... 0 x 6  
Sockets for panel mounting ..................................................... 3 x 6  
Cables, W.B. 11 ................................................................. 0 x 7  
Cables, A.C. 250 ................................................................. 0 x 4  
Variable Condensers, front ..................................................... 0 x 13  

See this High-class Apparatus at  

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nla.obj-628051097  
National Library of Australia
Q: I have built a two-set that the diagram was portable; one stage audio and one radio. It takes 135 volts on the plate. The storage battery weighs 25 pounds, and the "H" batteries weigh 53 pounds. What do you use in this set to make it portable? Ender Weight.

A: Try a good welder in wax with the antena.

Q: Three times last week while testing in a joint station my wife was down. What can I do to keep it up? Modified.

A: Try a good pair of suspenders.

Q: My wife and I have a receiving set, and he comes down every night to listen to. It has only one standing, and I think we should do better. If he had two to tune. Lovewick.

A: No, either the one you wanted in the thing.

Q: I have a detector and two stages on the water pipe for a ground and an outside aerial. What can I do to make this set portable? Ender H.

A: Mount the receiver on the dasher of a good motor track, and lead the wires, house plumbing, batteries, water plug, and about two feet of the water system in the rear of the track.

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 steady to the resonance-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 circuit 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 introduced, 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 curtailed.

The simplest solution of the difficulty is to use transformers wound and with copper, but with resistors and tuned transformers can be allowed to display their full power on the multi-valve set. Selectivity is reduced by the necessity for damping slightly in order to avoid oscillation, and efficiency as regards amplification suffers owing to the damping that must be introduced to control them.

The resonance wound transformers has an optimum wave length, and 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 such 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, attention being paid to all that is needed.
WIRELESS WEEKLY

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 own mentioned. Then he started and the announcer talked to what seemed to be himself. It was impossible that that little instrument was carrying his voice over mountains and states to little houses and hamlets, into pastoral homes and on 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. “Stupefied.” Then I thought he was talking about someone else. Finally I heard my own name paged and then audge from him, I was to begin. The perspiration began to pour in streams from my head 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 best 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 out before I heard the announcement note that line as a stock phrase. There was no response. Somehow or other one expected an answer. Instead, that note line just stood. It seemed an utterly stupid to be talking into that thing, nothing at the other end at which there was an angle of life. Subconsciously the impression prevailed that I, of all radio broadcasters, was not being heard, that this was the one time the glowing 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 blancketed little room. But one can get used to anything in time, even hoaring, and as I progressed I regained much of my normal confidence. 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, or perhaps him that he was through long before. Standing leisurely at my watch, I found that I had been talking 35 minutes. Outside in an airy room

QUALITY RADIO SUPPLIES

Dictograph 3000 ohms Head Sets
Their use on any Receiving Set, Crystal Detectors or Valves improves reception immeasurably 57/6 Complete

Matching\nRheostats, Transformers

Pirkaton’s Crystal Receiving Sets
Complete with dust-proof Detector and Head Set in Polished Cabinet

Price 90/-

Crystal Valves, Dial, Rheostats, Transformers etc.

Send for Price List. We pay Carriage throughout N.S.W.

W. HARRY WILES
Radio Depot, 60-62 Goulburn Street, Sydney
1 Door from Pitt Street
The wireless weekly: the hundred per cent Australian radio journal

The writer does not know of any firm from whom resistance wound transformers can be purchased ready-made, but they are an extremely simple to construct that anyone can make them up at home.

The wire used in No. 42 H.R. double silk covered 'Eureka' is 24. The price 2s. 10d. 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 one and a half lb., there is plenty left over.

For making up several transformers of similar value it is much better to buy the silk wound on a cardboard form, and后再 wind up any more needed.

The transformer winding is being wound, it may contain a slightly greater number of turns than here stated, and the effect of stripping off a few may be tried until the best arrangement is found. Once this has been ascertained the table may be used by adding or deducting the percentage found as the result of these experiments. It is very important that each set of transformers used simultaneously in a multivibrator set should be identical, otherwise they will lead to a failure, rather than to match each other's action.

Optimum

<table>
<thead>
<tr>
<th>Wave Length</th>
<th>Primary</th>
<th>Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>900</td>
<td>900</td>
</tr>
<tr>
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<tr>
<td></td>
<td>1500</td>
<td>1500</td>
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</tbody>
</table>

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 spindles 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 460 metres; they will deal quite effectively with transmissions on wave lengths from 500 to 550 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 automatically wind up to 20 per cent more. The reader only need find that his particular set requires either rather fewer or rather more turns than those given, for each depends upon the capacitance existing in the set itself and upon the valves used.

It is as well, therefore, to make a few experiments when the first

Figs. 9 and 10.
Wireless Weekly

October 28, 1928

A jazz band was tuning up and waiting its turn. I concluded not to ask the question. No success, none gained, no passage gained, no week gained, nothing gained. I don't know whether I had come over or not; I still do not know. As any rate the experience has been mine. I shall put it down in the scrap book of thrills, good evening ladies and gentlemen.

Q. & R.

By J. E. TANNEHILL

Useless questions addressed to this department will receive no answers as pointed out in the ad in the toe of W. H. L. of Sydney, N.S.W. No attention will be paid to questions not accompanied by money, postage, radio apparatus or smoking tins.

Q. I have an aerial across the back yard, ten feet long, and a lead-in wire 75 feet to the kitchen, and 50 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 ground? Far away?

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 make a bit 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 to night. What would you advise to improve receiving conditions? R. V. B.

A.: Try a good goophone in parallel with the set of your troubles.

The Receiving Set used for Long Distance Receiving

Q.: What are the principles of a short wave? Curious.

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

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

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

Q.: I have been using my neigh-

bore's clothes line for an aerial, but never could tune below 300 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 aero-line in parallel, the sheets in series and take a lead-in from the fifth button on the house of the aero-line. If it is a stiff shirt, your tuning will be very affected at 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 tinker call, thus getting the back end of the pro-
WIRELESS APPARATUS OF 100% EFFICIENCY

AIRWAY PRODUCTS

Condensers

<table>
<thead>
<tr>
<th>Plate</th>
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<td>33</td>
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Knobs and Dials 4 and 5 6 extra

Col-mo Variable Condensers

This Condenser has been designed to meet the requirements for a thoroughly reliable efficient and inexpensive Condenser.

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

<table>
<thead>
<tr>
<th>No. Plates</th>
<th>Capacity</th>
<th>K.H.</th>
<th>Assembled</th>
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<td>30006</td>
<td>0.0128</td>
<td>18/6</td>
<td>16/6</td>
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</table>

0006 with Variable adjustment... £1 0 0
0008 with Variable adjustment... £1 5 0
001 with Variable adjustment... £1 6 0

THE COLVILLE-MOORE WIRELESS SUPPLIES

10 ROWE STREET, SYDNEY

PHONE B2261
The wireless weekly : the hundred per cent Australian radio journal

October 20, 1923.

WIRELESS WEEKLY

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

Fig. 7.—Dimensions for red pieces.

Fig. 8.—The complete winding.

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 resistance-capacity method of coupling, which gives longer range and greater signal strengths than any other. When, however, the number of H.F. valves is increased, the tuned-cavity becomes increasingly difficult to handle, in amount of its tendency to fall into self-oscillation.

Two stages can be used by an expert: there would be no trouble in the resonance curve being cut by heavy damping as reported 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 with copper, but with resistance 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

and tuned transformers can be allowed to display their full power 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 such transformer can be allowed to give its fullest measure of amplification. Thus, for long-distance reception on the shorter wave length of three or even four H.F. valves can be used with no great difficulty, potentialmeter control being all that is needed.
The British General Electric Company, Limited, have pleasure in announcing that with the advent of Wireless Telephony and the early introduction of Broadcasting in Australia on a comprehensive scale by Messrs. Farmer and Company, Limited, arrangements have now been completed whereby supplies of our well-known \textit{GEcoPHONE} Receiving Sets will be available for distribution throughout the whole of New South Wales in ample time to enable discriminating “Listeners In” to obtain the best possible results from Messrs Farmer’s Broadcasting Service.

The best brains of the Wireless Engineering Department and Research Laboratories of our principals, The General Electric Company, Limited, of England, have been concentrated for some time on the production of Receiving Sets which conform with the Government’s Regulations, and which will be minutely adapted for the perfect reception of the comprehensive programme to be broadcasted by the House of Farmer’s.

This accumulated knowledge and experience has resulted in the production of \textit{GEcoPHONE} Receiving Sets—manufactured in the Company’s Telephone Works at Coventry, England, which cover an area of nine acres and are equipped with the finest and most up-to-date machinery in the world.

Advice and Further Particulars Gladly Given.

\textbf{British General Electric Company Limited}

\textit{154 CLARENCE STREET, SYDNEY.}
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The writer does not know of any firm from whose resistance wound transformers can be purchased ready-made, but they are an extremely simple thing to construct that anyone can make them up at home. The wire used in No. 42 B.A. double silk covered "Eureka" looks and feels exactly like 26 gauge, and each transformer for broadcast wave lengths requires only about half a pound. A single winder will suffice for making quite a number.

Fig. 9.—Clip for mounting the transformer.

The former end of the tube. To mount the transformer without a length of choke tube with an external diameter of 1.8 in. and an internal diameter of 1 in. Two end pieces are made from 3 in. diameter. It does not matter in the least whether these pieces are made as plugs to fit into the tube, or as flanges fixed to its ends. In either case each end must have a central hole to take a 21 A. rod, and two others for a 4 B.A. screen, or small terminals (see Fig. 7). The end pieces are fixed in position by means of a couple of B.A. screws. A 3 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 tube for winding. If a hole is not available in the baffle plate, drill in the side by means of its lug or horizontal handle, and insert one end of the B.A. rod into its chuck. Attach the end of the 6 in. wire to one of the screws on the end piece and wind on 250 turns as closely as possible. Keep the wire and attach it to the screw on the far end piece corresponding to the "pig" end on the transformer, and coil up the wire until it covers about 2 in. It may be started 1 in. from the end of the tube. To prevent the wire slipping, it should be given a thin coat of adhesive varnish.

Next, cover the primary winding with a layer of the sewing silk. This will provide good insulation between the windings. The secondary, which has 300 turns, is wound over the primary in the same direction. It will begin and end about 1 in. nearer to each end. Its ends are attached to two remaining screws. To make all secure, the windings should be slatted varnished, and may be wound over with silk to give a neat finish. The completed instrument is shown in Fig. 10.

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. The windings given have an optimum wave length of about 450 metres; they will deal quite effectively with transmissions on wave lengths from 400 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 automatically remain at 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 each depends upon the capacities existing in the set itself and upon the valves used.

It is as well, therefore, to make a few experiments when the first experiments. It is very important that each set of transformers used simultaneously in a multi-valve set should be identical, otherwise they will tend to blinder, rather than to assist each other's motion.

<table>
<thead>
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<th>Optimum</th>
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A Novel Condenser made of cotton reels.

FOR SALE: 6 volt storage battery, fully charged, 20 - $3 Oxford St., Camden Park.


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<td>8</td>
<td>0.015</td>
<td>16/6</td>
<td>18/6</td>
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Knobs and Dials 4- and 5/6 extra

Moulded Varicap, with Wood Type $2/6

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