WIRELESS WEEKLY

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VOL. 5. No. 23. FRIDAY, APRIL 3, 1925.

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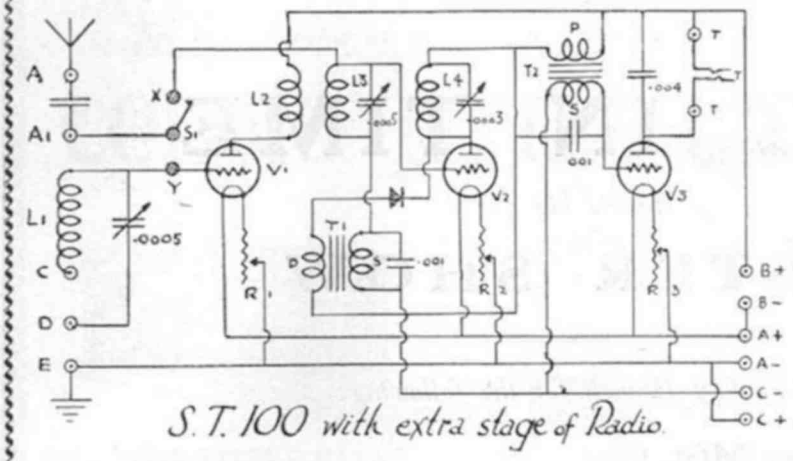
REIN. A.W. NOTES.

FEATURE:

A Selective Single Valver



S. T. 100 with extra stage of Radio

CULLEN'S CIRCUIT No. 4

"YOU HAVE MY WORD FOR IT."

CIRCUIT No. 4 of our series is one of John Scott Taggart's famous circuits which Mr. Hamilton, of this organisation, has done much to popularise in Australia. This reflex circuit receiver functions admirably for distance reception, employing three valves, but giving the output of two stages of Radio Frequency and two stages of Audio Frequency amplification. The crystal detector employed, which should be a good one, ensures sweet, mellow reproduction. Coils L2, L3 and L4 are coupled by a three coil holder in the order named while 4 is best kept at least four inches from the others.

Switch S1 cuts out the first valve at will and allows the standard ST100 to be employed. Provision is made by terminals A to E for constant aerial, parallel and series tuning.

Further information gladly given without obligation by our Mr. Hamilton. Why not call (or write) to-day.

MANY reports of the excellent results achieved with this receiver have reached us from all parts of the Commonwealth. Whether in connection with this receiver or on any wireless matter consult our Mr. Hamilton for advice and information No obligation whatever.

1 Bakelite Panel, 24 x 12 x 3/16 .. .. £1/10/-
1 3-Coil Holder, Unassembled, 1st Quality 15/6
1 Fixed Panel Plug, Remler, 3/6
2 .0005 Variable Condensers and Dials, Master £2/10/-
1 .0003 Variable Condenser and Dial, Master £1/5/-
1 S.P. D.T. Switch, Marco, 4/6
2 Audio Frequency Transformers, Jefferson Star £2/5/-
3 Rheostats, Nutmeg with Dial, £1/-/-
3 Valve Sockets, Master .. 18/-
1 .0001 Wetless Condenser.. 1/6
3 .001 Wetless Condensers.. 4/6
1 Crystal Detector, A.W.A... 5/6
1 S.T. Jack 2/6
11 Terminals. Ebonite 3/8
Panel Wire, Screws, etc.

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2 B Batteries
1 C Battery
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Wireless Weekly

12-16 REGENT STREET, SYDNEY, AUSTRALIA.
'Phones: Redfern 964 and 930.

Official Organ of the New South Wales Division of the Wireless Institute of Australia, with which are incorporated the Affiliated Radio Societies and the Australian Radio Relay League.

Editor: A. W. Watt.—The Editor will be glad to consider Technical and Topical Articles of interest to Australian Experimenters. All Manuscripts and Illustrations are sent at the author's risk, and although the greatest care will be taken to return unsuitable matter (if accompanied by stamps), the Editor cannot accept responsibility for its safe return.

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Advertising.—Advertising Rates may be had on application to the Advertising Manager. Copy must be in the hands of the Editor by the Friday preceding each issue. If copy is not received in time, the previous week's advertisement will be repeated.

All accounts should be made payable to Publicity Press Ltd., 12/16 Regent Street, Sydney.

Agents in Great Britain.—The Colonial Technical Press Ltd., Dudley House, Southampton Street, Strand, W.C. 2...

VOL. 5 No. 23 APRIL 3, 1925

Editorial.

SO THIS IS PARLIAMENT

ASIDE from strikes and the Easter holidays the principal topic of discussion throughout the whole of New South Wales is the Ne Temere Bill, so that the broadcasting of the parliamentary debate on the Bill by 2FC was one of the most successful stunts ever put over by that excellent station. Anything more popular or more in keeping with the public demand could scarcely be imagined, and according to reports, practically every set owner listened in on that particular evening. The transmission itself was perfect, and although 2FC committed a technical offence in permitting the debate to occupy 35 minutes of the other portion of the programme, there was general disappointment when the voice of the announcer broke in.

If the broadcasting of this debate achieved nothing else, it illustrated the behaviour of politicians in their own domain, and a lot of people listening to the courteous interjections and the general babel must have re-adjusted their ideas of Parliament. There were perhaps quite a number who had imagined the proceedings to be characterised by a solemnity and dignity in keeping with the accumulated genius and brains which gather there, but the microphone dispelled the illusion. Actually at times it was hard to differentiate between the debate and the barracking at a football match or a bout at the stadium and no one could possibly envy the Speaker his job of keeping order. But most of us will agree that a little parliament now and then would be a splendid idea, and as the management of 2FC is perfectly willing to do its share, it is to be hoped that the Government will put no obstacle in the way. Both the Premier and the Leader of the Opposition are reported to be against the installation of a microphone at Parliament House, but, although it is contended that Parliament is not suitable for broadcasting, nothing could be more suitable than that satisfactory arrangements should be made to enable the public to listen to debates upon vital topics.

A GENTLE HINT.

THE regulations governing CQ calls by transmitters stipulate three calls of CQ, the word De and the station's own call three times. Those are also the requirements in the United States, but we heard an American amateur station call CQ the other night for two and a half minutes without pause, so that, as in this country, the rules are honored more in the breach than in the observance. Three calls seem to us scarcely enough but all the same it is noticeable that some stations are not particular about a couple of dozen or so. If this must be done, it is a much better plan to split them up than to send them all out straight. For instance, the method suggested would be as follows, assuming 2XX were calling 3ZZ. The call 3XX three times—de—2XX three times, then repeat it over again in a series of, say, three. The same thing could of course be adopted when calling CQ. This would enable disinterested parties to look out for other stations, and would certainly obviate hanging on to some long-winded station for five minutes before getting his QRA.

Another thing we want also to touch upon. There are hundreds of interested listeners who are also anxious to know the QRA of the station to which they happen to be listening. In very many cases, they cannot read fast Morse, so, in order to give them a chance, it would be a very good plan when signing off, for the transmitter to send his call sign a couple of times very slowly.

This little action would, we know, be appreciated by a large number of radio enthusiasts who go in for DX work and who are trying to brush up on the code.

HEADQUARTERS
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SYDNEY, N.S.W.

Wireless Institute of Australia
N.S.W. Div. Inc.
Incorporating the Affiliated Societies and The Australian Radio Relay League

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A.H.Perrett Publicity Officer

Maclurcan Cup.

Reference was made in these notes last week to the Maclurcan Cup, presented by the President of the N.S.W. Division of the Wireless Institute of Australia for annual competition amongst the affiliated societies. It is generally recognised that this fills a definite need in as much as it is designed to increase the efficiency of clubs, and to stimulate the club movement generally.

The rules have been carefully drafted so that every club has the same chance of winning the cup, whether it be large or small, and no matter how frequently they may meet. A copy of the rules governing the Maclurcan Cup are published in another part of this issue and all club secretaries and members should carefully peruse these rules so that they may be familiar with what is required by the various affiliated clubs competing for this trophy.

New Zealand Tests.

A special test held for New Zealand experimenters which has been arranged for 1st to 10th May, both dates inclusive, will be a test of the efficiency of each individual station, and of the ability of the operator. It is particularly desired to obtain the over all efficiency of each station and entries for these tests should be put in the hands of the organising committee as early as possible. The preliminary arrangements have already been completed, but before the roster can be drawn up giving all the various wave lengths allotted, together with the code words, etc., necessary for the carrying out of these tests, it is essential that all the entries shall be to hand. All transmitters should immediately forward to Institute Headquarters, particulars of their station, call sign, power input, size and type of aerial, and full particulars of the station. Despite printed circulars and radio phone announcements no prizes are being offered in connection with these tests. Any announcement contrary to this intimation is entirely due to a misunderstanding.

The general rules are as follows:—

It is not intended that these tests should be competitive, but as a test of the efficiency of the individual station when operating on a specified wavelength band. Assistance will be given in this direction by the transmission of various wave lengths as standard frequency transmissions by the Wireless Institute of Australia, N.S.W. Division, from station 2CX. These transmissions will take place on Tuesday and Wednesday, 28th and 29th April, 1925, commencing at 10 p.m. They will be given on C.W. and will be announced by phone. The wavelength of each station transmitting will be checked throughout the test and arrangements will be made to do this from several of the transmitting stations. Each station will be allotted a definite time at which to commence operations, and they will proceed as follows: 5 minutes on C.W., 5 minutes on tonic train (buzzer); and 5 minutes on phone.

The procedure will be as follows: Station will call TESTS ZA 2—three times, and then the code word repeated four times, the break sign, and proceed in the same manner on buzzer, then the break sign again followed by phone calling as above and then repeat the allotted sentence, finally signing off with call sign and closing down signal.

Stations must cease transmitting at the termination of the allotted time so that the next station may carry on. Each transmission will be checked by one of the official stations. It is desired that each station entering for this test will keep a log of the transmissions of other stations, noting all characteristics, strength, etc., and forward same to Institute's Headquarters at the closing of the test. The roster will be published as soon as possible before the opening night of the tests. These tests should help the operator in the efficiency operation of his station, which is one of the aims of the tests. Hence it is not desired to make the test competitive, and to that end operators are urged to make as many notes as possible in the station log.

Regulations Governing Test.

1. Each transmitting station to be allotted a

definite wavelength, and code word. A single word will be allotted in Morse and a sentence for phone.

2. Each station to keep a log of the tests each night showing the plate voltage, plate current, radiation, etc. These readings to be certified to by another person. This to be forwarded to Institute Headquarters at the completion of the tests.

3. Each station to supply the following details of transmitter and receiver: (a) Type and size of valve used in transmitter; (b) Type of rectifier; (c) Source of plate supply; (d) Method of modulation; (e) Type and dimensions of aerial and counterpoise; (f) Type of receiver giving number of valves, type of circuit; (g) Type of receiving aerial.

4. Each station to keep an accurate log of reception during the tests indicating the times, atmospheric conditions and condition of receiver used, also an accurate return of the code words and call sign heard indicating their strength and general characteristics.

5. All records and reports to be forwarded to the Honorary Secretary at Institute Headquarters as soon as possible after the close of the test.

Relay League.

Members and associate members of the N.S.W. Dvision of the Wireless Institute of Australia, and members of Affiliated Radio Societies all of whom are eligible for membership in the League, are reminded that a mass meeting will be held at the Royal Society's Hall, 5 Elizabeth St., Sydney, on Wednesday, April 22, at 8 p.m., to receive the report of the special committee which has been arranging a scheme of operations, and to finalise the actual activities of the League. There is no fee for membership in the League.

Exhibition.

The second Wireless and Electrical Exhibition held under the auspices of the Wireless Institute of Australia, N.S.W. Division, will be held in the main hall of the Town Hall, from 6th to 11th of July, 1925.

Arrangements are now well in hand for the exhibition which will be the biggest ever staged in Australia. Although the last exhibition held in Sydney was an unqualified success there is every indication that the second one will by far out shine its predecessor. Assistance from members will be welcomed, and all those willing to assist are requested to notify the Honorary Secretary at Institute Headquarters, as early as possible. Don't forget the date, and arrange for your country friends to make their annual visit to you during this period.

SHORT WAVE BROADCASTING TO AUSTRALIA.

We are advised that WGY, the broadcasting station of the General Electric Company, Schenectady, New York, will carry out short wave broadcasts to Australia. The tests wi'l probably be carried out after the 1st of May, and as soon as definite arrangements are completed full details regarding wavelength, etc., will be published in "Wireless Weekly."

QRM.

Has your club entered for the Maclurcan Cup? See the rules elsewhere in this issue.

The Institute's annual dinner will take place at Sargent's Cafe, Market St., on April 30th, 1925, at 7 p.m.

2GM is working his transmitter without aerial or earth, and has carried out duplex transmission with 2JT.

2JT is out for world's records on low power. He has worked U.S.A. on 9.9 watts. He says he can do better. Carry on the good work, 2JT.

Have you heard the standard frequency transmissions from station 2CX? On Tuesday, March 24, wave band from 60-130 metres was transmitted. On Tuesday, April 7 the wavelength band 130-200 metres will be transmitted. Listen for them and forward reports to station 2CX.

CORRESPONDENCE

TARIFF ON VALVES.

To the Editor.

Sir,—As technical director of the company referred to in your editorial of March 20th, I would be glad of an opportunity to comment on some of the points raised therein. It is stated that at present approximately eighty different types of valves are being imported into Australia. The use of the word "type" in this connection is unfortunate and misleading. While it may be true that there are about eighty different makes of valves being imported, no one conversant with the subject would seriously maintain that there are eighty distinct types, each having a specific use being imported.

It is a matter of common knowledge that many of the well-known makes of valves possess very similar working characteristics and may be interchanged in any well designed set without difficulty. There is a considerable amount of misapprehension as to the information available to anyone undertaking the manufacture of valves in this country. The problems involved in valve manufacture are of two kinds—those relating to the proportions and relative positions of the essential elements, the filament grid and plate, and those concerned with the production of a vacuum of a very high order in the valve which shall be maintained over long periods under working conditions. The master of the design and disposition of the metallic elements of a valve necessary to secure effective operation has been fully worked out and the results may be found in the proper technical and scientific publications available in this country. As regards the production of high and stable vacua, the technique of their production is the common property of the physical laboratories of the world. This knowledge is freely available to those capable of utilising it, and is not by any means the exclusive property of the valve manufacturers. In this connection it may interest readers to know that at the present time researches are in progress in several laboratories involving the use of vacua of a considerably higher order than that necessary in the best receiving valves. In conclusion, I might state that we fully appreciated the difficulties involved in valve manufacture when we commenced operations. We therefore carried out an exhaustive programme of systematic research covering all the stages of the manufacture and testing of valves, in order to secure the uniformity of operating characteristics so essential to valves intended for use in multiple valve receiving sets. This research covered a period of several years, and involved the expenditure of some thousands of pounds, and was completed before we undertook mass production.

In view of the above considerations we feel that our application for protection can hardly be dismissed lightly on the ground that it is premature.

Yours, etc.,

S. RADCLIFF,

Technical Director, G. & R. Electric Co., Ltd.

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(To the Editor)

Sir,—Last night my wife and self had great pleasure in listening in to 2FC from 8 p.m. to 9.30 p.m. on a single slide crystal set. As you may remember, Inverell is 350 miles straight line distance from Sydney. My ordinary aerial 55ft. long and 45 feet high was used. The programme came in at a surprising strength. I had anticipated straining my ears to hear, but there was no need of that. I have had one reply to the letter you inserted re 2FC being less loud here than 2BL on a valve set. That letter was written merely to excite curiosity on the part of your readers, and has evidently failed to do so. In a little while I will give you the answer to the problem involved.

Yours etc.,

LEONARD L. SNOW.

Inverell, 27/3/'25.

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SOME INTERESTING TESTS.

ON Tuesday night and Wednesday morning last, between 11.45 p.m. and 2 a.m., 2YF—F. P. Clark, 36 Lauderdale Avenue, Manly—carried out tests with 5LO, Mr. Barker, Cumberland, S.A. An attempt was made by 5LO to ascertain the lowest power that could be used to communicate between S.A. and N.S.W. Commencing with 11 watts input, 5LO's sigs were very QSA, and there was no noticeable difference until 1.8 watts input was reached. Even then sigs were readable about 10 feet from speaker using det. and 1 A.F. The next input tried was .5 watt. This was QSA. At .3 watts input the sigs were fairly strong, but only a word here and there could be read owing to QRN, which had by this time become worse. The input used was 100 volts at 3 m.a.

The receiver used at 2YF was the Standard 3 coil low loss tuner, detector, and 1 A.F., using Acme condenser and A.F. transformer. Valves used were Phillips D4 as detector and 201A as amplifier. Further tests will be carried out between the two above stations shortly. The wavelength used by 2YF was 130 metres, and by 5LO 120 metres.

AN EXCELLENT 4-VALVE RECEIVER

Employing the Tuned Plate Method of H.F. Amplification

By Wireless Weekly.

REPORTS from dozens of readers—which, by the way, are always very much appreciated—confirm what was expected regarding the back view of the wiring of a three valve receiver (P1 circuit) as described in "Wireless Weekly" dated Feb. 13. Numerous requests for other circuits employing the same method of explanation have reached us, and we propose to publish these as time and space permit.

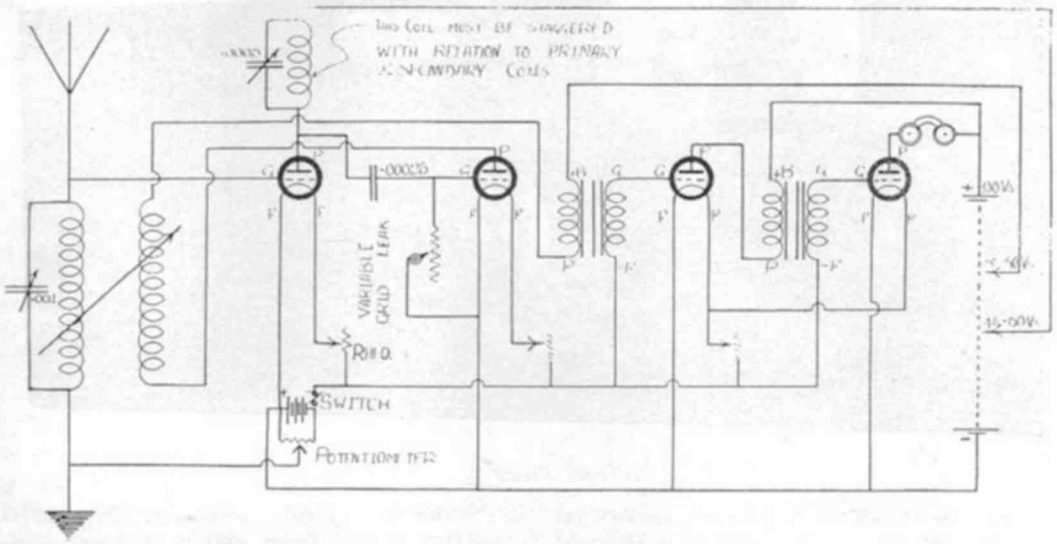
The pictorial view of the wiring and layout of a four valve receiver shown in this article, it is pointed out that if you copy wire for wire and connection for connection, the set will operate as soon as you pull the switch. The set illustrated gave very fair loud speaker strength in Sydney from the Perth broadcasting station, 6WF, and its all-round results were excellent. In spite of the extra tuning condenser the set is easy to tune, and the stage of high frquency amplification makes it a fairly selective one.

The following parts are required:—

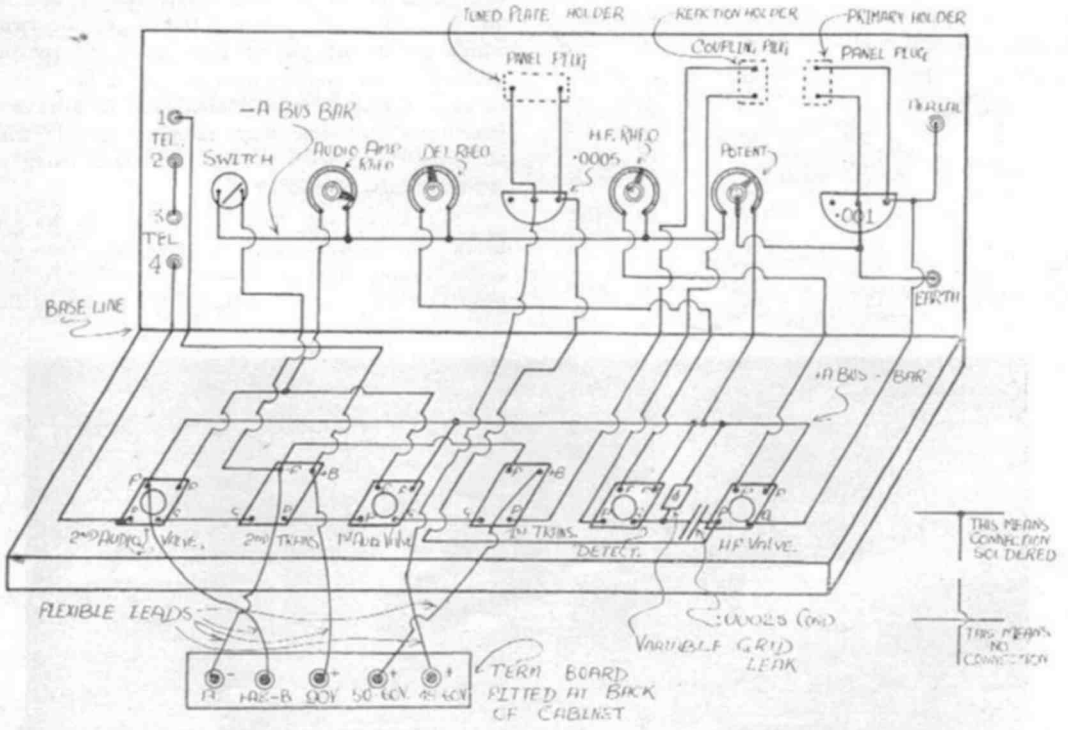
1 Bakelite panel, 24in. x 9 x 3/16.
1 Wooden baseboard, 24in. x 8 x 1.
2 Panel plugs,
1 Coupling plug,
or 2 coil mount and
one panel plug.
1 .001 Condenser with vernier.
1 .0005 Condenser with vernier.
1 Potentiometer (400 ohms).
4 Valves (hard).
4 Holders (American type).
3 Rheostats, 30 ohms.
1 .00025 Grid condenser.
1 Variable grid leak without condenser.
2 Audio transformers.
11 Terminals.
1 Piece of bakelite, 7in. x 1½in. x 3/16in.
1 Push pull battery switch.
Screws, bus bar wire, etc.
Honeycomb coils as required.

The following parts should be mounted on the bakelite panel:—One .001 variable condenser, one .0005 condenser, 2 panel plugs, one coupling plug (or two coil holder and one panel plug), one battery switch, three rheostats, one potentiometer, and six terminals two for aerial and earth, and four for telephones or loud speaker. If only one pair of phones is used, connect them between top and bottom terminals, No. 1 and 4 respectively, in Fig. 2. If two pairs of phones are to be used, one pair should be connected between terminals 1 and 2, and the other pair between 3 and 4. After mounting the above parts on the bakelite panel, lay out the remaining parts on the baseboard; a glance at the diagram and photograph will readily show you the relative positions of valve holders and transformers. You will notice that the valve holders are marked F, F, G, and P, and the transformers P, + B, G and —F. The circuit diagram or back view will show you that that G of the transformer goes to G of the valve holder in each case, and that P of valve holder goes to P of transformer. From P of the second valve (which is the detector) the connection must go through the reaction coil before going on to P of the first audio transformer. From P of the third valve holder, however, connection is made direct to P of second transformer. The + A bus bar wire goes from the extreme left hand F connection of the fourth valve holder to the extreme right hand connection of first valve. This should be the first wire to shape, then you have three others to solder to it, one from each of the two centre valve holders and on from the right hand connection of the potentiometer. Next connect the remaining two F connections of the third and fourth valve holder together, as here you have only one rheostat controlling the two amplifying valves. A further connection must now be taken from this up to the left hand rheostat. Now connect the next rheostat with the detecting valve and the other rheostat to the radio frequency valve. The other side of the three rheostats should now be connected together, and one connection taken to the battery switch and the other to the vacant terminal of the potentiometer, the centre terminal of which goes to earth.

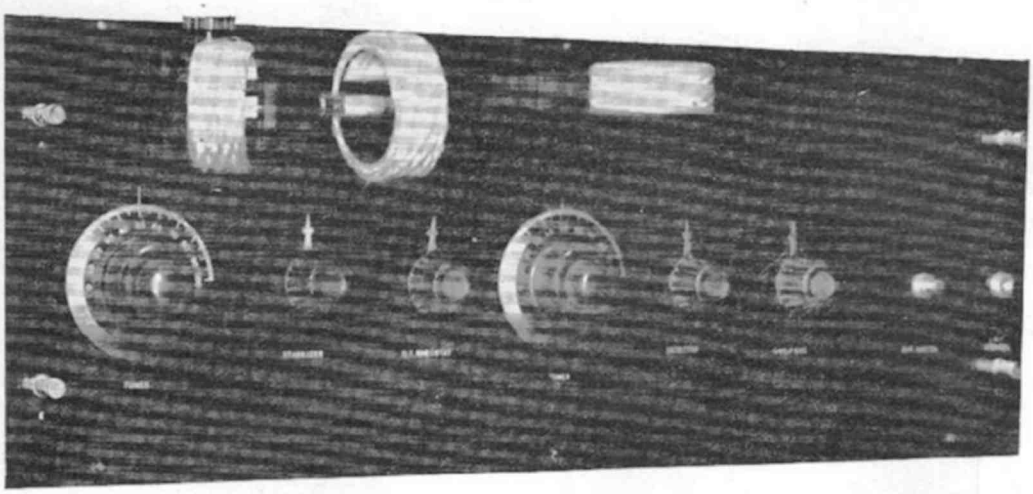
The other side of the battery switch now goes to the — F terminals of the transformers, which you will notice are also linked. Next make connections as per sketch Fig. 2 with condensers, panel plugs, coupling plug, grid leak, and grid condenser, etc. The only other connections to make are to the A and B batteries. A small bakelite terminal board 7in. x 1½in. x 3/16in. should be secured at the back



The Circuit Diagram.



Back of Panel Wiring.



Front View.

of the cabinet, the necessary holes being drilled in the cabinet to pass the flexible connections through to the terminals. Note carefully that the + A and — B connections are taken to one common terminal. Three + B terminals are provided; this enables separate tappings to be made for the plate of H.F. amplifier, detector, and audio amplifiers.

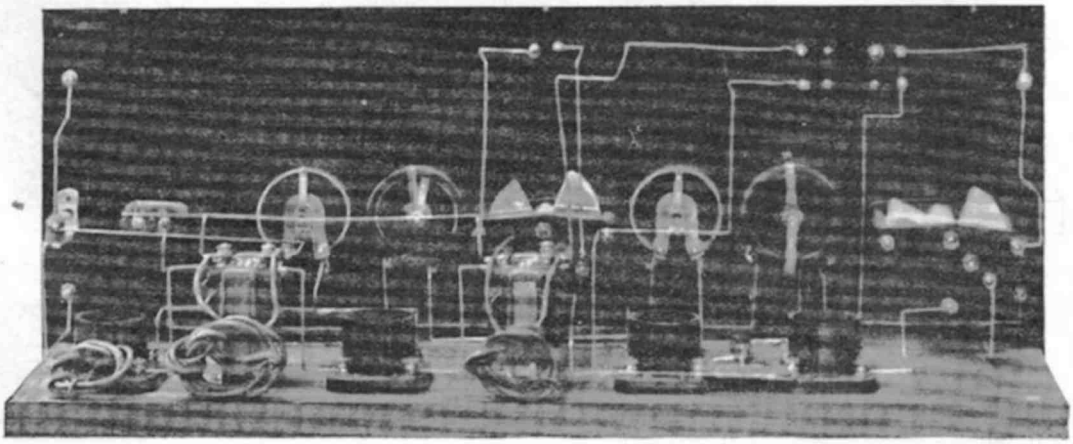
The following coils are required to tune to the various broadcast stations:—

Metres.	Station.	Primary.	Reaction.	Tuned Plate.
320	5CL	20	50	50
350	2BL	25	50 or 75	50
361	KGO	25	50	50
390	7ZL	25	50	75
480	3AR	75	100	75 or 100
1100	2FC	100	200	150
1250	6WF	150	200	200
1720	3LO	150	200	250

The primary turns mentioned above are O.K. for the standard 100 foot aerial; if larger aerials are used, a smaller coil in the primary will be needed.

A few words about the coils: If you mount your own coils, be sure you mount them all the same way, viz., either all of them with the outside layer end going to the pin and inside end to hole, or else all of them vice versa. Don't get the two ends which go to the pin or hole crossing over one another, but take them direct to pin or hole connection in each case. It is a golden rule to always mount your coils the same way, then no trouble will ever be experienced with reversed reaction using certain combinations of coils.

For those who wish to receive on wavelengths below the broadcasting wavelengths, the constant aerial tuning system should be used. To do this, place (.0003) fixed condenser in series with your



Back View of Panel.

aerial, which will bring the natural value of the aerial very low. Then with smaller coils in the primary as described in the article "How to Convert Your B.C.R. to a Short Wave Receiver" (Feb. 27th), the set will operate on the amateur wavelengths.

In conclusion, we would like to point out to our readers that it would be hard to design a better receiver for long distance broadcast reception (to suit Australian conditions) than that which is described in this article. It is what may be termed an "All Australian Receiver." We shall be glad to receive reports from readers constructing the set, giving details of reception of distant stations.

THAT SIMPLE TRANSMITTER.

Did you read the article on the five-watter published last week? And did you hear 2SX testing phone and CW on several nights? The transmitter used was the identical one described in "Wireless Weekly." 2SX wants to thank all those who kindly sent in reports, the furthest one so far being from Kerang, Vic., where phone was received QSA.

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A NEW TRANSMITTER.

Quite a number of requests have reached us from country readers concerning A2JB, who has been frequently heard during the last couple of weeks. Here is his QRA:—

P. J. Browne, 131 Avoca St., Randwick, N.S.W.

Miss Virginia Bassette, who is now broadcasting from station 2FC, Sydney, is the possessor of a fine contralto voice. A pupil of Mr. Roland Foster, she has met with considerable success in oratorio and on the concert platform throughout the State. Her transmissions are warmly praised by listeners.

INTERNATIONAL TRANSMISSIONS.

WORKING in conjunction with Mr. R. R. Rawson, of the Esperanto Club, "Radio Broadcast" has arranged for international transmission from the 1st to the 16th April. The test was arranged as an opening or preliminary to the Paris Radio Congress from April 16th to 20th. It is hoped that communication will be established between French stations and our Australian experimenters during preliminary tests, so that Australia may be kept in touch with the congress during its sitting.

Transmissions in all cases will be carried out on wavelengths between 75 to 100 meters, and the times and transmission will correspond with the hours of 3.30 and 5.30 Australian Eastern standard time. The French stations which will probably be transmitting are 8AB, 8BO, 8AE, 8FJ and 8BF, and experimenters are asked to make a careful watch for these stations during the periods mentioned.

The text of any transmissions received should be forwarded without delay to the office of the "Wireless Weekly" in Sydney or "Radio Broadcast" in Melbourne.

More about Low Loss Coils

(Editor's Note.—Although this subject has been dealt with pretty fully in this and other journals, we believe that this article will provide a little fresh material. A low loss condenser is useless without low loss coils, and experiments with various types of coils on actual signals is most enlightening. KGI may be heard almost any evening working KET on about 70 metres, so his signals could be used as a standard.)

WITH the coming of the "low loss" condensers, the tendency was to make the inductance coils along these same common sense principles, for an exceptionally good condenser will not offset the defects of a poor inductance coil used in conjunction with it. It should be remembered that the theory applying to "low loss" apparatus is identically the same as that applying to other radio apparatus, the only difference being that in real "low loss" apparatus (not stuff merely marked "low loss") consideration of details has been given, and any differences presented are largely those of mechanical design. Losses in the inductance coils may be divided into two important types: losses due to the ohmic resistance of the wire and dielectric losses. By reducing one, then the other, we may design a coil that is almost without any loss. Distributed capacity of inductance coils is not, strictly speaking, a loss, though sometimes considered as such.

Resistance.

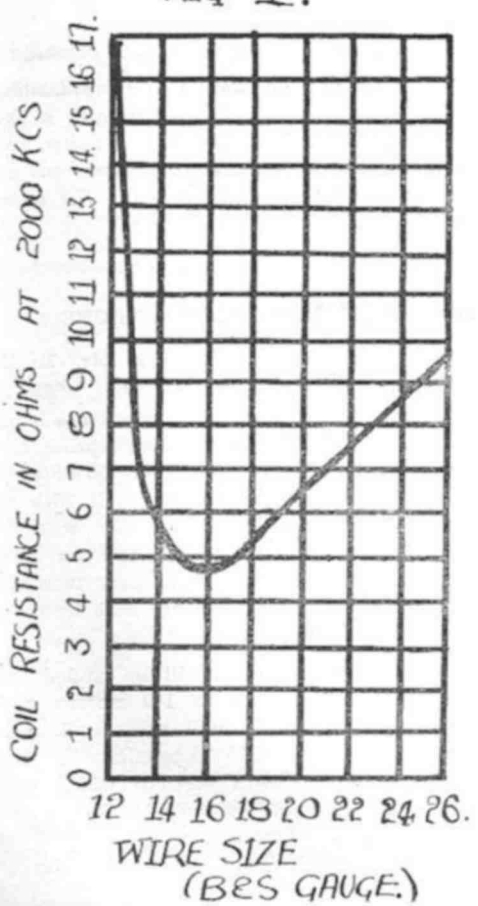
The first type of loss—that due to the resistance of the windings—is easily overcome by using larger wire in making the coils. To this end, a single wire should be used; litz and other forms of stranded wire hinder rather than aid the efficiency of a coil. It is found that for wavelengths above 600 or 1,000 some slight advantage is gained by using a stranded conductor. However, below this wave stranded wire is not as good as a soldi wire of large size.

Probably the best wire to use in making coils is silver wire as large as is convenient to handle. This is assuming that a direct current is flowing through the coils. However, a high frequency alternating current is flowing through the coils which somewhat alters this condition. It is well known that the electric current takes the path of least resistance, and in nickel-plated or tinned wire the heaviest current on the copper wire is just below the surface of nickel or tin. Ordinarily the larger surface presented to this alternating current, the lower the resistance of the wire will be. But this is only partly true.

Varies With Size.

If several coils having the same inductance and form are made with various sizes of wire, the resistance will vary as shown in the graph Fig. 2. By winding the coil with No. 22 wire rather than No. 26 wire, the resistance is decreased quite a bit. By continuing to wind with a larger wire the resistance will decrease until, about at No. 17 wire, the resistance will be at its minimum, and using larger wire will increase rather than decrease the coil resistance. The sharp slope of increasing resistance for wires larger than No. 16 is due to the fact that the fields around one wire cut in and interfere with the field of the next wire.

FIG 1.



Probably since this curve represents the resistance of wires wound close together the resistance could be decreased further by using, say, No. 12 or No. 14 wire and spacing the turns. This would be impractical for broadcast use on the higher bands,

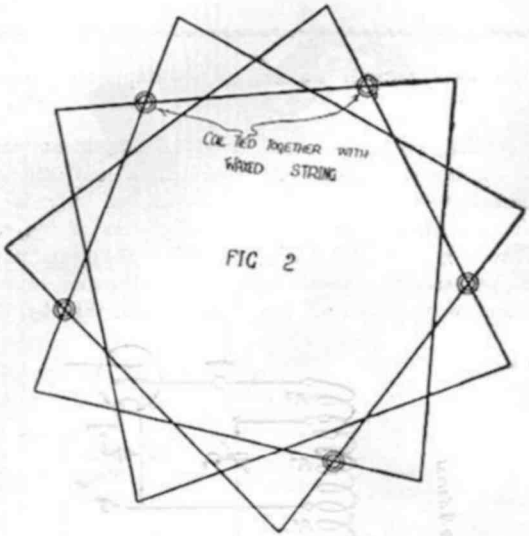


FIG 2

however, as too much room would be required to build a coil with No. 14 wire and spaced winding. When a coil is wound on a thick support, a part of the energy in the coil windings is absorbed by this support. This absorption is known as dielectric absorption, and a coil having dielectric losses may be considered as being made of a theoretically perfect coil with a resistance in series or in parallel with it.

Decrease Supports.

Since the dielectric loss, or absorption, is due to the solid matter supporting the coil, the obvious thing to do is to decrease the amount of supporting material. This is usually what is aimed at in the

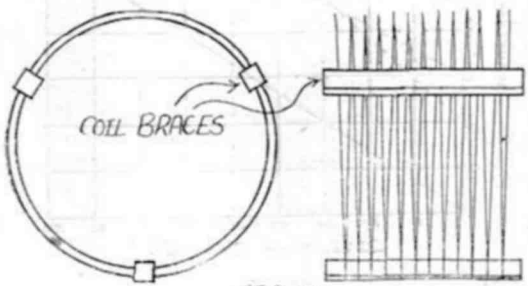


FIG 3

construction of "low loss" coils, but unless one is careful in building the coil one may introduce a type of loss greatly in excess of the loss that is eliminated. Undoubtedly the best type of coil would be one wound with No. 16 or No. 17 silver wire—or heavily plated copper wire—entirely without any supporting element; in other words, supported by air. Obviously these conditions are impossible to attain, although they may be approached to some extent.

As far as getting a coil with little supporting material (thus reducing dielectric losses), probably one of the best types of coils is shown in Figure 2. This coil is supported only by a few pieces of waxed string, and has been described before. The coil shown in Figure 3 is supported merely by a few strips of bakelite, and is another very good type of "low loss" coil. A type of coil resembling the one shown in Fig. 2, except that the bakelite supports have been replaced by strips of board to which the wire is held with sealing wax, seems to prove a highly efficient coil, although it is mechanically rather weak. It is generally agreed that distributed capacity does not cause losses. By reducing the distributed capacity a certain coil will have a greater wavelength range, but this, in itself, does not alter "losses." However, one effect of this coil capacity is to increase the resistance introduced into the circuit. The distributed capacity itself does not cause a loss, but it helps increase the resistance, which causes losses. It is impossible to make a coil without any distributed capacity, but the capacity may be reduced by spacing the turns. By all means don't put any "dope" on your "low loss" coil; it is unnecessary, and certainly does not help the weak signal to get through. For waves above 1,000 meters the coil capacity may usually be ignored. For waves between 1,000 and 200 meters this capacity should be taken into account for greatest accuracy, and for waves in the order of twenty, forty, and fifty meters this capacity plays such an important part that it is possible to tune in a station on these waves merely by changing the capacity by moving the adjacent wires closer together or further apart.

TOO MUCH REGENERATION.

If a regenerative receiver has a tendency to oscillate too much, even when the feed back control is set as low as possible, the following suggestions may help to stabilise operations:—

1. Cut down the plate voltage on the detector valve.
2. Reduce the filament current.
3. Use a larger by-pass condenser across the phones.
4. Connect the grid return to the positive side of the A battery.
5. If three honey-comb coils are used for tuning, use the next size small coil for the tickler.
6. Use a variable resistance grid leak.
7. Use a smaller grid condenser.

Some Notes on The "Reinartz" All Wave Tuner

By G.W.S.

HAVING recently constructed a "Reinartz" single valve tuner as described in "Wireless Weekly" of September 5th, 1924, by W. A. Stewart, the following data as the result of experiment with it may be of interest or help to other users or intending users of this set. I must here say that the data collected and here given has been made possible by the standard wavelength transmissions from 2CX, and I am much indebted to Mr. H. A. Stowe for the assistance these transmissions have been to me with this set, and also in other directions. I hope he continues them for some time, as I am anxious to try out some further experiments.

In his article Mr. W. A. Stewart specifies the use of a former 2½in. diameter on which to wind the coils. Following the instructions, I wound the detuning coil and the R.F. choke on this size former, as also the main tuning coil. This latter being of heavier wire (16 gauge) was wound round pegs as described in "Wireless Weekly" of December 19th. Now, following the instructions I wound my main tuning coil with 5-15-5 turns, and expected to get a range of from 150 to 250 meters, as set out in the article of September 5th, 1924. I was surprised, however, to obtain the curve I. in the diagram (Fig. 2), showing a range from 100 to 230 meters. Again, an 8-24-8 coil on the same former gave curve II., showing a range from 142 to 320 metres. For the sake of clearness I have drawn in Fig. 1 the part of the circuit to which I refer.

The range of the coils on the 1:3:1 formula should be between the number of turns on portion A2x10 (min.) and (A1 + A2 + A3) x 10 (max.). I therefore began to reason out why (i) the results as shown by the curves were not proportional to the turns as stated, and (ii) why the two curves I. and II. were not parallel. The reason is not far to seek, and it shows the fallacy of stating without qualification that a given number of turns on a given former will result in a desired wavelength. I desire to say that I am not criticising or reflecting on Mr. W. A. Stewart, to whom we all are much indebted for valuable information, especially relating to "low loss" receivers, but I desire to set out my deductions in the hope that they will help others, and if others have had similar experiences and will make them public through "Wireless Weekly," they will in turn help me. I take it we are all seeking after knowledge.

Firstly, we know that a given length of wire has an inherent equivalent wavelength and also an inherent "inductance" value. Thus far only is it correct to state these quantities in terms of "given turns on a given former." Secondly, the inductance varies according to the mutual interference caused by the opposite side of the coils, and further by the

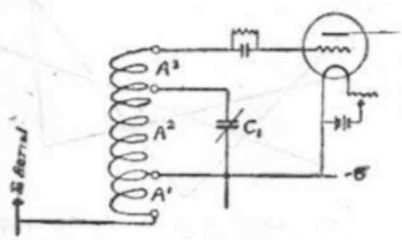


FIG. 1.

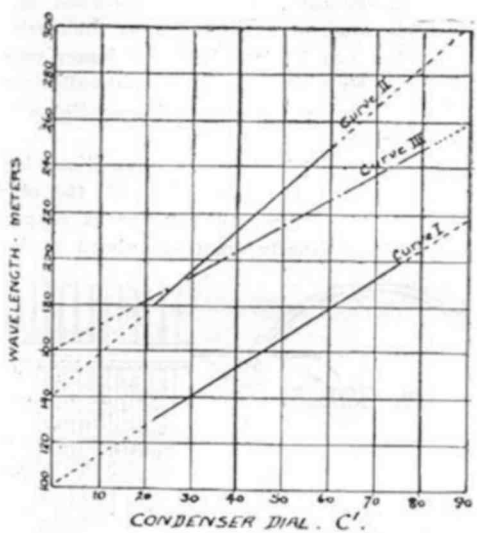


FIG. 2.

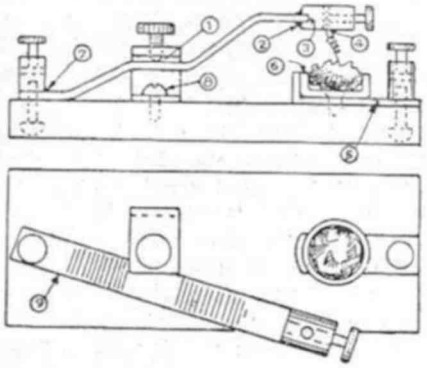
mutual induction caused by adjacent turns of the coil. It therefore follows that the wavelength is dependent on and is varied by the value of these inductances. Thirdly, the dielectric capacity value of the insulation on the wire used will again cause

a variation, and under this heading the manner also in which the coil is wound will have to be taken into account. If the wires are bunched closely together the capacity interference will be greater than if the wires are wound criss-cross around pegs, and this again will be greater with the criss-cross winding than if the turns of wire are fixed apart from each other. Fourthly, the wavelength of aerial, capacity of the set, and various other external factors will again vary the condenser reading.

In order to test effect of different size coils I wound a 5-15 5 coil on a 3½in. former in exactly the same manner as the 2½in. coil previously used, and the curve III. resulted, conforming more nearly to the 1:3:1 formula. The exact coil required would be somewhere between these two. I tried the set again without the portion of the coil A3, and obtained equally good results as with it in (the two terminals being shorted), but with a slight alteration in setting of the condenser. Can anyone tell me why this portion A3 is included in this circuit and what is its particular function? It is interesting to note that the curves I., II., and III. are straight lines. The condensers used are Gilfillan 11 plate.

CRYSTAL MOUNTING.

In the illustration is shown a very good setting and operating lever for a crystal set. The adjusting device consists of a U shaped piece mounted on a base carrying a pointed adjusting screw 1. A binding post is used to hold the catswhisker, the base of which is soldered, at 2, in a slot cut in it, as at 3. The catswhisker is held in the hole 4. The binding post for the output has a metal strip, 5, at the base to hold the mounting, 6, for the crystal. The input binding post holds the lever at 7. The screw 8 holds the adjusting clip. The lever, 9, can be turned to one side as shown.



A Selective Single Valver

By "INSULATOR."

BACK again, people, and feeling quite refreshed after my holiday. I've been spelling for the last few weeks—annual leave, in fact, for it is now over twelve months since I started writing for "Wireless Weekly." Let me thank the many interested readers who presented me with such things as pens, inks and pencils. I have started again, and will continue, I hope.

A single valve set is going to be my effort this week—a really good, selective, single valve set which will be a "thing of joy and a blessing forever." But don't expect it to equal those single valve sets you often hear about which receive every broadcasting station in Australia regularly, and that without aerial, earth, phones, etc. Let me be emphatic—this receiver needs a good aerial and a good earth; the better these two, the better the results. The good old P1 is still a great favourite with me, but unfortunately it has a strong disadvantage, i.e., it lacks selectivity. This fact will be borne out by those folks who live close to one of the "B" class broadcasting stations. It is with great difficulty that they manage to listen to 2BL while the B class station is transmitting. The present receiver will assist greatly in the elimination of the unwanted station. Glance at the photograph and you will notice that a three coil holder is hungrily awaiting the necessary coils. Suppose now I go into simple details for a moment or two. This receiver boasts of three coils, a primary, a secondary, and a tickler or reaction coil. The diagram will show you that the primary coil and the primary condenser are not in any way directly connected to any other part of the circuit, but have the aerial and the earth hooked on. It may seem strange that the incoming signal is conveyed to the valve, phones, etc., as a consequence.

Without going into a long technical discussion on inductance and capacity (I don't feel equal to it to-night, anyway), let us see what happens. The incoming signals or oscillations flow through this primary coil from the aerial to the earth and back to the aerial, changing the direction of the flow many thousand times per second. The secondary (middle) coil, being in close proximity to the primary coil, accepts some of this energy by a process known as induction, and this energy is fed along to actuate on the grid of the valve. This latter article, in course of its daily work, feeds energy into the reaction coil, which you must understand is in close proximity to the secondary coil, and transfers this energy from the tickler back to the secondary again by induction. This operation is repeated many times practically instantaneously until the set bursts into self oscillation—in other words, the valve spills over. With few exceptions the closer the coils are brought to one another, the more energy is induced. So much for my little threepenny worth of simple explanation. Those of you who wish to go further in this matter are earnestly referred to the excellent articles of Mr. E. Joseph which have appeared and I hope will continue to appear in "Wireless Weekly."

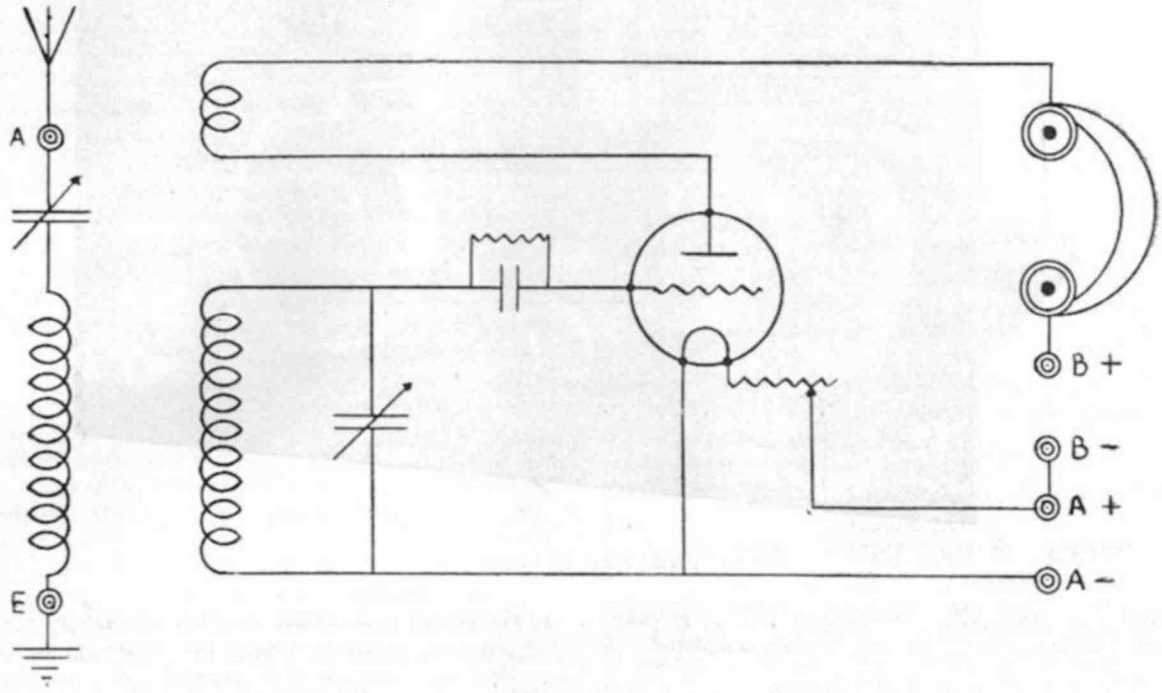
Now I'll get on with the washing. These are the parts I used to construct my little set:

1 Bakelite panel, 12 x 5½ x ¼ inch.
1 3-Coil holder (Remler or Emmco type).
2 Variable condensers and dials, one .001 and one .0005.
1 Grid leak and condenser (.00025).
1 Panel mounting valve socket (UV199 type).
1 30 ohm rheostat.
1 Single circuit jack.
6 Ebonite top terminals.
Square bus bar, etc.

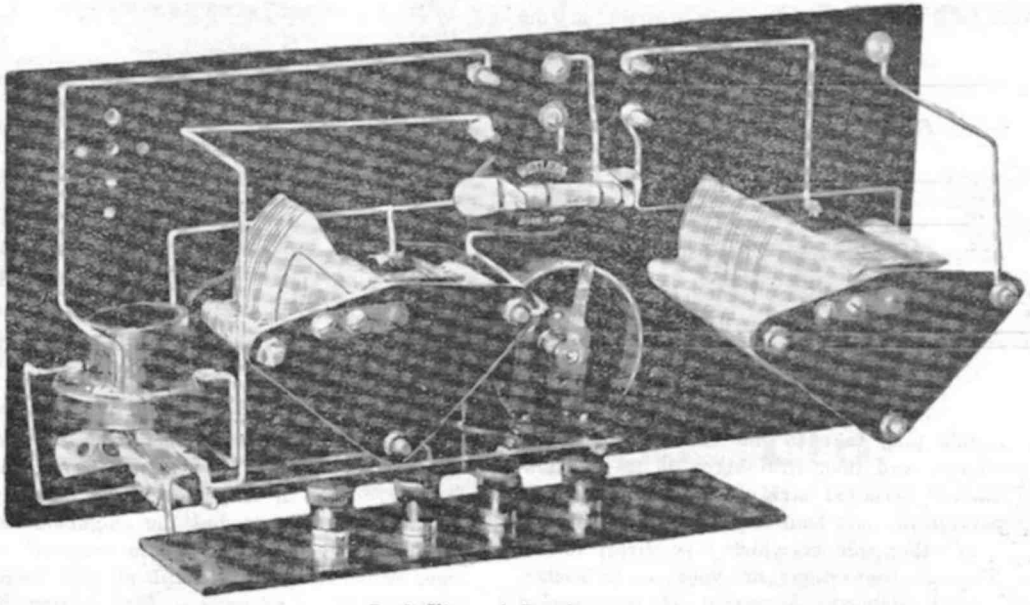
This sounds like the ingredients to a new dish, but don't "mix all together, add pepper and salt to taste, and serve up warm with buttered pumpkin." If you do you'll strike trouble. No; start off with squaring your panel and laying it out as shown in the panel layout. Using a centre punch (a strong nail will do), mark off all prospective holes. A tap with a hammer will ensure an easy entrance for your drill. Now drill your holes. It will be found that the condensers, rheostat, and jack invariably require a ⅜ inch hole, while ¼ inch holes suffice for the remaining drilling. This little job having been accomplished, a rub with Brasso (metal polish, not the popular "Wireless Weekly" writer—there's too much fat about him) will ensure a nice high polish.

Now assemble your components, the rheostat first, next the coil holders, then valve socket, jack, terminals, and condensers last. Obtain a small piece of bakelite 5 inches by 1½ inches by ¼ inch. To accept your 4 battery terminals, drill 4 holes an inch apart in this strip and mount your terminals on this. Proceed now with the wiring, putting your aerial condenser in series wire up in this fashion: Follow me closely now—aerial terminal to fixed plates of the .001 variable condenser, moving plates of this condenser to the top connection of your primary coil

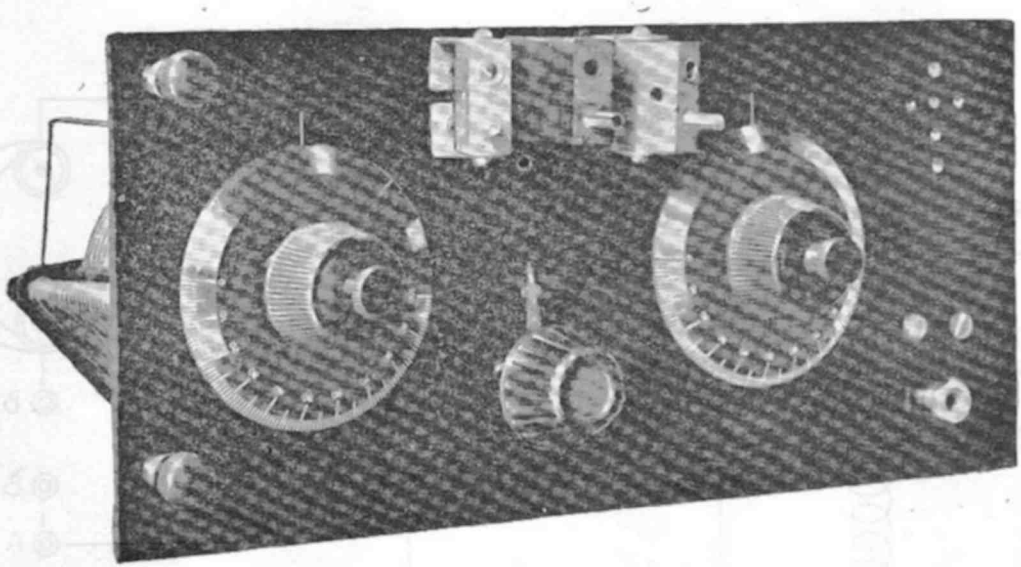
(Continued on Page 22.)



The Circuit.



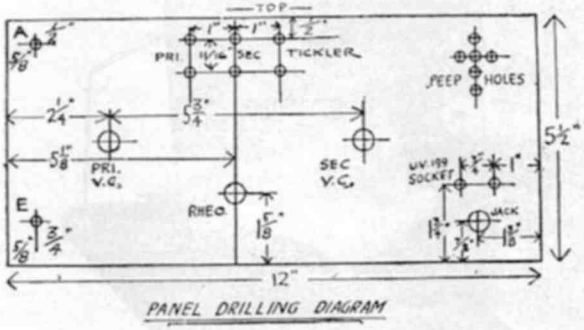
Back View of Panel.



Front View of Panel.

(outer left hand plug). Bottom of this plug, take to the earth terminal. Primary circuit completed.

Now top of middle plug (secondary) to movable plates of .0005 condenser; top of the same plug to one side of the grid leak and condenser, the other side of which take to the grid connection of the valve socket. By using stiff bus bar for wiring, this grid leak will be supported easily. Again bottom



PANEL DRILLING DIAGRAM

of the middle plug take to the fixed plates of the .0005 condenser and then straight on to A—terminal on the battery terminal strip. Junction from the nearest part of the last lead to one terminal of your rheostat, the other side of which take direct to one of the filament connections on your valve socket. The remaining filament connection of your socket join to the A+ terminal. Plate of your socket lead to the top of your tickler coil, bottom of which connect to one side of your jack, the other side of your jack join to the B+ terminal. Complete your wiring by connecting the B— terminal to the A+ terminal on your terminal board. That is exactly how my set is wired, and it is not a difficult job. Hook on to your aerial and earth, insert your 199 valve (AW99 is a good valve), connect your A and B batteries to their respective terminals, and plug in for 2BL the following coils: P.35, S.35, T.50 turns, and insert your phone plug. Listening-in, rotate both condensers slowly. Yes, that's Uncle George. Don't you recognise his "bunkey doo," etc.? Of course, you will be just in time to hear the bedtime stories—hence my presumption. Personally, I generally manage to finish a new set in time to hear the orchestra play the last bars of "God Save the King," and then the chase for amateurs resolves itself into chasing "Over." Remarkable it is that one always manages to tune in an amateur nicely to hear him saying "Over." The next amateur also yields an "Over," and so it goes on. There are eight balls to an over, I know, but the neighbours always hear each and every one of those "bawls" emitted by me. However, next week I propose to describe the making of an all-wave crystal receiver for the crystal man.

INTERSTATE NOTES

VICTORIA.

Apologies for Officialism.

READERS of these notes may have concluded that the writer has no time for officialdom, but, on the contrary, he has a sincere admiration for the many rare qualities that go to make up a good administrator, and in particular fully appreciates the many temptations that urge the official to ignore those for whom he is elected to act. At a recent club meeting, the president feelingly referred to the way in which members "sat like dummies" and left everything to the committee. With adorable meekness the members still "sat like dummies" and took in the presidential dictum like mother's milk. When an official radiating enthusiasm finds the surrounding members unresponsive, he is thrown back on himself and proceeds to oscillate on his own fundamental, that may or may not be modulated to the best interests of all concerned, but any rate it radiates. Where the mistake is made is in neglecting to sort out those who prefer a different wavelength from those who use none at all, and, after all, the blame for recent happenings in the Institute lies mainly at the door of the aforesaid "dummies." There is this, however, also to be remembered by the officials, that members of character are turned away from attendance at meetings where officialdom rules the roost, and everything is cut and dried beforehand. After all, one can get along in these days quite well without an Institute. There is a bigger one on the bookshelves and the bookstalls, and a mind that is endowed with selectivity and fine tuning and resents being forced into oscillations foreign to its own waveband simply absents itself from "dummies' meetings." The loss of such minds, however, affects the status of an Institute very considerably, and is hardly compensated for by the contrasting brilliancy of the few remaining lions surrounded by adoring asses who await the reversion of their cast-off skins.

Short Circuits Through the Ether.

Listeners-in sometimes hear no good of themselves. It is unwise to write frank letters to transmitting friends, lest they turn again and rend you. It is good to be broad-minded. It pays to be a broadcaster. But to accuse an amateur of broad tuning is the mere folly of a B.C.L.

"Some of these birds that say we can be heard on 3LO's wavelength ought to learn something about wireless!" Elegant extract from a discourse on ornithology transmitted from an eastern suburb. 3SW had a very fine vocalist in one of his recent tests. Frequent references to "gentle persuasion," "tact," and other adventitious aids to encore numbers indicated that the delicate operation of "tuning in" was calling forth all his powers. The result of the test was that the lady came through with flying colours, and listeners-in agreed that 3SW was Some Wavelength.

The mystery of 3JG is solved. He is Jones and Glew, of Brunswick, wireless dealers, and his modest concealment of the fact over the ether is greatly to his credit, as also are his concerts over the same medium. There is still that uncanny evasiveness of the wavelength besetting him, and he has lost some of his earlier thump, but his gramophone selections are equal to anything heard by turning a handle in most suburban homes, and he has a very pretty taste in records that one could ill afford to buy. To hear

(Continued on Page 26.)

2FC IN MELBOURNE.

The following letter speaks for itself:—

Hawthorn, Vic., 19.3.25.

Editor,
"Wireless Weekly."

Sir,—Mr. Dutton, East Kew, and myself have each made up the 3 valve set as published by you in "Wireless Weekly," Jan. 2nd issue ("A Very Selective Three Valve Receiver"), and we wish to offer our congratulations on its excellence. We both live within 10 miles of Braybrook (3LO), and it has been and still is looked upon as almost impossible to get 2FC while 3LO is broadcasting, but I'm pleased to say that we have both been able to get 2FC on the loud speaker every night. It took us some time to locate 2FC, and we quite agreed with your note, "When you find your station, make a note of condenser readings, so that you will be able to get him easily next time."

Yours sincerely,
E. McCAULEY.

Enclosed with the letter were two cuttings from a Melbourne wireless paper advising correspondents that the reason why they had no success with 2FC was because that station was "blanketed" by 3LO. Both the gentlemen mentioned in the letter are yearly subscribers to "Wireless Weekly."

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.. .. 19 8 3
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Jefferson Star 22/6
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4 Volts—Mullard ORA, Phillips D1, DIV, 15/-; Cossor, 17/6; DVI, Double Grid, 20/-. 6 Volts—Radiotron, 200, 25/-.

General Purpose (Accumulated type)—
4 Volts—Ediswan AR, ARDE, Phillips DII, DV, E, 15/-; Cossor P11, 17/6. 6 Volts—Radiotron 201A, Cunningham 301A, DV2, 25/-; Marconi R5, 15/-; A.P. Double Filament, 18/6.

Dry Cell type—
1½ Volts—WD12 and Weco, 25/-. 3 Volts—Phillips BII, 22/6. Marconi DE3, 25/-; Phillips BVI, Double Grid, 35/-. 4½ Volts—AW99, Mullard DF, 25/-; Ediswan ARO6, 25/-.

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(Continued from Page 23.)

Galli-Curci emulating the gentle lark and followed by Melba on the same theme was a musical treat one Sunday after dinner, and one learns to await something good after the information that "my telephone number is (crescendo) Brunswick....seven....nine seven!"

But who is 3JA, of Canterbury? Another mysterious "J" not caged as yet in any list. A bird of rather dull repetitions, but some possibilities, and quite evidently a knowing bird and no novice. 3UI and 3FM have taken to browsing around the pastures of 3JG and 3SW, and it is fine practice sorting them out. Some very creditable quick changing over was performed by these two confidential cronies recently, and they did well to congratulate each other on sharpened tuning. The fact that they "talk shop" to each other over the immense distance intervening between Middle Brighton and Balaclava, quite five miles apart by a route not at all circuitous and use only a few hundred millimps, is refreshing in these days of deadly kilowatts.

3JM was in one of his critical moods again recently. What is there about the initial "J" that predisposes one to hear something good in the way of transmission? Not exclusively, of course, because there are jays of other initials, and there are always "joeys," but still there you are! To take a long jump, 5CL is coming in most exceedingly well at times of late. He has a soprano it is worth having ears to hear, as she is undoubtedly prima donna of the ether, although some fine singers have been heard and appreciated from stations in every State. Her name we long to know. Who is it, Brother Adelaide?

If to hear a tantalising "6WF closing down; good-night!" followed by the strains of the National Anthem on one valve, at the solemn midnight hour, is any criterion of loud speaker strength for four valves and the rest of the programme, then Perth must be quite a pleasant place to spend an evening in if you are a millionaire, but prefer to live in Melbourne and listen in to Perth. To hear it on one valve, stop up till midnight, tune to the carrier whistle, and don't be annoyed if you hear Morse, because that is right in the spot. If you hear ever so tiring a noise that won't sort out into articulate words, manipulate a magnet near your coils, and, hey, presto! there is 6WF calling! Perhaps any piece of old iron will do equally well. Try it.

The Wrestlers.

As vivid and clean cut as a Grecian frieze came through the animated description of the wrestling between Miller and Karasick that was broadcasted by 3LO per medium of Mr. McCann (?). Frankly, this result was not anticipated. "Pooh! Pooh!" was the sage remark made by this critic when it was announced that such a feat was to be attempted, and it required a strong effort of one's spirit of fair play to settle down to the anticipated torture of a colourless flow of words with a view to blaming 3LO for another wasted evening. Certainly the attempt had an inauspicious prelude. In order to create the necessary atmosphere 3LO staged that unspeakable abomination of crudities entitled "The Barbarous Barber," too evidently composed by an imbecile schoolboy for some obscure college's break-up. A dreary collection of stale and musty jokes, interspersed with sounds indicative of personal violence and ending in an alleged song whose words and music must have tortured the ears even of the trained musicians who accompanied it. However, no doubt 3LO knows its cue. The curtain rose again on a confused rustle of noises from the Stadium, on which broke a clear resonant voice with a pleasant manly ring about it, that held us spellbound for the rest of the night. The wrestling was described in such telling phrases and with such a genuine quiver of intelligent excitement in the telling that probably listeners-in saw more of the game than many who were actually present, but had no such mentor to put them up to the fine points. The appearance of the wrestlers was sketched. Karasick was a fine figure of a man. Miller had a skin that a girl might envy (giggle overheard in the microphone from some adjacent girl). "This is thirsty work. I have half a gallon of water here, but nothing in it. The reason is one has to remain sober to pronounce the name Karasick." The raconteur misses nothing. He tells us of the holds that make up modern wrestling. He refers to the characteristic methods of each wrestler. Karasick gives spectacular leaps into the air and poses for the crowd. Miller gets coolly to work, and looks around for a favourable grip. Karasick frees himself with a convulsive kick and a spin, and "up again in the referee hold." Miller staggers

and weakens under the merciless headlock and loses everything about his senses except the will that says to them "Hold on!" and finally wins on points because of that tenacious will. Altogether it was a splendid achievement. Even the crowd came in for brief mention. "The serried ranks of the three-shilling benches present a remarkable sight," and as everyone knows half the fun of the fair is watching the rest of the audience, so little touches like this brought home the scene. Those who remember the fine piece of work in "Kenilworth," where Rebecca draws in the casement and describes for the injured knight the brilliant scene without, prompted by eager questions on technical points, can realise for themselves exactly how much more vivid the description becomes when the describer is himself a master, not only of words, but of the thing described. Probably the finest and most telling touch of the whole discourse was the short, low, eager little laugh that came involuntarily and told us even before the words did about "a very pretty bit of work." To sum up, a verbatim report of the actual words used would have made "a very pretty bit of literature," and if the describer can retain this freshness for future events they will be well worth listening to. Even those who think a wrestling match not worth seeing must acknowledge that the 3LO description of it was exceedingly well worth hearing.

The Ballarat Success.

Broadcasting the A.N.A. speeches from Ballarat was so successfully accomplished by 3LO that there is really little room left for any possibility of future improvement in this direction. Unfortunately this report has to rely on the pleased remarks of others, as a trifling engagement elsewhere prevented personal impressions being collected, but too evidently a "treat" was missed. Apart, however, from special long distance difficulties encountered, the use of a trunk line for amplified transmission is comparatively free from "cross talk" and other interferences likely to be met with in congested city works, so that one might expect fairly decent results even from a trunk line transmission from Sydney or Adelaide to Melbourne, which would indeed be a spectacular piece of work, but not at all outside the bounds of possibility. The transmission lines from Yalbourn and Newport also open up interesting possibilities. But the reverse of the picture is even more inviting. If from Ballarat to Melbourne, why not viva voce, as the schoolboy wrote in mistake for vice versa? A re-broadcasting station in Ballarat or Bendigo fed from 3LO would be a boon to the inlanders, and will probably be an accomplished fact in a few years' time. Even Canberra will not seem quite so outside civilisation when, in addition to its other modern contrivances, it sets up also special land lines and re-broadcasts the programmes from the centres of intellectual and other activities in the State Capitals. An interesting test would be to amplify up to radio frequency and transmit a programme over a land line simultaneously used for ordinary telephony, or even for electric light. One wonders how St. Paul's chimes would sound if sent along the lighting mains to the studio of 3LO.

Institute Lecturers.

It is with sincere regret that protest is raised in these notes against the very poor standard of lecturing set up by the Institute. Our young men are now being afforded opportunities, or making them in the press, the classroom, and the broadcasting studio, to impart their wireless knowledge to the public and to students, and they are making a very poor show of it. Some of the articles appearing from the pens of prominent members of the Institute are very indifferent stuff, to say the least. Some of the lectures delivered, not only to the clubs, but also broadcast, are inaccurate and misleading, and the way in which the educational course is at present being conducted makes one wonder whether the Education Department ought not to enforce its regulations against unregistered teachers. Dealing with this last more in detail, since it is an ambitious attempt to do a course in three months that is to qualify those who attend for a pass in the wireless operator's examination, it must be insisted on that no success can come of an intensive course that is not run on a strict syllabus and with preparatory study of each evening's lesson by the teacher. Haphazard readings from a text book and perfunctory attempts at experiments that sometimes fail, and pauses of perplexity in the midst of a bewildered attempt to explain what the teacher has not himself grasped, are not giving value even for the small amount charged, and it is with the utmost good will for all concerned that the advice is seriously offered not to imagine one's self more capable than is actually the case. Even the most experienced teacher maps out his lesson beforehand and makes himself familiar even with the most elementary parts of it.

The Institute and the Broadcaster.

No more striking confirmation of the success of broadcasting in Victoria can be found than the way in which prominent members of the Institute are becoming interested in it. As was pointed out recently by a leading member, had it not been for amateur experimenters there would have been no broadcasting, no regulations, no trade in wireless goods, and, in fact, no wireless at all. The authorities appear to have recognised this, and have allotted important functions to Institute officials. Mr. T. P. Court is now lecturing once a week at 3LO, and among other valuable information disclosed the fact that it is not actually electricity that travels out from 3LO when he and others speak or sing, but electromagnetic waves, and that these become converted into sound waves at the receiver. Scientific facts of that kind are not generally known or admitted among scientists, so that an amateur investigator again takes the lead in the popular dissemination of concealed truths. Appropriately enough, at the close of Mr. Court's address the gentleman with the eager and caressing voice who announces things from 3LO gave us the pleasing information that a Wireless Exhibition is to be held from May 20-30, and that 3LO will be backing it up with special programmes "if it lasts the whole time," which sounds somewhat ambiguous, but may be taken to refer to 3LO's precarious existence during the currency of the exhibition counter-attraction. On top of all this the president of the Institute himself is scheduled to fly over Melbourne in an aeroplane shortly, and will deliver one of his famous ex tempore addresses on what it feels like to look down on other people as he flies, and this will be picked up by 3JU and re-broadcast from 3LO just like Mr. J. A. M. Elder's address from K.D.K.A. (but this

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time let us hope there will be no JAM through oscillating receivers). In this way the Institute hopes to popularise broadcasting and bring it to the same level that the Institute occupies in the minds of all superior people. If these experiments are a success, no doubt the broadcasters will be admitted to an exclusive section of the Institute and taken seriously in hand.

SOUTH AUSTRALIA.

A Church Service Broadcast.

LAST Sunday was a red-letter day for listeners-in in South Australia, as the first complete church service was broadcast on that day. It was the occasion of the harvest thanksgiving service at the Maughan Methodist Church, Franklin Street, Adelaide.

During the afternoon the cantata "The Rolling Season" was given, and in the evening the whole service was broadcasted.

The Rev. W. H. Cann officiated, and stated that the broadcasting of church services is a power for great good, and has already produced a very profound impression through the country.

At Bedford Park and Myrtle Bank Soldiers' Homes a large number of soldiers were able to hear the service.

Central Broadcasters Ltd. are to be congratulated for the manner in which the services came through, the transmissions being very clear.

S.A. listeners-in are looking forward to hearing these services every Sunday.

Madam Elsa Stralia Serenaded.

Last Monday evening a serenade concert was given by members of the Orpheus Society to Madam Elsa Stralia. The concert was given on the balcony of the South Australian Hotel, under the baton of Mr. John Dunn.

Central Broadcasters had their microphone placed on the balcony, and a number of musical items were broadcast.

Again on Wednesday evening the Bach Society gave a serenade concert to this famous singer, and vocal items were broadcasted by 5CL.

Central Broadcasters Ask Dealers For Support.

Recently Central Broadcasters Ltd. approached the radio dealers of South Australia, asking them to subscribe from £3000 to £5000 capital to the company in order to allow it to go to allotment. The dealers appointed a special committee to make a recommendation on the matter, and on Thursday the committee met and decided that the dealers would not support Central Broadcasters financially. This decision, it understood, was communicated to the Broadcasting Company on Friday.

Another Crisis Evident.

It is evident that another crisis is at hand in this State in connection with A class broadcasting. According to Central Broadcasters they are required to be on the air on full power by May 20th. As nothing has been done towards the building of the station, it seems doubtful whether it will be in operation by that date.

Dealers Discuss Broadcasting.

Several meetings of the radio dealers have recently been held in Adelaide to discuss broadcasting and other matters, and one matter that has been receiving attention is the establishment of a broadcasting station in which all the trade would be interested.

A committee has been formed to go into the matter, and it is not unlikely that further representation will be made to the Federal authorities regarding the granting of a license.

The reason why an "A" class license was not granted to Mr. E. J. Hume seems somewhat obscure. He was prepared to get the best transmitter that money could buy. South Australia is again left in the lurch, but the transmissions from the "B" station, 5DN, are much appreciated.

Radio in the South-East.

Mr. R. B. Caldwell (president of the South Australian Division of the Wireless Institute of Australia) has just returned from a holiday trip to Naracoorte, whence he took his four valve tuned anode set. Naracoorte is approximately 190 miles from Adelaide, 240 miles from Melbourne, 620 from Sydney, and 1,500 from Perth.

Using a single wire aerial 100 feet long and 20 feet high, 6WF came in so strong that his speech could be understood 10 feet away from the loud speaker. 2FC was quite as strong as 3LO at night, but was not heard in the daytime. 3LO is clearly audible at all times when working.

Experimenters down there state that they get 3LO best in the daytime and 2FC best at night. 2BL also comes in very well.

Mr. Caldwell states that he was absolutely astounded at the strength that 5DN comes in down there, being twice as strong as 3LO. Mr. Hume's announcements came through as if he was standing alongside the loud speaker, and the music as if the gramophone was right in the room. 5CL was also very clear and a little stronger than 6WF.

Static was not very prevalent down there during Mr. Caldwell's stay, and QRM was entirely absent.

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The Wireless Institute.

At the next meeting of the S.A. Division of the Wireless Institute, which will be held on the 1st April, the subject for discussion will be "Battery Charging Rectifiers." Various types of rectifiers will be exhibited, and the working of them explained.

At the following general meeting to be held on the 6th May, an explanation of the neutrodyne circuit will be explained and a demonstration with a five valve neutrodyne set will be given.

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Round the Clubs

The asterisk denotes clubs affiliated with the Wireless Institute of Australia (N.S.W. Division).

CONCORD AMATEUR RADIO CLUB *

The usual weekly meeting of the above club was held on Thursday, March 26th, at the club-room, "Euripides," Wallace St., Concord. The President, Mr. R. L. Stevenson, occupied the chair and opened the meeting at 8 p.m. Attendance was 75 per cent. of total membership which was very good considering that three of the most consistent members are absent owing to camp and other duties. Our ranks were further strengthened by the admittance of a new member, Mr. Pike, Ryde, who was unanimously elected.

After a discussion as to the gear necessary to put the club's transmitter and wavemeter in first class order, several members came to light with presentations of various parts. They were duly thanked by the club, and the fact placed on record in the minutes. It is very gratifying to the officers of the club to find such generosity and enthusiasm and speaks well for our future career. During the evening the conditions governing the competition for the Maclurcan Cup were fully discussed and it was the general opinion of the members that the competition is a very good idea, worthy of the genial 2CM, and one calculated to stimulate interest in the various clubs. The proposed syllabus for next quarter was the next business and after a lively discussion and a few amendments were adopted. This syllabus will be strictly adhered to, due allowance being made for any night on which we are favoured by the presence of a lecturer from the Wireless Institute. A line from any intending member, addressed to Mr. W. Barker, at Club's Headquarters, will be replied to. Meeting closed at 10.45 p.m.

THE CROYDON RADIO CLUB *

The usual weekly meeting of the above club was held on Saturday, 21st inst., at 7.30 p.m., in the club-rooms, "Rockleigh," Lang St., Croydon. Mr. C. W. Slade occupied the chair. Taking into account the unsettled state of the weather there was a very good attendance. After the minutes of the previous meeting had been passed and all business completed the club's delegate read a portion of the report of the Delegates' Council. 2JT was congratulated on "getting over" to 9ZT on a five watter. Although this is not a record these days, it was thought tha taking into account 2JT's aerial, it was a very creditable performance.

Mr. Pickering, our member whose new mast was badly bent a few weeks ago, was back with us, looking little the worse for his accident. Mr. Thrum is still in hospital. A short discussion on the contents of the question box brought the proceedings to a close. The Beginners' Morse Class is still held at 7 p.m. on Saturday evenings. All inquiries and applications for membership are to be addressed to the Hon. Secretary, G. Maxwell Cutts, 25 Malvern Avenue, Croydon.

STRATHFIELD RADIO CLUB. *

The ordinary weekly meeting of this club was held at the club rooms on Monday evening, 23rd inst., with the usual good attendance of members. Mr. A. F. Jacob presided and the main business of the evening was a lengthy discussion on the rules to govern the proposed competition for a trophy to be donated by Mr. C. D. Maclurcan. A lengthy discussion of the draft rules failed to show any serious errors or omission in same, although a few very useful suggestions for their improvement were put forward for consideration when the matter is being finalised by the Institute council.

Our members unanimously signified their approval for the club to compete in the proposed competition, and the discussion closed with a hearty vote of thanks to Mr. Maclurcan for his proposal to donate the trophy and the painstaking care he exercised in drawing up the draft rules. The proposed competition touches every phase of radio club activity and the system of marking proposed is such that interest should be stimulated in the work of individual clubs, besides promoting a healthy rivalry among the various affiliated clubs.

Mr. Jacob also entertained members with an interesting demonstration of the efficiency of the latest "high-loss" contraption of his own special manufacture, incorporating a modified 3 coil circuit and a few other products of his own inventive genius. 'Cheapness combined with efficiency' seems to be his slogan, and he certainly achieves very

good results. At the meeting of the Technical Committee on Wednesday evening, 25th inst., a start was made with the construction of the club's new demonstration apparatus and good progress made. Several members were also given an hour's Morse Code instruction. Members of this and other clubs are hereby reminded that Mr. Geo. Apperley will give an interesting lecture illustrated by lantern slides before this cub on Monday evening, April 6th. A hearty welcome is extended to any member of other clubs who would like to be present.

Inquiries regarding the club's activities addressed to the Hon. Secretary, 44 Bayard St., Mortlake, will receive prompt attention.

ELSTERNWICK RADIO CLUB.

The Elsternwick Radio Club held its second meeting at the A.N.A. Hall, on March 24th. The meeting was taken up by a talk on the foundation of the Wireless Institute of Australia by Mr. B. Jermyn Masters, which was very interesting. During the meeting it was resolved that the club should meet every first and third Monday in each month and should become a section of the Wireless Institute of Australia. Some interesting lectures have been arranged for forthcoming meetings. All persons interested are heartily invited. The Secretary's address is Mr. Yelland, Rusden St., Elstenwick.

WAVERLEY RADIO CLUB *

Waverley Radio Club is finding its transmitter (2BL) of considerable value in attracting new members. Since it has been on the air regularly the meetings have been packed. DX work is carried out frequently on short waves, in addition to which a club bulletin of interest to members and outsiders, is transmitted regularly on Sunday nights between 10 and 11 o'clock, on about 200 metres.

Several transmitters are now included on the members' list. At the meeting held on March 25th, 2ZN (Mr. W. Cottrell) gave an address on Low Power Transmitters, which all of the members found interesting and instructive. At the conclusion a vote of thanks was passed to 2ZN.

The half-yearly elections are set down for 31st March.

CAMPSIE AND DISTRICT RADIO CLUB.*

The above club will hold a special meeting at the temporary club rooms at the residence of Mr. R. Shelton, tobacconist, Beamish Street, Campsie (near railway station), on Wednesday, 8th April, at 8 p.m. Any person interested in radio in any form is cordially invited to be present.

As this club was formed with a view to helping in any way possible any person interested in the science of radio, it is up to those residing in the district who possess wireless apparatus (crystal or valve) to come along and make this meeting a success.

A lecture on "Broadcast Receiver Troubles" will be delivered by the hon. secretary, Mr. E. P. Mawson, of Wonga Street, Campsie.

THE LEICHHARDT AND DISTRICT RADIO SOCIETY.*

There was an excellent roll-up of members to the 124th general meeting of the Leichhardt and District Radio Society, held at the club room, 176 Johnston Street, Annandale, on Tuesday, March 24th.

The principal business of the evening was the delivery of the fifth lecture of Syllabus No. 3 by Mr. H. F. Whitworth, B.Sc., who dealt with the important subject, "The Elementary Principles of Electricity and Magnetism." The subject, difficult and bulky as it is, was handled with skill and confidence, and the lecturer showed himself to have an excellent knowledge of matters dealing with the discovery and development of electrical science. Magnetism, attraction and repulsion, electricity, the electroscope, static and dynamic electricity, magnetic fields, and many other matters were touched upon during the course of the lecture, which, although quite lengthy, did not contain one dull moment, which speaks volumes for the manner in which the subject was handled. At the conclusion of the lecture Mr. Whitworth was called upon to reply to a large number of questions, and, these having been satisfactorily dealt with, a vote of thanks was carried by acclamation.

Next Tuesday evening the society will hold its 30th monthly business meeting, at which applications for membership will be dealt with and other business on hand disposed of.

At the following meeting, to be held on April 14th, Mr. R. C. Caldwell will deliver his second lecture under the heading "The Problem of Fading Signals." This will be the sixth lecture of Syllabus No. 3, and should prove very interesting and instructive.

Inquiries regarding the activities of the society are welcomed, and should be addressed to the hon. secretary, Mr. W. J. Zech, 145 Booth Street, Annandale.

MARRICKVILLE AND DISTRICT RADIO CLUB.*

The weekly meeting of the above club was held at Marrickville School of Arts on Monday evening, 23rd March, 1925. There was a good roll-up of members and friends.

After the usual business had been disposed of, Mr. W. L. Hamilton, the club's president, delivered a lecture dealing with "The Construction of a 'B' Battery and Chemical Recharger." As the subject is of great interest to all connected with the study of radio, needless to say the lecturer was given a most attentive hearing, and in his usual lucid and attractive manner the process was fully explained with the further aid of blackboard diagrams. At the close many questions touching on various points of the lecture were fully answered, and Mr. Hamilton was accorded a hearty vote of thanks.

There will be no meeting of the club on Monday, 30th March, as members wish to avail themselves of the opportunity of attending the "All Clubs' Night."

Arrangements have been made for Mr. Parish to deliver a lecture on the night of Monday, 6th April, 1925, the subject of same being "Super Hetrodynes." Same promises to be of exceptional interest, and a good roll-up is assured. Members of other clubs, should they care to come along, will receive a hearty welcome.

Vacancies exist for new members, and a line addressed to the club's secretary, Mr. A. W. Hemming, of 23 Central Avenue, Marrickville, will bring full particulars as to entrance fee, etc.

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RAILWAY AND TRAMWAY RADIO ASSOCIATION.*

The Railway and Tramway Radio Association held its usual weekly meeting in the club room at the Railway Institute on 25th March, 1925.

The evening was spent dealing with the association's business. The most important was a discussion on the Maclurean Shie'd. The association has decided to take part in the yearly competitions.

On Wednesday, April 8th, Mr. J. Joel will lecture on low loss apparatus. This should prove very interesting.

Enquiries concerning the association's activities will be welcomed by the hon. secretary, Mr. W. L. Carter, c/o the Solicitor for Railways, 139 Phillip Street, Sydney.

C. H. CLARK, Publicity Officer.

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BRIGHTON SECTION OF THE WIRELESS INSTITUTE OF AUSTRALIA.

In an effort to raise funds for improvement to the new club rooms, it has been proposed by the committee to hold an exhibition of members' apparatus on May 14, 15, and 16. The exhibition will also be the official opening night of the new club rooms. Some excellent exhibits have been promised, included in which will be the display of valves collected by Mr. P. K. Trood, of the Amalgamted Wireless Co. The movement has the support of all local listeners-in, and will no doubt be a financial success.

At the last meeting of the club held on Thursday night, 19th inst., a low loss receiver was built by Mr. J. Muir, who at the same time gave a very interesting talk on the construction and operation of the same. At the conclusion of Mr. Muir's lecture a further short talk was given by the president, Major R. P. Whalley, on the activities of members of the club during a military camp held at Seymour. Using a very improvised aerial and counterpoise and a two valve low loss receiver, a large number of English and American experimental stations were heard during the tests.

Listeners-in are asked to get in touch with the hon. secretary at the club office, 241 Bay Street North, Brighton, or attend any meetings of the section, which are held on every Thursday night in the club rooms, Higinbotham Hall, Brighton Library Buildings, Bay Street North, Brighton; 'phone, X 4861.

R. SURRIDGE, Publicity Officer.

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INTERNATIONAL COMPETITION.

"The Language Problem in Radio Telephony" is the subject on which the Italian Academy of Science and Literature, "Mastino della Scala," at Verona, invite radio enthusiasts to write athesis. This competition is open to anyone capable of dealing with the matter in a practical manner and as an inducement to art diploma, and a cash prize of five hundred lires are to be awarded to the writer of the best treatise. The academy reserves the right to publish the winning composition and any others that it may deem fit for publication, but this will not interfere with the author's rights. No entrance fee or coupons are necessary. Papers may be written in any one of the following languages: English, French, German, Italian, Spanish or Esperanto and are not to exceed 50 pages of 25 typewritten lines each.

The purport of the subject must be theoetically practicable, take into consideration experience gained during recent years and define the relations between the scientific basis of broadcasting and its progressive international application.

Additional information may be obtained by sending a stamped envelope to Mr. F. T. Simon, member of the International Radio Association, 226 Avoca Street, Randwick, N.S.W.

The Little Station with the Big Kick

THAT'S how they refer to 2UW, the "B" class station run by Otto Sandel, Victoria Road, Bellevue Hill.

Next Sunday, April 5th, Mr. Sandell tells us to look out for an extra good programme. It is announced below, so keep it by you for reference. 2UW transmits on 267 metres.

Sunday Afternoon, at 3 o'clock.

Mr. Bennett (tenor)—
(a) "Coming Home."
(b) "Absent."
Miss Bellamey (piano)—
(a) "Aida."
(b) Valse, C Minor (Chopin).
Miss Anderson (contralto)—
(a) "I Wonder if Ever the Rose."
(b) "Annie Laurie."
Miss Roberts (violin)—
(a) and (b) will be announced.
Mr. Dalton (tenor)—
(a) "Shores of Minnetonka."
(b) "Mexacali Rose."
Miss Bellamey (soprano)—
(a) "Happy Song."
(b) "April Morn."
Mr. Williams (tenor)—
(a) and (b) will be announced.

Sunday Night.

7—7.30 p.m., Bedtime Stories and Songs.
7.30, Pianoforte Solos—
(a) "Silver Sleigh Bells."
(b) "Nightingale."
Mr. Dalton (tenor)—
Duet (to be announced).
(a) "Old Pal."
Mr. Williams (tenor)—
(a) and (b) to be announced.
Miss Jean Kennelly—
(a) "Lift Thine Eyes."
(b) "Look Down, Dear Eyes."
Mr. Bennett (tenor)—
(a) "Mate o' Mine."
(b) "Love Sends a Little Gift of Roses."
Mr. Herbert and Miss Elliott (tenor & soprano)—
Duet (to be announced).
Miss Lottie Davies (piano)—
(a) "Trinity Chimes."
(b) "Songs at the Piano."
Mr. Herbert—
(a) and (b) to be announced.
Miss Jean Kennelly (soprano)—
"Il Trovatore."

A Progressive Concern

IT is very pleasing to note the progress made by the Weldon Electric Supply Co., Ltd., now located at 352 Kent Street, Sydney. On viewing their Offices and Stores they certainly have a very large and comprehensive stock of all Electrical and Radio Accessories.

The Directorate of the firm consists of Mr. W. J. Gale, Mr. V. J. Buckley, and Mr. L. T. West, and the results of their efforts during the past 4 years has certainly been very remarkable, and what success they have achieved we all are only too willing to congratulate them upon their accomplishment.

On interviewing Mr. Buckley, he stated that amongst the many lines carried in stock, those for wireless purposes were,

Enamelled Wire
Double Cotton Covered Wire.
Silk Covered Wire.
Aerial Wire.
Repeater Head Sets.
Bakelite.

Large stocks of these materials are on hand in anticipation of the consistent demand that he thinks will exist during the coming season.

Mr. West gave rather a glowing account of the properties of the Repeater 'phones, and stated that he had 4000 'phones waiting now for the demand of the market. This in itself will be very encouraging news to the majority of wireless dealers, who possibly are not looking towards the future so optimistically as Mr. West, but when challenged on this matter he stated that wireless in this country had not as yet started, and when the average Australian takes wireless seriously and appreciates the benefits to be derived from it we certainly shall have record seasons.

In conclusion we again extend our congratulations to these young returned men who are popularly and well known through the trade, and wish their firm every success.

Here is a tip that will be useful to the listeners-in in rural districts who have no water pipes for earths. Take a common window screen wire, galvanised preferred, and make a cylinder about 4 inches in diameter and about 3 feet long, fill it with charcoal and set it in the ground 3 or 4 feet deep and drive the earth rod right down through it. The charcoal will draw the moisture and will always be wet and damp, and will make the best of a ground connection. The earth rod need not be over 6 or 8 feet long. A 3/8-inch galvanised steel pump rod such as may be bought at an implement store makes one of the best rods. The earth wire should be soldered to the rod.

The Maclurcan Cup

Conditions Governing Control.

Entire control of trophy to be in the hands of the Wireless Institute, who will insure.

The trophy to be a perpetual one, to be competed for yearly by all clubs affiliated with the Wireless Institute, and will be presented at the annual dinner of the W.I.A.

The main object of the trophy is to stimulate club activities and to induce individual members to take more interest in their club movements.

The cost of engraving and small shields to be borne by the Wireless Institute. On the small shields will be engraved the name of the winning club, together with the names of president, the secretary, and three of its members (see schedule).

The winning club shall be entitled to hold the trophy for one year, and it shall be on exhibition at their club rooms. It may only be removed for exhibition at other places by written consent of the Wireless Institute.

Judges and Management Committee.

Three judges shall be appointed annually by the council of the Wireless Institute of Australia from among the full members of the W.I.A. These judges shall also form the management committee, who will handle all matters in connection with the trophy for that year. The decision of the judges shall be final.

Progressive Marking.

So as to keep up the interest in the competition, marks will be awarded to competing clubs each quarter. These marks will be posted in the Institute rooms, and must also be published in the W.I.A. official publicity columns of "Wireless Weekly."

Disqualification.

Only the full council of the W.I.A. shall have the power to disqualify a club from competing. This can only be done in the event of the conduct of the club being in any way unworthy of experimenters. In such an event the club or clubs in question shall be notified immediately. Such disqualification shall, however, extend only for the current year.

Marking Forms.

Marking forms will be sent to all clubs affiliated with the W.I.A. every quarter. These must be filled in and returned by a specified date. The form shall follow the lines of Schedule 2.

Alteration of Conditions.

These conditions may be altered from time to time, but must have the donor's consent.

SCHEDULE 1.

Method of Judging..... ....

Marks will be awarded each quarter under the following headings:—

Attendance at Club Meetings.

For attendance at club meetings up to 100 marks may be allowed. These marks shall be given according to the percentage of attendances to the total number of financial members. Those clubs having country members or members who have moved to another suburb who obviously cannot attend meetings may deduct such number from their total number of financial members. Any other peculiar circumstances affecting attendance may be brought under the judges' notice, who may make any reasonable allowances.

Lectures.

Ten marks will be awarded for each lecture or paper read at general meetings. Also for any properly organised debate, question, or demonstration night held at general meetings. Lectures from outside the club are permitted.

Individual or Combined Experimentation or Research.

Space will be allowed on the judging form for each club to state fully any particular experimentation or research carried out either collectively or by individual members of the club. It must be understood that this work must be something more than straight-out D.X. work. Such work might include:—Direction finding (tracing howling waves or power leaks), public demonstrations, combined work in the erection or dismantling of high masts and other apparatus, relay work, tests of reception in different localities, audibility readings, club competitions, and tests in general.

Prize Winning.

The club will be entitled to marks for any prizes won by its members in any of the W.I.A. Exhibitions; 20 marks for each first prize, 10 for each second prize, and 5 for each third prize.

Three Best Members.

The winning club shall be entitled to hold the trophy for one year. It shall also be entitled to have engraved on the small shield, in addition to its president and secretary, the names of its three most active members.

The names of these members will be decided by ballot in extraordinary general meeting called for the purpose. The object is to find the three members who are most generally enthusiastic in club activities and useful to wireless experimentation generally.

SCHEDULE 2.

Marking Form.

The marking forms will be set out as below. Every three months a marking form will be sent to each affiliated club to be filled in by the club secretary and countersigned by the president.

Marking Form.

This form is to be filled in by the secretary and returned to the secretary, W.I.A., not later than

Date .....

I, ..., of ....., president, and I, ..., of ....., secretary, of the ..... Radio Club, hereby declare that the following information contained in this form is, as far as we are aware, a true and correct statement.

(Signed) ..... President.

..... Hon. Secretary.

Name of Club.

Address.

Number of Financial Members.

Number of Country Members to be Deducted.

Attendance.

(Up to 100 marks allowed.)

Number of meetings held since last return.

Total number of Members present.

Average for each meeting.

Average percentage of total Membership.

Marks (for Judges' use only).

(10 Marks allowed for each.)

Total Number of Lectures for above meetings.

Total number of Papers read during above meetings.

Total number of Organised Debates during above meetings.

Total number of Organised Question Nights during above meetings.

Total number of Demonstration Nights during above meetings.

Marks.

(For Judges' use only.)

Prize Winning.

(20, 10, and 5 marks allowed for 1st, 2nd, and 3rd prizes respectively.)

First Prizes won at W.I.A. Exhibition.

(State below names of winners and for what.)

Third Ditto.

Second Ditto.

Marks.

(For Judges' use only.)

Individual or Combined Experimentation or Research.

(Up to 100 marks may be allowed for each.)

State below any particular work or experiment research carried out either by the club or individual members. This does not necessarily mean ordinary transmitting or receiving D.X. work. In awarding marks for this section judges will give full consideration to the value and ultimate benefit derived. Give dates and as full particulars as possible.

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AERIALS.

The first thought that confronts the beginner in the radio field is the construction of an aerial. After being told that any single conductor stretched between two supports will answer the purpose, he is left to solve his own problems.

To those in this predicament, with the knowledge they already may have on the constructional details of an aerial system, there are a few points that are well to bear in mind. By this we mean the directional qualities present in nearly all aerials. The aerials used for broadcast reception, for the most part, are highly directional; that is to say, they receive signals from some particular direction better than they do signals from the opposite direction, and it is problematical as to just what efficiency they will receive on the remaining points of the compass.

The type which has gained greatest popularity is the inverted L, which gets its name from its likeness in its shape to the inverted letter L. This type will receive better from the two directions in which the aerial wire points than in other direction, and will receive very well from the direction in which the lead-in points.

The T type aerial, which owes its name to its likeness to the letter T, will provide better reception characteristics in the direction in which the two ends of the aerial point, but will receive better in all general directions than the inverted L type.

Therefore, if you expect to erect an aerial of the above types, it would be well to have the end of the aerial at which the lead-in is fastened pointing toward the station from which you expect to do the most receiving.

The better type would be a single conductor going straight up into the air, directly from the lead in. This type will receive equally well in all directions, but has the bad feature of requiring an exceptionally high support.

The flat top fan, composed of four or five wires, is less directional than the ordinary flat top, and for this reason is suitable for long distance reception in all directions of the compass. The wider the fan is made the less directional the reception will be. With a fan of 90 degrees the efficiency will be found to be practically equal in all directions. The main bad feature of this type aerial is the necessity of three supporting members.

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