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Broadway, Sydney
A Talk with Wireless Weekly.

Large Numbers Entertained

Wireless Weekly's offer of free Wireless Music has met with phenomenal success. Every day Radio College Reception Room has been crowded with people eager to hear and learn something about Wireless.

We feel delighted to think that we have been able to entertain so many and at the same time bring before the public, especially the country public the possibilities of Wireless. Those country people who have already attended and heard the telephony have all been anxious to know whether it would be possible to instal a set in their distant homes and so have the same entertainment there as we have been giving them in the city. When answering them in the affirmative, our only difficulty has been that we have been unable to give them a definite date as to when Broadcasting Proper will commence.

Wireless dealers all have the same complaint, they cannot give their customers a definite date.

Amalgamated Wireless Ltd., who from reports hold all the Patents, seem to be the stumbling block that is going to make Australia the last in the field with Broadcasting.

It is hoped that all differences will be swept aside by the Postmaster General at the conference he is to hold on the 9th inst.

Amateurs are again warned regarding licenses and interference. The authorities are aware of the fact that a great number of Amateur Experimenters do not hold licenses and no doubt they will make examples of the first batch of culprits brought to book.

Howling valves are still causing a lot of interference with commercial stations as well as interfering with Amateurs who are testing with one another on low power. Now this allowing of valves to howl is principally caused by lack of knowledge, i.e., persons using valves not having a license to experiment with them. We appeal to all our readers to get a copy of the Regulations, and abide by them.
MANDOLIN ORCHESTRA BY WIRELESS.

Last Tuesday week Mr. King’s Mandolin Orchestra traveled from Bombala to Bega to transmit selections by wireless at Mr. Culville’s station.

Though this experiment was new in Mr. Culville, i.e., to transmit selections by a whole orchestra, it met with great success, and numerous reports have reached him from distant suburbs.

Great thanks are due to Mr. King and his orchestra for having given these services.

SOLDERED CONNECTIONS
HELP RADIO SETS.

WESTERN ELECTRIC GIVES
HINTS TO RADIO FANS.

Everyone who has tinkered with a radio set has had experience with that mostchance trouble—the loose connection. Where many wires must be connected, some to binding posts of many kinds, the greatest care must be taken to see that every joint is tight and if possible soldered. But even then may take a tip from the practical of the Western Electric Company, whose workmen make millions of soldered connections every year in building mammoth telephone switchboards and in all sorts of apparatus work. In fact, the only connections that are not soldered are those that must be opened as a matter of routine, as in replacing worn-out cords or batteries.

A good electrical joint must first of all be strong enough to stand the strains of handling, etc., to which it will be subjected. When two wires are joined, they should always be twisted together for mechanical strength. A wire should be twisted around some part of a fixed leader. Where a flat screw or nut is turned down on the wire, the latter should pass nearly around the screw, but not cross itself. This allows the screw or nut to seat itself evenly. If two or more wires are to be clamped under the same screw, a washer should be put between each wire, or the wires should be twisted together before being bent around the screw.

Avoid the kind of binding post through which a wire passes and which clamps the wire under the tip of a screw.

The ideal connection, however, is one made on a flat metal lug, which has a notch in one or both sides, through which the wire is bent. This transmits a pull on the wire directly to the lug, and the solder is not strained. Solder is not a strong metal; a wire held by it alone can be pulled loose, and repeated binding will soon make it crumble and give way.

Before starting to work with a soldering gun, file the tip of it to a smooth surface on all sides, then heat it, being careful to keep the tip in the flame. When heated in air, copper rapidly takes on a black coating of oxide. When hot enough to melt solder, give the tip a good rub with the file, then quickly rub it in a little sal ammoniac powder or salting paste, in which are
DE FOREST RADIO EQUIPMENT

For efficient service, this line of Radio Goods can be thoroughly recommended, being of excellent workmanship, and so it competes first class materials it commands better results. Send for catalogue of receiving sets and accessories.

Mallard Valves. We have a complete range of these Valves, Transmitting, Receiving and Amplifying, made to specification of the British Army and Navy.

Head 'Phone. Our stock includes the following makes, Brown's, Brandeis, Mallard's, and Stromberg-Carlson.

These Honeycomb cells are ideal for tuning. They are Australian made, and carry our guarantee.

The Latest Admiralty Wireless Handbook now in stock.
Wasteful Aerial Resistance and its Reduction

Most amateurs who have installed, or are contemplating installing, a transmitting outfit, spend practically all their time designing and constructing the set itself, and devoting the set to the highest point of efficiency and perfection, writes L. R. Felder, in "The Wireless Age." But when it comes to the aerial system they swing their wires in the easiest place, attach their ground lead to that good old standby, the external water pipe, and then expect that the Post Office will work overtime delivering letters to them from stations all over the country, telling them how QNA their signals are. It is about time they got wise to the fact that no matter how efficient their generation station may be, they cannot get any decent results for putting juice into a radiating system that is full of leaks. Just as you've got to know how to design your power transformer and get all you can out of it, so you've also got to know how to design your aerial and ground system. And unless you understand just what determines the resistance and radiating power of your aerial, you will not be able to design the aerial system properly.

Now, let me see just how we are able to reduce the resistance of the aerial and to increase the range of the transmitter. The resistance of an aerial is composed essentially of the following:

1. Ohmic resistance, namely, of the aerial wires, ground and ground leads, lead-in wires, connection joints, etc.

2. Resistance due to imperfect dielectrics in the electric field surrounding the aerial.

3. Reflection resistance of the aerial.

The above three components add up to make the total aerial resistance. Of these three, the first two components are wasteful, that is, electric energy is wasted in the form of heat due to them. The last component is the useful component, the greater this is the greater will be the radiated energy be. Must amateurs aren't blood trying to pass the results of their reflection meter off the aerial. They cannot seem to get into their minds that it is not so much more current that they want as it is more radiated energy, ten amperes in one aerial may not carry as far as five of these amperes in another aerial. What good are the amateur's ten amperes of nine of them are wasted in the resistance of the first two components before mentioned, while only one of these amperes is useful in radiating energy? What the amateur should first learn, therefore, is to reduce the first two components to the lowest minimum possible, and to increase the last component.

THE OHMIC RESISTANCE OF THE AERIAL.

In the first place the aerial wires should have a maximum of surface area on account of the skin effect, the current travels on the...
surface of the wire. This can be secured by the use of large diameter wire or flat copper strip, but as these are rather inconvenient for aerials, stranded wire should be used, the best being seven strands of phosphor bronze wire. This stranded wire has been found far superior to a solid conductor, having the same surface area, as far as resistance of wire is concerned.

Now, when it comes to the particular disposition of those wires, a very important factor enters, namely, the so-called "edge effect," which is somewhat similar to the skin effect in conductors. When a flat tapped aerial is used, having more than two conductors, as for example, a four-wire inverted L, there are two outside conductors and two inside conductors, or more, depending upon the number of turns. Just as in a solid wire, the current tends to flow on the outside surface of the wire, as in the case of the aerial having multiple wires, the current tends to crowd to the outside wires, thus the distribution of current in the aerial wires is non-uniform, the outside wires carrying more than their share. As a result of the non-uniform current distribution the resistance of the aerial is increased. Consequently this form of aerial is not recommended. This effect can be avoided if the aerial is constructed so that all its wires are on the outside, and the only type of aerial in which this is possible is the bow-tie aerial, as shown in Fig. 1, see elements of a cell and are equally distant from the centre, thus bearing uniform current distribution, hence resistance than the other types of aerials. For the name reason the loss of the aerial should be in the case type, but the writer has found the best form of aerial to be of the particular type shown in Fig. 1, another being a tapering cage. This particular form of aerial in the type of lead-in offers the lower resistance of any type of lead-in, and secondly, which is just as important, offers a reduced capacity. For best results it is desirable that the aerial capacitance be confined to the top portion of the aerial. Since the capacity of the cage type is directly proportional to the diameter of the cage, it is apparent that the lead-in has a maximum capacitance at the top, and its minimum at the bottom, which is what is wanted. This type of lead-in, therefore, offers

NEW RADIO BOOKS.

Radio for Amateurs—How to Use, Make, and Install Wireless Telephone and Telegraph Instruments by A. Werrill, 1 ½, posted.

Book of Wireless Telegraphy and Telephone, by A. A. Collins, 8/-, posted.

Oscillation Valve: Elementary Principles of its Application to Wireless Telegraphy, by Rangney 8/- posted.


Wireless Telegraphy and Hertzian Waves, by S. Bottome, 4/10, posted.


Making Wireless Outfits. By N. Harrison, 4/- posted.


Experimental Wireless Construction. By A. Morgan, 2/6, posted.

Wireless Construction and Installation for Beginners. By A. Morgan, 2/6.

A.R.C. of Wireless: A Popular Explanation. By P. Harris 1/- posted.

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Frame Aerials in Radio Reception

A CONSIDERATION OF SOME OF THEIR PROPERTIES, WITH DATA FOR CONSTRUCTION

Because the frame or loop aerial is a rather poor collector of energy from electromagnetic waves as compared with the ordinary elevated type of aerial, its use has been very restricted until the advent of the thermionic valve and its development as an amplifier. Now, however, the frame aerial finds favour in many applications and may be equally as good for radio reception as elevated aerials, provided that additional amplification is available, whilst in addition, the frame aerial has many important advantages over other types.

One of the special advantages of the frame aerial is its directional properties. For the benefit of those not familiar with the theory of directional reception with frame aerials, it may be mentioned that reception is strongest when the frame is in the same plane as the direction of the station being received, and that if the frame is rotated through 90 degrees, it will be noticed that the strength of the incoming signal is at a minimum since the frame is least sensitive in this position. A further movement through 90 degrees, or 180 degrees from the original position, brings back the strength again to maximum, since the frame is again in the plane of the direction of the station being received.

On account of these directional properties it is possible to use a frame aerial as a means of reducing or entirely eliminating interference from transmitting stations not in the same plane as the station which it is desired to receive. Thus, for instance, if a receiving station is in the vicinity of a powerful transmitter which normally causes interference, it may be possible, by employing a frame aerial, to eliminate this interference where reception of stations in a direction at right angles to the interfering station is concerned.

Similarly, the frame aerial is now extensively used in the reception of commercial range Atlantic signals, partly on account of the directional properties assisting in eliminating interference from other high power stations but largely because, as compared with elevated aerials, the frame aerial is less sensitive to atmospheric interference, which is one of the most serious problems of long distance commercial working.

Fig. 1 shows a photograph of a frame aerial of portable type, with the tuning condenser mounted on the base. In designing a frame aerial for amateur and experimental purposes, some consideration should be given to the type of circuit to be employed with it. Theoretically it is desirable that the whole of the inductance of the tuning circuit should be included in the frame itself, in order that the maximum voltage may be obtained across the variable condenser in parallel with the frame aerial inductance, which is provided for tuning. This condenser should have a maximum value preferably not exceeding 0.01 mfd.

One of the most important papers on the subject of frame aerials and frame aerial design has been published in the
April 6, 1923.

WIRELESS WEEKLY

has been shown to be a matter of considerable importan ce. If the turns are wound close together the inductance value is increased, but at the same time the resistance goes up. The most suitable spacing is where the resistance is kept as low as possible without a loss in the inductance value.

(3) The size of the wire used does not, of course, have any effect on the wavelength range, and the important point in choosing the wire is that it should have a low resistance. Wire of Nos. 22 to 14 gage is suitable, whilst standard electrical lighting flex is especially efficient and has the advantage that it is convenient to wind and being well insulated, the turns can be arranged to touch if desired.

(4) If the frame is closely wound, then it is essential that the wire should be insulated, but with suitable spacing, bare wire may be employed.

(5) The tuning condenser used in conjunction with frame aerials should preferably not exceed a maximum value of .001 mfd.

(6) In use, a frame aerial should be kept at some distance from the walls of buildings, since proximity to such masses causes the effective resistance of the frame.

(7) It is preferable not to tap out the turns of a frame aerial inductance, since this method introduces dead-end turns on some adjustments. It is therefore better, if possible, to design the frame so that it covers the required range of wavelength without tapping.

The mechanical construction of a frame to carry the wires for a frame aerial is a matter which leaves much scope for individual ingenuity. There are several points to be remembered in designing the frame. The limitations of size, depending on the space available for installing it, is an important factor, and it must be remembered that sufficient space must be allowed to permit the free rotation of the frame without fouling other apparatus, etc. It must be easy to rotate the frame, which should be held in rigidly secured bearings, in order that it shall not be capable of swinging or swaying, as otherwise the strength of signals would be continually varying.

In making use of reaction with a frame aerial, different methods of procedure are available. A part of the inductance may be distinct from the frame and the reaction coil of the plate circuit coupled to it, or the reaction coil may form part of the frame itself. In this case it is best to arrange a second frame, either hinged to the side of the main frame or pivoted within it. Figs. 2 and 3 are suggestions for the design of frame, to either of which reaction frames may be added. In Fig 3 a suggestion is made for ebolute slots to receive the wire with which the frame is wound, and in this case bare wire, either stranded or of substantial diameter, may be used in place of insulated wire, since the slatted ebolute carriers will serve to separate the turns.
In Fig. 3 the frame is wound as a helix, whilst in Fig. 2 the winding would take the more usual form of a solenoid. In Fig. 3 the method of rotating the frame would be by mounting it on a rod, for which purpose a guiding bracket and an upper bearing are provided, as shown. The frame shown in Fig. 2 is not arranged to rotate freely, but would be required to be moved round to stand in the desired position.

A good deal of data regarding the number of turns required for different wavelength ranges has been published. The chart in Fig. 4, published in the "Journal of the Franklin Institute," gives data on the best dimensions and number of turns for wave lengths up to 10,000 metres. Suppose that it is desired to design a frame for reception on 3,500 metres. From the chart we find the following as possible combinations:

| Size of Frame | T
<table>
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<tbody>
<tr>
<td>4 feet</td>
<td>3</td>
</tr>
<tr>
<td>6 feet</td>
<td>4</td>
</tr>
<tr>
<td>10 feet</td>
<td>5</td>
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</table>

If now we refer to the curves on the upper half of the chart we can find the "reception factor," which indicates which of these combinations is the most efficient on this wavelength.

<table>
<thead>
<tr>
<th>Size of Frame</th>
<th>Factor</th>
</tr>
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<tbody>
<tr>
<td>4 feet</td>
<td>9,400</td>
</tr>
<tr>
<td>6 feet</td>
<td>9,300</td>
</tr>
<tr>
<td>10 feet</td>
<td>8,600</td>
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</tbody>
</table>

From this it will be seen that the highest reception factor is with the 4 ft. frame, and therefore this is the most suitable for use on 3,500 metres with the spacing given.

An interesting fact in connection with the design of loop aerials for definite wave lengths is that, where the same length of wire is used the inductance will give the same fundamental wavelength, irrespective of the size of frame, if suitable spacing is arranged. In illustration of this the following table is given, which appeared in a radio pamphlet, published by the U.S. Signal Corps.

<table>
<thead>
<tr>
<th>No. of Turns</th>
<th>Value of Parallel Condenser (mfd.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0005</td>
</tr>
<tr>
<td>2</td>
<td>0.001</td>
</tr>
<tr>
<td>3</td>
<td>0.005</td>
</tr>
</tbody>
</table>

Where it is desired to make use of ordinary electric lighting flex, the following data may be of value for reception on short wave lengths. In this case the condenser employed has a maximum value of 0.0001 mfd., and the turns are wound without spacing.
The wireless weekly : the hundred per cent Australian radio journal

The photograph (Fig. 1) is included as of interest. This illustrates a frame aerial in use at the Observatory, Paris, for the reception of weather reports transmitted locally.

H.S.P.

Wasteful Aerial Resistance

and its Reduction

Continued from page 3

Both resistance and capacity advantages. As far as installation points and others go, it is hardly how that all points should be thoroughly avoided. An undesired joint will erode in time, and may increase the aerial resistance by several ohms.

One of the most prolific sources of wasted energy is in the ground resistance, and this is largely due to poor design of the ground system. The importance of the ground will at once be evident when the amateur realises that the current density is a maximum at the ground. The distribution of current in the aerial is generally of the form shown in Fig. 2, showing that at the ground it is a maximum. Since the heating effect is proportional to the product of resistance by the square of the current, it is evident that this resistance should be a minimum. Now, there is one important reason why most ground systems as built by amateurs have very high resistances; and that there is very little surface area to their grounds, as a result the total current is confined to small area, thus increasing the current density at that point, and hence increasing the resistance to large values. In Fig. 3 (a) is shown the path which the electric lines of force from aerial to earth take. It will be seen that the lines of force from the aerial spread out a considerable distance over the earth, and that these lines of force travel to the ground through the earth. Now, if a small ground is used, as in Fig. 3 (a), the lines of force concentrate around this small ground, resulting in great current density in limited area, hence there is a great loss in heat. If, however, a large surface ground is utilised, as shown in Fig. 3 (b), the lines of force are more uniformly distributed over the ground, and there is smaller current-density, resulting in less loss and lower resistance. It is therefore best to provide a ground covering a large area. Since the electric lines of force come from aerial to ground, the ground should be placed as far as possible directly under the aerial.

There is one type of ground system which enables a minimum resistance, and which is preferable to the above type of direct ground, and this is the counterpoise ground. This is a system where either a large metal plate, or a network of wires is placed over the ground and insulated from the ground, as shown in Fig. 1. The direction of the electric lines of force is now as shown. The advantage of this type of ground is that the lines of force flow directly from aerial to counterpoise, and due to the large area presented by the counterpoise, a more uniform distribution of current is obtained. This type of ground is often simpler to install than a real direct ground, and should be given more attention by the amateur. Measurements taken on a certain particular aerial employing that a direct ground and then a counterpoise,

slowed a reduction in aerial resistance from 10 ohms at 600 metres, to a ohms at 600 metres. This is such a tremendous saving in resistance by the use of the counterpoise that the amateur may employ this type of ground, and have thereby been able to reduce his aerial resistance to such low values as one to two ohms.

In the actual construction of this counterpoise ground, the following must be considered. Place the aerial of the counterpoise should be as large as possible, and should be as near as possible directly under the aerial, and should extend for some distance around the aerial. The wire has found that it is more convenient to employ a network of wires for the counterpoise rather than a solid sheet, as this is too expensive and cumbersome to handle. The counterpoise should be placed about three to four feet above the surface of the ground, and should be the same distance above the ground at all points. As many wires as possible should be used, but a good average number is about 20 wires. At frequent intervals these counterpoise wires should be connected together by jumpers, as shown in Fig. 1. It must be well understood that the supports for the counterpoise wires must be well insulated from the ground, and that if wood supports are used, they should be well insulated. Not only that, but an amount of rain the wires should be insulated by means of ground, non-conductive insulators. The wire leading from the counterpoise from the ground terminal on the transmitter should be composed of a few wires of wide copper strip, since the current is at its highest value at the ground.

RESISTANCE DUE TO IMPERFECT DIELECTRIC

This factor in the resistance of the aerial is very largely overcome by nearly all amateurs. There is a very large conductor, one plate of which is the aerial proper, the other plate being the earth or counterpoise. Consequently for minimum resistance the dielectric of this plate should be as perfect as possible. Much of the aerial resistance is therefore due to the presence of material in the surrounding space about the aerial which are poor dielectrics. Trees, buildings, etc., are a great

Continued on page 12
Wireless De Luxe.

"Here’s to the girl who’s leaving us soon, to waste her time on a honeymoon," quoted a tall, brown-eyed girl to a number of young ladies seated round the room, and raising aloft her cup of tea, she made a bow to a little dark-haired, rosy-cheeked girl, who was certainly the centre of attraction.

"Oh, Pixie!" cried a plump little damsel sitting beside her. "Just listen to that! Unwind, Thora, somebody, she’ll carry on that daguerre for hours if you don’t." "All right," said Thora. "I won’t regale you with my gift, or in my ear give you a lift, but, Pixie, dear, do tell us when you hope to see this Best of Men." "Well," laughed Pixie, "I expect Douglas early to-morrow morning, the boat gets in late to-night, but the passengers disembark to-morrow. Jimmy had them by wireless only this morning.

"By the bye, how’s Jimmy getting on with his experiments lately?" asked Nancy Chectors. "Last time I saw him he was awfully busy." "Buying the rings!" this question from Thora, who loved to tease.

"He’s getting on pretty well," answered Pixie, trying not to laugh. She was very interested in her elder brother’s experiments, as well she might be, for he had already made a name for himself in the wireless world, being in charge of a large station, and was at that time trying with very fair success, the latest discovery, that of controlling a boat by wireless—truly a wonderful discovery, and one that had yet to prove its utility. Jimmy had been in touch with the S.S. "Land-sprout," on which Pixie’s fiancée, as wireless operator, was returning from England, where he also had been studying the science.

The house had held a merry gathering of some of Jimmy’s old school friends, during the afternoon, viewing the trousseau, and, of course, most of the talk had been of her approaching marriage, for Douglas Measures was a favourite as well as Pixie, and many and varied were the presents, ranging from beautiful linen, silverware and crockery, to a little black kitten, much treasured by the little boy next door, who insisted on the great sacrifice of parting with his pet for "Dear Little Miss Pixie’s wedding-moon." Pixie and her two brothers dined alone, as their father, Mr. Harring, was out of town on business; Mrs. Harring had died when Pixie was quite a little girl, and after leaving school Pixie had acted as housekeeper for her father and brothers, Jimmy and Leslie, and a dearer little daughter, sister or housekeeper, according to them, couldn’t be found. There had been an anxious time when Jimmy and Leslie were away at the front, though they had come through without any serious injury. Douglas had been in the same battalion, too, and the trip, dear to Pixie and her father, had at last come safely home, and Pixie was thinking how free from anxiety was this second return of Douglas’s, no submarine this time, and troubles from floating mines had been almost eliminated.

Pixie was trying to put the word "almost" out of her mind when her brother came into the room. "I’m sorry, little girl," he said, "but I think I had better tell you, I have just had an S.O.S. call from Doug. The ship has struck a floating mine; he gave me the position, but hasn’t answered since. A rescue steamer is on the way out now, and I’m sending my wireless boat, too, if you’d like to come." But he got no further, for Pixie was already at his side. "Oh, Jimmy, you must get them," she said. "I’ll come. But he got no further, away." On the way downstairs Jimmy explained that the vessel had made extra good time, and was only a few miles out. She had struck the mine about nine o’clock, and was sinking slowly. "If she can only last another hour or so, we can reach her yet," he said. A little later the girl was standing beside the anxious-faced man working to save the lives of those in peril on the sea. Guiding his boat by a chart to the latitude and longitude given, Jimmy wireless the rescue steamer to watch out for it, and caught a faint repeated S.O.S. from the doomed vessel. Then, "Passengers in life-boats—crew only left—sinking fast." Fifteen minutes later came a message from the rescue steamer, "Passengers picked up. Heavy seas running. Scratching for crew.

Two hours later, the rescuers and rescued were safe in harbour, but the crew were missing. Jimmy seemed to have lost control of his boat, but there was still one hope, he was fitted with a motor engine, and if the wireless went wrong she could be driven. It was past midnight when a message came to the weary brother and sister, a message that was worth waiting for: "Lost her way;
Wireless Music and Telephony.

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Box 578 G.P.O.

Would be pleased to hear Wireless Music FREE, and would be glad if you will arrange an appointment for me.

came just in time; will be in soon; all aboard, "Douglas."
A little later Pixie almost forgot the terrible hours of waiting, when she felt two strong arms round her and heard Doug's voice saying, "What! still up! Floating mines are dashed silly things to leave about, eh, Pixie, mine?"

Afterwards he explained how suddenly everything had happened. "Had we struck anchored," he said, "nothing would have saved us. We got the passengers off all right, but the wind was rising, and one of the boats sank, so the crew was left without any means of escape, but to swim! Then your boat came up; Lord it was eerie! Straight for us she came, and we clambered aboard to find her empty! We just had time to get clear of the poor old 'arkespur' before she turned over. Then the captain took charge of the boat, and I patrolled with the wireless till I got that message to you. The other steamer would have been much too late to have been of any use to us. By Jove, Jimmy, if it hadn't been for that boat of yours we'd all be tucked in Davy Jones' locker by this time. I can't tell you what I feel, old chap, I--"

But his hand-clasp told Jimmy all that he wanted to say.

Among all the congratulations that Jimmy received, he deemed none so precious as his little sister's shining eyes, and her softly spoken, "Oh, Jimmy, Jimmy, dear, I think you're wonderful," as she kissed him "Goodnight."

Mr. MacIvor's Wavelength.

Amateurs should note that Mr. Chas. MacIvor (2GM) is now using a wavelength of 1300 metres.

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Condenser Plates, 1/9 per doz.; Condenser Rodding, 3/9 per set; Condenser Ends, 1/8 pair; Honeycomb Coils, from 3/6; Honeycomb Mounts, 3/6 each; Magnetic Resistors, 7/6 each; Calibrated Dials, 1/6 each; Knobs, 1/6, 2/-, 2/6 each; Contact Stubs, 1/6 per doz.; Switches, 3/., 4/; Terminals, 6d. each; Phone Condensers, 1/4, Grid Condensers, 1/6; Variable Condensers, 2/5, 30/-.

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K Y Hickson, G. F. Eiger Road, Box Hill, R.

K Z Stewart, J. F. 15 Simonds Street, Campbell’s Creek, R.

L A Gibson, C. in Nicholson Street, Essendon, R.

L B Craig, T. H. "Thelma," 29 WilliamBay Avenue, North Brighton, R.

L C Haggrave, H. C. 22 Wynnstay Grove, Armadale, R.

L D Nevin, A. T. Warrick Post Office, via Sunraysia, R.

L E McDonald, L. M. C. 29 Coombe Street, St. Kilda, R.

L F Routledge, R. D. St. Savio’s Road, Fyshwick, St. Kilda West, R.

L G Chevall, Ian R. E. 33 Murphy Street, South Yarra, R.

L H Surridge, H. 28 St. Andrew Street, Brighton, R.

L I Sanden, R. W. 217 High Street, Northcote, R.

L J Ross, Joseph 56 Bellair Street, Kensington, R.

L K Price, C. E. 18 Fawkner Street, South Yarra, R.

L L Mongrave, A. 16 Stewart Street, Windsor, R.

L M Masters, B. J. 16 Sutherland Road, Armadale, R.

L N Muir, R. O. 32 Kemp Street, Northcote, R.

L O Moore, L. E. Park Street, Seymour, R.

L P King, A. W. V. 24 Heideli Street, Thornbury, R.

L Q Golding, R. A. "Chapman," Chapel Street, East St. Kilda, E.

L S Biscoe, R. T. 30 Wordsworth Street, Essendon, R.

L T Wright, C. D. 112 Cadman Street, Gardenville, R.

L U Smith, A. V. 125 Kent Street, Flemington, R.

L W Wriggles, K. S. "Woodlands," Leslie Road, Essendon, R.

L N Wignall, R. Palethorn Upper, R.

L L Thompson, W. V. 146 Ormond Road, Elwood, R.

L Z Scarlett, H. W. 361 Rochdale Street, Bentleigh, R.

M O Rivas, P. R. 27 Caroline Crescent, Oakleigh, R.

M H Whitemore, W. H. Railway Station, Loco, R.

M I Keig, H. H. 23 Midwood Street, Kew, R.

M J Carwell, F. H. 96 Children Street, East Kew, R.

M K McMillan, R. 36 Oak Street, Hawthorn, R.

M L Sturgeon, C. M. 90 Chapman Street, North Melbourne, R.

M M Pond, R. G. 127 Wilds Road, Box Hill, R.

M N Gray, R. T. 44 Lorne Street, Malvern, R.

M O Gilchrist, N. 39 Alfred Crescent, North Fitzroy, R.

M P Honner, S. V. 42 Melville Street, Hawthorn, R.

M Q Cuthine, C. L. 3 Heathier Street, South Melbourne, R.

M R Oke, A. R. 42 Oberon Street, South Yarra, R.

M S Irwin, J. E. 139 Telford Road, South Yarra, R.

M T Aspinall, T. W. 226 Bayswater, North Caftrton, R.

M U Brookenshires, M. E. 169 Randell Street, Elsternwick, R.

M V Collett, H. J. 10 Woodland Avenue, Malvern, R.

M W Bridge, J. E. 16 Bond Street, Mordialloc, R.

M X Bronsfield, J. S. "Harold," Summer Street, Melb., R.

M Y Rogers, V. E. 15 Stirling Street, Kew, R.

M Z Witt, S. H. "Reina," Tranter Street, Camberwell, R.

M A Pendley, E. C. 25 Lach Avenue, East St. Kilda, R.

M V Thors, C. W. 21 Breakfast Road, Upper Hawthorn, R.

M C Low-Smith, P. O. 25 Lawn Avenue, Mount Waverley, R.

M D Smith, H. R. Langhams Street, Sunnyside, B.

M E Stright, H. L. 203 Lach Avenue, Warrnambool, R.

M F Smith, K. H. 6 Glen Erin Road, Elsternwick, R.

M G Cantor, S. J. Asbros Reserve, Kew, R.

M N H Aiton, N. T. L. J. D. 1 Holyrod Street, Hamilton, R.

M I Reddingham, N. A. 83 Ferrigay Street, St. Kilda, R.

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WIRELESS WEEKLY

April 6, 1925.

most energy. It should, therefore, be the aim of amateurs to build
their circuits so that the fundamentals of oscillation are as near 200 meters as possible.
Of course, if the aerial has a natural wave-length of 200 meters, it
may be bunched up with enough coil to permit coupling to the secondary, which immediately increases the wave-length. This should be done preferably for the reason of a series resonant circuit, but not in which does not.

Fig. 1 shows the details of the aerial as described herein, which
gives excellent results. A six wire aerial is used, made of seven strands of No. 18 phosphor bronze wire. The length of the aerial may be about 75 feet. The distance of the rings being two feet. Every 12 feet a metal ring of copper tubing is added to the wire. The wires are wound around the metal rings twice, and then soldered, as shown in the details. The lead-in is like wise a ring, but tapered, with similar centering rings, which are of reduced size so as not to affect the inner tubes of the aerial, and also for the lead-in. The counterpoise is supported by wooden stakes, but at each stake, small electro-static insulators are employed to keep the wires away from the stakes.

Finally, a last word with reference again to the insulators employed on the aerial. Insulators cannot be too strongly stressed, and it is suggested that the insulators should be looked over, and if any breakage or damage is found, it will probably be found that improvements can be made.

ION 78.

Don't try to transmit without a licence.

Don't forget that tube sets are far more efficient than crystal sets.

Don't handle the crystals of your set.

Don't try to get a fine adjustment while touching the detector with bare hands.

Don't fail to make good connections.

Don't forget to scrape off the insulators and base wires before making connections.

Don't cover bread with adhesive tape; use "spaghetti," or varnish suitable tubing wherever possible.

Don't all any portion of a set. Don't blame your set until you are sure it is not your fault that something is wrong.

Don't be discouraged if the first try is not very sensitive. Try a number of pieces.

Don't connect the lighting switch to an inside ground.

Don't use less for an aerial.

Don't forget to keep the aerial and lead-in insulated from all other objects.

Don't forget that a good ground is necessary.

Don't try to use your instruments just before, just after, or during a thunderstorm.

Don't rush blindly at the set and turn knobs and handles but if anything goes wrong, be calm and patient and go slowly.

WIRELESS GOODS

at City Prices

Valves, Crystals, Shunters, etc.

Oscillation House

Late P. L. Stimson & Co.

82 King St., Newtown

G. Caletti, Wireless Manager

Phone: L1108

RADIO SETS

and Parts to make your own

Send for Price List.

ELECTRICAL UTILITIES SUPPLY CO.

RADIO HOUSE

605 George St., Sydney.

Electrical Goods

FOR THE HOME.

IRONS - 38.6, 35/- 42.6

TOASTERS - 47.6, 55/- 95/-

VACUUM CLEANERS - £14 10 0

LAMPS, 18-50 Candle Power

1/3, 2/3 each.

100-4.3: 200-6: 300-8.9.

RADIATORS - 30/- 90/-

O'Sullivan's Electric Shop

296 Pitt St., Opp. W.A.S. Board.
WIRELESS WEEKLY

MOUNTING FOR LOOP AERIAL

A unique method of mounting a loop aerial, so that it is steady yet at the same time may be freely rotated, is shown in the diagram here given.

All the material necessary is one dozen nickel-plated study log knobs which can be purchased in any hardware store for 24 cents and 2 ordinary shelf brackets—2 for 5 cents. All other things that are used can be found in any home.

Any kind of a loop or any type of winding can be employed, the amateur usually preferring his own style. I will therefore deal solely with the construction of the mounting. The exact measurements are shown in the illustration.

The base Fig. 2, is constructed of sheet plus 10 inches square. Legs 1 by 1 by 1 of an inch are attached to the corners to allow for variation of the length of the base. A 3/8-inch hole is drilled in the exact centre of the base.

The frame Fig. 3, is the same size as the base. Place the exact centre and draw a circle with a radius of 4 inches. Paste the knobs at equal distances on this circle. Now here another 3/8-inch hole in the centre of the turntable. Paste the shelf brackets on opposite sides of the support A, 1/16th another 3/8-inch hole, B, in the end of the support deep enough to afford ample support for the frame, yet avoiding the hole for the outside wire of the loop, C. It must be understood that the loop is not depending upon the belt for its support.

Now pass the belt through the base, turntable and the hole in the end of the support and adjust the aid so that the turntable knobs fit finish with the base.

Contributed by C. V. Holdali

RADIO COLLEGE

Applications are now being received for forming the next class.

23 LANG STREET

F. B. COOKE, Principal

SHIPS YOU SHOULD HEAR THIS WEEK.

DURHAM XIB
HATIPARA BHH
MONTORO GIDJ
PORT PIRIE ZNM
PORT STEPHENS ZSU
RUNIO MWU
VENTURA WBL
WAFHERO GBBQ
BARADINE GFBN
CARINA VZM
MORELLA GMR
ORVIETO MJO
THEMISTOCLES MCM
Echuca VZBG

MAKE YOUR OWN SET

We Stock All Parts

All kinds of Electrical Accessories

Call and inspect our Stocks

J. J. Hoelle & Co.
57 Goulburn Street

Factory: 49 ALMA STREET, DARLINGHURST

HAVE YOU A LICENSE FOR THAT SET?

Wireless amateurs are warned that they must hold a license before they can use a wireless set. With the increasing number of experimenters, a very strict watch is being kept for breaches of the Wireless Act.
Leichhardt and District Radio Society

The membership of the Leichhardt and District Radio Society continues to grow, and several new faces were noticed at the recent weekly meeting held on Tuesday, March 29th.

The Society has received an offer of the use of some convenient and commodious premises for the holding of its business, and it is probable that the offer will be accepted. Members are requested to watch these columns for a further announcement with regard to this matter.

In the meantime weekly meetings are held each Tuesday night at Victory Hall rear of Methodist Church, Johnstone St., Annandale, and any inquiries regarding the Society’s activities will be willingly answered by the Hon. Secretary, Mr. W. J. Zech, 145 Booth St., Annandale.

Western Suburbs Amateur Wireless Association...

General Meeting held 7th February, 1923.

Going to the numerous number of junior members about the club, it was decided to consider the introduction of a junior section. This section it was proposed to have a lower fee and provide the information suitable for the juveniles and novice boys who work on pocket money dig free. The committee also decided to receive any suggestions from the members.

Mr. Martin, although not long with the club, proved very proficient as a secretary, and his leaving the district compelled him to resign. The Club regret the loss of their member and hope for him a very successful career in the wireless code plaques.

In conclusion, a new member was elected, and Mr. Phil McRae, Hon. Sec., Wireless Institute, was entertained, and later in the evening talked to the club of the many quests of wireless. Also during the talk with Mr. McRae the affiliation of clubs was discussed at length.

The Club wish to make it quite clear to members that they are ever willing to help the cause when required to do so in club numbers or not.

Correspondence to Hon. Secretary goes to H. Atkinson, Pine and Cumberland Roads, Ashbury.

Croydon Radio School.

Mr. Chas. Simko, of Lang Street, Croydon, who holds first-class operator’s certificate, was for 13 years P.O. telegraphist in the British Navy, has opened a Wireless and Morse Code School at the above address.

At present he is holding numerous evening classes in Morse Code Fee which he charges a normal fee for each lesson.

These classes offer a splendid opportunity to those who are passing from Crystal to Valen and wish to pass the 12 word’s a minute test.

2 amateurs going strong.

Listening in during the Easter holidays for amateur transmitting, I was surprised at the number of stations I heard on telephony.

Radio College was sending strong music on Friday night; it came in strong, and the modulation was perfect.

Mr. O’Dwyer has also been sending out good stuff.

Mr. Cowper was going strong every evening; I listened in on Monday evening, and found Radio came in stronger than any of the others. There is no difficulty in getting good amateur work any night in the week; just listen in on wave-lengths between 200 and 400 metres and you will see only 2 or 3 transmitters.

Wireless Weekly

Friends

of course drop in on us to hear the latest in wireless.

An Extra Head Set

Western Electric radio instruments are always reliable.

Your regular radio dealer can supply you at advice and details can be had direct from Western Electric.

A Wireless Dinner.

Take half a dozen beets, one pound of high frequency currents and a pint of butter. Remove the cores from the beets, and carefully scrape and break the high frequency currents. Strain the other through a finely meshed grid in a warm electroscope. Heat well in a bimetallic receiver, and serve for half an hour. Place in a transformer well-done to an appetizing turn, and serve with a garnishing of stale on a hot plate.
CORRESPONDENCE

X.V.B., writes.—

In your issue dated the 23rd inst., I was surprised to hear that Miss Judy Monteble was the first theatrical star to entertain the Australian public by radio phone. Speaking of personal experiences I can recall the evening of an afternoon listening to at Westerport, V.V., to a concert conducted from St. Michael's Theatre, Melbourne, a distance of over 40 miles away. On that occasion Miss Monteble sang several items, assisted by several other artists. Mr. F. D. of the Amalgamated Wireless, conducted the wireless transmissions, on about 900 metres. The music was excellent and could be heard several miles away from the model. The model used was a French eight valve resistance-capacity coupled amplifier with the last valve employed as a neutralizer. V.V. at this time I am speaking of 12 months ago was used to broadcast some excellent music and speech, really the best I have heard in Australia. He was reported to have been heard by V.P.R. at 8000 miles. This is about an Australian record for telephone. Even at the best of times we could only have heard V.V. at about 750 miles. V.V. at this time was really a success of the time and under very good conditions, or on a fresh night he may have been heard at 8000. Personally I think the operator at St. Michael's have strained his ear drums a great deal to hear V.V. We are not at present in listening in at St. Michael's concerts. He is good. 295 is also very good and we received his speech and music at maximum and his modulation was excellent, when he was in full swing. At times he went off and most of his speech becoming too loud apparently but we are very pleased to hear him and consider him a great asset for dispensing good care. He asked for a ring, but we were unable to ring from where we are living. VZT8A is the morse code. 2PA was a great success on Monday evening on 140 metres, but was jumbled for a time by 2HR testing on 200 metres. It’s hard to say whether 2HR’s testing was long or whether our amplifier was the culprit, as we have nothing in operation on waves below 600 metres. We use a seven valve Maxwell amplifier with an 8 valve detector and naturally these concerts can be heard several feet away from the phone. V.K.O. and V.M.S. the great users of unnecessary power, especially the latter, but V.M.S. must play with something, hence his continual calling of ships out of range on maximum power. We hear him very plainly here, more plainly than the concerts in fact. Well, I will quit for the present. Hoping to hear more of you.

QUESTIONS

Accompanied by the coupon below will receive a prompt reply. Please understand that 2 questions only can be answered with each coupon. Editor.

Question Coupon

To Information Editor

AVAILABLE TILL 19-4-23

NAME

Address

FOR 2 QUESTIONS ONLY

For Sale or Exchange


WELLINGTON BROADCASTING NIGHTS

April 8, 1923

The following “Broadcasting Nights” is published in the New Zealand “Broadcasting News.”

Australia seems to be the very last. If New Zealand with her smaller population can make broadcasting, why cannot it be done here.

“Monday night.—De Forest Company.

“Tuesday night.—Federal Company.

“Wednesday night.—Federal Company.

“Thursday night.—Federal Company.

“Friday night.—De Forest Company.

“All the above concerts are broadcast on 270 metres, starting at 7.30 p.m., finishing between 9.30 and 10 p.m.”

Seen at the Wireless Room—Valve legs.

Song of the lost signal—“Come Back to Erin.”

Why did the valve oscillate?

Because it had got the “flage.”

He who oscillates is “caused.”

Waves of a feather jam together.

Why did the valve “howl”?

Because an electron passed round the plate, and found it 2 M. T.

Radio Greetings—“Hallo, Old Grid!”

Published by W. J. Moxon

“Trum,” Forbes Street, Neutral Bay, Sydney, at the offices of W. J. Moxon, 201 Castlereagh Street, Sydney.
Amplifying Transformers

The Amplifying Transformer is one of the important integral parts of the Radio Receiving Set. Probably no other part is more subject to quality than the Transformer. Its functions can not be definitely performed that satisfactory results are most dependent on the performance of this little instrument.

The Jefferson Electric Manufacturing Company were quite logically attracted to this field. As originators, pioneers and manufacturing specialists of Transformers for a period of twenty years, they are in a good position to develop an Amplifying Transformer of the highest quality.

1. Ratio of secondary to primary turns, 3.75 to 1.
2. Useful low-frequency range, 60,000 cycles.
3. Allowable current on such winding 10 milli-ampere.
4. Test voltage between primary and secondary, between primary, secondary, and ground, 300 volts.
5. Terminal voltage tests on open circuit, 500 volts.
6. D.C. resistance of windings: Primary, 1000 ohms (approx.); Secondary, 1000 ohms (approx.).
7. Primary and secondary wound with No. 40 enamel covered copper wire.

The core iron is so designed and assembled as to get an even distribution of flux through the entire circuit. Compelling Transformers operate above saturation point at some sections as account of poorly designed core. The number of turns in the Jefferson Transformers is anywhere from 30 per cent to three times as many as are used on Transformers which sell for approximately the same money. Jefferson Transformers will operate with tubes having impedance from plate to filament of 20,000 to 30,000 ohms, and grid to filament 250,000 to 300,000 ohms.

The Colville-Moore Wireless Supplies
10 Rowe Street, Sydney.

QUALITY RADIO

Winter seasons are the best for Radio Reception. Secure your Set before the season arrives.

WE STOCK COMPLETE SITS OR PARTS TO BUILD YOUR OWN.

R.F.I. English Detecting, 35/-; Amplifying, 35/-; and Transmitting Valves, 40/-; Head Sets 2000 to 8000 ohms; Crystal Sets complete with 4000 ohms; Head Set, 25.

SEND FOR PRICE LIST TO

W. HARRY WILES,
Radio Department,
60-62 Goulburn Street,
One door from Pitt Street,
SYDNEY.
3 Coil Valve Set Complete

with "A" & "B" Batteries, Phones, Etc., Ready to "Listen-in" on.

To Our Country Visitors,

Don’t go back home without hearing Wireless Music.
We are arranging Wireless Telephone Demonstrations to show what our sets will do.
You can instal a complete Wireless Receiving Set in your home for £14 14 0.
Consult us for advice and all particulars in Wireless Matters.

Radio Company

18 Elizabeth Street
(4 doors from Hunter Street)

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