



WIRELESS WEEKLY

April 20th, 1923.

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Vol. 2.

April 20th, 1923.

No. 16

A Talk with Wireless Weekly.

The Writing on the Wall.

Official Broadcasting is bound to come in the near future. To every licensed experimenter we will have at least 1000 subscribers to the Wireless Broadcast Service. (These sets will be designed not to cause interference).

These subscribers will be unable to listen to Broadcasting owing to the howling of valves. **WHO GOES OUT, SUBSCRIBERS OR EXPERIMENTERS?** We leave the answer to you.

The Government has said to put your house in order or you will have no house. What is the remedy? Appoint Honorary Radio Inspectors who will have the support of all Radio Clubs and every decent-minded Amateur, and see that the regulations are carried out.

HOWLING—WHO CAUSES IT?

FIRST.—The illicit experimenter who is too mean to pay 10/-.

SECOND.—The Crystal license holder who is using a valve.

THIRD.—Valve license holders who don't understand how to work their set.

Amateurs—what is going to happen if you cause interference "later on." What are you going to do with all that gear you have? Sell it and pay for the hire of a Broadcast Receiver (sealed on set wave length)?

Better put your house in order now and when "later on" comes you will not be interfered with.

TRANSMITTING STATIONS.

Amateur Transmitters look to you sets! It is to you we look to set an example to the whole body of Amateur Experimenters. You would not behold that transmitting License if you were inexperienced. You know the damage you can do.

Watch that Broad Tuning. Use only the power that is laid down for you. Be able to read your 12 words before you touch the Key—can you? Don't let it be said that you are living on the Transmitting Key.

That Terrific Hum caused by incomplete rectification or imperfect smoothing out devices. Give it a bit more of your attention.

"IRRESPONSIBILITY AND SUPERABUNDANCE OF YOUTH," said one man, "will soon put an end to Amateur Transmitting in Australia." We told him what he was—Don't fail us, Amateur Transmitters.

An Inexpensive Aerial for All-Round Use.

The Fan Type—By David Lay

The fan-type aerial may be used either for transmitting or receiving. It is rigid in construction and therefore especi-

ally suitable for use where the location is swept by strong winds, as there are no heavy spreaders used in its construction, says D. Lay, in "Popular Radio."



ally suitable for use where the location is swept by strong winds, as there are no heavy spreaders used in its construction, says D. Lay, in "Popular Radio."

This type of aerial is less directional than the ordinary flat-topped aerial, and for this reason is suitable for long distance work in all directions of the compass.

The wider the fan is made, the less directional will be the reception or transmission. With a fan of 90 degrees, the efficiency will be found practically equal in all directions from the station.

The support for the aerial consists of three masts (or other elevated structures) as shown in the above diagram. One of these masts is located at the

lead-in end and the other two masts support the far end; these latter two supports are connected by a wire, to which is attached the ends of the three middle wires. The wires are all joined together and soldered at the lead-in end.

Measurement Charts.

For Determining the Dimensions of Your Coil.

(By RAOUL J. HOFFMAN, A.M.E., in "Popular Radio.")

When the amateur has finally decided what range of wavelengths he desires to cover in his proposed transmitting or receiving set, and when he has determined the correct electrical constants for the coils which will cover this range (by means of the alignment charts given in the first article of this series, published last week) the next step is to construct

"READING, WRITING, ARITHMETIC"—AND RADIO.

The young radio fan who lives in the vicinity of East Ninth Street, in New York, does not have to play hookey when he builds his receiving set; he goes to Public School No. 64 instead. The construction of crystal sets is now a part of the school course; each pupil may own the set he builds upon payment of the actual cost of the raw material that he uses.

FIFTY RADIOGRAMS AN HOUR.

One of the radio operators on the liner "Majestic" recently sent out, on a four-hour watch, 200 complete messages, ranging from 8 to 85 words each. This is at the rate of one message in a little more than a minute, signatures, O.K.'s and "go-aheads" included.

LISTENING TO THE SOUND OF THEIR MONEY.

Dressing up in one's Sunday-go-to-meeting clothes is no longer a requirement of the radio fan who attends church—not even when he attends the most fashionable houses of worship in the country. The latest recruit to the growing list of radio churches is the famous St. Thomas', in the very heart of Fifth Avenue's exclusive residential district. The shut-in may now eavesdrop on New York's Four Hundred at prayer meeting by tuning in on WJZ. Every detail of the service may be heard—even to the dropping of the coins in the collection plate!

the coils that will have these constants.

In other words, if the amateur wants to tune to a wavelength of 400 metres and he has an antenna with a capacity of approximately .0002 mfd., his primary coil should have an inductance of 225 microhenries. The question now is:—

"What size of coil will I make that will give me this value of inductance?"

Of course, the answer can be figured out mathematically by an engineer but the average radio fan would find himself in water too deep for him if he should try to do it himself. However the simple align-

based on mathematical formulas but all the reader must know is how to draw a straight line and how to read figures.

For the benefit of the more experienced amateur who un-

derstands something of mathematics, I will show how the alignment charts for inductance and design of a coil were evolved. The reader may skip

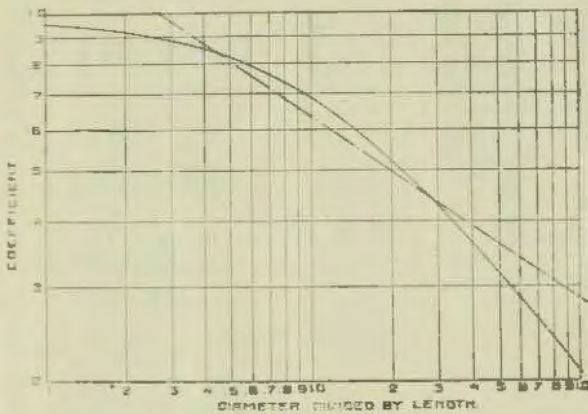
the following formulas if he desires and take my word for it that they will answer his problem, in the form of charts, whether he reads and understands them or not.

The formula for inductance of a coil follows the equation: $L = \frac{4}{n} \left(\frac{d}{2} \right)^2 \frac{2}{2 + n} K$ wherein

- L equals the inductance required;
- d equals the diameter of the coil in centimetres;
- l equals the length of the coil in centimetres;
- n equals the number of turns per centimetre; and
- k equals a constant depending on the ratio d/l .

As the correction factor k depends on the relation of the diameter and the length of the coil we cannot by means of the above formula, calculate directly the dimensions of a coil assuming the other three variables.

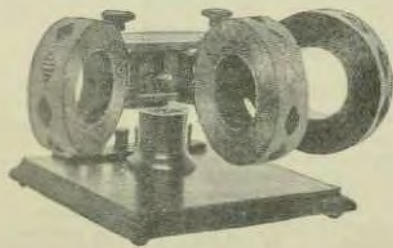
Therefore, in order to make the equation No. 1 available for a simple alignment chart, we will



ment charts that accompany this article have been prepared so that even the novice will find the answer to his problem in a few seconds. These charts are

derstands something of mathematics, I will show how the alignment charts for inductance and design of a coil were evolved. The reader may skip

"BECO" HONEYCOMB COILS



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have to eliminate the coefficient k . We plot the correction factor against the ratio d/l on a sheet of logarithmic cross-section paper and substitute a straight line for the curve. By so doing we eliminate this troublesome feature of the formula, with results which will not differ perceptibly from the original values, within the practical limits of a coil design. (See Figure 1.)

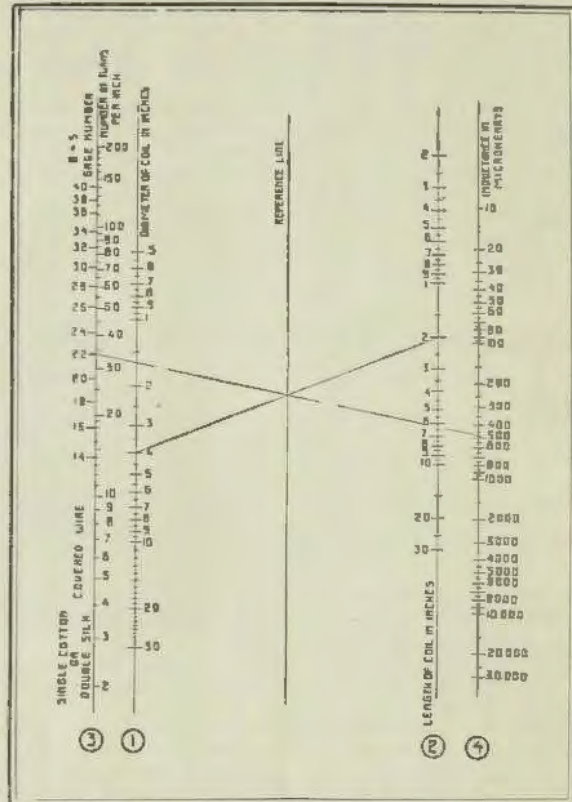
The equation for a straight line on logarithmic paper has the form:

y equals n over $e^{x \dots 2}$ where y and x are variables and e and n are constants.

A STEP IN THE PREPARATION OF THE CHART.

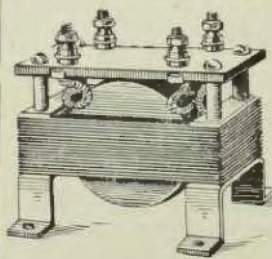
Figure 1.—In this diagram we have the correction factor k , plotted against the ratio d/l , which is shown in the form of a curve. In order to eliminate the factor k from the formula used in the charts, this curve has been replaced by a straight line with results that do not differ perceptibly from the original values in the original curve.

Substituting for y and x the coefficient and the ratio of d/l respectively, the following expression is obtained:



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k equals e over n ($1/d$)...3
Evaluating we will have:
 k equals e .35 over ($1/d$)...4
then substituting k in equation (No. 1) by the equation No. 4, we will have:

L equals 2 over en , 1.35 over 1, 1.65 over d 5
and using the inductance values found in laboratory tested coils and the units in inches we will have:

L equals 2 over .015n, 1.35 over d , 1.65 over 1.....6
where—

L equals the inductance in microhenries;

n equals the number of turns per inch;

d equals the diameter of the coil in inches; and

l equals the length of the coil in inches.

This formula can be used only with the aid of logarithms. For practical use we have converted it into a chart, shown on the page opposite.

Knowing the inductance value we wish to incorporate in a single layer coil, we must decide two factors in the coil design:—

First, the diameter of the tube we intend to wind the coil upon.

Second, the size of wire we intend to wind the coil with.

To understand fully and clearly the use of the chart let us consider the following example:—

We want to build a coil with an inductance of 480 microhenries. We have some insulating composition tubing 4 inches in diameter that we want to use. We also have a quantity of No. 22 single-cotton-covered wire on hand that will be suitable.

Continued on Page 8.

Wireless Books

- Radio Telephony for Everyone, by L. M. Cookaday, Posted 9/8.
A.B.C. of Vacuum Tubes in Radio Reception, by E. Lewis, Posted 6/4
Wireless Telegraphy and Telephony, by A. Morgan, 9/4 posted.
Radio Experimenter's Handbook, valuable information is given on Antennas, Receivers, Transmitters, and Vacuum Tubes, by M. Sleeper, 6/4 posted.
Radio Hook-Ups: Book of Circuits of Receivers, Amplifiers, and Transmitters, by M. Sleeper, 4/10 posted.
Design Data for Radio Transmitters and Receivers, by M. Sleeper, 4/10 posted.
Construction of Radio Phone and Telegraph Receivers for Beginners: Prepared specially for the Radio Novice and Experimenter, by M. Sleeper, 4/10 posted.
Construction of New Type Transatlantic Receiving Sets, by M. Sleeper, 4/10 posted.
Radio Year Book, 1923 (First Year) Book of Reference for all interested in Broadcast Receivers, 2/3 posted.

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A RADIO CLOCK.

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Some Constructional Notes.

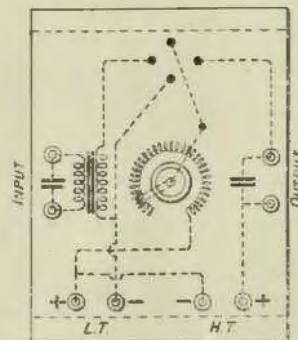
A Low Frequency Amplifying Panel.

Those readers who are already in possession of either a crystal or single-valve receiving set and desire to obtain greater signal strength, will find an amplifying "unit" or panel, constructed in accordance with the following particulars, extremely useful. The arrangement shown in the diagram comprises an ebonite panel fitted with eight terminals, two marked "Input," two marked "Output," and two for each of the batteries, H.T. and L.T., together with valve socket, filament rheostat, step-up transformer and fixed condenser.

If a somewhat cheaper style of construction is preferred, a wooden panel may be substituted for the ebonite. In this case the standard form of valve holder (flanged pattern to be inserted from below) may be used, but it will be desirable to either bash the holes for input, output, and H.T. battery terminals with ebonite or to drill clear holes and fit the terminals themselves upon strips of ebonite. For the sake of uniformity the dimensions of the panel should be made to correspond with an existing valve panel, but if it is to be used in conjunction with a crystal or other complete set a convenient size is $6\frac{1}{2}$ ins. by $4\frac{1}{2}$ ins.

The filament rheostat may either be purchased complete

or made up by winding about 9 feet of No. 21 SWG Nichrome resistance wire upon a lead-pencil and securing around a fibre disc $2\frac{1}{2}$ ins. in diameter. The disc should, of course, be grooved to form a seating for the resistance wire and a rotating arm fitted to make sliding contact upon the turns.



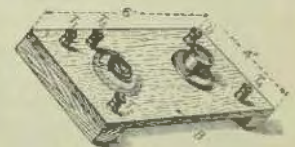
The condenser across the primary of the transformer may consist of eight pieces of tin-foil, each 11 ins. by 1 inch, arranged alternately and separated by mica of good quality, about 1/200 of an inch thick, leaving a clear margin of 1/8 in. round three sides of each foil and about 1/4 in. of foil projecting (4 down one end and 4 down the other) to be bent over the mica when all assembled and secured by means of a strip of soft brass squeezed down with a pair of pliers, to form a

kind of clip. Soldered connections are subsequently to be made to these brass "clips." If it is desired to buy a condenser, a Dubilier, capacity .001 mfd is very suitable.

One of the usual "inter-valve" transformers, readily obtainable from our advertisers, and connected so as to give a "step-up" effect, is quite suitable for use with this type of amplifying panel. The method of connecting up the assembled components is clearly shown in the diagram, all connecting wires being of course, beneath the panel itself. The whole may be mounted upon a shallow box or merely upon two "battens" as indicated by the dotted lines. In use, the input terminals are to be connected to the telephone terminals on the existing set whilst the 'phones themselves are transferred to the two terminals marked "Output."

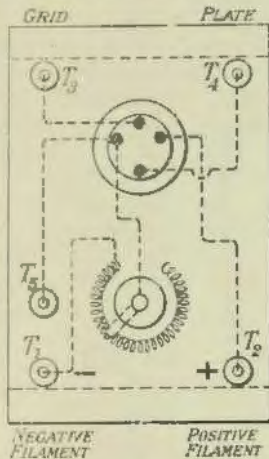
THE CONSTRUCTION OF A VALVE PANEL.

A valve panel which may be made for about 5/6 is shown in the accompanying sketches. An ebonite or wooden base B has



mounted on it four terminals, T1, T2, T3, and T4, a valve holder which may be purchased for about 1/6, and a rotary filament rheostat which may

be purchased for about 4/-. The method of securing the valve holder and the rheostat to the base board B needs no descrip-



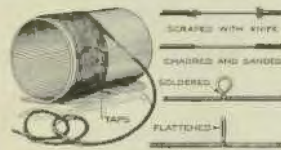
tion. The wiring of the panel is shown in the lower figure. There is no need to mark the filament terminals positive and negative because in some circuits it is desirable to have the filament rheostat next to the positive side of the filament accumulator.

In both diagrams an additional terminal T5 is shown and is connected to one of the filament sockets of the valve holder. This terminal may be used in certain circuits where this special connection is shown.

Owing to Government regulations in Sweden, nothing has been done so far to stimulate popular interest in amateur radio telephony, according to William L. Peck, of the American consulate, Stockholm. The use of radio apparatus is controlled by the Royal Telegraph Board; private firms may use it under license, but they have not availed themselves of this right.

TAPPING RADIO COILS.

In the construction of radio coils, one should never attempt to bare the wire and make taps after the coils have been wound. This method is not only difficult, but shows poor workmanship. The proper method is to make the taps during the winding process. Do



not scrape the wire bare with a knife, which frays the braiding or sewing, but hold the portion to be tapped over the flame to char about 1 inch of the cotton or silk insulation. Then rub the copper with a piece of fine sandpaper or emery cloth until the wire is bright. Double the bare part and give it one full twist around. Having formed all the taps in this way, solder to them the wires that lead to the switch points. When completely finished, slip lengths of rubber tubing over the joints to make a neat looking job. No. 16 or 18 copper wire should be used for leads from the taps to the switch points.

A TELEPHONE TRANSFORMER FOR USE WITH LOW RESISTANCE TELEPHONES.

From the point of view of cheapness, or perhaps on account of their more robust construction many amateurs have purchased telephone receivers of low resistance. As such telephones cannot be satisfactorily used with either a crystal or a valve receiving set without the addition of a "transformer," it is thought that constructional

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details of a suitable transformer will prove of service.

It consists of an iron core, 4 1/2 inches long by 1/2 inch in diameter, made up of No. 22 SWG, soft iron wires; two end flanges, 1 1/2 inches square, by 3-8 inch thick, with central hole to take the ends of the iron core; insulation over the core, two layers of Empire cloth or paraffin-waxed paper; thick-wire winding (or secondary, as this is a "step-down" transformer), 1700 turns of No. 28 SWG, d.s.c. copper wire; insulation between windings, the same as that between core and first winding; fine-wire winding (or primary), 3,800 turns of No. 44 SWG, d.s.c. copper wire; outer insulation and protection to winding, two layers of Empire cloth, or similar material; and four brass terminals, arranged as shown in the diagram herewith.



In use, the fine-wire winding is to be connected to the telephone terminals on the existing crystal or valve set whilst the low-resistance telephones are connected to the thick-wire winding of the transformer. The effect of a transformer of this description is to reduce the voltage and increase the current through the windings of the telephones.

Continued from Page 5



PHOTO

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The problem is: "How much wire will we wind on to make a coil with an inductance of 480 microhenries?"

On the chart on page 4, on scale 3, connect, with a ruler, the size of wire (No. 22) with the inductance in microhenries (480) on scale 4. A line so drawn will cross the reference line at a certain spot. Now turn to scale 1. Connect the diameter of the tube (4 inches) with the before mentioned spot on the reference line and carry the line over until it crosses the scale 2. At this point on scale 2 we find the answer; we need a coil 2 inches long.

We now proceed to wind on the tube (4 inches in diameter) 2 inches of winding, of No. 22 single-cotton-covered wire—knowing beforehand that the inductance of the completed coil will be 480 microhenries.

Try out these charts the next time you build a receiver or a transmitter and learn for yourself how simple the system is. You will then know exactly what size of coils to use for the wavelength range you want to cover.

In radio work there is no one thing that is more fascinating or more satisfying than the knowledge that you can predetermine the "constants" of your set.

NEWS ITEMS IN THE AIR

Sixty-eight newspapers in the United States are now maintaining broadcasting stations. Yet the uses of radio for collecting and disseminating news are only beginning to be developed.

April 20th, 1923.

WIRELESS WEEKLY

9

Fault Tracing and Maintenance.

By "ELECTRONE."

FULL OF USEFUL ADVICE FOR
ALL "LISTENERS-IN."

The faults which occur in connection with the average amateur wireless receiver do not manifest themselves in a very great variety of ways, says "Electrone," in "The Broadcaster." Complete failure to obtain signals of any description is one of the commonest ways in which a fault is made known. Sometimes, however, a fault will only cause a diminution of signal strength without destroying signals altogether, whilst, at other times, a particular kind of fault may give rise to an intermittent interruption of signals.

We may therefore note three main classes of faults. They are those which cause (1) no signals, (2) weak or unsatisfactory signals, and (3) intermittent signals. Generally speaking, these three primary manifestations of trouble may originate in the same instruments under different conditions.

In certain instances, however, they may each be due to some special kind of fault peculiar to one particular instrument. For purposes of clarity and simplicity it will therefore be best to treat each class separately as a group by itself. For the same reason it will be advisable to regard each receiving equipment as comprising three main systems: (1) the aerial-earth circuit, (2) the detecting and amplifying circuits, and (3) the telephone circuit.

Commencing with the first main class of fault, we may say that when no signals are heard the fault may lie in either of the three abovementioned systems. This will be obvious when it is remembered that a break in the continuity of any of the circuits is sufficient to prevent the flow of the small electric currents that are induced in the receiving aerial by the passing wireless waves. If the cause of the trouble is confined to the aerial-earth circuit, it may be looked for in the following forms:—

WATCH DIRT AND DUST.

(1) A loose or dirty connection at either the aerial or the earth terminal.

The terminal itself may be coated with a thin film of dust, or the ends

of the wires may not present a clean surface. The latter is frequently the cause of trouble when sufficient care has not been taken to remove the rubber or varnish insulation from the wire preparatory to making contact.

MAKE GOOD CONNECTIONS.

(2) An unsatisfactory joint between the aerial horizontal wire and the aerial down-lead, or between the earth wire and the metallic substance to which the connection to earth is effected.

Both these joints should be soldered. This is of special importance in the case of the aerial connection, which is exposed to all kinds of weather conditions. It is also desirable in the case of the earth connection, although, if sufficient care be taken, this may be performed satisfactorily by means of a strong metal clamp. When soldered connections are used, the wires should first be thoroughly cleaned. Careless soldering may result in insulating one wire from the other.

THE AERIAL.

(3) A complete break in the horizontal aerial wire or in the earth wire.

Although the latter rarely happens the former is a not infrequent source of trouble. Aerial wires are made to take a good deal of strain, of course; yet they sometimes break gradually, one strand at a time. When this happens unnoticed, it is not unusual for the last strands to give way suddenly when some undue pressure is exerted upon them, as, for instance, in a heavy gale of wind.

The same trouble might also be brought about by omitting to "trim" the masts during excessively wet or dry weather. The expansion or contraction of the rope stays and halyards which are used in connection with most amateur installations may result in bending the masts out of their true position to such an extent that the aerial is unable to withstand the extra strain imposed upon it.

SHORT CIRCUITS.

(4) A direct short circuit between the aerial and the earth.

This may arise from one or more causes. If the aerial wire is allowed to make contact with a neighbouring tree or wall, for instance, the incoming signals may be conducted straight to earth instead of going through the receiving instrument. This may not necessarily result in no signals being heard, though in many cases it will do so—particularly during damp weather. Again, if suitable insulators are not employed at the extremities of the aerial wires, a thin layer of moisture on their surfaces can easily result in shorting the receiver by affording a conductive path to earth via the staying rope and halyards.

THE A.T.I.

(5) A break in the aerial inductance coil inside the receiving instrument, or in any wire which should be directly connected to it.

The two ends of this coil are soldered to the aerial and earth terminals inside the container box. Should these terminals become loose, it is customary to tighten them from the outside of the box, and, in doing so, the internal connections of the inductance coil are sometimes broken off. Occasionally, in fact, rough handling of the receiver will effect this, without any turning of the terminals in their sockets. Sometimes this coil is variable and sometimes not. Even when it is not variable it may be directly connected to some other part of the receiving circuit, and this connection can also become loosened or broken by jolting the receiving box.

When it is a variable inductance there are usually numerous points at which contact between the wires may be broken. Every fourth or fifth wire, for instance, may be connected to one of a semi-circular row of studs, over the face of which a contact arm moves. The tapping lead is thus soldered at both ends, and if there are, say, 20 tapplings, it means that there are 40 soldered joints connected with this particular piece of apparatus. It does not necessarily follow that, if one of these joints is broken, it will be impossible to hear any signals. The fracture may only result in no signals being heard on that particular tuning; on the other hand, the break may have the effect of cutting out all signals.

MOVABLE CONTACTS.

(6) The end of the contact arm may not be pressing on some of the studs.

This may be due to the studs having become very worn; or to the spring which is usually employed with such an instrument having become too weak to secure a good firm contact between the studs and the end of the revolving arm; or to a loose or broken connection between the contact arm and the single wire which connects each of the tappings in turn in series with the aerial. Moreover, the old trouble of dirty connections may also be met with here. Sometimes, even though the revolving arm makes quite good contact with the studs, the presence of a layer of dust on the surface of the latter may be sufficient to prevent electrical continuity.

CONDENSER TROUBLES.

(7) A faulty condenser, when used parallel to, or in series with, the aerial inductance.

The faultiness of the condenser, in either case, may take a number of different forms. It may, for instance, arise from the two sets of plates being shorted inside the condenser, owing to one plate from one set being in steady contact with

one plate from the other set.

When condensers employ an "air dielectric," trouble of this kind is constantly encountered. The plates, which consist of very thin metal sheets, revolve at a distance of a fraction of an inch from each other, and should two adjacent plates become warped from any cause, it is almost certain that contact will be effected between them at some point or other. This, of course, may only result in a "short" for one particular position of the plates, and even in that position it may be possible to hear signals.

More usually, however, a shorted condenser leads to permanent trouble, especially if the false contact occurs between the spindles which carry the two sets of plates. The whole trouble, on the other hand, may be caused by the old problem of dirty or loose connections.

INSULATION FAULTS.

(8) Faulty insulation at any point in the aerial-earth circuit where insulation is needed.

The aerial down-lead should be carefully insulated for some little distance before it is brought into the room in which the receiver is installed and right up to the aerial

terminal. It is usual to employ some kind of insulating tube for conducting the down-lead to the receiver. If bare wire be taken through this tube, however, the latter may, in wet weather, be the means of providing a highly conductive path to earth for the received signals.

As already stated, the wire should be insulated before it is taken through the tube. The insulation of the inductance coil is of equal importance, whilst particular attention should be paid to the insulation of whatever loose connecting wires are used to link up the various instruments with each other.

To sum up, when no signals are received, it may be due to any of the following faults arising in connection with the aerial-earth circuit: Loose or dirty connections, unsoldered or badly soldered joints in the aerial or earth wires, a complete break in either of these wires, short circuit between aerial and earth, a break in the aerial tuning inductance, faulty connection between contact arm and studs of inductance or condenser, a short between two or more condenser plates, bad insulation at any point of the circuit where insulation is required.

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April 20, 1924.

WIRELESS WEEKLY

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WIRELESS INSTITUTE OF AUSTRALIA—N.S.W. DIVISION.

ANNUAL GENERAL MEETING.

The annual general meeting of the above Institute was held in the Royal Society's Hall on Wednesday last (11th) when Mr. F. Basil-Cooke, F.R.A.S., Vice-President, occupied the chair. The Treasurer (Mr. O. F. Mingay) presented a financial statement which showed that the present council took office with about £60 in debt, but was able to complete the year by wiping out all these debts and at that moment the Institute had over £20 nett credit. This was very gratifying under the circumstances, and it was freely expected that the forthcoming year would prove one of financial benefit to the Institute. The report also mentioned the excellent services rendered the Institute by the late President, Mr. Chas. Bartholomew, and also the esteemed Hon. Secretary, Mr. Phil Renshaw, without whose valuable assistance it would have been very difficult to carry on.

The report was unanimously received. The Presidential annual report was then read by Mr. Basil-Cooke.

The report was also adopted unanimously. The Chairman then introduced Mr. George A. Taylor, and stated that Mr. Taylor had the honour of being the first chairman of the Institute which was founded in 1910, when a party of enthusiasts met at the Hotel Australia to discuss and endeavour the remedies that the amateur's experienced in those early days. Mr. Taylor read a most interesting paper on "Australian Wireless Development—A Plea for its Encouragement."

The world today is alert. For ages it had wailed on. Events happened and the world woke for a space and then it slept again in its matter-of-fact way. To-day it is wide awake; the crash of the great war upon history sounded a thump that is still reverberating round the earth in the changing conditions of

National Government in the altered views of human rights, but more in the realm of scientific achievement, and no where more than in wireless communication have better results been achieved. Yet, different from other scientific investigations, wireless development did not want pressure to stir it to activity.

So the speaker carried the audience through the pioneering stages of Australian wireless. He dealt lucidly with the early pioneers who DID THINGS, without any encouragement or assistance, which are only NOW being proclaimed by prominent German and American radio engineers as being invented in their countries. The communication by wireless between moving trains, the explosion of artillery guns, the guiding of aeroplanes, and dropping of bombs, etc., all performed by Australians in Australia.

As now, so there existed in those days certain hindrances to experimenters, that was the Wireless Act, when £3/3/- was charged for a license. This so crippled wireless development that in 1910 the Wireless Institute was founded and Mr. Taylor was the first chairman.

Mr. Wilkinson was successful in transmitting pictures by wireless (vide "Evening News," February, 1911). The speaker also proved that he was responsible for showing

how sound waves and wireless could be utilised for locating disturbances in 1911 (vide "Commonwealth Military Journal," March, 1912), and in the control of airships by wireless by Mr. Roberts in 1912 (vide "Evening News," 16/5/1912).

Mr. Taylor explained the many other experiments, successfully carried out in regard to the motorless aeroplane in 1909, and made strong references to the great work of Lawrence Hargrave, in connection with the initiation of flying machines.

The whole proceedings were very keenly appreciated by all those in attendance, and Mr. MacLurean and many others, all voiced their intense interest in the subject matters referred to.

Mr. Taylor was accorded a hearty vote of thanks by prolonged acclamation.

The ballot for the new council was then conducted by Messrs. Marsden and Colville, which resulted in the following gentlemen being elected:

Messrs. Chas. MacLurean, Basil-Cooke, Cruicker, Gregory, Stowe, Renshaw and Mingay.

(We regret owing to the lack of space this week, we are unable to publish the Presidential Report of the N.S.W. Division of the Wireless Institute.—Editor.)

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AMATEUR CALLS

NEW SOUTH WALES

Licenses issued during the months of February and March, 1923:—

Call Sign.	Name	Address.
2 F A	Colville, S. V.	10 Rowe St., Sydney. T.
2 J M	Marsden, R. C.	Victoria Rd., Edgecliffe. T.
2 S O	Newcastle Radio Club (A. V. Zoppi)	25 Winship St., Hamilton. T.
2 S P	Evans, R.	"Garth Craig," 8 Flood St., Cleavelly. T.
2 S X	Slade, H. C.	"Rockleigh," Lang St., Croydon. T.
2 U I	Illawarra Radio Club (C. A. Gorman)	75 Montgomerie St., Kogarah. T.

RECEIVING ONLY.

Call Sign.	Name	Address.
2 O L	Pinnell, J. C.	295 Annandale St., Annandale. R.
2 O M	Chambers, M. C.	Slade St., Crow's Nest. R.
2 O N	Manning, J.	Tavistock St., Drummoyne. R.
2 O O	Inch, E. A.	C/o Commercial Banking Company, Mudgee. R.
2 O Q	Nuttens, Mrs. J.	Stanton Rd., Mosman. R.
2 O B	Alder, A. W.	50 Loudon St., Enmore. R.
2 O S	Atkinson, A. E. H.	31 Balfour St., Kogarah. R.
2 O T	Todd, T. A.	Vinera Rd., Eastwood. R.
2 O U	Jones, G. E.	118 Cardigan St., Stanmore. R.
2 O V	Marsden, N. P.	5 Collins St., Annandale. R.
2 O W	Page, C. M.	47 George St., St. Peter's. R.
2 O X	Heizenberger, L.	72 Queen St., Woolahra. R.
2 O Y	Steele, A. H. H.	280 Railway Pde., Kogarah. R.
2 O Z	Chown, R. H.	68 Stanmore Rd., Petersham. R.
2 P A	Cotton, A. F.	4 Prince St., Waratah. R.
2 P B	Page, Chas.	40 Turf St., Grafton. R.
2 P C	Armidale Radio Club (E. Barlow)	Rusden St., Armidale. R.
2 P D	Swadling, N.	20 Leansdale St., Leichhardt. R.
2 P E	Swanson, L. N.	Spark St., Canterbury. R.
2 P F	Carruthers, F. A.	50 Wollongong Rd., Arncliffe. R.
2 P G	Winton, G. R. A.	Railway St., Campbelltown. R.
2 P H	Allan, A. E.	15 Villa St., Kogarah. R.
2 P I	Nicol, J. W.	Wattle St., Killara. R.
2 P J	Richardson, A. C.	Charlotte St., Campsie. R.
2 P K	Pritchard, J. W.	135 High St., Nth. Sydney. R.
2 P L	Hale, S. C.	134 Blue's Point Rd., North Sydney. R.
2 P M	French, H. J. M.	"Kia-Ora," Loch Maree St., Sth. Randwick. R.
2 P N	Desprez, R. V.	574 Railway St., Hurstville. R.
2 P O	Hudson, W. H.	95 Warren Rd., Marrickville. R.
2 P P	Illingworth, Alf.	Gibbs St., Auburn. R.
2 P Q	Dowley, G. F.	Military Rd., Port Kembla. R.
2 P R	Bullivant, W. N.	Charles St., Albury. R.
2 P S	Wellman, L. J.	18 Meeks St., Murrickville. R.
2 P T	Stephenson, J. V.	La Mascotte Avenue, Concord. R.
2 P U	Sindel, C.	118 Young St., Annandale. R.
2 P V	Sharp, R. W.	Weston St., Harris Park. R.
2 P W	Spooner, C.	Richmond Rd., Rose Bay. R.
2 P X	Stewart, W. A.	15 Belgrave St., Waverley. R.
2 P Y	Sharp, K. C.	Essex St., Epping. R.
2 P Z	Thompson, J.	Edward St., Gordon, Nth. Sydney. R.
2 Q A	Rose, F. G. D.	14 Bond St., Mosman. R.
2 Q B	Woolnough, D. W.	Middle Harbour Rd., Lindfield. R.

SHIPS YOU SHOULD HEAR THIS WEEK.

ACHATINA	GFPD
ARAFURA	GBFV
AUSTRALIA	YSN
CANADIAN IMPORTER	XWQ
EASTERN SEA	KTEA
EASTERN PLANET	KUPD
EUDUNDA	CGG
HOBSON'S BAY	VZBW
INDIAN CITY	GDPC
KENTUCKY	NIQ
MARELLA	GBKJ
MARSINA	VKZ
MATATUA	GBLJ
MORINDA	VJF
NALDERA	GOTZ
MOLDAVIA	GDVZ
POONA	MSO
TANGO MARU	JTG

THE BELLS OF MALINES.

The King and Queen of the Belgians are the latest Royal radio fans to date. They attended closely to the test concert of the Malines Cathedral chimes, broadcasted from the tower of this famous edifice. As every listener-in to 2LO knows, chimes broadcast remarkably well, and the reception was so clear and the modulation so perfect, that the Royal amateurs were delighted.

2/6 will be paid for the best "BIT" of wireless humour sent in each week. Articles sent in will become the property of Wireless Weekly Newspaper. 2/6 will be paid for each humorous drawing accepted.

AMATEUR TRANSMITTING STATIONS.

Those you should hear during week, ending 22nd April:
 Monday: 8.30 to 9, 2 FA.
 Tuesday: 7.30 to 8, 2 BB; 8 to 8.30, 2 IX; 8.30 to 9, 2 FA.
 Wednesday: 7.30 to 8, 2 LI; 8 to 8.30, 2 LI; 8.30 to 9, 2 FA.
 Thursday: 8.30 to 9, 2 FA.
 Friday: 7.30 to 8, 2 IX; 8 to 8.30, 2 IX; 8.30 to 9, 2 FA.
 Saturday: 7.30 to 8, 2 BB; 8 to 8.30, 2 LI; 8.30 to 9, 2 FA.
 Sunday: 7.30 to 8, 2 CM; 8 to 8.30, 2 CM; 8.30 to 9, 2 FA.

April 20th, 1923.

WIRELESS WEEKLY

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ALL CLUBS' NIGHT.

The N.S.W. Division of the Wireless Institute is holding an All Clubs' Night on May 10th, in the Lecture Hall, Education Department, Bridge Street. A very special lecture will be given, entitled "The Co-Relation of Various Forms of Energy," by Mr. Alex Heeter, Manager, Burrows Welcome.

All clubs are invited to attend in full strength.

RADIO ASSOCIATION OF NEW SOUTH WALES.

The 6th meeting of the delegates of the Radio Association of N.S.W. was held at the Laurel Cafe, Royal Arcade, on Tuesday evening, 10th April.

The principal business was in connection with the appointment of Hon. Radio Inspectors. Mr. Crawford, Radio Inspector for New South Wales, was present, and explained to the delegates the idea.

"That it was Mr. Malone's intention to appoint 4 Hon. Radio Inspectors in N.S.W. Certain powers would be given him; their main work would be to locate unlicensed and illicit stations, check power, wave length, etc., of transmitting stations and to assist the Radio Inspectors to see that the regulations were maintained."

A number of questions were asked, to which Mr. Crawford replied.

A resolution was carried to the effect that the Radio Association of N.S.W. was in favour of Hon. Radio Inspectors being appointed.

A further resolution that all clubs should be asked to give their opinion with an amendment that clubs should at once appoint nominees was carried.

The chairman thanked Mr. Crawford for his having attended and explained Mr. Malone's scheme.

AMATEUR TRANSMITTERS' MEETING.

A meeting of Amateur Transmitters called by Mr. Chas. MacLurean, met immediately after the Radio Association of N.S.W. meeting on Tuesday, 19th Inst., at the Laurel Cafe, Royal Arcade.

Mr. MacLurean stated that the object of the meeting was to see if a scheme could not be formulated to regulate Amateur Transmission. Complaints had been numerous during the last few weeks. Jamming was going on night after night, and if the Amateurs did not regulate for themselves there would not in his opinion be any amateurs to regulate in a few months' time.

A scheme was put forward "that each evening 1 hour, say 7 p.m. to 8 p.m., be set aside for test work only, i.e., no music; from 8 p.m. half hourly transmissions should be carried on by different stations. A timekeeper to be appointed who could easily be got in touch with to arrange the times of transmission to suit each operator so as not to have overlapping.

After a good deal of discussion most of it away from the real object of the meeting, it was decided to carry out this scheme. Mr. Marsden was appointed timekeeper.

WENTWORTH.

At the meeting of the Wentworth Radio Club on Wednesday, Mr. R. C. Marsden will lecture on

the reception of telephony. He will also give a practical demonstration. All interested are invited.

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THE NORTH SYDNEY RADIO CLUB.

At the North Sydney Radio Club, on Tuesday, the 10th inst., a very fine lecture upon the "Armstrong Super Regenerative Circuit," was delivered by Mr. Raymond McIntosh.

Before dealing with the main subject, Mr. McIntosh first of all briefly ran over the theory of the ordinary regenerative circuit for the benefit of those who had missed his previous lectures upon the subject.

He then went on to explain that if, in the ordinary regenerative circuit, the plate circuit was exactly tuned to the aerial circuit, the oscillations would build up and continue to such an extent that the incoming signals would be entirely choked out.

The only thing, then, in that case, was the interrupting of the oscillations at the moment of their greatest strength, and this was what Major Armstrong had accomplished with the circuit under discussion.

Mr. McIntosh then proceeded to show diagrammatically a number of ways in which this object was achieved.

In conclusion, Mr. McIntosh stated that the possibilities of this wonderful circuit were absolutely limitless, and offered the experimenter a vast field of research towards its simplification.

The lecture was supported throughout by a practical demonstration of the subject of the lecture upon a set constructed by Mr. McIntosh and Mr. Charlesworth, who was experimenting that evening, could be heard distinctly twenty feet away from the set.

A hearty vote of thanks was accorded Mr. McIntosh, in conveying which, the President (Mr. J. O'Brien) said that the series of lectures which had just been concluded had been of the greatest possible value to the Club members and others who had been privileged to hear them, and it was largely due to Mr. McIntosh's unfailing energy and interest that the Club occupied the position it held to-day as a purely experimental club.

The next meeting will be held on Tuesday night, when all interested in the science are invited to be present.

BALMAIN RADIO SOCIETY.

The Society held its usual weekly meeting on Tuesday night. The members are making good headway with the buzzer, every member getting good practice at sending and receiving. We hope to have our technical instructor (Mr. P. G.

RADIO COLLEGE

Applications are now being received for forming the next class.

23 LANG STREET

F. B. COOKE, Principal

Stephens) back with us again very shortly. Mr. Stephens, who has had practical radio station experience, and late wireless instructor to the Navy League, will be forming a class in May, for those desirous of obtaining private instruction in radio. The fee will be very moderate, and the students will get the best practical training. Any information will be gladly supplied by Mr. T. W. Riccardi, 77 Grove Street, Balmain.

LEICHHARDT AND DISTRICT RADIO SOCIETY.

Members of the Leichhardt and District Radio Society said "Good-bye" to the club room at Victory Hall, on Tuesday, April 10th, a larger and more convenient room having been secured for the use of members. It is situated at the rear of 176 Johnston St., Annandale, and will be available for use about every night — an advantage which should strongly appeal to members. The work of erection of an aerial and the installation of a set will be gone on with immediately, and the future of the Society is felt to be full of promise. Since its inauguration six months ago, the membership has steadily increased, and now stands at 38, with several prospective members in view. It is the ambition of the Society to have in its ranks every experimenter in the district, and the Hon. Secretary, Mr. W. J. Zock, of 145 Booth St., Annandale, will be pleased to receive inquiries from those who have not yet become members.

Winter is Near

Radiators from 55/-
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April 20th, 1923.

WIRELESS WEEKLY

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"THE PEST" AGAIN.

Mr. H. C. Walker writes:—

Pressure of business during Easter prevented me from replying sooner, but with your permission I would like to express my gratification at Mr. Robinson's excellent reception of my remarks on the above subject (transmitted at not less than the statutory 12 words per minute), and his more tolerant attitude.

His statement that he does not contend that proficiency in Morse implies a knowledge of valve operation is quite unnecessary, as I did not read that meaning into his statement, and did not try to saddle him with such an absurd contention. My object in replying was to defend the "pest" (i.e., amateur), and to point out the injustice of issuing a license on a Morse qualification only, and withholding it from one with reasonable technical qualifications and no knowledge of Morse.

Mr. R. urges that we consider the matter from a practical standpoint, to which I reply that nothing can be more practical than the examination of the applicant in the subject he wishes to practice.

The motor car driver, on whose skill depends the safety of the pedestrian and his passengers, not to mention his own, does not have to prove he has a knowledge of botany, or even physics, neither is the winding engine driver expected to be a geologist. A practical test with a car, and a knowledge of traffic regulations, passes the former, and a practical test, plus an examination in elementary engineering, the latter.

"J.W.R." evades the points I raised, and uses the slothfulness of the department as a defence for his fetish, the Morse test. He agrees that "the Morse test has its disadvantages," also that "a technical test would be a good deal better," so why not let us strive for the better? He thinks that "if the licenses for each State were issued in that State we could advocate a practical test." Why not let us strive for decentralisation also, and cut out the irritating delays? If experience in other countries is a fair indication, radio men will be numerous here, and numbers tell.

Referring to the editorial comment, I suspect that when it was written, a distinct lump showed on

the editorial cheek, due to the presence of the editorial tongue therein. The owner of a radiating valve (who presumably does not know sufficient to know that it is radiating) would surely be the last person to think that a request to desist applied to him.

The paragraph re examinations was rather ambiguous, and I feel sure a little further information would be welcomed by numerous readers who, like myself, despise Morse, but desire to use a valve.

(Editor: A perusal of a copy of Wireless Telegraphy Regulations, obtainable at Government Printing Office for about 1/3, will show Mr. H. C. Walker what is laid down in them for use of "valves." These regulations, which it took so long to frame, are not likely to be altered in any way for some time. If a man is sufficiently interested in the science, a little extra work, such as learning to read Morse at 12 words a minute should not deter him.)

CRYSTAL RECEPTION.

The following may be of some interest to the readers of your much valued and estimable journal.

RECEPTION OF 2LI (NOT 2LO) ON CRYSTAL.

Until the recent holidays I had considered my loose-coupler set absolutely and without reservation as the roughest set in N.S.W. That is to say, as far as finish went; because V.I.S. and ships come in excellently. But I listened in vain for Mr. Macburean's Sunday night treat.

However, on Good Friday, having spent the day on the harbour, I came home feeling rather bucked, so to speak, as it were, and made up my mind to spend the evening reading and listening-in to whatever may happen along.

About 9 o'clock I heard a ship very faintly, and proceeded to tune down to his wave-length, which seemed rather low; but he stopped, and instead I heard other weird and wonderful sounds very faintly. I didn't take much notice of this, however, but went on reading. The sounds still persisted after quite a while, so I moved the slider a little, shortening the wave-length, and lo and behold, the sound took into it-

self definite form, and resolved itself into faint music. I sat entranced, not daring to touch either slider or secondary for fear of losing him. Suddenly the music, which sounded like a violin, stopped, and a man's voice took up the running; what he said was quite unintelligible, but nevertheless it was unmistakably a man's voice. Evidently this little speech was the end of proceedings, because I heard no more.

Next day, being Saturday, I went into town in the morning, and found that 2LI had been transmitting the night before, and was going to transmit again that afternoon and evening.

Accordingly I started to listen in about 3 o'clock, and sure enough music began to come in very faintly. But I had become brave overnight, and so first I moved the slider very carefully, and then the secondary, until I had it so that it could be heard with the 'phones held out about an inch from the ears. Although the speech was unintelligible, except for a word here and there, throughout the afternoon and evening I listened to an enjoyable programme. There is no doubt about it, Mr. Cook has an admirable repertoire, and he intermixes jazz and grand opera well. Since then I have listened to 2LI fairly frequently, and I am very much obliged to the people of "The Manor" for their entertainments.

We amateurs ought to be very grateful to these pioneers of broadcasting, and it is to be hoped that they are not entirely forgotten, even when official broadcasting actually commences.

A few words about the set: It is made from the description of a loose coupler set in one of the early numbers of "Wireless Weekly," and the circuit used is the one given there. All tuning is done with the slider and secondary, no variable condensers being used. The detector is a galena crystal, with a copper wire contact. The antenna is 3 wire, T type, 25ft. average height, each wire 60ft. long, excluding lead in. Badly screened by hills on north-west and east sides, and pointing east, south-east, and west-north-west. Earth connection is soldered to water pipe.

And so I bid all ye discouraged crystal set owners to take heart, for you may yet hear the silver strains of music from the ether.

—(2TD.)

ILLAWARRA RADIO CLUB.

The 20th general meeting of the Club was held at the club room, 75 Montgomery St., Kogarah, on Thursday, 12th inst. After minutes had been confirmed and another new member elected, Mr. E. G. Bailey delivered a very interesting lecture on "Radio Measurements and Calculations." The wave meter and combined wave meter and oscillator was described in detail—the various uses to which it could be put and its method of construction and operation being clearly explained, accompanied by the various circuit diagrams. The lecturer showed in turn the means by which wave lengths, inductances and capacities could be accurately arrived at per medium of this extremely useful instrument, the circuits and formulae for ascertaining the required values in each case being given. A great deal of practical information was gained from the lecture, which would be very helpful to members in endeavouring to arrive at the wave-length of their aeriads, and values of their condensers and coils. It was clearly seen that a wave meter was an invaluable unit in any experimenter's station, more particularly for wave length calibration purposes with amateur transmitters. A hearty vote of thanks was accorded Mr. Bailey, who responded, and hoped to go further into the subject at a later date.

Mr. L. R. Hewett (delegate) explained the result of the last meeting of the Radio Association, at which Mr. Crawford, Radio Inspector, had been present, and reported developments of negotiations which had been proceeding between the Association and the authorities with regard to what was to be the status, jurisdiction, powers and rights of the Association from the official point of view, and matters in this connection were proceeding very satisfactorily.

Mr. Hewett also spoke of the recent meeting of amateur transmitters, and to the agreement which had been arrived at between them to operate at specified times, each to have a clear run for a certain period, according to arrangement, which would give each station a better chance, and prevent interference. This was thought to be an excellent arrangement.

The most important matter which had been mentioned by Mr. Crawford

For Sale or Exchange

FOR SALE.—Loose Coupler, complete with 2,000 ohm. Phones, Two-way Switch, Phone Condenser, Two Crystal Detectors, 50ft. Aerial. In Good Order. Cheap. E. CORNEY, 10 Albermarle St., Marrickville.

FOR SALE.—Panel Crystal Set, with 2000 ohm. Phones, £3. Also Loose Coupler (6,000m.), 30/- N. J. HURLI, "Strathcona," Northcote Ave., Killara. Phone: J1113.

A Crystal Loose-coupled Set, var. cond., etc., cheap. E. Harris, 186 James St., Leichhardt.

ford at the above meeting was the appointment from among the N.S.W. amateurs of hon. radio inspectors, of which it was proposed there should be four, for the Northern, Southern, Eastern and Western portion, respectively, of the Metropolitan area. This had already been done in other States, and it was imperative that it should be given effect to here as soon as practicable, and the clubs were therefore looked to to give the matter their early and serious consideration, with a view of appointing these officers.

Mr. Hewett pointed out, therefore the necessity of the Club considering the question of the appointment as a Hon. Radio Inspector for the Southern District with which this club was concerned.

A special general meeting of members to fully discuss and finalise this important question has been called for next meeting night, Thursday, 26th April at club room, 75 Montgomery St., Kogarah, at 8 p.m., at which all members are urged to attend. There will also be a lecture.

Although not quite complete, the club's single valve receiving set was given a try out at last meeting, and although no music or telephony was received (only a temporary hook-up and a very poor earth was used) quite a number of Australian, New Zealand and other Stations were heard. Some finishing touches have yet to be applied, and it is hoped to have the set O.K. for next meeting, when some music may be expected.

The Hon. Secretary (Mr. W. D. Graham, 44 Cameron St., Rockdale) is always pleased to hear from anyone interested or desirous of joining the club.

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

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Address

FOR 2 QUESTIONS ONLY

E. M. (Arneliffe):

Q.—(1) When a valve is oscillating for the reception of C.W., does it cause interference with other stations or only when it is howling? (2) When using a Grid Condenser for detecting what it is that causes the radio component of the plate current as well as the audio frequency.

A.—(1) When a valve is oscillating it is energising the aerial, and therefore acting as a transmitter. (2) The arrival of the incoming signal.

T.S.S. (Draunmoyné):

Q.—(1) How to make a long wave loose coupler a receiving set? (2) How to make ordinary telephone receiver (watch type) to 8000 ohm receiver?

A.—(1) Published in "Wireless Weekly," Vol 1, No. 4. (2) With very few exceptions rewound telephones are not satisfactory; your best plan is to use a telephone transformer (see this issue).

S.H. (North Sydney):

Q.—(1) Would close proximity to an iron roof of my lead in cause any decrease in signal strength. The distance between the lead in and the roof being about four inches? (2) Where can I buy a large capacity condenser, i.e. on from 1/2 to 1 microfarads capacity?

A.—(1) Under the circumstances where the lead in passes the edge of the roof, cut a piece of timber about three feet with insulators to keep the lead in clear. (2) Any advertiser of wireless goods in this paper will supply.

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April 20th, 1923.

WIRELESS WEEKLY

Wireless Experimenters Requirements

Apparatus and Parts with a Guarantee of 100% Efficiency.

DOUBLE SLIDE TUNERS, £2; complete with phone condenser detector panel.
LOOSE COUPLERS, £3; with detector panel, £3/15/-.
LOOSE COUPLER PARTS: Baseboard, 1/6; complete set of ends, 2/3; tubes 6d. each; slider, 3/6; secondary sliding rods, 1/8 pair; primary wire, 2/-; secondary wire, 1/6; 8 studs and stops, 2/-; secondary switch, 2/9; Crystal detector, 4/6; all loose coupler parts nickel plated.
VALVE RECEIVING SETS, equal to any on the world's market, from £10; complete with high and low tension Bat aerial wire, insulators, etc.
CRYSTAL PANEL MOUNTED SETS, £7, complete with phones, aerial wire, etc.
VALVES: Expense "B," 35/-; Radiotrons, 200, 37/-, 201, £2, 202, £3; Myers' Detectors and Amplifiers, 35/-; Marconi "R," 37/-; V-24, 37/-; Mulard Ora, 28/-; D.E.R., 37/-.
PHONES: Brown's single, 25/-; Murdock's, 30/-; Bestone, 32/6; Trim's, 39/6; Western Electric, 4000, 42/-, 8000, 45/-; Baldwin's £4/18/6; Brown's Loud Speakers, £5/5/-; Amphiphones, 12/6 each.
CRYSTALS: Galena tested and guaranteed, 2/-; magnetite iron pyrites selicon, 1/6 each.
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INTERVALVE TRANSFORMERS: Jefferson, £2; Radio Frequency, 10/- each.
TERMINALS: From 5d. each; studs, 2/- and 2/3 per dozen.
SWITCHES: 2/9, 3/-, and 4/- each.

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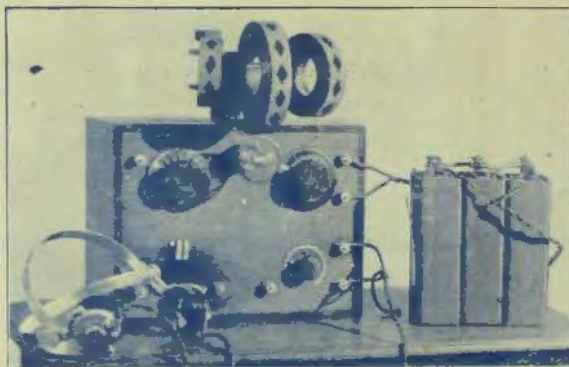
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