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OUR NEW COVER NEXT WEEK



OFFICIAL ORGAN OF THE AUSTRALASIAN RADIO RELAY LEAGUE.

Vol. 3.

Friday, April 11, 1924.

No. 27

Chicago

"Did you hear Chicago?" was the question aimed at 95 per cent. of the Sydney experimenters during the last week.

Letters have appeared in the Press from those who claim that the items which were heard really emanated from a station at Wagga. On the other hand, there are others who are fully confident that what they heard was the Chicago Broadcasting Station.

From the many and varied versions of that particular night's performance it is practically impossible to arrive at whether the reception was or was not from Chicago.

The outstanding feature is that the American and Australian wireless men are so far confident, that a definite organised attempt has been made to reach Australia with American broadcasting.

It is a trend of the times, and to those who are able to regard the incident from a broad standpoint it may be regarded as the first stepping stone on the road to the linking up of Australia with the outside world by the medium of wireless broadcasting. As such it should be encouraged and fostered to the point where those in authority should seriously consider it from the point of view of the development of wireless in Australia.

The present system of Australian broadcasting imposes serious limitations, and it is beyond argument that the placing of limitations upon anything retards its progress. Remove the present limitations upon broadcasting and New York, London and Paris will be at our doors.

Roster for Week ending 9th April, 1924

	7.30 to 8.0	8.0 to 8.30	8.30 to 9.0	9 to 9.30	9.30 to 10	10 to 10.30
Thur, April 3	2 RA 2 GR	2 IJ 2 JM	2 YI	2 UW 2 ZN	2 YG 2 VM 2 ZZ	2 ZG
Friday,	4 2 IJ 2 GR	"	"	" "	" "	"
Saturday,	5 2 RA 2 GR	2 IJ	"	" "	" "	"
Sunday, ..	6 2 RA 2 GR	"	"	" "	" "	"
Mon.,	7 2 RA 2 GR	2 IJ	"	" "	" "	"
Tues.,	8 2 IJ	"	"	" "	" "	"
Wednes., ...	9 2 RA 2 GR	2 IJ	"	" "	" "	"

Wireless Weekly
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All communications to be addressed to the Editor, Wireless Weekly, 33 Regent St., Sydney.

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Radio and Australia.

By The Little American

What has the future in it for radio? That question is asked over and over again. It is especially stressed by people entering or about to enter the game. Up to this time the situation in Australia seems to be on an uncertain basis. Now the turning point is at hand. I would like to give you a few facts about the Radio situation in the United States regarding the present and future and compare the results with what Radio has a possibility of developing into in Australia.

Events in this industry have been kaleidoscopic. They stand unparalleled and unmatched with any other recent scientific or business development. Today we have the background of over two years' experience, and yet the real part to be played by radio, the real accomplishments of that industry, are yet to be made and yet to be told, although the events of the past two years have left milestones in the road. I will refer to a few figures that mark these events.

It is estimated that, measured in the consumers' list price, the American public spent in 1922 between £15,000,000 and £20,000,000 on radio. That was the year before last. This takes in the entire industry which includes sets, tubes, parts and accessories, head phones, batteries and the like.

On this basis it may be estimated on a conservative figure that they spent at least £30,000,000 on radio. Those in the business are more inclined to soar upward to the figure of £35,000,000. I sincerely believe that this industry will go on for the next few years virtually doubling in volume each year. It is safe to estimate that within the next few years, the radio industry will be worth £100,000,000 in consumers' prices.

The public is the ultimate consumer. It is very difficult to obtain accurate figures on the number of sets in use, because there are a good many home-made sets that cannot be recorded. But it is regarded as a very conservative estimate that 3,000,000 sets are in use in the United States. Multiplying this figure by the size of the average American family, you have a radio audience totalling approximately twelve millions, and if it be true that this business is to double itself each year for the next few years, until it reaches a certain level, we may expect to have

a radio audience of practically fifty million people. This includes the listeners in the United States alone, to say nothing of our Canadian friends across the border and of the rest of the world within listening range of our stations.

A few more figures. There are in operation to-day over 450 broadcasting stations in the United States. Of this number about fifty stations may be regarded as faulty stations — that is, those capable of doing a fairly satisfactory job within the present limitation of the art. The other 400 are local stations, made up of composite equipment and operated more or less for experimentation, without regular operating schedules.

The broadcasting station itself, is the crux of the situation. If you have not a proper service from the broadcast transmitting station, you have nothing whatsoever in radio. The broadcast station is the all-important element, and I would remind you, too, that in this scramble for better and newer receivers and devices on the receiving side, the meaning of the broadcast sending station is often lost sight of. Much yet remains to be done there technically, in order to produce the desired result, and the change of the receiver and the improvement of the receiver is directly proportional to the things done technically at the sending end.

Since an industry of this magnitude is dependent solely upon the ability of the broadcasting station to transmit and deliver material in the home, it is perhaps wise to glance over the present and future of that phase of the radio situation.

I believe the present number of stations merely represents a transient phenomena in the march of events. Most of these stations will go out of business in time. It is not desired that they should for at the present they are doing no harm. But in their place will come a new picture of radio broadcast transmission; a super-power broadcast station. It is more and more evident that the purpose of the broadcast station is to do those things which other agencies cannot do as well or at all. No other agency can speak with a single voice to 10,000,000 people. It is an agency for national events, for high-grade talent, for good music, for

Satisfaction-Efficiency—"Col-Mo"

Friday, April 11, 1924.

WIRELESS WEEKLY

3

good lectures, and therefore means a few high powered broadcast stations, suitably located, simultaneously radiating the same programme, and linked together either by wire or radio, with power sufficient to reach every home in the whole country to give enjoyable loud speaker operation. This will necessitate an organisation capable of measuring up to the responsibilities of the character of a national service.

All of this is in embryo but is very certain to come about in time.

Broadcasting is being heard across the continent continuously and more power is being utilised than was ever thought possible before. Distance can and is being annihilated daily, and it merely means raising the power of the present broadcast stations from a half kilowatt or one kilowatt to 100 or 200 kilowatts. This, technically speaking, is not a difficult matter.

The development of the vacuum tube on the sending side has been entirely comparable to the development of the vacuum tube on the receiving side. Vacuum tubes are being built, no larger than a milk bottle which radiate 20 kilowatts on the air. Five of these constitute 100 watts. This has been made possible by the General Electric Company, the Westinghouse Electric and Manufacturing Company and the Western Electric Company, all of whom are doing a tremendous amount of work on the development of the vacuum tube.

Now, how about supporting these broadcasting stations? To begin with, I don't think anyone, especially in Australia or America, wants to get something for nothing. They want to do their share and make their contribution, but the difficulty of the moment is that no concrete plan, no well-rounded out programme has been arrived at or submitted, which would make it possible and convenient to work the thing out in co-operation.

I do not despair of the future possibility of doing that very thing. But I do want to establish this point of view, and if there are those who differ with me in that point of view, let them be heard, because we need all the points of view we can get on this situation in Australia.

It has been said by a great many people and a great many large and able companies, that broadcasting depends upon a solution of the problem whereby the consumer will pay for the entertainment which he receives. In other words it has been said that unless some method is provided whereby a means is created for collecting re-

venue from the user of a broadcast machine, then the whole industry is founded on sand, and that it is bound to collapse in time, because there will be no means of supporting it.

The solution of the problem is not difficult. The greatest advantage of broadcasting lies in its universality; in its ability to reach everybody, everywhere, anywhere; in giving free entertainment, culture, instruction and all the items which constitute a programme; in doing that which no other agency has yet been able to do. It is up to us, with intelligence and technique and broadmindedness of spirit and vision as to the future, to preserve that most delightful element in the whole situation; The Freedom of Radio, and I'll tell the world: IT CAN BE DONE.

REMARKABLE TESTS.

Enngonia, the sheep station of Mr. H. L. M. Crossing is located away out on the Queensland border, 180 miles on the other side of Bourke, "way out west," as the Bourkite puts it. And Mr. E. W. Platt, Manager of the Radio Department of Mark Foys Ltd., (Sydney) who during the last couple of weeks traversed the plains of the Never Never with five complete receivers tucked under his arm may be hailed as a pioneer along with Bourke and the others who made Australian history.

Mr. Platt did not suffer from water shortage or the pangs of hunger, but from a wireless point of view he met and overcame difficulties which we with our back-yard aerials and "loops" could scarcely imagine. The purpose of the expedition was to try out different receivers under the actual conditions which prevail out there and to determine the most suitable type to adopt as a design intended for use generally in those distant parts of the country. Enngonia was chosen as the testing ground.

In all five sets were experimented with. 1. A 3 valve regenerative using 201A as detector and 301 A's as amplifiers. 2. A 3 valve Reflex (S.T. 150) employing 301A as low frequency and high frequency and U.V. 200 as detector. 3. A 4 valve Reflex using 201 A's throughout. 4. A 5 valve Reflex using Mullard valves as detector and L.F. amplifiers and Marconi R's as H.F. 5. A valve Reflex comprising 201 A's throughout. A most interesting little assortment, and all of course of the "open" variety.

The best results (during the hours of darkness), were obtained on the 5 valve Reflex using the American val-

es and the next best was the 3 valve regenerative. On this set static (which was very bad) proved to be least troublesome, and music from an Amplion loud speaker was clearly heard 15ft. away. The loud speaker was very successfully used with all the sets except the S.T. 150.

Two different aerials were tried out, one being a twin wire L type 200 ft. long and the other an L type single wire 120 ft. long—both only 16 ft. from the ground. The latter proved the more successful, as static was less noticeable.

At one end a small tree was used as a support, and a temporary pole served the purpose at the other. The earth used was a waterpipe leading to an artesian bore. Surrounding the verandah was a sheet of wire gauze embedded a few inches in the ground, and this was also tried as an earth. It was found that when using this, signals were just as strong when the aerial and earth connections were reversed. A two wire counterpoise which was later used in conjunction with the earth made no appreciable difference to the results. A small loop containing about 80 feet of wire inserted in series with the aerial helped to cut down static, and after the directional effect had been obtained, made tuning much easier, and increased volume to an extent. Both 2F.C. and 2B.L. were received, there being no noticeable difference in the strength of signals. Amateurs were not listened for, but one evening while tuning, 2GR was heard at good strength on phones. No doubt others would have been heard if a proper trial had been made.

Ships could be heard 50 yards from the loud speaker, and on one occasion the shearers crowded around to listen to H.M.S. "Hood." Using separate aerials both 2B.L. and 2F.C. were received together. During daylight hours results of course were not so good, although static being considerably less than at night, the 3 valve regenerative operated the loud speaker fairly well.

Mr. Platt is to be congratulated, not only upon his achievement, but also upon the fact that, since he could get no definite information locally as to which particular type of receiver would work most satisfactorily in Central Australia, he had the initiative to go out and determine for himself.

Tell your friends about
"Wireless Weekly"

True distortionless music is a feature with N.H.M. Crystal Rectification

HOW FAR HAVE YOU RECEIVED?

Have you ever logged a Yank? Or a little old ten watter away over in N.Z., or South Australia? Or a ship punching traffic somewhere east of Suez or up north of Suva? If so, drop us a line and tell us all about it.

Remember it's a far greater achievement to receive with the aid of a crystal and the old home-made loose coupler a ship working Perth, than to pull in station KXYZ (Texas) with an untried valve receiver.

So when you write us, give us the details of your receiver. Your results may be a record.

D.X. REPORTS FROM 2YI.

Phil Nolan reports logging the following. This list will also serve as a Q.S.L. to the transmitters mentioned.

Victoria: 3BD, 3DD, 3FH, 3ER, 3BY, 3BU, 3BL, 3BU, 3DE, 3BQ, 3AP, 3BM, 3JU, 3HH, 3UX, 3EF, 3FM, 3IU.

South Australia: 5BQ, 5AG, 5AH.

Tasmania: 7AA, 7AI.

New Zealand: 4AA, 4AK, 4AG, 3AP, 2AC, 2AI, 2UX, 2AP, 2XA.

Country stations: 2SO, 2HM, 2GQ, 2BM, 2YA, 2CH.

Phil says that there is no doubt that given a reasonably well designed receiving set and a not too shaky hand, good results are inevitable. Unfortunately the position of his aerial is not very suitable for the reception of signals coming from an easterly direction and to date no Americans have been logged. This is partly due to the fact that there is a fairly tall hill situated right up against his station to the east. Reports are always welcomed by 2YI, especially those from a northerly direction.

Recent prolonged tests between Mr. F. D. Bell, of Waibemo, Otago, N.Z., and a Melbourne amateur seemed to prove that for successful long-distance transmission it is more important that the transmitted be in darkness than the receiver. At 4.10 o'clock in the morning Mr. Bell's signals commenced to fade, and at 4.30 a.m. they had disappeared entirely. It was then broad daylight at Waibemo.

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NTH, 1931

QUESTIONS AND ANSWERS

G.H. (Cremorne):

(1) There would be nothing gained by adding another wire to your aerial.

(2) The reception of VIS and VIB (600 metres) would depend upon the number of turns on your primary and secondary.

E.S.D. (Newtown):

See this issue. Other States will follow.

Burgin Electric Co. for Service and Quality

Cash Bargains for Experimenters

W.D. II. Valves, 11. volt, .25 amp, 37/6; Mullard "Ora," 20/-; Wecovalves, 11 volt, .25 amp, 37/6; Mullard Sockets, 2/-; 199 or 299 sockets, 4/-; Potentiometers, 12/6 and 14/6; Radio Frequency Transformers, 200-600 metres, 30/-; 200-5000, 45/-; Audio Frequency Transformers, 30/-; C. H. Battery Switches, 4/6; Telephone Plugs, 4/-; Valve Pin Insulators, 1/6.

LOUD SPEAKERS, 65/-.

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WIRELESS ENGINEERS AND SUPPLIERS

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391 GEORGE ST., SYDNEY

Friday, April 11, 1924.

WIRELESS WEEKLY

5

Ten Watters' Club.

Mr. J. S. Marks (President) writes us as follows:

"Country week tests, organised by Wireless Weekly, were carried out satisfactorily last week except that one or two transmitters somewhat upset the harmony of the arrangements by interfering with those who were transmitting.

In appealing to the sportsmanship and good nature of offenders, the Ten Watters' Club wants to point out that there are thousands of experimenters who possess receivers only, and their pleasure is confined to listening in. That pleasure is sadly interfered with when half a dozen transmitters are going at the one time, and some of them with fluctuating wave lengths.

A heavy carrier wave is most disconcerting to receivers when it is continually changing up and down right through another man's transmission. Another very important point to be considered is that there are quite a number of broadcasting receivers being used by people who have paid for a service. It is not fair that these people be interfered with, and it can

be fully realised with a careless transmitter situated only a few blocks away is quite liable to cause annoyance which if persisted in must inevitably lead to intervention by the authorities.

Further, unless those transmitters who wilfully persist in disregarding the rights of others restrain their activities, then those other transmitters who do properly interpret the spirit of experimenting will, to avoid being penalised for the negligence of a few irresponsible, be forced to take steps to safeguard their own interests.

These remarks, it should be made perfectly clear, are intended in no cavilling or domineering spirit. They are intended on the one hand as an appeal to the sporting instincts of those to whom they are directed, and on the other, as a definite warning that if that appeal fails, then other steps will be taken to enforce that co-operation which is the general desire of the majority of amateur transmitters.

It is earnestly hoped that the forthcoming Trans Pacific Tests with 2 C.D.M. will proceed without the annoyance prevalent in previous tests."

NOTES.

2J.M. is sending out very good pianoforte selections. Modulation perfect. Strength very great.

2Y.I.'s selections are much appreciated. Modulation perfect and good tone.

2U.W. is evidently going for power to the detriment of his modulation. Chasing radiation is a mistake. Otherwise his transmissions are very good.

2G.R. is still going strong. Enough said.

2Z.Z. C.W. is very strong, but not steady, and is very broad.

2Y.G. has something up his sleeve—his modulation is excellent and his punch terrific. He ought to go far and fare better.

2Z.N. has not been heard lately. 2L.I. is starting up again. By the by the Eastern Suburbs is literally honey-combed with transmitting sets, and if they all start at once something will bust.

2Z.G. is still going strong in the early hours of the morning, which is the best time for it.

How You Can Know Latest Facts About RADIO—

The very best way to know all Radio facts is to own a Lefax Perpetual Radio Handbook. When you buy it, you become a registered owner. That means complete facts as they are discovered, are mailed to you every month—printed, punched, ready to insert instantly in your Lefax Handbook. Lefax doesn't, cannot grow old. It keeps on giving you information, but you pay only once. There is no charge for the first twelve month's mailings.

Here is a different, better book on Radio. It was written by Dr. J. H. Dellinger and L. E. Whittemore, Chiefs of the Radio Laboratory, U.S. Bureau of Standards, Washington, D.C. Ordinary books on Radio grow old and out-of-date almost as soon as printed. Changes occur rapidly. Lefax gives them all, as they happen. You get all the new ideas, in loose leaf form, pocket size, beautifully, accurately illustrated. And you get a complete list of broadcasting stations, with full information about each one.

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LEFAX Perpetual Radio Handbook

Welby Radio Company

13 Royal Arcade SYDNEY

Distributed in Australia by

Radio 2YI. Phil. Nolan's Station

During the past 5 months amateurs around Sydney have become fairly conversant with the letters 2YI, and a short description of the transmitter used at this station will no doubt be interesting.

The system of tuning is the Meissner circuit, using 3 coils. The number of turns on each coil is probably the most interesting part, especially to those intending to construct such a set.

The grid leak used is about 15,000 ohms resistance and can be varied slightly to suit varying atmospheric conditions. The grid condenser used is .0005 mfd. capacity and about half this is used normally.

The plate coil has also a .0005 mfd. condenser shunted across it. The method used for tuning the set is as follows:

The grid rotor is put in a position parallel to the plate coil, i.e., full coup-

fusion. Also, once the plate coil has been put in resonance with the aerial coil this adjustment should not be moved except for very slight alterations as the grid coupling is decreased.

Other amateurs may disagree with some of the foregoing statements, but 2YI has lately had some fairly successful results using this system of tuning, and it seems to operate well in this particular case.

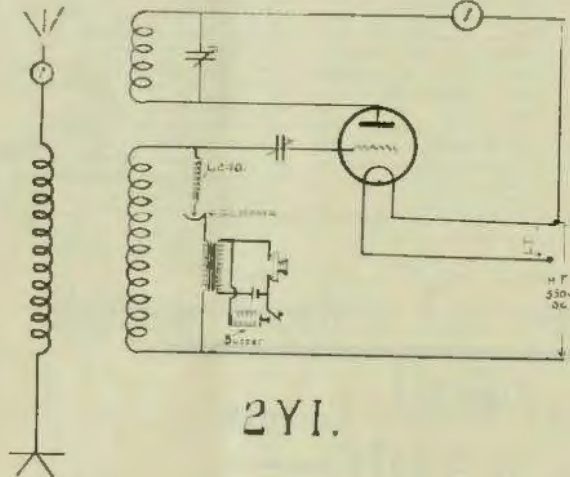
The high tension for the plate circuit is obtained from rectified A.C. from a transformer and the choke coil is 100 henries impedance shunted with two 2 M.F.D. condensers, which need to be of good insulation to withstand the voltage passing this circuit.

By consulting the diagram the circuit can be easily traced out. The transformer and Kenotron rectification is left out to simplify the diagram.

Using the set as above, during the last few weeks some good distant reports have been received; especially from Melbourne amateurs, and on two occasions two-way conversation has been carried on.

After slight alterations to the receiving set it is hoped to make this an ordinary every night performance.

The aerial used is a six wire cage inverted L type, 74 feet long, 60 feet high one end, 34 feet at lead-in coil. The counterpoise is a six wire fan, directly beneath the aerial and same length. Aerial and counterpoise only are used for transmitting.



Starting with the grid coil, this is wound on a 3/4 inch rotor and consists of 32 turns, no. 20 d.c.c. wire.

The plate coil is wound on a 5 inch diam. bakelite tube 6 inches long and consists of 29 turns of No. 10 gauge d.c.c. wire.

The aerial coil is wound on a 4 1/2 inch tube and is so arranged that it can be slid in and out of the plate coil, in the same manner as a loose coupler.

The number of turns on this coil will of course vary with the wave length desired, also if earth and aerial are used less turns are needed whereas with aerial and counterpoise more inductance is needed if the aerial be of ordinary dimensions. In the case of this station the aerial and counterpoise are each 74 feet long and working on a wave length of 210 metres, 25 turns are needed.

ling. Then the plate coil is tuned to the aerial coil with the variable plate condenser until a position is found where good radiation is obtained with a low input. By varying the condenser again a position will be found where maximum radiation with lowest input is obtained. This is found to be a balance between the aerial and plate coil, i.e., the two coils are in resonance, and therefore at maximum efficiency.

Strength of modulation is obtained by varying the coupling between the grid and plate coils, also by altering the value of the grid leak and grid condenser until the strongest signals are obtained. This, however, can only be done by testing with some other radio-telephone at a distance, and it is advisable that small adjustments be made at a time to one control only, as this avoids

Single Valve Set—Reinartz short wave, 175 to 450 metres (Radiotron), very efficient. Cheap. W. Wahers, Rutledge St., Eastwood.

WIRELESS APPARATUS

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Bought, Sold or Exchanged

HOWELL'S

19 Barlow Street

Up-to-date Radio Equipment of the first quality

A Valve Panel

By "Insulator."

It is said that only a woman can exercise the prerogative of changing her mind, but I am going to be the exception to the rule this time.

Last week I promised to describe a crystal receiving set for short wave work, but instead of this the article this week is on the making of a valve panel.

Many requests have come to me to

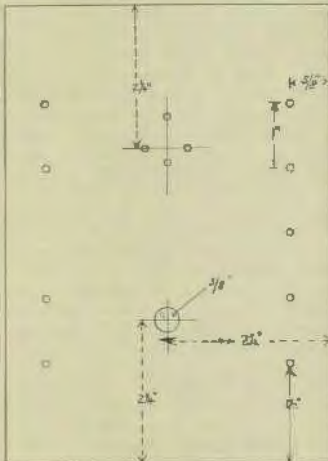


Fig. 1

give the details of a suitable panel to be used in conjunction with the loose coupler I described, so here goes.

This panel is one of the most useful adjuncts to an experimenter's outfit, for it is readily adaptable to all purposes, and many and strange are the uses it can be put to.

Once again we can make use of a cigar box, but this time the lid is dispensed with altogether and a bakelite panel substituted in its place.

Here is a list of material required:

- 1 Cigar box (25 size.)
- 1 Bakelite panel (to fit neatly on top of cigar box in place of the lid). This panel will be roughly 7 in. x 5 in.
- 1 Rheostat (6ohm)
- 1 Valve socket.
- 9 Terminals.
- 1 2ft. length of busbar for connections.

All this material can be obtained

at Competitive Prices. 10 Rowe Street Sydney.

from any of the radio shops advertising in this issue.

First of all, square up the panel and smooth the edges, using sandpaper for the purpose. Then mark it out as shown in Fig. 1. A simple way of doing this is to make a copy of Fig. 1 according to the size of your panel, and paste this copy on the bakelite, and with a centre punch mark out the holes to be drilled. Never draw with a lead pencil on the surface of the panel as this action is liable to cause trouble owing to leakage. Always remember this.

It will be noticed that I have only allowed one 3/8 in. hole for the rheostat. My reason for this is that these one-hole fixing rheostats are now obtainable and are well worth while.

Having drilled the panel, mount the terminals, rheostat and valve holder,

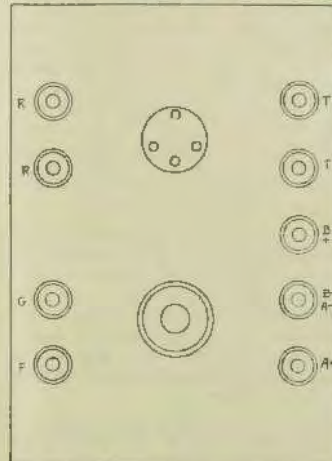


Fig. 2

the appearance of the panel being after the style of Fig. 2.

You are now ready to wire up. Fig. 3, a view of the back of the panel, shows how to do this. Use the busbar for this purpose and a neat job will be the result.

Don't be scared in wiring this little panel. It is perfectly simple and provided you follow out the suggestion of Fig. 3, you will have no difficulty.

I want you to pay attention to the

fact that the minus of the A and the minus of the B battery have a terminal in common. All that remains to be done now is to fit it into the cigar box which if it has been sandpapered and shellaced will look very neat.

Now to put this panel in use with the loose coupler is the work of a few moments. With a short piece of wire bridge or short the two terminals marked R.

To the terminal G connect one end of the flex coming from the secondary of the loose coupler and connect the other flexible lead to terminal F. The A and B batteries are connected to the terminals marked accordingly and the telephones of course are attached to the two terminals marked T.

Perhaps some of you haven't got a valve nor an accumulator and B battery. May I suggest that instead of purchasing an expensive accumulator, to work a 6-volt valve, try using a dull emitter. The Marconi D.E.R. valve yields splendid results and only requires 2 dry cells to light the filament. This is a saving worthy of consideration. Don't think that because the D.E.R. doesn't glow very brightly that it is not a good valve. My own experience tells me that this little valve

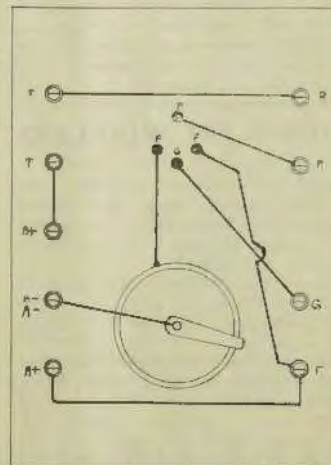


Fig. 3

will give splendid results. I know mine did, but alas! will do so no more. I dropped it and—well, I just dropped it.

Some of you may be wondering just what purpose the two terminals marked R are for, as I have asked you to shorten them. Well, they are for re-action when the authorities will allow us to use it. I understand the man on the land under certain circumstances can use re-action. For his benefit I will tell you how re-action is applied on the panel.

Connect up the A and B batteries and telephones as before. Now on the loose coupler (which has been connected to aerial and earth in the usual manner) take a lead from the aerial terminal of the primary to terminal G on the panel and also a lead from the earth terminal of the primary to terminal F on the panel. The flexible leads from the secondary are connected 1 each to terminals R which should not in this case be shorted or bridged.

The secondary coil now becomes the re-action coil, so care should be taken to see that the coupling is loose; that is, away from the primary. As the re-action coil is pushed nearer the primary coil so is more re-action introduced into the circuit.

One day or rather one night soon I will describe a note magnifier which can be added to this panel and again in an article showing how to add a stage of radio frequency amplification without disturbing anything at all. Look out for this!

FOR SALE—3 Valve Set. Complete with all necessities. Demonstration by arrangement, any evening, at 2 Bowler's Av., Rockdale.

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- Twenty-Four Radio Diagrams and Hook Ups, of Crystal and Audion Receiving Sets.* Price, 3/3 posted.
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- Radio 'Phone Crystal Set. How to Make.* Price, 3/3 posted.
- Reflex Receiver. How to Make.* Price, 3/3 posted.
- Radio Frequency Amplifiers and How to Make Them.* By J. Avery. Price, 1/8 posted.

N.S.W. Bookstall Co. Ltd

476 George Street, City

Wireless.

TELEGRAPHY AND TELEPHONY. HOW TRANSMISSION IS EFFECTED. A SIMPLE EXPLANATION.

(By "Student.")

With the advancement of the wireless movement in Australia, many persons are displaying a keen interest in connection with both the sending and reception of messages. Those who understand little or nothing of wireless are hearing of the broadcasting of speech, and almost invariably express surprise when they learn that it is received just as clearly as is the case with speech which comes through an ordinary telephone. The wireless amateur or experimenter is daily asked by the uninitiated just what is heard when he is receiving wireless messages; is everything tapped out in dots and dashes, how is music and speech transmitted, and what does it sound like when it is received? The inquirer in most cases finds it very hard to believe that wireless telephony comes through the receiving instruments in a perfectly natural manner, and that if certain apparatus is used the sound can be made to fill a room. However, having learned this, his next question is almost invariably a request for some information as to how the transmission is effected.

It is generally known, even by those who are not closely acquainted with wireless, that for all classes of radio communication ether waves are used. The ether is the vast medium which permeates all matter and all space, and in it electrical waves are created at a sending station and received at a receiving station.

If a stone dropped into a pond of water, waves spread out from it in every direction towards the banks of the pond. These waves possess a certain height, or amplitude, which gradually diminishes as they get further away from the source of the disturbance, until they finally die out. If a block of wood or some other floating object lies in the path of these waves it will move with an up and down motion as they pass it. This analogy, although to a certain extent technically incorrect, aptly illustrates just what happens when a wireless message is transmitted by a station using the

spark or damped wave method of transmission.

It was discovered by Heinrich Hertz many years ago that a disruptive electrical discharge created a disturbance which had effects some distance away. Hertz, however, does not appear to have realised the value of his discovery, and it was left to those who followed him to put to practical use the waves which he discovered and which are to this day termed Hertzian waves.

At a station where the spark method of transmission is used several operations are carried out before the wireless message is actually shot forth into space. First of all, the current which is used must be at a very high voltage or pressure, and either a transformer or an induction coil is used to raise its pressure. When the current has been raised to a sufficiently high voltage a condenser which is really an instrument which will hold electrical energy is charged by it. It is charged to more than its capacity, and discharges itself through a spark gap. The discharge takes place so rapidly that the current oversteps the mark and rushes quickly through a certain part of the circuit.

It again oversteps the mark, and re-enters through the condenser, this time in the opposite direction. This cycle of operations is repeated until the condenser has finally discharged itself and the current comes to rest. From this description it may be thought that this takes some considerable time, but such is not the case. The current will swing or oscillate in the circuit at a speed of perhaps one million times per second. Such a current is known as an oscillating current, and the number of times which it makes a complete change of flow is known as its frequency. In wireless telegraphy this frequency is very high, and the current is therefore termed a high frequency current.

The current which is created by the condenser discharge is then conveyed either conductively or inductively to the aerial, via certain tuning instru-

Continued on page 20

"MELLO" Phones 25/- Set 4,000 ohms, are ALL BRITISH

Friday, April 11, 1924.

WIRELESS WEEKLY

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*List of N.S.W. Transmitting Licenses Granted up to the End of February, 1924**Continued from last week*

- 2GD—Concord Radio Club, "Quondong," La Mascotte Ave., Concord.
 2GE—Challenger, G. R., 77 Park Rd., Auburn.
 2GM—Cutts, G. M., "Carwell," Highbury St., Croydon.
 2GP—Mackay, C. S., Urunga.
 2GR—Marks, J. S., Ritz Flats, Salisbury Rd., Rose Bay.
 2GU—Dunn, R., 324 Anzac Pde., Sth. Kensington.
 2GY—North Sydney Radio Club (G. McClure), Burns Bay Rd., Lane Cove.
 2HB—Botten, H. W., 350 George St., Sydney.
 2HF—Thompson, F., 12 Pearson St., East Balmain.
 2HH—Wireless Institute, N.S.W. Div., Queens Chambers, Calley St., Sydney.
 2HM—Marshall, H. A., Allingham St., Armidale.
 2HS—Fagan, R. J., Sunny Ridge, Mandurama.
 2HY—Bongers, C. S., "Marmora," Rawson St., Rockdale.
 2IJ—Gray, A. H., Florence St., Killara.
 2IN—Payne, 143 Avoca St., Randwick.
 2JC—Fraser, H., Roderick St., Tamworth.
 2JI—Wilson, W. A., Archbold Rd., Roseville.
 2JM—Marsden, R. C., Victoria Rd., Edgecliffe.
 2JN—Wireless Electric Co. (A. J. Connolly), Aquarium Bldgs., Coogee.
 2JS—Stanley, J. M., Northcote St., Crow's Nest.
 2JT—Luckman, C., 14 Queen St., Croydon.
 2KC—Fry, R. H., Brighton St., Croydon.
 2LE—Ginger, L. V., 93 Middle Head Rd., Mosman.
 2LI—Cooke, F. B., 23 Lang St., Sydney.
 2LO—Schultz, I. N., "Waraba," Burns Bay Rd., Lane Cove.
 2LY—Shaw, R. H., 129 Grafton St., Woollahra.
 2MJ—Newman, W. H., "Narwenda," Cooney Rd., Artarmon.
 2MR—Stewart, J. E., Corrick St., Mayfield, Newcastle.
 2MU—Nangle, J., Tupper St., Marrickville.
- 20I—Whitaker, A. T., 31 Railway Cnt., Banksia.
 20J—Whitaker, A. T., 31 Railway Crescent, Banksia.
 2QY—Williams, E. A., Crown St., Wollongong.
 2RA—Vickery, K. J., Kilbridge St., Hurlstone Park.
 2RY—Volkman, Reg. V., Post Office, South Grafton.
 2SO—Newcastle Radio Club (A. V. Zoppi), 25 Winship St., Hamilton.
 2SP—Evans, R., "Garth Craig," 6 Flood St., Clovelly.
 2ST—Tatham, S. E., 6 Stonehenge Flats, Kurraba Rd., Neutral Bay.
 2SX—Slade, H. C., "Rockleigh," Lang St., Croydon.
 2TS—Gill, A. W., Illaroo, Greengate Rd., Killara.
 2UI—Illawarra Radio Club (C. A. Gorman), 75 Montgomery St., Kogarah.
 2UR—Creamer, A. A., 10 Hereford St., Glebe Point.
 2UU—Roberts, R. G. C., 9 Church St., Ashfield.
 2UW—Sandel, O., Mooramie Ave., Kensington.
 2VM—Derrick, V. M., 3 Berrigs Rd., Bellevue Hill, Woollahra.
 2IV—McIntyre, D. G., "Parooga," Livingstone Ave., Pymble.
 2WU—Morey, W. H., Ranget's Ave., Watersleigh.
 2WV—Burgin Electric Co., 352 Kent St., Sydney.
 2XA—James, H. K., 12 Rosemount Ave., Summer Hill.
 2XI—Mingay, O. F., Kuring-gai Chase, Turramurra.
 2YA—Haynes, B. L., Saumarez Stn., Armidale.

*To be concluded next week**Electronic Theory of Matter.**(Editor's Note:—We regret very much that owing to pressure of space, this matter was cut out of our last issue.)*

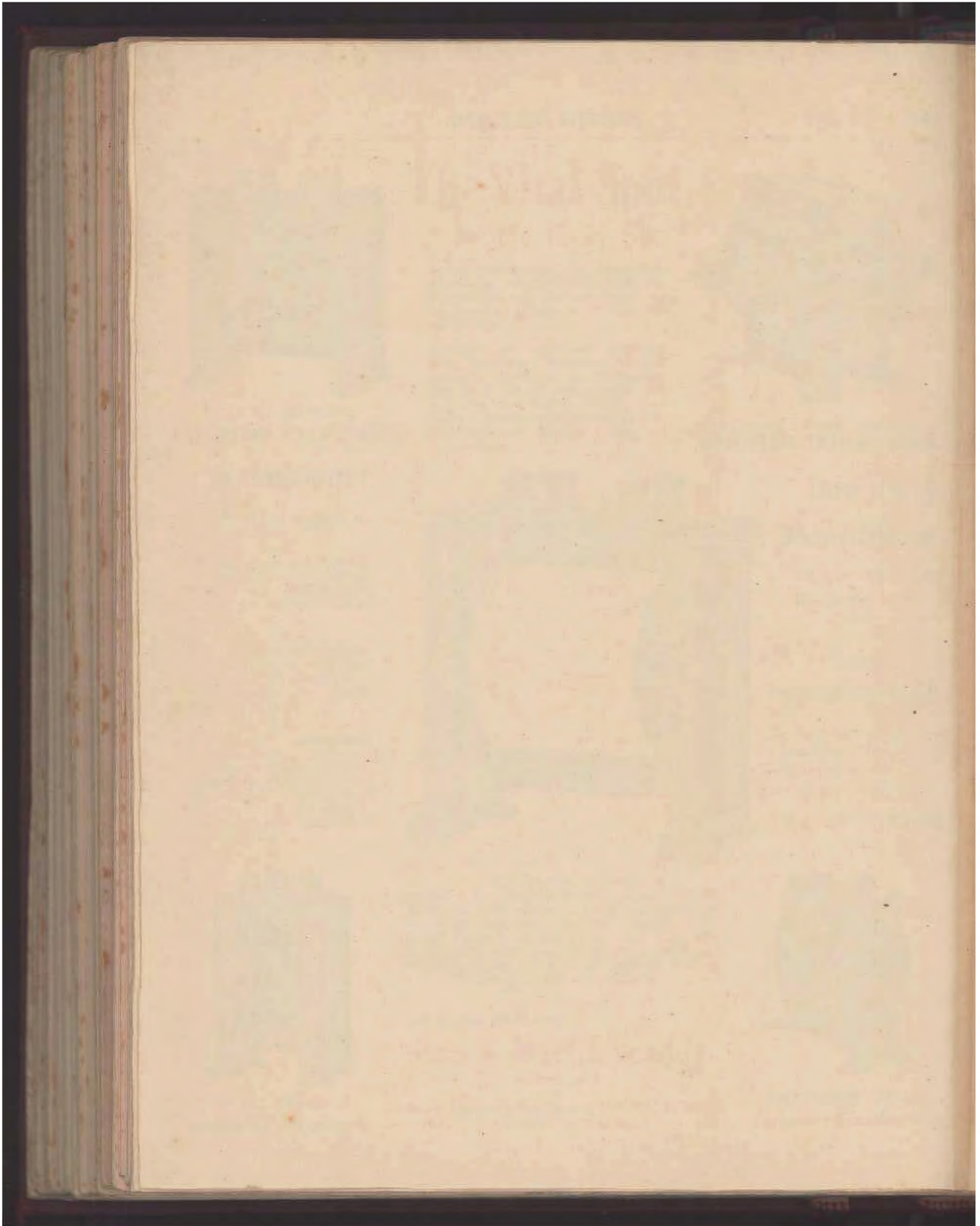
At the 42nd meeting of the club, held on 26th February, those present spent one of the most interesting and enjoyable evenings the club has seen to date. The occasion was a lecture by Mr. C. H. Fischer (of the University Chemistry Department), a member of the club, and his subject was the "Electronic Theory of Matter." The goodly collection of scientific apparatus that met one's eye on entering had a business like appearance, and gave

promise of something good to follow. This impression proved to be right, for the series of experiments which followed, was an eye-opener to all. The lecturer started out by touching on matter in its various forms; it could be classified into elements and compounds, all of which assumed one of three forms—solid, liquid or gaseous. All matter was fundamentally the same, differing only in degree or interatomic structure. It was thought for some time that the atom was the smallest quantity of matter, but later research had revealed the fact that the atom was in itself really a miniature solar system, the most generally accepted theory being that the atom was composed of a positive nucleus surrounded by negative electrons systematically arranged about the central body, the number and arrangement differing in the case of the different substances. This was clearly illustrated by the analogy of the floating corks to which magnets were attached, the large central cork representing the positive nucleus, and the smaller corks being of a different polarity representing the negative electrons; the smaller corks were consequently attracted to the positive central body, and they were seen to arrange themselves symmetrically about the central body, according to the number applied; the theory of atomic structure was thus easily grasped. It was stated that, apart from the apparent inertia of substances, matter was constantly in motion within itself, due to the perpetual movement of the electrons of which the atoms were constituted.

A series of experiments was then carried out with a number of evacuated glass tubes, containing certain objects, to which current was applied producing certain effects. The necessary high frequency current was supplied by a very fine spark coil, which threw a decidedly healthy looking spark, and was capable of "some kick" as some of the over enthusiastic ones found to their cost. The spark coil was fed by 20 volts or more storage batteries, several of the "old reliables" bringing along their accumulators for the occasion. The first experiments was with a vacuum tube, containing an electrode at either end, interposed between which was a revolving wheel with vanes, which was free to move back and forth within the tube. When the current was applied the electrons flowing through the tube from one electrode to the other would strike the vanes of the wheel in their path caus-

Continued on page 14

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60-62 Goulburn Street Sydney.
Telephone City 3688 1 door from Pitt St.

Wireless Supplies Ltd.
21 Royal Arcade, Sydney
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E. R. Cullen
96 Bathurst Street
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Radio House
619 George Street Sydney
Telephone: City 1487.

Colville-Moore Wireless Supplies
10 Rowe Street Sydney.
Telephone: B2261.

Ramsay, Sharp & Co. Ltd.
217 George Street, Sydney.
Telephone: City 3176.

The Home Electric
106a King Street, Sydney.
Telephone: B 5565.

Swains Ltd.
119-123 Pitt Street, Sydney.

Wireless Conference

In view of the fact that the reported Conference regarding broadcasting has been narrowed down by the Postmaster General to calling together only the trade interests and broadcasting licensees to endeavour to find a solution to the problem facing the Government in regard to its obligation to those licensees who have inaugurated services, the Wireless Institute of Australia, N.S.W. Division, has forwarded the following letter to the Postmaster-General:

Sydney, 4th April, 1924
The Honorable the Postmaster-General
General Post Office,
Melbourne,
Sir,

I have been instructed by the Council of this division of the Wireless Institute of Australia to communicate with you in view of the fact that it has been publicly pronounced in the press that you intended calling a conference in Sydney concerning broadcasting and to point out that as we now understand representatives of various trade interests and broadcasting licensees are to meet in conference in Sydney General Post Office on Tuesday next, the 8th instant, we suggest that as license fees may be a matter of discussion at such conference, then, when such discussion takes place, it is desirable that the interest of the present day experimenters shall be represented.

For your information I desire to add that as a result of a conference in Sydney on 19th March last, twenty Radio Societies in N.S.W. have subscribed to affiliation with this Institute.

Yours faithfully,
(Signed) PHIL. RENSHAW,
Honorary Secretary.

A LINE FROM 2CDM.

Mr. C. MacLurean, who is carrying out tests on R.M.S. "Tahiti," sent us a card from Papeete, on the way up to Frisco. Up to the date of posting, a run of bad luck had been experienced, commencing with the night before arrival in N.Z., when the generator was burnt out. Another one was obtained from the University at Wellington, but this did not function too well.

The next mishap occurred after leaving N.Z., when nearly all the valves went west, leaving only a 1.5 watt. However, even with that power, N.Z. amateurs were worked at over 2,000 miles. "Mac." expects to be on full power on the return trip, and anticipates good results.

Broadcasting and Transmitting Stations in New Zealand.

The following is a complete list of licenses issued up to January, 1924:

Toll Broadcasting Stations.

Auckland Radio Service, Ltd., Auckland	500 watts 260 metres	1YA
Dominion Radio Co., Ltd., Wellington	500 watts 275 metres	2YK
Radio Supply Co. (Norman Arundel), Dunedin	500 watts 370 metres	4YO

Private Broadcasting Stations

British Electrical and Engineering Co., (E. J. O'Neill), Dunedin	500 watts 370 metres	4YA
Gisborne Radio Co., Gisborne	500 watts 335 metres	2YM
Pearson, Charles Henry (on behalf of Newcombe, Ltd.), Auckland	500 watts 260 metres	1YB
Wellington Broadcasters, Ltd., Wellington	500 watts 275 metres	2YB

Experimental Stations.

Prof. Robert Jack (for University of Otago)	50 watts 395 metres	4XO
Victoria University College, Wellington	50 watts 395 metres	2XB

Transmitting and Receiving Stations, Grade I.

Bell, Frank Dillon, Waihemo	50 watts 171, 161, 151 metres	4AA
Bingham, John Merton, Levin	50 watts 180, 170, 160 metres	2AA
Buist, Dr. William Frederick, Hawera	50 watts 180, 170, 160 metres	2AM
Radio Society of Christchurch (Inc.) Christchurch	15 watts 300, 175, 155 metres	3AC
Coutts William Morton, Taihape	15 watts 175, 165, 155 metres	2AQ
Edwards, Cecil Norman, Auckland	10 watts 180, 170, 160 metres	1AA
Hamilton Amateur Radio Club, Hamilton	50 watts 175, 165, 155 metres	1AM
Hartle and Gray, Auckland	50 watts 175, 165, 155 metres	1AH
Jordan, Arthur Edward, Invercargill	50 watts 175, 165, 155 metres	4AD
O'Meara, Ivan Henry, Gisborne	50 watts 175, 165, 155 metres	2AC
Orbell, Reginald John, Christchurch	50 watts 175, 165, 155 metres	3AA
Otago Radio Assn. (Inc.), Dunedin	50 watts 300 and 160 metres	4AB
(Transmitting apparatus dismantled 17-8-'23.)		
Robinson, Robert Edward, Dunedin	50 watts 175, 165, 155 metres	4AC
Simpson, Albert Edward Huia, Wellington	15 watts 160, 170 metres	2AS
Sinclair, William John, Gisborne	50 watts 176, 165, 150 metres	2AF
Vincent, Francis, Christchurch	20 watts 175 and 155 metres	3AB
Wanganui Amateur Wireless Club, Wanganui	50 watts 175, 165, 155 metres	2AH

Transmitting and Receiving Stations, Grade II.

Aubin, Rolf Ernest Lempriere, Auckland	5 watts 140 metres	1AU
Ball, Leonard Francis, Sydenham, Christchurch	5 watts 140 metres	3AF
Blake, Robt. George Fredk., Greymouth	5 watts 140 metres	3AD
Brangrove, Thos. Henry, Stratford	5 watts 140 metres	2AJ
Brunette, Gordon, Albert J-hn, Opunake	5 watts 140 metres	2AO
Claxton, William Henry, Thames	5 watts 140 metres	1AK
Collier, Percy Charles, Wellington	5 watts 140 metres	2AP
Courtis, Henry Burall, Timaru	5 watts 140 metres	3AH
Grainger, Ralph Eric, Auckland	5 watts 140 metres	1AS
Harrison, Walter Leslie, Wellington	5 watts 140 metres	2AI

Distance Reception—N.H.M. Galena Crystal

Hobbs, Frank Beesely, Claudelands, Hamilton	5 watts 140 metres	1AR
MacDonald, Ian Sinclair, Dunedin	5 watts 140 metres	4AH
McGeorge, Claude Norman Douglas, Dunedin	5 watts 140 metres	4AJ
Patty, Robert James, Gisborne	5 watts 140 metres	2AE
Penny, Victor George, Auckland	5 watts 140 metres	1AB
Reynolds, Ernest, Ashburton	5 watts 140 metres	3AK
Rowson, Leslie, Hawera	5 watts 140 metres	2AK
Slade, Ralph, Dunedin	3.5 watts 140 metres	4AC
Sommerville, Aymer Alex., Thames	5 watts 140 metres	1AQ
Spackman, Leonard Storkey, Auckland	5 watts 140 metres	1AC
Stevens, Percy Ronald, Gisborne	5 watts 140 metres	2AD
White, Russell Garland, Auckland	5 watts 140 metres	1AO
Wilkinson, Dan, Motueka	1.5 watts 140 metres	2AB
Withers, Bernard Tyndall, Christchurch	5 watts 140 metres	3AM

WIRELESS ON THE HARBOUR.

Broadcasting on "Kuitabul."

On Saturday evening, the 29th March the Sydney Ferry Company's S.S. "Kuitabul," put out from Fort Macquarie, carrying about 1,000 Scots, who had gathered under the auspices of the Highland Society of N.S.W.

In addition to the inevitable bagpipes a broadcast receiving set was installed on the upper deck and with the blessing of the P.M.G. and Messrs. Farmer and Co., Ltd., the musical programme from 2 F.C. was given. The success of the reproduction may be judged from the fact that music was heard all over the upper deck; so strongly in fact, that it seriously challenged the combined efforts of the bagpipes, backed up by the jazz band.

The radio apparatus was loaned, erected and operated by the New System Telephone Pty., Ltd., and in view of the fact that this achievement is unique in the wireless history of Australia, it may be of interest to supply a few technical details.

A "T.M.C." single valve receiver was used in conjunction with a 3 valve power amplifier. Six loud speakers,

Continued from page 9

ing it to revolve rapidly and move up and down the tube, according to the direction of the applied current; this, it was explained, proved that the electrons although of infinitesimally small weight travelled at such high velocity as to produce a momentum sufficiently strong to move the metal object in their path. Another tube contained a small metal cross set upright in the tube directly in the path of the electronic rays as before. When the current was applied the metal cross on

being struck with the electrons was thrown up in silhouette on the end of the tube, and it was shown that by passing a permanent magnet in close proximity to the tube so that the magnetic field merged with the electronic flow, the course of the electronic flow was deflected by the magnetic lines of force, as was seen by the movement of the shadow of the metal object on the end of the tube.

Other tubes working on the same principle and containing different sub-

Continued on page 17



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THIS WEEK we are featuring all the necessary parts required to make the VALVE PANEL as described by "INSULATOR" in this issue.

We are prepared at any time to answer questions covering any points not quite understood by readers of the article.

CALL FOR OUR EXPERT ADVICE

Friday, April 11, 1924.

WIRELESS WEEKLY

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were distributed throughout the upper deck, and were so arranged as to render an even distribution of the music throughout the whole area, and to the hundreds of people gathered there.

The arrangement decided upon proved remarkably successful, it being found that so well were the "sound beams," from the various speakers interwoven that regardless of the position taken up on the large deck, no great difference in strength could be noticed in the music; and this, in spite of the various noises always associated with a large crowd.

Messrs. R. C. Allsop and Gordon Atkinson, both of New Systems Telephones Pty., Ltd., are to be congratulated on their achievement, which may be described as the first successful one of its kind.

CODE LEARNING MADE EASY.

One of the best Australian inventions of recent date is the "Tapograph," an instrument which will reproduce wireless signals or by adapting to a sounder will faithfully reproduce ordinary sounder signals.

Those who are laboring over learning the code will welcome this instrument as a God-send, especially to those situated out of town.

Wireless Weekly Transmitting Tests

Mr. C. Walker's (Clifton, Q.) is the first report to be sent in.

Time	Station Heard	Strength	Modulation
7.40 p.m.	2 R.A.	5 Points	6 Points
7.57 p.m.	2 G.R.	8 points	4 pts. slight hum
9.30 p.m.	2 Z.H.	3 points	10 points, perfect
9.55 p.m.	2 U.W.	5 points	7 points
Atmospherics fairly strong at times. Also logged 2 A.Q., New Zealand, 2 C.M., 2 H.M., 5 A.H.; but don't think they were in W.W. list.			
7.55 p.m.	2 G.R.	9 Points	7Pts. Music 5 pts. Speech
9.35 p.m.	2 Y.G.	7 points	4 points
9.55 p.m.	2 U.W.	5 points	7 points
10.5 p.m.	2 F.A.	9 points	10 points
11.45 p.m.	2 Z.G.	9 points	10pts. Music 8 pts. Speech

Atmospherics strong. Also logged:—1 Y.A., New Zealand; 2 H.M., 2 C.Q., 3 B.V., and 2 C.M. calling 2 C.D.M. San Francisco harbour. Did not keep records of C.W. All above on music and speech.

26th MARCH, 1924.
Atmospherics very bad; impossible to log Sydney amateurs.
27th MARCH, 1924.
Atmospherics too strong, storms all around.
28th MARCH, 1924.
Stormy night; impossible to operate receiver.
29th MARCH, 1924.
Storms cleared up; but atmospherics still strong.
30th MARCH, 1924.
Atmospherics still strong, but logged few stations.

7.55 p.m.	2 R.A.	6 Points	6 Points
7.57 p.m.	2 G.R.	9 points	7 points
9.20 p.m.	2 U.W.	7 points	7 points

Atmospherics too strong, so gave up.

An illustration of our

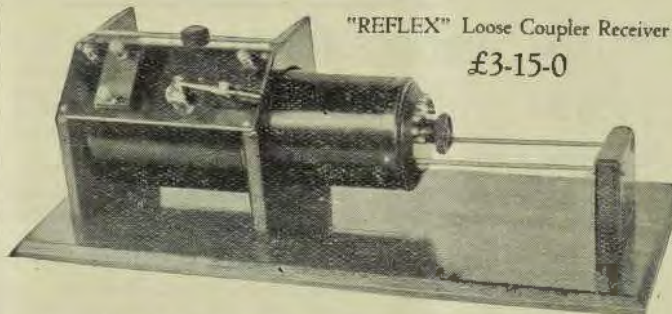
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as Quoted in our Price List

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Complete Set of Parts to make the above Set 36/6

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THE LEICHHARDT AND DISTRICT RADIO SOCIETY.

The 18th monthly business meeting of the Leichhardt and District Radio Society was held at the Club room, 176 Johnston St., Annandale, on Tuesday, April 2nd.

The attendance was excellent, and amongst other business transacted, three new applications for membership were accepted.

Special interest is attached to next Tuesday's meeting on account of the fact that a lecture on that most interesting of subjects: "Valves," is to be delivered by Mr. F. Letts. This lecture will be the 6th of the new syllabus, and the 7th will be delivered three weeks later—on May 13th—when

Mr. W. J. Zech will have a few words to say about "Batteries."

Mr. Lett's lecture on Valves promises to be of exceptional interest, and a cordial invitation is extended to non-members to be present on that occasion. Any information regarding the activities of the Society may be obtained from the Hon. Secretary, Mr. W. J. Zech, 145 Booth St., Annandale.

WENTWORTH RADIO CLUB.

The usual fortnightly meeting of the Wentworth Radio Club was held at the club rooms, 142 Bellevue Road, on Wednesday, April 2nd.

For the last few meetings the members have been attending in good numbers and in spite of the usual rain on the meeting nights, there was a very good attendance. A discussion as to changing the meeting night showed that the majority of the members were in favour of keeping the night as at present, i.e., every second Wednesday in the month. Members who were unable to attend might note this and try to keep this night free for the Club in future.

After the club business was finished Mr. P. Sewell gave an interesting lec-

ture on the Autoplex Circuit and by the manner in which he answered several questions at the conclusion of the lecture, showed that he had a good knowledge of the intricacies of this very interesting circuit. Mr. Sewell has also promised to give the members a working demonstration at the next meeting.

R. C. Marsden and W. Cottrell also gave short lectures on subject of general interest to members, and after this the meeting closed.

The next meeting will be held on Wednesday, April 16th. Experimenters living in the Eastern Suburbs wishing to join the club are invited to attend the next meeting. P. S. Nolan, 2Y1, Hon. Secretary.

NORTHBRIDGE RADIO CLUB.

The above club has been completely re-organised. At a meeting held at the club room on 12th instant, the following were elected officers for 1924: President, L. C. Forsyth; Vice-President, R. W. L. Woolridge; Secretary, A. Cameron; Treasurer, D. Marriott; Committee, Messrs. Prince and Robinson.

It was decided to hold meetings of

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Friday, April 11, 1924.

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the club on the first and third Wednesday evenings of each month instead of weekly as before. For the benefit of new members present the various types of receiving apparatus were explained. Mr. Forsyth, who has lent his large shed for a club room, offered to assist any members of the club on Saturday afternoon with the erection of masts and aeriols.

The next meeting will be held at "Haylake," Sailor's Bay Road, North-bridge, on Wednesday, 16th April. Local experimenters and persons interested in wireless are cordially invited to be present. Any enquiries regarding the Club may be addressed to Hon. Secretary, A. Cameron, "Ogilvie," Clan William St., Chatswood.

ILLAWARRA RADIO CLUB.

The 43rd meeting of the Club was held on the 11th inst., with a fair attendance, when most of the evening was occupied with business affecting the club.

A letter from the Wireless Institute, inviting the Club's co-operation at a meeting of Club delegates to be held on the 19th inst., for the purpose of considering a scheme for the co-ordination of experimental interests, was read and the Institute's proposal fully discussed. Mr. Graham (secretary) was appointed to attend this meeting as club delegate, and was instructed how to act in the matter, on behalf of the club.

Other vital matters affecting the welfare of the club were discussed, and will be the subject of early attention at the hands of the executive.

The meeting concluded with general discussion, buzzer practice and operating of the club's set.

With a view to stirring the interest of members and increasing attendances it is hoped to have some attractive fixtures for the near future, and members are accordingly asked to respond by attending in greater numbers, remembering that a full house is an encouragement to lecturers, and an inducement for distant visitors to come out and give the Club the benefit of their knowledge and experience. The assurance of good attendances will therefore result in some first-class items being a feature of future programmes.

STRATHFIELD AND DISTRICT RADIO CLUB.

The third general meeting of the club was held at the secretary's residence, South Strathfield, on Thursday, April 3rd, Mr. Rourke, vice-president, being in the chair.

After discussion, the constitution of the club was put through, clause by clause, and a great amount of discussion ensued, but the constitution was eventually adopted.

The club hopes to be finally settled in the new club room by next week. On the 18th May the club intends to hold a first-class concert to raise funds for the installation of a four-valve receiving set for the new club room.

Vice-president R. MacIntosh at present cannot give the promised address from his station, but expects to be able to do so in about three weeks time. He will then deliver a half-hourly address on wireless matters weekly for a period of about five or six weeks.

Competitions, etc., open to all experimenters, will be a feature of the club, and details will be published in "Wireless Weekly" at a later date. One thing the club desires to know, is the reason why so many men holding transmitting licenses do not make use of them. If the man with a receiving licence is to be called upon to show that he is experimenting, then the club considers this should also apply to the transmitting licensee. Many of the transmitting calls published in "Wireless Weekly" have never been heard by the members of the Strathfield Club.

CROYDON RADIO CLUB.

The Croydon Radio Club held its usual weekly meeting at "Rockleigh," Lang Street, Croydon, on Saturday, March 30th, at 7.30 p.m. Mr. C. W. Slade presided.

The club enjoyed a visit from members of the Marrickville Radio Club.

The meeting discussed the position of the experimenter if sealed sets were to go and open sets used for broadcast listeners.

Many interesting points were discussed by members of both clubs.

Mr. Slade gave a demonstration of an Inverse Duplex receiver, and the Marrickville members were entertained to supper by the Croydon Club.

The meeting closed at 11 p.m.

The Secretary, G. Maxwell Cutts, "Garwell," Highbury Street, Croydon, will be pleased to hear from intending members.

*Electronic Theory of Matter**Continued from page 14*

stances such as gems, seashells, mineral salts, etc., were operated in the same way. All the tubes when in operation became fluorescent, and in the case of those containing gems and

mineral substances, many beautiful color effects were obtained by the play of the electronic rays on the crystal facets of these substances, which remained luminous in various delicate colors for some time after the current was switched off. This throwing off of colors by different substances on high frequency current being applied to them, was a method sometimes used for determining the nature and characteristics of such substances, different substances having colors peculiar to themselves.

An X-ray tube was then described and the principles on which it worked fully explained. By way of illustration the tube was then put into operation, a small prepared screen being used in conjunction therewith. On the hand being interposed between the tube and the screen, that is, in the path of the rays, the skeleton image of the hand was clearly defined upon the screen, showing the bones and solid parts in sharp relief, as against the comparatively transparent appearance of the fleshy tissues. This experiment was the subject of deep interest, and gave those present a realisation of the great value of X-rays to medical science, and the great benefit of this discovery of Rontgen's to the world at large.

The lecture was one of really first class order, and merited a far larger attendance than the comparatively small number present. The absent ones can consider themselves extremely unfortunate at having missed something "right out of the box." Members present voted the lecture the most highly interesting the Club has yet witnessed. A notable feature was the absolute quiet which reigned throughout, the lecturer holding the wrapt attention of his audience for the best part of two hours, such was the absorbing and fascinating nature of the subject. Quite a considerable amount of light was thrown on the ways of the "elusive electron," and a great deal of food for thought was gained as to the electronic theory and its application to wireless science.

At the conclusion a very hearty vote of thanks to Mr. Fischer was carried by acclamation, particularly for the able way in which he had dealt with the subject and the great amount of trouble he had gone to in the matter. Mr. Fischer replied to many questions arising out of the lecture, and in responding to the members' thanks, said he hoped to go into the subject further on some future date.

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The Moore Fund

OPEN LETTER TO CLUB SECRETARIES.

Dear Sirs,

The Waverley Radio Club, as you no doubt noticed in a recent issue of Wireless Weekly, has decided to close its floating fund which was inaugurated for the relief of the widow of Experimenter F. L. Moore. The amount is to be forwarded at an early date. A recent letter from the Katoomba School of Arts Radio Club intimates that a subscription list has been opened for the Moore Fund. Clubs as far distant as Newcastle and Goulburn have already responded to the appeal, as have a number of city and suburban clubs. In again appealing to you we feel sure that, in approaching the members of your clubs, the worthiness of the appeal need only be stressed by you to evoke a generous response.

Yours faithfully,

WIRELESS WEEKLY.

Send that shilling to-day to "Wireless Weekly," 33 Regent Street, Sydney, or to Mr. Phil. Renshaw, Box 3120, G.P.O., Sydney.

The funds will be handled by a Board of Trustees, consisting of Messrs. F. Basil Cooke, Phil. Renshaw and J. W. Robinson. Those gentlemen will see that the money is properly disbursed.

Contributions to date:

Proprietors Wireless Weekly	£5 0 0
United Distributing	10 10 0
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WIRELESS WEEKLY

19

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		Total	£91 5 6

AUSTRALIAN AMERICAN TESTS.

These tests have been conducted since March 15th. American and Australian stations will transmit on April 15th from 6 p.m. to 9 p.m., April 16th from 9 p.m. to 12 p.m. and April 30th from 6 p.m. to 12 p.m. During this period the American stations will transmit during the first 15 minutes in each hour, the Australians during the next 15 minutes, and so on. All times are Melbourne time and transmission periods are free for all.

Messrs. Fox and MacGillieuddy Ltd. have generously agreed to forego an amount of £4/2/6 which Mr. F. L. Moore owed them, and this has been accepted by the trustees as a donation to the fund for the relief of Mrs. Moore.

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Continued from page 8
ments, and surges up and down the antenna system. This violent surging up and down creates a state of magnetic strain in the ether which surrounds the aerial, and this state of magnetic strain in turn creates a state of electric strain. Thus waves which really take the form of alternate states of electric and magnetic strain in the ether are radiated into space and move outwards in all directions from the sending station at a speed of 186,000 miles per second.

The charging and discharging of the condenser, causing the transmission of waves, is controlled by a key, which is placed in a suitable portion of the apparatus. Thus the operator, by depressing the key for a fraction of a second, starts a short train of ether waves, and by holding it down for a longer period he starts a longer train of waves. By depressing the key for certain periods he can form the symbols of the morse code, or rather can speed forth trains of waves in the code signs.

At the receiving station the opposite action takes place. The ether waves cut across the aerial and induce in it oscillating currents. These currents are conveyed to the tuning instruments and are then passed through a detector of some sort. They are still in the form of oscillating currents, which are flowing first in one direction and then in another. In order to affect the receivers they must be unidirectional currents, so that they are first passed through some form of detector which allows them to travel in one direction only, and not to return. By this means they are converted into direct currents, and if they are passed through telephone headgear they affect the magnetism of the telephone pole pieces and so cause sounds which can be heard.

When the spark method is used for wireless purposes, however, the waves gradually diminish in height, or in technical terms become "damped." They cannot therefore be used for the transmission of speech, because if a voice were impinged on them it would be continually fading out. For telephony a different form of wave is used. This consists of the continuous wave, a wave which results in any oscillations which are generated by a thermionic valve, and on this wave the

speech is impinged. At the transmitting station one or more transmitting valves create the waves. The speech or music which is to be transmitted is then lead to a microphone much like the ordinary mouthpiece of a telephone. The sound waves are converted by this instrument into electrical currents, and these currents are impinged upon the continuous wave which is being generated, produced by the valves. The continuous waves do not vary in amplitude or height, and consequently the impressions on them caused by the voice or music are not in any way lost. They are radiated into space, and at the receiving station are separated from the continuous wave by the use of receivers similar to those employed in connection with the reception of spark signals, and are rendered audible by the use of telephones. They may be passed through a loud speaking device which will build the sound up and make it audible to a large number of people.

Continuous waves are also used for telegraphic purposes, their height being varied by the depression of a key which is placed in certain portions of the transmitting circuit. When this method is employed a certain type of receiver must be employed which will create a local disturbance for the purpose of reacting against the incoming ether wave. Without this local disturbance it would be impossible to distinguish the duration of the variation in the waves, and so would be impossible to read the symbols of the code.

Most of the vessels on the Australian coast use the spark system of telegraphy, as also do the land stations of the Commonwealth. Various forms of spark gaps are used which have the effect of giving a high number of sparks per second, each spark representing a condenser discharge. Continuous wave telegraphy is used by some of the long distance stations, and also by almost all the amateur transmitting stations.

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Friday, April 11, 1924.

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