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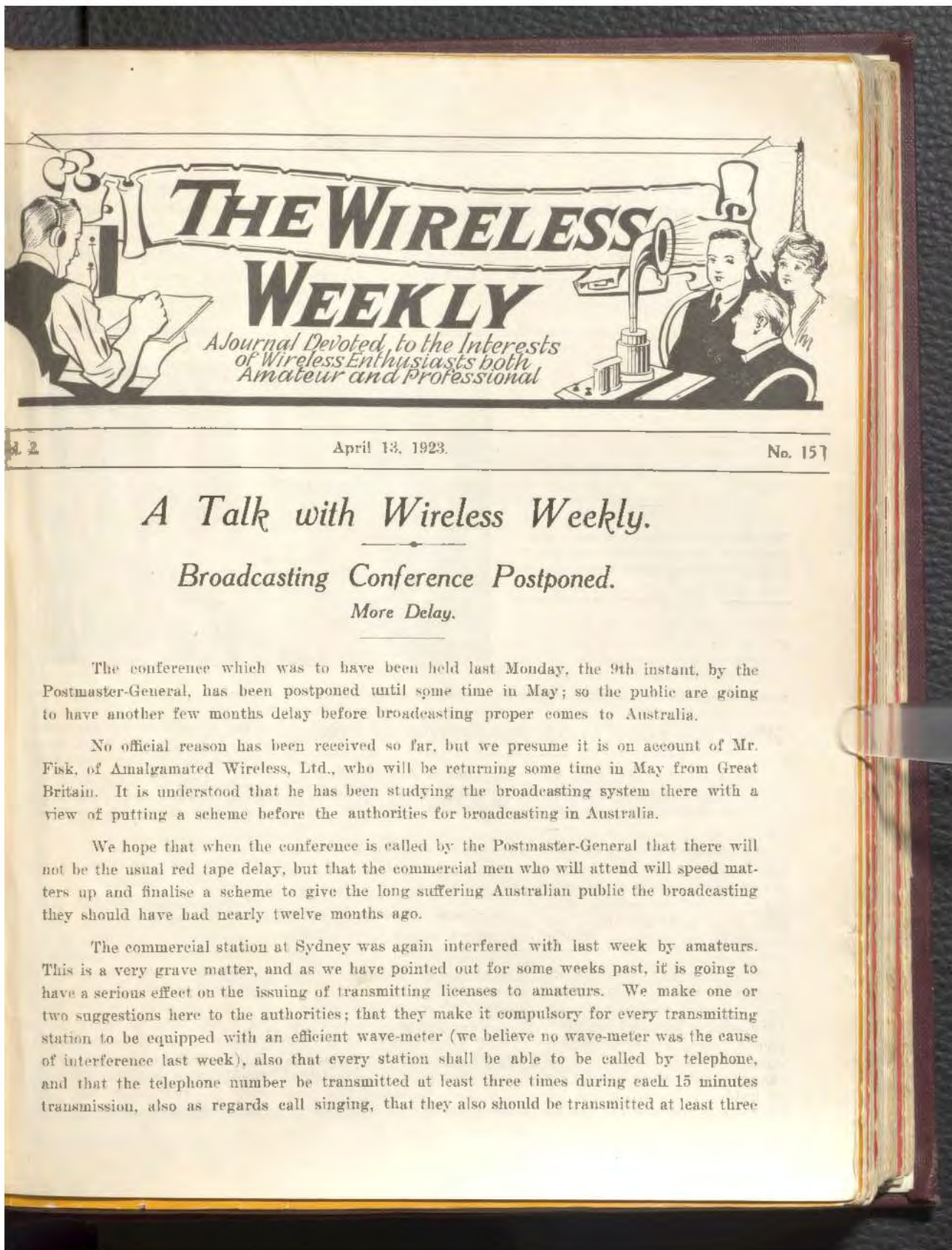
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GRACE BROS. LTD.

Broadway, Sydney



Vol. 2

April 13, 1923.

No. 157

A Talk with Wireless Weekly.

Broadcasting Conference Postponed.

More Delay.

The conference which was to have been held last Monday, the 9th instant, by the Postmaster-General, has been postponed until some time in May; so the public are going to have another few months delay before broadcasting proper comes to Australia.

No official reason has been received so far, but we presume it is on account of Mr. Fisk, of Amalgamated Wireless, Ltd., who will be returning some time in May from Great Britain. It is understood that he has been studying the broadcasting system there with a view of putting a scheme before the authorities for broadcasting in Australia.

We hope that when the conference is called by the Postmaster-General that there will not be the usual red tape delay, but that the commercial men who will attend will speed matters up and finalise a scheme to give the long suffering Australian public the broadcasting they should have had nearly twelve months ago.

The commercial station at Sydney was again interfered with last week by amateurs. This is a very grave matter, and as we have pointed out for some weeks past, it is going to have a serious effect on the issuing of transmitting licenses to amateurs. We make one or two suggestions here to the authorities; that they make it compulsory for every transmitting station to be equipped with an efficient wave-meter (we believe no wave-meter was the cause of interference last week), also that every station shall be able to be called by telephone, and that the telephone number be transmitted at least three times during each 15 minutes transmission, also as regards call singing, that they also should be transmitted at least three

times during each 15 minutes transmission. Luckily last week one interfering amateur did give his telephone number after some hours of interfering. He was immediately rung up by some other amateurs, who were listening-in, and told of his interference. This goes to show the average amateur experimenter is only too anxious to work within the regulations laid down, still, it behoves us all to seek out and report any persistent interferer, who will jeopardise the whole body of amateur experimenters in this country.

"Young Australia Listens In."

The set shown in accompanying photograph was built and installed by Messrs. Colville-Moore, Rowe Street, City.



What Kind of a Receiving Set Should I Buy?

Pointed Questions that Every Layman is Asked when He Starts out to Select His Equipment; Questions that He Must Decide Before He Makes His Purchase.

The uninformed layman who selects and purchases instruments for his radio receiver is about as likely to make a wise choice as a Hindu poet attempting to outfit an Arctic expedition.

He is offered the choice of an extensive line of apparatus, each piece of which seems to have certain specified technical merits. Only a few of the instruments are essential, although many others are highly desirable; if the buyer can afford them; but he does not al-

ways know this, and after a few minutes of demonstration is lost in a maze of indecision.

Despite the diversity of radio equipment on sale, only a little knowledge is required to make a sensible and economical purchase with due regard to the buyer's financial limitations. The important point is to know exactly what is wanted in the way of results and to watch for defects in construction, which are obvious if they are pointed out.

The answer to the layman's general question, "What kind of set should I buy?" may best be answered by a consideration of what he wants his set to do—the service he expects from it.

1. "HOW LOUD A SIGNAL DO YOU WANT?"

This is usually the first question to be decided. If the buyer can pay the price he can receive music from a broadcast station more than a thousand miles distant and make it audible for a block or two from his house. On the other hand, a salesman may state truthfully that a certain station can be heard at a certain distance with a particular set, yet that signal may be so

weak that it will be drowned out by the ticking of a watch.

The question of signal strength is not hard to settle. It is determined by four factors:—

- The distance from the transmitting station;
- The size of the antenna;
- The type of detector used;
- The amount of amplification to which the detected signal is subjected.

If the buyer is content to lounge comfortably in a chair with a pair of earphones on his head and is satisfied if but one or two persons may listen in at a time, signal strength of the order obtained on a crystal set or vacuum tube detector set will be sufficient.

But if he wants to dance to radiophone music, or if he wants to make concerts audible to as many persons as he can accommodate in a room, or if the buyer is bothered by the prospect of wearing a receiver on his head for several hours each evening, instruments will be needed which produce

greater signal energy. This must be sufficient to operate a loud-speaking horn, and except for short distances an amplifier is necessary. Provided money enough is spent, a signal can be amplified to practically any degree of strength.

Of course, the distance from the transmitting station is a fixed quantity.

The type of receiver essential to obtain signals of sufficient loudness for head telephones and the type for operating loud-speakers for various distances from the transmitting station can be determined after reading further points discussed in this article.

2

“WHAT SIZE OF ANTENNA CAN YOU USE?”

The size and design of the antenna partly determine the amount of energy which is collected to actuate the receiver, just as the distance from the transmitter determines the amount of energy available.

In general, the longer the an-

tenna the greater the energy received. For receiving purposes many wires are not essential; a single wire is practically as effective as four parallel wires of equal length, and it is easier and simpler to erect. A one-hundred-foot antenna may be considered an average length. In some cases, by increasing the length of a fifty-foot antenna to two hundred feet the signal strength is increased to the same degree as by one stage of amplification. Hence the longer it is practical to make an antenna up to two hundred feet, the louder the signal obtained.

The natural wave-length of an antenna—that is, the wave-length to which it responds without the addition of tuning apparatus—is roughly proportional to its length. For the reception of broadcast music on a wavelength of 360 metres, a one-hundred-foot antenna may be connected directly to the receiving apparatus. A longer antenna requires an artificial means of shortening its

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natural period or wave-length. This is accomplished by means of a variable condenser inserted in the ground connection or lead-in. With such a condenser, the concerts broadcasted on 360 metres can be heard on antennas of two hundred feet or longer.

When the lead-in to the receiving set is taken from one end of a single-wire antenna, greater energy is received from stations in the direction from which the lead-in is taken. The single-wire antenna may thus be considered as an arrow, with its head or point at the end where the lead-in is taken. This directional effect is marked and should be taken advantage of by pointing the aerial so that maximum energy is received from the most desirable broadcast station.

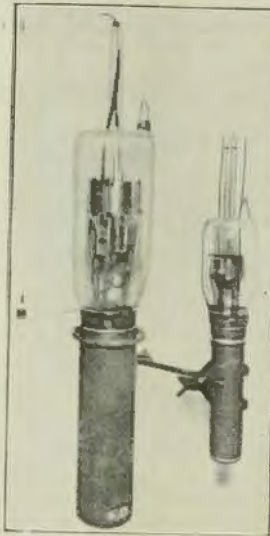
Signals received on indoor aerials usually require considerable amplification: First, because the indoor antenna is limited in size; secondly, because some of the energy is absorbed by steel girders or other metal parts of the building in which they are located. For these reasons, outdoor antennas are recommended.

Indoor antennas are of two

types, loop and flat top.

The loop antenna consists of a number of turns of wire mounted on a frame (usually one to three feet square), so ar-

Latest Valves



TWO GIANT TUBES

A small receiving tube is shown in comparison on the left.

anged that the loop may be rotated on a horizontal axis.

A loop has strong directional characteristics, hence interference from stations in directions other than that at which a desired station is located may be reduced or eliminated. But the loop antenna collects so little energy that many stages of amplification are necessary to make a signal of strength equal to that obtainable from a long single-wire outdoor antenna—and amplifiers are costly.

An indoor flat-top antenna consists of one or more wires stretched through the greatest available length.

If an indoor antenna is long enough and located high enough in a building, it may approach the efficiency of an outdoor antenna of equal length, provided the absorption from the steel framework of the building is not too great.

3.

“WHAT DETECTOR WILL YOU CHOOSE?”

Receiving sets may be classified thus:—

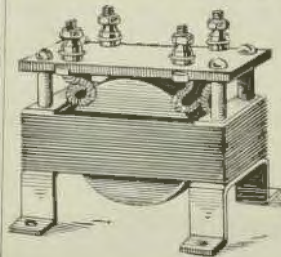
Those that employ crystal detectors;

Those that employ a vacuum tube as a detector;

Those that employ a vacuum tube detector with a regenerative circuit.

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The crystal detector is the least expensive type. For short-distance work it gives a satisfactory signal in the telephones. The vacuum tube detector is expensive but it is a much more stable device and gives a signal approximately twice as loud as a crystal detector.

The vacuum detector tube employed with a revolving set that uses a regenerative circuit is still more sensitive, although it requires greater skill in adjustment. The degree of regeneration is determined by the adjustment of the tickler or regeneration control. If too great a degree of regeneration is employed the quality of the received music will be distorted, and if a still greater degree is used the music will be entirely destroyed. But a set in this condition (it is then acting as an oscillator or transmitter) is capable of receiving C. W. (continuous wave) telegraph signals, which require ability to read the continental code for interpretation.

One stage of amplification makes a faint signal comfortably audible in the receivers. A second stage makes such a signal loud enough to hear all over an average room. Hence, if the antenna does not pick up enough energy to give a comfortably loud signal, an amplifier solves the difficulty. Also, if a signal is received sufficiently loud so as to be heard easily with receivers, and it is desired to have it audible throughout a room, an additional step of amplification is necessary.

"HOW FAR ARE YOU FROM A STATION?"

Assuming that the antenna is of average length, say, one hundred feet, the buyer can

Continued on Page 8.

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Calculations in Telegraphy and Telephony. By H. Few. 3/-, posted.

Experimental Wireless Construction. By A. Morgan. 2/9, posted.

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MEASUREMENT CHARTS.

By RAOUL J. HOFFMAN.

One of the most important problems to confront the amateur who designs his own radio set is how to calculate the correct sizes of inductances and the condensers for the various parts of a radio circuit for a given wave-length.

There are several mathematical formulas for determining these "constants" as they are called. But these formulas are usually so complicated that they are not much used by the ordinary amateur.

Most amateurs who design their sets resort to the "cut and try" system; that is, they wind a temporary coil with taps, connect it in the circuit, find the correct tap and then build a permanent coil with a corresponding number of turns on it. Sometimes they build a number of coils and try them all out in order to find the best size to use.

Fairly good results are often obtained in this way, but this method is obviously unscientific. It entails a waste of time, energy and money. It is better and more practical to use standard formulas that will give the correct size for all parts to be built; further, these standard formulas enable the builder to design his set on paper and then build it according to the recorded specifications; in that way he will know in advance just what the results will be.

For the benefit of the average amateur, some of these standard formulas have been sim-

plified and are represented here in the form of "alignment charts."

These charts offer the most convenient possible way of solving equations, which have

three or four variables. They make it possible for the ordinary radio fan to use the formulas without the aid of anything more than common sense and a ruler.

The prime problem to be dealt with in radio is that of "resonance" in the different circuits. In order to have re-

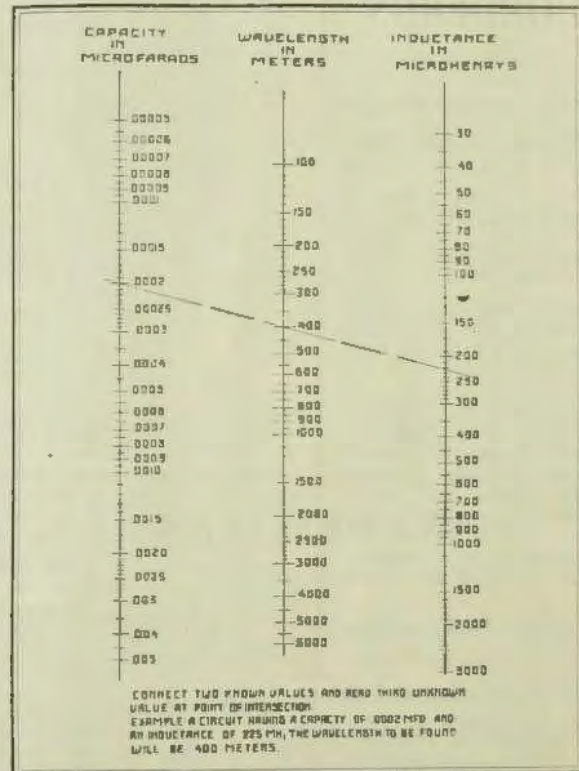


Figure 2.

Measurement Charts for Determining Constants of Radio Circuits and Calculating.

sonance in a circuit, or in other words, in order to tune a circuit to any particular wave-length, the circuit must contain inductance in the form of a coil and capacity in the form of a condenser. A certain value of inductance and certain value of capacity together in a circuit give it a certain wave-length; unless either or both of these values are varied, the circuit will absorb energy of no other wave-length.

The basic formula for the wave-length (W.L.) follows the equation:

$$W.L. = 1884 \sqrt{LXC} \dots \dots \dots 1$$

wherein L is the inductance in microhenries and C the capacity in microfarads. The above formula is shown in chart form in Fig. 2.

In order to illustrate the method of using this chart, let us take the following problem: In Fig. 1 we have a coil connected in an antenna circuit. This circuit is equivalent to a coil with a condenser connected across it—the condenser in this case being the capacity between the antenna and ground.

The example is this:

To find the proper value of inductance for this coil when used in an antenna circuit that has a capacity of .0002 microfarads, in order to tune up to 400 metres. With a ruler on the chart in Fig. 2, connect the value of capacity (.0002 mfd.) on scale 1, with the wave-length desired (400 metres) on scale 2. The answer will be found at the intersection on scale 3; it is 225 microhenries.

This same example applies to calculations for a secondary cir-

cuit in which the capacity will be the variable condenser connected across the coil.

To calculate a circuit that has two capacities (as shown in Fig. 4), we find first the resulting capacity which will follow the relation:

$$\frac{1}{C} = \frac{1}{C1} + \frac{1}{C2} \dots \dots \dots 2$$

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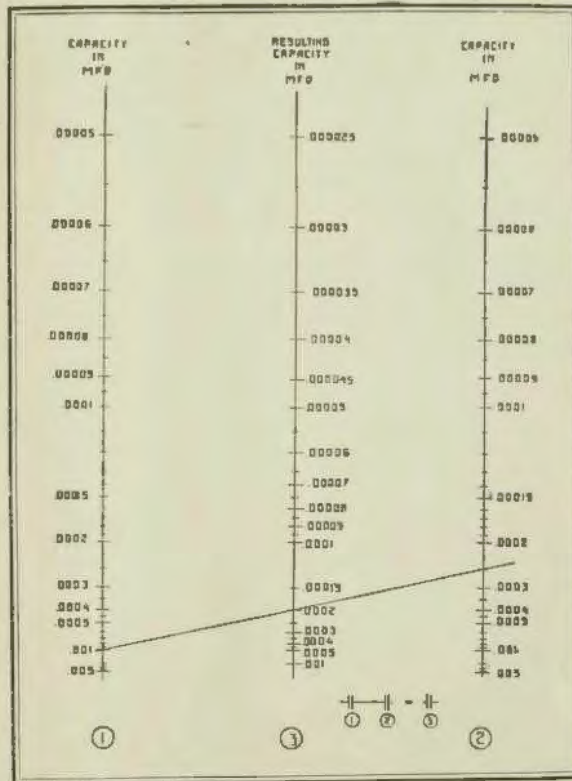


Figure 3.

wherein C1, C2 are the capacities connected in series and C is the resulting capacity. This formula is plotted on a chart

shown in Fig. 3.

Let us take another example: Calculations for an antenna circuit with a coil in series re-

solve themselves into a simple formula for a wavelength of a coil with a condenser shunted across it. The condenser in

and read at the intersection with scale No. 3 the resulting capacity of .0002 mfd. Having a capacity of .0002 mfd. and a

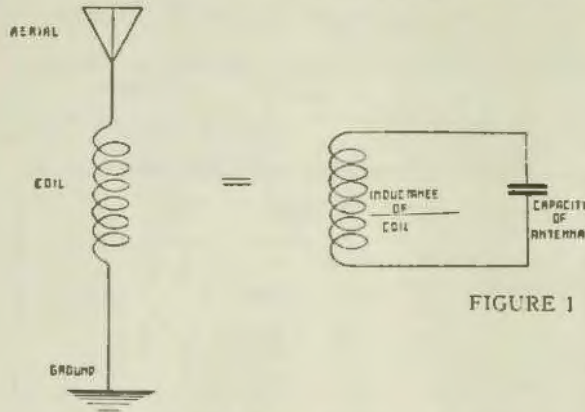


FIGURE 1

this case represents the capacity between the antenna and the ground.

To calculate an antenna circuit with a coil and a condenser in series resolves itself into a formula for a coil with two condensers in series with it. One of these capacities is the condenser and the other is that between the antenna and the ground. These are added together by means of the chart in Figure 3.

Find the correct value of inductance to use in a circuit shown in Figure 3 in which a condenser is placed in series with the antenna circuit, the antenna having a capacity of .00025 mfd. and the condenser a capacity of .001 mfd. to tune to 400 metres.

The first step is to find the resulting capacity of the two condensers with the aid of the chart in Figure 3. Connect .001 on scale No. 1 with .0025 on scale No. 2 by a straight line

desired wavelength of 400 metres, we find that we will need an inductance of 225 microhenries, as found in the first example we have given.

The chart shown in Figure 2 may also be used to find the wavelength, when the capacity and inductance are known, or to find the capacity when the inductance and wavelength are known. The general rule is this: Connect two known values on any two scales and the unknown will be found where the line crosses on the remaining scale.

The amateur is advised to keep these charts for reference, to be used along with additional charts on the design of coils necessary to get a certain value of inductance, and also with charts that will calculate the capacity of an antenna.

By the use of these charts the amateur may design his set with a definite knowledge of what wavelength range to expect when his set is finally put together and connected up.

What Kind of Receiving Set Should I Buy?

Continued from Page 5

then decide just what is necessary for him to purchase to receive broadcast programmes from a transmitting station located at a given distance.

For distances up to twenty-five miles, using head telephone receivers, a crystal detector and simple tuner are sufficient.

A vacuum tube detector instead of a crystal detector permits the use of four or five telephone receivers at the same time.

A vacuum tube detector with a receiver of the regenerative type makes a signal loud enough to be audible through a small room, when projected through an amplifying horn. The addition of a one-stage amplifier to this equipment produces a signal audible through a room.

For distances up to fifty miles, a vacuum tube detector is essential to a clearly audible signal. A regenerative circuit increases the range of reception up to 200 miles. A regenerative receiver and one-stage of amplification increases the range for reception from broadcast stations up to 500 miles, and a second stage of amplification brings the range up to 1,000 miles.

In each of these cases an additional stage of amplification brings the signal to sufficient audibility to be heard throughout a room of average size when the signal is projected through a loud-speaking horn. However, it is not advisable to use more than three stages of audio frequency amplification.

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April 13, 1923.

WIRELESS WEEKLY

9

Fault Tracing and Maintenance.

By "ELECTRONE."

If it has been your unhappy lot to have invited some friends to "listen-in," and then to have found that something has "gone wrong," read these articles so that the occurrence will not be repeated.

It is the tragic lot of the beginner at wireless that his red-hot enthusiasm is liable to be dumped down for days at a stretch when something goes "radically wrong" with his receiving instruments. The thing that goes "radically wrong," of course, may be no more than a loose connection; yet the fact remains that, in spite of his best efforts, no signals are received from the Monday afternoon until the following Wednesday morning, when he happens to come across the loose connection by accident.

EXPERIENCE "THE TUTOR."

Experience will teach its lesson in time, no doubt, but frequently it does so at the expense of a good deal of time and material and effort which could have been used to much better advantage. A little personal experience (of the unpleasant kind) is, of course, beneficial to the beginner; it develops an alertness of mind and a faculty of observation which are always valuable assets to the pursuer of scientific work of any kind. But it takes a long time to learn all about a subject by oneself—even the practical aspect of it—and the time spent in "learning from bitter experience" can often be spent with much better effect by the beginner in learning from the experience of someone else.

A SPECIAL FEATURE.

Useful information with regard to the avoidance of faults, the tracing of faults, the correction of faults, and practical hints on the proper care and maintenance of amateur installations will form the substance of these Notes. Unfortunately it is not always as easy to tell when a wireless receiver is out of order as it is the case of, say, a motor-bike. If you can't get your motor-bike to "fire," there are certain definite places where you may be fairly sure of locating the cause of the trouble. In the case of a wireless receiver, however, if no signals are received it is quite a different matter to locate the "fault." It may, literally, be anywhere—in the telephones, the aerial, the valve, the condenser, the inductance, the terminals, etc. There is

this analogy between the two cases, however: the petrol and oil which supply the motive power of the former may be resembled to the H.T. voltage and filament current which feed the valve in the latter. And just as there are certain characteristics which easily betray a shortage of oil or petrol in a motor-bike, there are similar means of recognising any unwonted decrease in the strength of the valve batteries. It will be the object of the present article to tender some general advice to the beginner which, if followed, will enable him to keep his instruments working at their maximum efficiency, and thus reduce the possibility of faults arising at unexpected moments.

WORK WITH A SYSTEM.

The first thing I would endeavour to impress upon the practical amateur is the great advantage of working with a system. One is frequently hearing that there are two ways of doing everything: a right way and a wrong way. It would be more correct to say that there are a hundred and two ways of doing everything, a right way and a hundred and one wrong ways. In the case of wireless, at any rate, I'm sure any experienced amateur will agree that this is true. When something goes wrong with your receiving instrument the only right way to set about repairing the trouble is to tackle the job systematically.

YOU MAY BE LUCKY—OR—

You may, of course, "chance to luck," and start by disconnecting the diaphragm of your telephones in order to make sure that the magnet coils are all right. Having ascertained that these are intact, you may decide next to take out your tuning condenser to make sure that there is not a permanent short between two plates. And when you have satisfied yourself that there is no condenser trouble you may then decide to take a walk outside and have a good look at your aerial in case the wind should have broken or disconnected it. Finally, after you have wasted half an hour scrambling around the roof until you are convinced that the aerial is in perfect

condition, you may decide to return to your receiving room and run over all the connections again. Then—then—you may find that the H.T. battery happens to be disconnected.

That is just one of the hundred and one wrong ways of doing the thing. The reader, no doubt, will be familiar with a number of the remaining hundred! All that trouble could have been avoided by the exercise of a little method in the first instance.

The beginner should endeavour to make it a golden rule that, on the first indication of trouble with his instruments, his first action will be to go over all the connections and make sure that they are correctly and firmly made. This is of particular importance in the case of the experimenting amateur, whose instruments are usually scattered loosely around his operating table, thus increasing the risk of making wrong corrections.

THE VALUE OF DIAGRAMS.

A very useful practice to be followed in this connection is the drawing of diagrams. A diagram of the connections should always be convenient to hand, and the experimenter should make a point of preparing a fresh diagram each time he alters the arrangement of his instruments. His memory may be an excellent one, of course, and may stand him in good stead in nine cases out of ten. But it is just the tenth case that the wise experimenter wants to guard against. That may be the particular instance when it is most important for him to rectify a temporary fault.

He may, for example, be carrying out an experiment in connection with "time signals" when some little fault suddenly crops up and his memory fails him as to the exact connections of the circuit he is working on. He tries to recollect, in vain; time signals will not wait for any man—and the experiment fails.

KEEP A "LOG."

Another good plan is to keep a notebook beside your instruments on the operating table for the purpose of recording your various experiences with faults. In other words, keep a "maintenance log." When you have successfully surmounted some practical difficulty enter up an account of it in your log, with the date on which it occurred. You might make two separate en-

Continued on page 16

Continued from Page 8

5

"WILL INTERFERENCE TROUBLE YOU?"

The next point to be decided

by the buyer is the selectivity required of his receiving set. The selective quality of a receiving set is determined by the circuit employed. In general, there are two types:

Single-circuit receivers, in which the energy is delivered to the detector direct from the antenna circuit; and two-circuit receivers, in which the antenna is coupled to a secondary circuit tuned to the same wave-length as the antenna circuit, the detector taking its energy from this secondary circuit.

A single-circuit receiver is simple to operate. There is only one adjustment to be made to vary the wavelength to which the receiver responds. But it is not always possible to eliminate a spark station with a single-circuit receiver.

Some two-circuit receivers have been designed, which combine the selectivity of the two-circuit receiver with the simplicity of adjustment of the single-circuit receiver. In such sets, the coupling between the

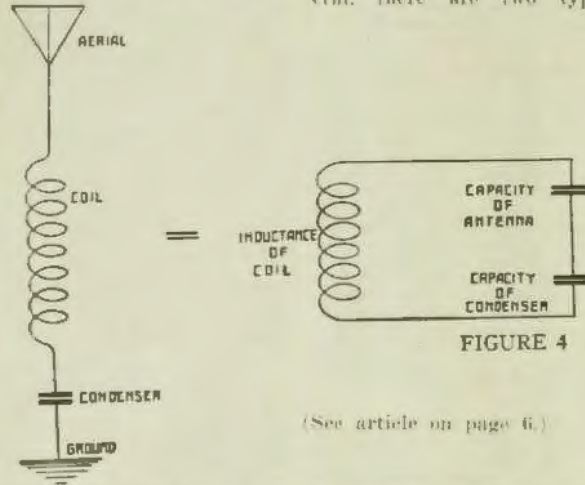


FIGURE 4

(See article on page 6.)

Continued on Page 12

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WIRELESS WEEKLY

11

The Grid, Leak and Condenser

SOME HINTS AND SUGGESTIONS CONCERNING A VERY SMALL, BUT HIGHLY IMPORTANT PIECE OF RADIO RECEIVING APPARATUS.

(By KENNETH ULLYETT, in "The Broadcaster.")

Many amateurs are probably in doubt as to the reason for connecting a small fixed condenser shunted by a high resistance in the lead between the aerial and the grid of the rectifying valve, and also the function of this little piece of apparatus.

If they have tried the experiment they will have found that, although there is no appreciable difference in the strength of the signals received, there is a marked difference in the quality of the music, etc., and that the control of oscillation is greatly facilitated, a delicate matter in these wary days.

In some cases signals do come in stronger, while in others a condenser and leak are not required. The whole matter rests on the valve in use, which is rather a broad subject to discuss, but as a rule, "hard valves" such as the "R" type give better results with a condenser and leak, while the "soft" valves, always rather difficult to adjust, are improved by the use of a potentiometer connected in the lead attaching the filament battery to earth.

The writer uses the standard Marconi "R" type valves on his set and finds that a combination of the condenser and potentiometer methods is extremely useful, especially when receiving distant telephony. A grid condenser should have quite a small value—about .0002 is usually right for short wave-lengths. Its insulation must be particularly good, for although it is shunted by a resistance, a leak in the condenser dielectric renders the apparatus very inefficient.

Theoretically the leak should have a different value for every different valve used, but a fixed resistance of 3 megohms (3,000,000 ohms) is found to be quite satisfactory. A small length of slate pencil covered with Indian ink does admirably for this.

The potentiometer should be purchased, as it is difficult to make one with a steady increase of resistance. Two torch batteries would be sufficient to connect across it,

but some other form of cell having a longer life would be better.

Briefly, the action of the grid condenser is this. When the aerial becomes positive, a positive charge is induced on the opposite side of the condenser, and being of the same sign is pushed on to the grid of the valve, where it is choked by the stream of electrons passing from the filament to the plate.

At the next cycle the aerial becomes negative, charges the condenser, which passes this charge on to the grid, where it is allowed to stay.

The condenser thus has a cumulative effect, and would tend to give the grid a high negative potential. This is advantageous up to a limit, but a very large number of negative electrons would reduce the plate current to practically nil, so it is necessary to have a leak of high resistance across the condenser, or between grid and filament, in

order that the unnecessary negative charges may leak away.

The usual position for the leak is across the grid condenser, but when H.F. valves are added it is sometimes necessary to connect it between the grid side of the condenser and the filament battery.

By experimenting a little with different valves for the condensers and leaks, the amateur will find it possible to increase the sensitiveness and general efficiency of his set by 20 per cent.

AN AUTOMATIC FIRE ALARM— BY RADIO.

A widely known radio engineer, William Dubilier, has devised an apparatus by means of which fire signals may be broadcast by the operation of an automatic switch when water is set in motion by the opening of any valve in the pipes of the sprinkler system that is installed in buildings. A central listening station administered by the Fire Department may thus be enabled to hear the characteristic calls for each building and so locate the danger. The use of this system might conceivably mean substantial savings in fire loss.

Get Your Wireless Gear at Electricity House

387 GEORGE STREET (OP. STRAND). TEL 2961 CITY.

Condenser Plates, 1/9 per doz.; Condenser Spindles, 2/9 per set; Condenser Ends, 1/9 pair; Honeycomb Coils, from 3/6; Honeycomb Mount ngs, 3/- ea h; Filament Resistances, 7/6 each; Calibrated Dials, 1/6 each; Knobs, 1/6, 2/-, 2/6 each; Contact Studs, 1/9 per doz.; Switcharms, 3/-, 4/6; Terminals, 6d. each; 'Phone Condensers, 1/6; Grid Condensers, 1/6; Variable Condensers, 25/-, 30/-.

Murdoch's 'Phones, 35/-; Myers' Valves, 35/-.

Catalogues, 9d. each, including wiring and other diagrams. All makes of Telephones and Valves.

Crystal Cups, 1/-; Detectors, 5/- each; Loose Couplers, 40/-; Cabinets, Ebonite, Bakelite, and All-round Materials.

Complete Crystal Sets, £3/10/-, £8/10/-, £7/10/-; Valve Sets, from £9 to £35, 1, 2 or 3 valve; Radiotron Valves, 37/6; Vernier Rheostats, 15/-.

INTERVALVE TRANSFORMER, 40/-
Closed Iron Core.

UNDER NEW MANAGEMENT.

Works Manager: Raymond McIntosh.

General Manager: J. S. Marks.

All Communications to the Firm.

Radio Notes.

DO AMATEUR TRANSMITTERS SIGN ENOUGH?

We have to hand a number of complaints from both suburban and country experimenters, that they cannot get the call signs of a number of amateur transmitting stations. Music they are getting, but they do not know who is sending it. One well-known country amateur writes as follows:—

"For the past ten days I have been receiving radiophone every night on low wave length (amateur wave-length). I have identified some of the calls. Whether the following were sending out music, or receiving it, I am not certain: 2AF or 2FA, 3IL, (2IX on Sunday night). The speech is hard to tune to, but is plain one tuned in. Saturday night last there seemed to be about three different ones sending singing, speech and gramophone very clear. I also received some CW code words, "Word" and "Moon," and numerous other sentences. Mr. MacIurcan identified the CW as Melbourne amateurs.

"It is very annoying to be receiving radiophone and not knowing where it is coming from. The trouble is that these radiophone testers do not sign enough. Would you kindly inform anybody you know to sign more often."

DEMONSTRATION OF WIRELESS AT NARRABEEN.

On Saturday last, Radio College 2LI transmitted for Narrabeen Surf Club Concert, held at Narrabeen. The music and

speech was clearly heard by the 500 persons present.

The set used for the reception was a four-valve, with a Magnavox Loud Speaker, kindly lent by Mr. Schultz.

During the last 10 days 2LI has been transmitting between the hours of 12.30 and 2 p.m. daily.

SETS FOR EXPORT TO AMERICA.

We hear that one Australian wireless firm has orders for 5,000 receiving sets to be exported to America, and that they are working day and night to execute them. We hope that in the course of the next few months they will be executing orders for double the number for the use of Australians in Australia.

2BB.

Mr. Crocker (2BB) has added another 5 watt tube to his set. He is now using 10 watts, 7-30, in his starting time, and he can be heard nearly every night.

ROUND THE RADIO WORLD.

ALMOST ONE MINUTE.

On board the liner "Majestic," a week or two back, one of the operators during his four hours watch sent out two hundred messages. These were of all lengths and sorts, ranging from eight to sixty-five words each, without the O.K.'s, signatures and "go aheads," which are inseparable from wireless traffic. This rate, therefore, was fifty messages per hour, which wants some heating.

HELLO, AMERICA!

Some short while ago, Mr. Thomas B. Trott, of Plymouth, successfully received the whole of the programme broadcasted from Sta-

tion WZY, New York, U.S.A. This consisted of music, orchestral and vocal, weather reports, news bulletin, etc. Mr. Trott's apparatus was a Buradepht Ultra IV, fitted with a loud-speaker. This is "Hands across the world" with a vengeance —when one reflects how many pairs of hands are all doing the same thing at the same time, i.e., adjusting radio connections.

Continued from page 10

primary and secondary circuit is fixed and the tuning of both primary and secondary circuits is effected simultaneously by a single control knob.

More complicated circuits, such as used by the amateur relay stations, have four controls for tuning. One controls the wave-length of the antenna or primary circuit; the second controls the coupling between the primary and secondary circuit; the third controls the wave-length of the secondary circuit; and the fourth the amount of regeneration.

These circuits require skillful adjustment, but with a set so designed interference can usually be eliminated by trying various degrees of coupling and then returning the primary and secondary and tickler controls.

6.

"WHAT APPARATUS CAN YOU AFFORD?"

In selecting receiving equipment, a buyer unversed in the radio art is more or less dependent upon the reputation of the dealer who sells and the manufacturer who builds the apparatus selected.

However, certain mechanical defects that are easily detected if the buyer is forewarned should decide him against an instrument possessing them, despite any claims made by the salesman for its electrical efficiency.

Continued on page 16

April 13, 1923

WIRELESS WEEKLY

13

SHIPS YOU SHOULD HEAR
HEAR THIS WEEK

BANFFSHIRE	GVM
CARIGNANO	IOR
CITY OF BRISBANE	GDNX
CLAN MACIVER	GFP
EASTERN	YUI
ETHELIA	CGF
HOKKAI MARU	JYP
INDUS MARU	JOB
MATARAM	VHU
MEDIC	MKK
NARGAMO MARU	JCI
NADANA	GOLF
STAGERA	OBE
SURADA	GOF
VILLE DE METZ	PLB
WAJOTAITI	GDKM
MELUSIA	CGT
TISNAREN	SHQ
ANDROMEDE	UCQ

Readers are requested to either ring Bedford 732 or write to W.W., 33 Regent St., City, for particulars of any calls they desire to know.

I HEAR YOU CALLING ME!

During December one hundred and twenty communications from America were heard overseas. These are the recorded tests. There may be more, as these were made from low power in some cases. One of the most interesting was that received by A. G. Jeffries, in London, announcing that he was the parent of a daughter born at Richmond, Virginia.

In the past three years French and Swiss amateurs have vainly tried to get messages from amateurs in America, and they, too, have succeeded at last. Switzerland caught signals from stations BSS (Baldwinville, N.Y.), ARGL, 2RF, and SAQO.

THE RADIO PILOT

French engineers have now proved that it is quite possible to steer aeroplanes by means of radio waves. The machine, pilotless, is thus immune from attack by enemy sharpshooters, a fact which is of inestimable benefit in warfare.

Some little while ago the first such flight, made by a plane from Paris, was successfully directed by three electrical engineers, Messrs. Demarçay, Bouche and Perderon. Operating a specially designed radio transmitter, which they had placed in a hut in an out-of-the-way corner of a Parisian aerodrome, they sent up a 30-horse-power Voisin

plane. This machine rose from the ground quite alone, circled above and around the field for several hours, obedient to every change, in steering made by the pilots on terra firma, and then descended in perfect safety.

RADIO ENTERTAINERS AS
DICTATORS.

When sister studios shorthand at home evenings she need no longer impose upon the members of the family by coaxing them to dictate to her while she takes down practice notes. By merely adjusting the earphones of a receiving set she

may get all the practice she wants by transcribing broadcast speeches. The idea originated in Pittsburgh.

WIRELESS GOODS
at City Prices

Valves, Crystals, Sliders, etc.

Oscillation House

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G. Caletti, Wireless Manager
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and Parts to make your own

Send for Price List.

ELECTRICAL UTILITIES SUPPLY CO.
RADIO HOUSE
605 GEORGE STREET, SYDNEY.



**Electrical Goods
FOR THE HOME.**

IRONS	38/6, 35/-, 42/6
TOASTERS	47/6, 55/-, 95/-
VACUUM CLEANERS	£14 10 0
LAMPS, 16.50 Candle Power	
1/3, 2/3 each.	
100-4/3; 200-6/-; 300-8/9.	
RADIATORS	50/-, 90/-

Sullivan's Electric Shop

296 Pitt St., Opp. W. & S. Board.

"MAKING RADIO HISTORY."

Acting on a suggestion made to them by this journal, the British National Opera Company, the only institution of its kind (co-operative), broadcasted on Monday, January 8, part of Mozart's "Magic Flute."

This was done direct from the Opera House, Covent Garden, by the British Broadcasting Company, not, as previously, from Marconi House with a special gathering of artists. Seven hundred yards of electric cable and wire, aided and abetted by microphones and a certain apparatus under the stage, carried the sounds to Marconi House.

Tests had been made with "Hansel and Gretel" on a preceding occasion, and so successful was the broadcasting that part of every opera given by the company was transmitted. "Siegfried," "Madame Butterfly," "Marriage of Figaro," were in part, wafted into hundreds of houses and clubs, but the event de luxe took place on Wednesday evening, January 17th. The whole of "La Boheme," with Dame Nellie Melba singing "Mimi," was then broadcasted. Acting

in accordance with the wishes of many listeners-in, a speaker from Marconi House not only told the story of the opera, the cast and conductor, composer, etc., but interposed remarks from time to time during the actual performance.

MELBA'S BROADCAST SUCCESS.

Whether it is the quality of her voice, or whether it is due to her wonderful knowledge of voice production, doesn't matter. What does matter is that of any and every voice broadcasted in England, Melba's transmits the best, says "The Broadcaster." Every tone, every inflection is perfect—the singer in "Boheme" moves about Covent Garden's huge stage a great deal. There was also a noticeable suggestion of vast spaces, almost as though the singer were alone in some great lofty cathedral when the famous solos, "Me Chiamano Mimi" (They call me Mimi) and "Addio" (Farewell) were sung. It was extremely difficult to refrain from joining in the frantic applause which the radio registered in all its prolonged din.

TO BE OR NOT TO BE.

In Illinois, U.S.A., the State Convention of Music Dealers have got together and are in fierce debate. Subject: "Is a radio set a musical instrument?" If these worthies decide in the affirmative, they will consider the apparatus on the same basis as any other musical instrument, and set their mighty minds

RADIO COLLEGE

Applications are now being received for forming the next class.

23 LANG STREET

F. B. COOKE, *Principal*

working to further develop it. We tremble to think what will happen if they say "No!" Of course, so far as they are concerned, the loud speaker is all they are interested in, and certainly this is open to improvement. Whether music dealers are the right people to take the matter in hand or not, and just what they can do, is a matter for thought, but undoubtedly someone should come to the rescue. Anyone with musical appreciation will second this statement, after a moment's reflection upon the throaty sounds, and, at times, "raucousness" of the average horn.

GREENLAND'S ICY MOUNTAINS.

About this time last year one Haggard D. I. Eherold was appointed leader of a meteorological expedition sent forth by a Bergen institute. A barren bit of rock-bound coast, beyond Iceland, was selected by him as a place of domicile for many months. From this remote citadel by the Arctic shores his observations went forth via radio to the institute and other interested parties.

So valuable were they that an observatory has now been established there by the Government of Norway, and scientists are confident that this station will be epoch-making in the history of radio.

Make Your Own Set

We Stock All Parts

All kinds of Electrical Accessories

Call and inspect our Stocks

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57 Goulburn Street

Factory : 49 ALMA STREET, DARLINGHURST



LEICHHARDT AND DISTRICT RADIO SOCIETY.

At the seventh business meeting of the Leichhardt and District Radio Society, held on Tuesday, April 3rd, four new members were added to the register, making a total to date of 38. Later, the important question of a suggested change of quarters was discussed, and it was unanimously agreed to accept an offer recently made to the Society, whereby members would have the use of more commodious quarters, which would be at their disposal at more frequent intervals than the rooms at present in use. The new Club room is situated at the rear of 176 Johnston Street, Annandale (two doors from the electric light sub-station), and it will be formally taken over at the meeting to be held on Tuesday next, April 17th, at 8 p.m. It is expected that there will be a good roll-up of members to celebrate the occasion, and any non-members who are interested in radio work are invited to be present.

At the meeting held on Tuesday last, Mr. W. Bird relinquished the position of Hon. Treasurer, on account of pressure of business, and was accorded a very hearty vote of thanks for the excellent work which he had done on behalf of the Society since its inception in October last. Mr. S. P. Williams was elected to take his place, and the Society has every confidence in the ability of the new Treasurer to follow in the footsteps of his predecessor.

The Society's Hon. Secretary, Mr. W. J. Zech, of 145 Booth Street, Annandale, will be pleased to answer any inquiries from persons interested in its activities.

RADIO LEAGUE OF VICTORIA.

The fortnightly general meeting of the Club was held at the Club rooms, rear of the Presbyterian Church, Box Hill, on 22nd March. The President, Mr. Howden, took the chair. The minutes of the pre-

vious meeting were read and confirmed. The Secretary then gave an interesting lecture on "Wireless Construction" for beginners, outlining several circuits, and complete detail of their construction. The Club's transmitting license has been applied for, and as soon as it has been granted the set will be completed, and got into working order. It was proposed to use the full power, 25 watts, but was decided on the last minute to use 5 watts, and add later. The receiver will be of three valves.

At the next meeting Mr. Love, Chairman of the Trans-Pacific Test Committee, will lecture on the "Test" (5th April).

On the 19th April, Mr. Howden will lecture on the construction of set suitable for short wave work.

All inquiries relative to the Club activities should be addressed to the Hon. Secretary, Mr. H. Hurst, No. 3 Wellington Road, Box Hill.

THE NORTH SYDNEY RADIO CLUB.

The usual fortnightly business meeting of the above Club was held on Tuesday, 3rd inst., when various matters were brought forward for discussion. All members are particularly requested to be present next Tuesday night, when a matter of vital importance will be dealt with.

BONDI RADIO CLUB.

Owing to the heavy rain on Tuesday, 20th ult., the first meeting had to be postponed. However, plans have been going ahead, and another meeting is being held on the Tuesday, 10th inst., at the same address as before, viz., 276 Birrell Street, Bondi (between Ocean and Watson Streets). Any persons interested are cordially invited to attend.

There are a large number of amateurs in the Bondi district, and a Club to look after their interests and give facilities for buzzer practice, lectures, transmitting, etc., would be an advantage.

Hygienic



A Radio Head-set is frequently used by several persons.

The "Western Electric" Head-set is by reason of its wire headband cleaner and more hygienic for use by several listeners.

It is remarkably light in weight, and at the same time equal in strength to the heavy types.

For all your Radio outfit you can rely on "Western Electric" products. You can get them from your Radio dealer. If you have any difficulty, apply to—

Western Electric

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192 CASTLEREAGH STREET, SYDNEY
(a few doors from Park Street)
Melbourne Address: C. R. FOSTER, 588 Bourke Street

Therefore, roll-up and we will soon have things going, and be doing some real work.

Communications should be addressed to R. H. Callaway, 33 Ocean Street South, Bondi.

FOR SALE.—Loose Coupler Crystal Receiving Set, Oak Mounted, 23/10/-, or reasonable offer. 262 Old Canterbury Road, Summer Hill.

Continued from page 9

tries of it, in fact, one stating how the trouble manifested itself in the first instance, the other recording what the cause of the trouble turned out to be eventually, and what steps you took to eradicate it. Then, if the same kind of trouble appears to be commencing again at a later date, you will be able, on referring to your log, to diagnose it and treat it successfully in the shortest possible time.

There are some other practical habits which the amateur will do well to cultivate. A minute speck of dust or dirt may be responsible for a receiver "giving up," and when this kind of fault arises it is often extremely difficult to locate it. It is therefore of primary importance to keep all instruments free from dust. To this end it is a sound practice to dust them with a small brush each day after use; they should also be covered at night with a dust-proof cloth. If these precautions seem rather superfluous to a beginner, it is only because he has not yet had occasion to learn how much damage can be caused by an invisible speck of dust.

THE DANGER OF DUST.

The trouble with dust, of course, is due to the fact that it acts as an insulator in some cases, and in others as a conductor. Strangely enough it seems to be endowed with some perverse quality which makes it function in whichever character it is likely to give most trouble. When it acts as a conductor it "shorts" two isolated parts of the gear, and when it functions as an insulator it insulates two conductors with one another! Moisture may also have the effect of "shorting"; for this reason it is a good plan to wipe over the surface of the instruments occasionally with a dry cloth.

INSULATION.

Another frequent source of trouble which can be avoided with a little care lies in the wiring of instruments. Bare wires should never be used on the operating table. In every case, insulated wires are best. But every precaution should be taken to ensure that the connecting ends of insulated wires are well cleaned before joining them to their terminals.

Many forms of insulated wiring are covered with two layers of insulation, usually an outer layer of cotton thread with a rubber covering beneath. After both of these have been removed, the wire should be

scraped gently (to avoid weakening it) with a knife so as to remove all traces of the rubber from the surface of the wire. Some other kinds of stranded wire are covered with enamel varnish; this also should be removed carefully.

REMOVING INSULATION.

When removing insulating tape it will be found that if a cut is made through the insulation round the wire at the point from which it is desired to strip the wire, the insulation will then slide off the end of the wire without further trouble.

Where the insulation is of the adhesive type it will be found advisable to make a further cut from the original one, lengthway along the wire to the end of the wire, when the insulation can be peeled off without danger of breaking the wire underneath.

If the advice that will be given in these articles month by month be attended to, and acted upon, the amateur will find that his instruments will be far less liable to develop faults than formerly, and will, moreover, in their normal working, function with considerably greater efficiency. And the slight amount of extra labour entailed by the precautions outlined above will have its due reward.

Continued from page 12

In a well-made set, the control knobs work smoothly and easily and with uniform resistance throughout the scale. The dials run true and do not scrape the panel at any point. There is no play in the bearings of the instruments; they cannot be pulled in and out. The panel is usually made of one of the synthetic-resinous compounds. The vacuum tubes are accessible and mounted on non-vibrating supports. All wiring is secured firmly in place, soldered at each connection and binding post. All the units in the cabinet are firmly attached to the panel and are readily inspected.

After this beginning and the first enjoyment of listening-in, the layman may, and usually will, delve further into the mechanism of receiving sets. He is no longer a tyro.

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 10.4.23

NAME _____

Address _____

FOR 2 QUESTIONS ONLY

QUESTIONS AND ANSWERS.

"Sparks" (Nowra):—

A. (1) No objections whatever, there would be no danger to your house. (2) We would require further particulars, are you using a valve or crystal? If a crystal, then your set is working very well. (3) If you tune sharply and if the transmitter is strong enough, you will get his telephony. (4) You have obviously made a mistake in your diagram because as shown the primary is short circuited. A variable condenser 1001 m.f. across your secondary will give you better results and fine tuning. (5) Approximately 200 metres. (6) Send 4d. for each back number wanted to "Wireless Weekly," Box 378 G.P.O., Sydney.

"S.L." (Tamworth):—

A. A Ford spark coil should not be used under any circumstances as a step down transformer from the mains.

"A.G.H." (Tamora):—

A. (1) The range of such a set will depend entirely on the sensitivity of the crystal and the skill of the operator; you should be able to hear as far as Melbourne and Townsville. (2) For low wave-lengths up to 600 metres; you had better use your loose coupler, but should you desire to use honeycomb coils, use two such coils as suggested. (3) There is no need to take the slider off, as then you cannot vary your inductance.

Published by W. J. Macfarley, "Truro," Powell Street, Neutral Bay at the offices of W. M. Macfarley, 249 Castlereagh Street, Sydney.

April 13, 1923.

WIRELESS WEEKLY

Build Your Own Condenser

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No technical experience necessary. Parts supplied in knock-down or assembled, as desired.

Best quality heavy gauge aluminium plates; turned brass spindles, rods, bushes and Coned Adjustable bearings, Ebonite ends.

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9...	.00033	10/-	14/-
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25...	.0008	15/6	21/-
35...	.0012	18/6	25/-
67...	.0022	30/-	45/-

With Vernier Control, 7/6 extra on assembled price.

For Finer Tuning in Telephony it is absolutely necessary to have a **VERNIER** Control on your Condensers



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WE STOCK COMPLETE SETS OR PARTS TO BUILD YOUR OWN.

B.T.H. English Detecting, 35/-; Amplifying, 35/-; and Transmitting Valves, 40/-; Head Sets 2000 to 8000 ohms.; Crystal Sets complete with 4000 ohms.; Head Set, £5.

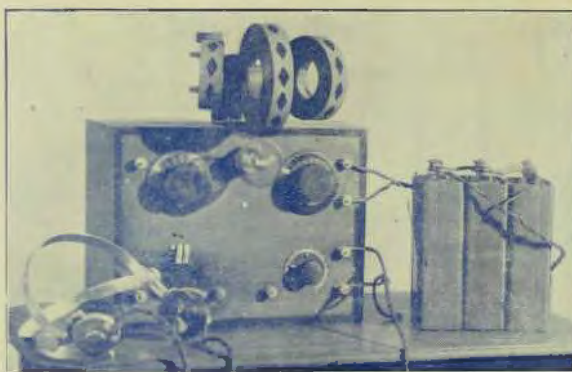
SEND FOR PRICE LIST TO

W. HARRY WILES,
Radio Department,
60-62 GOULBURN STREET,
One door from Pitt Street.
SYDNEY.

WIRELESS WEEKLY

April 13, 1923.

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.

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Radio Company

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B 5586



Crystal Set Complete with Phones Ready to "Listen-in" on.