



Friday, May 23, 1921.

WIRELESS WEEKLY

## The Open Set is Coming

Now is the time to purchase your material for the Set that you are going to construct this Winter, for as soon as the Open Set arrives, there will not be sufficient Radio Parts in Australia to supply the demand.

In constructing your Set, we recommend that you use the following:

**United Transformers** technically perfect and used by all leading manufacturers throughout Australia.

**United Condensers**, either plain or vernier all capacities.

**United Honeycomb Coils**, properly wound, correct inductance. Most trustworthy and efficient Coil on the Market.

**United Coil Mountings**, 2 coil mounting, 3 coil mounting, Coil plugs, Panel plugs, Coupling plugs and Handles.

**Signal Fixed and Mica Condensers.**

**Quick Heat Leaks.**

In your Crystal Set use QSA Crystals.

These and other "UNITED" and "SIGNAL" parts are for sale by all dealers

Applause Cards furnished Dealers and Clubs without charge.

**United Distributing Coys., (N.S.W.) Ltd.**

WHOLESALE ONLY

— Manufacturers of —

**RADIOVOX SETS**

A Few Territories open for Agents.

28 CLARENCE ST., SYDNEY and at 592 BOURKE ST., MELBOURNE



Official Organ of the Australasian Radio Relay League

Vol. 4.

Friday, May 23, 1924.

No. 6

### Is Broadcasting Purely an Entertainment ?

The basic idea behind the statements and opinions expressed by most writers and speakers upon the subject of broadcasting is that the art may be regarded only as an entertainment; merely an added pleasure to while away the evening hours.

For many in the cities, where movie shows, theatres and ball rooms are, so to speak just around the corner, no doubt this is so. Circumstances are such that they are able to pick and choose their entertainment.

There are hundreds of thousands in Australia, however, who are not so fortunately placed. We may find them lying sick in hospitals; in homes and other institutions; or on homesteads out in the isolation of the bush, where for months on end there is nothing to mitigate the deadly monotony of life. For these people, broadcasting will be something far removed from mere entertainment. It will become a vital force in their lives. The fact that the

Education Department has invited radio dealers to conduct tests at Bourke next month for the purpose of determining how broadcasting can be used for educational purposes, shows that serious consideration is being given to an important phase which can certainly not be termed entertainment.

The adoption of such a system would provide added facilities for the younger generation to acquire knowledge, and when we consider the difficulties under which our back-blocks' schools labour, it is not difficult to imagine the benefits that would result from educational broadcasting.

It is inevitable that the present system of broadcasting news, stock and market reports will be enlarged to cover a wide variety of subjects for the education of the people, and it is unquestionable that the time is not far distant when broadcasting may be aptly termed a public necessity.

### Roster for Week ending 28th May, 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, May 22	2 RA 2 GR	2 IJ 2 JM	2 YI	2 UW	2 YG 2 VM	2 ZG
Friday 23	2 IJ 2 GR	"	"	2 ZN "	2 ZZ	"
Saturday 24	2 RA 2 GR	2 IJ	"	"	"	"
Sunday 25	2 RA 2 GR	"	"	"	"	"
Mon. 26	2 RA 2 GR	2 IJ	"	"	"	"
Tues. 27	2 IJ	"	"	"	"	"
Wednes. 28	2 RA 2 GR	2 IJ	"	"	"	"

## Wireless Apparatus and Regulations Ten Years Hence.

By Malcolm Pery

In dealing with this subject, and a very debatable one at that, my main object is to endeavour to forecast what the wireless position will be like in ten years' time, so that we may now make some provision for the future. We have found so many examples of short sighted policies in connection with our public works in Australia that the fact is often overlooked that Australia is a growing and prosperous country. We must be very careful, however, not to provide regulations for wireless in 50 years' time, such as the sealed set regulations did; for after all laws are made for the present generation, and it would not be fair to penalise the living for the unborn.

A manager of a business will make his plans as far as ten years ahead, but he would not make rules for the carrying out of his business operations fifty years' ahead. So I think we can be permitted to look ten years' ahead for the reason that wireless has made such wonderful progress in such a short space of time that we may reach 1934 much sooner than we expect. Wireless regulations of the future will be very similar to aeroplane regulations, the only difference being that there is more room in the air for aeroplanes. If, however, aeroplanes become very cheap, every person will have one, and it is possible that the same congestion may arise with aeroplanes as with wireless.

The more I see of wireless, the more I am impressed that wireless is not for the few, but for the many, and I venture to suggest that the present generation will see the day when the wage-earner will use wireless as his means of communication with his friends, whilst the employer will have his wired telephones and telegraphs just the same as the ordinary man rides in public tramcars whilst the well-to-do have their private motor cars.

So let the experimenter in everything that he does and says always remember that he will in ten years' time be only one in probably five millions using wireless.

If he always keeps this view before him, it will greatly assist him in his direction of research, and all arguments as to regulations under which we work will include on all sides the fact that wireless is for the people. We

will all therefore have a common starting point for research work.

The day will no doubt come when every home will be equipped with its wireless set and loud speaker, and what is going to happen if there are hundreds of powerful loud speakers in the one street simultaneously playing from twenty different broadcasting stations? It is rather hard to say, but don't you think that regulations will be necessary here? So if you are experimenting with loud speakers do not go in for volume of sound because it will not be wanted.

The position of valves is becoming interesting, and just the same as you would not wear a ship's chronometer on your watch chain or carry an old time door key for your front door, so Mr. (or Miss) 1934, will want some sort of noiseless detector that is cheap and efficient. We will probably see some sort of Neen tube, or a controllable crystal come into use, operated directly from electric power mains. If we could only find out exactly what a crystal acts like, I think we have got to the stage in wireless when it is necessary to study chemistry and physics.

The type of circuits that will be in use will be extremely selective, more especially those used for commercial work, although the amateur will still want a circuit that has a fairly wide wave length range. This makes me think that sets will be designed with a multi-point switch that will in one movement change over from one circuit to another, or a switch-board could be used similar to a cordless telephone switchboard. Telephone receivers will be remodelled and made lighter and more comfortable. It may be that we will get telephone receiver that will oscillate itself without the use of valves. What I am thinking of is a receiver similar to those used by deaf people.

Licences for receiving sets will be issued just the same, but from a different point of view. Every receiving station will be numbered, not from a point of collecting revenue, but in order to distinguish one station from another for the convenience of those stations just as is the case of a large business where every employee has a number.

The commercial transmitting side will undergo many changes, especially

in regard to wave lengths. You see, the greatest difficulty in ship communication is that all ships must listen in on the one wave length, 600 metres. The reason of this is that when a ship sends an S.O.S. signal, it will be heard by all ships in the vicinity, otherwise safety of life at sea would be lessened and the great benefit of wireless would be destroyed. I have always maintained that telephony will never supersede the telegraphy as a means of commercial communication, but there will be an opportunity for telephony. Each ship will probably be installed with a special S.O.S. telegraphy receiving and transmitting set, which would be equipped with one or more loud speakers. This set would always be fixed to one wave length, say, 800 metres, and the loud speakers would be installed on the bridge of the ship. When a ship wished to send an S.O.S. signal the wireless operator would simply speak into the microphone and his words would be repeated on the bridges of all ships within a radius of say 200 miles.

If some method were adopted like this, it would enable ship to ship, and ship to shore traffic to go on many different wave lengths, thereby easing up the congestion on 600 metres which is now at times very bad in Australia. What must it be like in the English Channel?

Our much talked about nuisance, Mr. Harmonic, will be made great use of. I think that for certain purposes some transmitting stations will be designed especially to have armonic harmonics. With the opening up of the band of commercial wave lengths, a ship calling to another ship would call simultaneously on 600, 1200 and 2400 metres.

The receiving station would tune in and pick out the most suitable wave length to receive on (to avoid interference) and reply, "Radiate your 1200 metre harmonic." There is no doubt that strict attention will be paid to strength of signals and transmitting stations will eventually have some means of correctly cutting down their power so that they can only be heard up to the required distance. Our great present difficulty is that we have no commercial method of measuring signal strength, but there is no doubt that before long we will be able to at-

**BROADCASTING Solves Your Home Entertainment Problems. "COL-MO" Receiving SETS, from £4 Complete.**

Friday, May 23, 1924.

## WIRELESS WEEKLY

3

each meter to our receiving sets and read off the strength of received signals just the same as you measure the voltage of your "B" battery.

I had the pleasure of listening to Mr. MacLurean's report on his Trans-Pacific Tests, at the recent Wireless Institute dinner, but I must confess that I went home with the feeling that although the night range of 2CM on a five watt set was approximately 6000 miles, the interference range was also 6000 miles. To put it in another way, every time that a five watt station is operating, it is causing interference up to a distance of 6000 miles, or if you are moving to an amateur in Victoria you are worrying the amateurs in New Zealand.

Does it not mean that every wireless station in the world is a broadcasting station? And so transmitting stations in 1924 will be designated with two ranges, their constant communication range and their interference range.

I could not close this article without saying something about static. It is an admitted fact that static comes at you on all wave lengths, so this makes special circuits for tuning it out useless; but where static comes from is not admitted. The majority of experimenters believe that it comes from up above, yet when they use a loop aerial with no earth connection, a lot of static is eliminated. Discussing the question with a mining engineer, he told me that if you go down a mine during the hours immediately following sunset and sunrise you will hear the earth creeping, due no doubt to the expansion and contraction of the earth caused by the sun. Now, static is invariably worse during the hours immediately after sunset and sunrise, and it may be that the bulk of the static comes from the earth. It seems to me that if we can place a wireless receiving set where there is no static and where there are wireless signals, then the solution of the difficulty will be found. Another method that may prove successful, would be to use a tuned telephone diaphragm, one that would respond to signals only of high frequency, although the adjustment of such a diaphragm would present difficulties. As I said before, we have got to the stage where it is necessary to call in the chemist and the "physicist."

**FOR SALE**—New Loose Coupler complete with phone, £3, perfect order, also panel Crystal Set, £2, perfect order. Both tune Broadcasters and Farmers, etc. Apply Spark Gap, c/o Wireless Weekly.

**Up-to-date RADIO EQUIPMENT, of the First Quality, at Competitive Prices. "COL-MO," 10 Rowe St., Sydney.**

## CORRESPONDENCE.

The Editor,  
Dear Sir,

The authorities only allow us a band of wave lengths from 150 to 250 metres.

Now it is up to every amateur transmitter to tune his wave so as to take up the smallest possible portion of the comparatively small band.

We have a pest with us now who takes up about ten metres of that narrow margin for hours on end by sending record after record; which nobody listens to.

But that is not all, a worse pest is springing up around us; the buzzer fiend who takes up at least 20 or 30 metres with a squeaky agonising buzzer which gives you a headache every time you have the misfortune to tune across it. Of course it is impossible to do any D.X. work through such Q.R.M.

Why can't C.W. be used? It is just as easy to read and easier to send. If I.C.W. must be used why not try 2 Z.G.'s stunt with a child's trumpet; it has a good note and isn't half so broad.

Yours faithfully

Len Schultz (2L.O.)

Mr. R. J. Fagan of Mandurama is having great success with apparatus supplied by the Burgin Electric Company, Sydney.

He writes to the Burgin Company as follows:—

"It will probably interest you to know that on May 4th and again last evening, May 11th, I have been successful in getting K.G.O., Oakland, California, with the five valve Neutrodyne. The music and speech have come in very clearly. I am keeping a record of the announcer's statements in case of argument."

## SUCCESSFUL SYDNEY AMATEUR.

Probably no experimental transmitter has achieved more consistently good results than Mr. R. Allsop, Coogee, N.S.W. whom we reported last week as having been heard on a loud speaker by 7A.A. Tas.

The call 2 Y.G. is familiar to most amateurs, and a big collection of Q.S.L. cards received by Mr Allsop shows that two way working has been maintained with practically all the most successful Australasian transmitters.

Looking through these cards at random one finds reports from 3 E.F., A3 B.D., A7 A.A., 4 A.A. (N.Z.) 2 A.P. (N.Z.) and a host of others one hears almost every night when conditions are good. With all those 2 Y.G.

has worked two way phone conversations; with many others C.W. and a shoal of letters from those operating receiving stations throughout N.Z. and all Australian States except W.A., support Mr. Allsop's claim that 2 Y.G. is 100 per cent efficient.

J. Sewell, Christchurch writes to say that "Your programme was successfully received here on March 24th." W. T. Watkins (Hobart) says "Have had your phone on my Loud Speaker often here and your modulation is always very good."

E. H. Cox (Elsternwick Vic) has received 2 Y.G. on an indoor loop, while Mr. Todd (Tamworth) reports "Your speech loud and clear."

The design of the station at 2 Y.G. is an eye opener to those usually accustomed to seeing a mass of junk strewn all over the operating room; in fact it bears a very close resemblance to a ship station, so compact and workmanlike is the job.

Just now Mr. Allsop is engaged in a general overhaul and remodelling and is therefore temporarily closed down.

## CORRESPONDENCE.

To the Editor

Sir,—I am in full sympathy with your correspondent, Mr. A. Stewart, when he complains about continuous transmission from one station, but Mr. Stewart will not find many to annoy him in this manner.

However, I would like to point out that Mr. Stewart is not obliged to listen to music and that there are plenty of stations using C.W. In fact 5 or 6 transmitters may be heard every night doing Interstate work on C.W.

With regard to those stations referred to by your correspondent as continually being altered, it is well known that most efficient stations are those which are frequently altered and improved. There would be no progress if we all stuck in the same old rut.

Concerning the last paragraph of Mr. Stewart's letter, there is a club in existence known as the 10 Watters, consisting of all the leading transmitters, and as President, I need hardly assure friend Stewart that if he is a transmitter we would be glad to have him as a member.

Meanwhile I would welcome an opportunity to personally convince the gentleman he is wrong if he would take the trouble to call on me.

Yours etc.,

J. S. MARKS (2GR)

# THE REINARTZ CIRCUIT

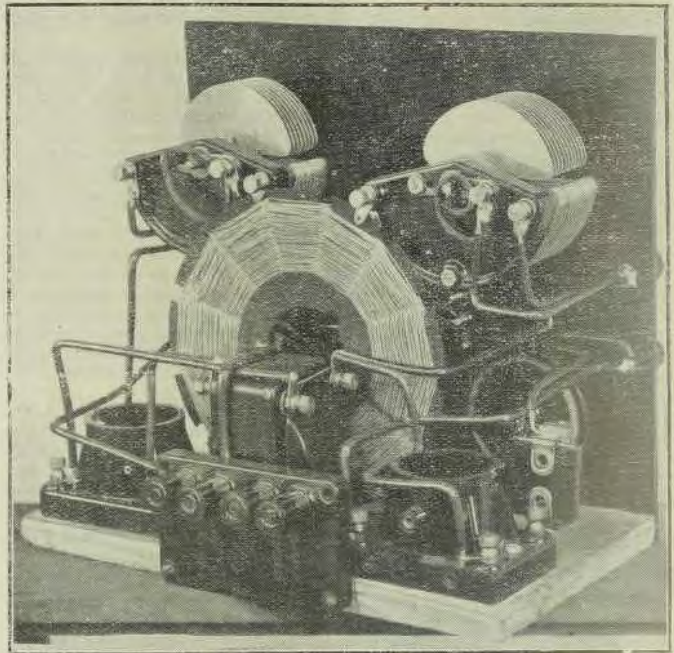
BY THE LITTLE AMERICAN.

This is a circuit in which the feed-back or tickler action is secured by connection to the coil, which also forms part of the tuned circuit. A condenser is also connected between the plate of a detector and the aerial. The aerial circuit itself is not tuned.

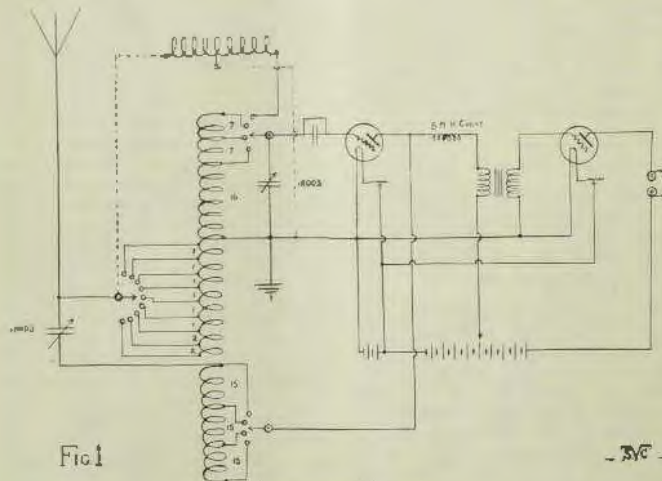
The aerial may therefore be much longer than is ordinarily possible if it must be tuned to the received signals. The tuning of the secondary circuit is relied upon to secure selectivity.

The parts used are the following:—

- 1 spider web form.
- 1-8 lb. No. 26 D.C.C. wire.
- 1 .0005 variable condenser, 23 plate.
- 1 .0003 variable condenser, 17 plate.
- 2 20 ohm rheostats.
- 2 V.T. sockets.
- 1 audio frequency transformer.
- 3 switch arms.
- 16 switch taps.
- 8 binding posts.
- 2 3in. dials for condensers.
- 2 2½in. dials for rheostats.
- 1 panel, 1-8in. x 8in. x 9in.
- 1 grid condenser and leak.
- 1 terminal board 2in. x 4in.
- 1 base board, 5in. x 9in.
- 3 lengths spaghetti tubing.



Back View of Panel.



Reinartz Circuit.

Wind the spider web coil as one continuous winding 85 turns. Cut at the 45th turn from centre of coil using inside coil as feedback. (See diagram.)

Tap at each 15th turn. Tap outside coil starting with inner winding and tap at 2nd, 4th, and then a tap 16 turns from the last set, then 7 and 7. The panel is 8in. x 9in. of 1-8in. bakelite.

Use drill for mounting all instruments and taps.

Use 18 drill for binding posts.

Templates are furnished with all instruments.

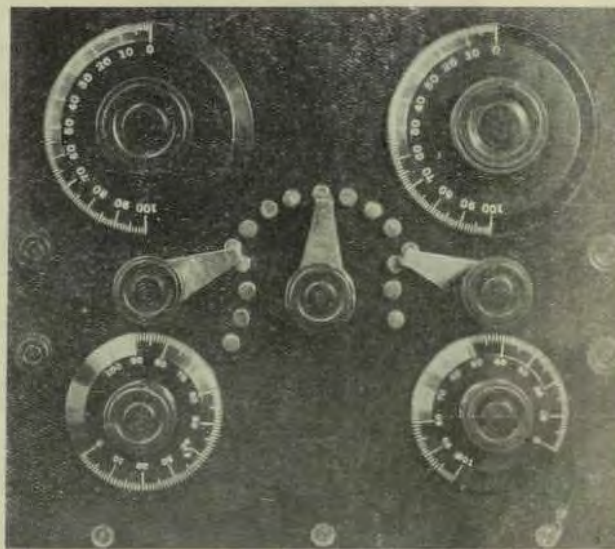
Mounting instruments on panel, attach base board and mount sockets and transformer, then connect by following diagram carefully. Care should be taken to keep all leads as short as possible. The coil with 85 turns will receive from 150 meters to 400 meters. If it is desired to receive longer wave signals a proportionately larger number of turns may be used all along the coil, or a loading coil may be inserted

The most extensive stock of Wireless Sundries is at 10 Rowe Street, Sydney.

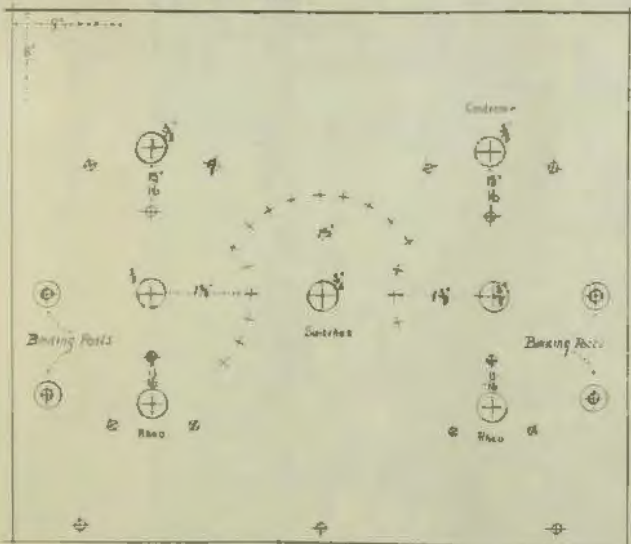
as shown by dotted line portion of diagram. The insertion of a radio frequency choke coil at the point marked in the plate circuit of the detector tube will serve to increase the strength of the signals in case the distributed capacity of the primary winding of the amplifier transformer is larger.

In actual use this circuit is quite similar to the ordinary single circuit regenerative receiving set, regeneration being here controlled by means of a condenser connected to the aerial. The setting of this condenser does not change very much with the wave length. The use of this method of feedback also tends to minimise the effect of the capacity between the circuit and the hand of the operator. In sensitivity the circuit is probably about the same as the ordinary regenerative circuit using tickler feedback. Care should be taken not to let it oscillate as the radiation interferes with other receiving stations nearby.

This set is very good on distinct reception on the lower waves and makes a compact neat set. The next receiver described will be the Flewelling. To experimenters who are going to follow this series of circuits and build each one; take notice that the same apparatus will be used in each one as nearly as practicable, so as to lessen the num-



Front View of Panel.



Panel Lay-out.

ber of parts to be purchased for changing from one hook-up to another.

**Wireless Experimenters**

Call or write for full particulars of Long-range 2-Valve Sets, from £12 to £16. A special line of 1-Valve Sets at £8/10/- each. The above are complete in cabinets, with valves, phones and batteries. These sets are equal to any purchased elsewhere at double the price. Demonstrations every evening 7 till 10. A. E. Clarke, "Marsden," 34 Botany St., Waverley, near Bondi Junction.

FOR SALE—S.T. 100 Set, complete; also Baby Brown Loud Speaker and 12-volt magnetic Rectifier for charging batteries. All O.K. Ring North 891.

She: "I wonder if you remember me? Years ago you asked me to marry you."

The Absent Minded Professor: "Ah, yes, and did you?"—"Michigan Gargoyle."

TRUE, DISTORTIONLESS MUSIC IS A FEATURE WITH N.H.M. CRYSTAL RECTIFICATION.

*The Canterbury Intermediate High School Radio Club.  
Sydney, N.S.W.*



*This club was founded by Mr. C. W. Mann, the gentleman on the right hand of the two standing in the centre (without phones.)  
With the hard work of Mr. Mann and the enthusiastic co-operation of the members, the Club to-day is  
easily the most successful High School Club in Australia.*



Friday, May 23, 1924.

WIRELESS WEEKLY

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APPLAUSE CARD.

The panel below shows a copy of a card produced by United Distributing Company (N.S.W.) Ltd. If you haven't one by you, send to your nearest radio store for a few. They are always handy and are much appreciated by the artists.

<p><b>I LIKED IT!</b></p> <p><b>YOUR SET</b></p> <p>should contain</p> <p>"UNITED" COILS</p> <p>"UNITED" TRANSFORMERS</p> <p>"SIGNAL" CONDENSERS</p> <p>"QUICKMEAT" LEAKS</p> <p>For sale at all Dealers</p> <p><b>United Distributors</b></p> <p>LTD.</p> <p>28 CLARENCE STREET</p> <p>SYDNEY</p>	<p><b>THANK YOU!</b></p> <p>Date _____</p> <p><b>Broadcasters Ltd. (2 B.L.)</b></p> <p>This is to let you know that I am enjoying your splendid programs. I especially enjoyed _____</p> <p>Music _____</p> <p>Artist _____</p> <p>I will be grateful if you will express my appreciation to the artist named.</p> <p>Signed _____</p> <p>Address _____</p>
--	---



"Grodan" Loud Speaker Attachment

Good Acoustics  
Fit any type of Head Phone

Price 30/-

All principal Radio Dealers

**Grose & Daniel**

Office

63 Mountain St. Sydney.

**ANNOUNCEMENT**

We are pleased to notify our customers, both Wholesale and Retail, that we are now ready to quote for the erection of aerial masts from 30ft. to 200ft. in either Wood or Iron, also for flags of any design.

---

**E. H. BRETT & SONS LTD.**  
LITTLE AVENUE. BALMAIN EAST  
Phone W 1205

## THE WILES' SPECIAL

It is claimed that circuits employing reaction, besides being prohibited are gradually becoming out of date with the more advanced type of experimenter. The man who listens to broadcasting for the first time with a reaction circuit very often finds that on account of his non-understanding of the proper method of adjustment, the received speech or music is harsh or distorted.

Reflex circuits are now becoming more and more popular. The advantages of the Reflex circuits are that they are easy to handle, have a longer range with a given number of tubes (the tubes function both as radio and audio amplifiers) and give much clearer reproduction.

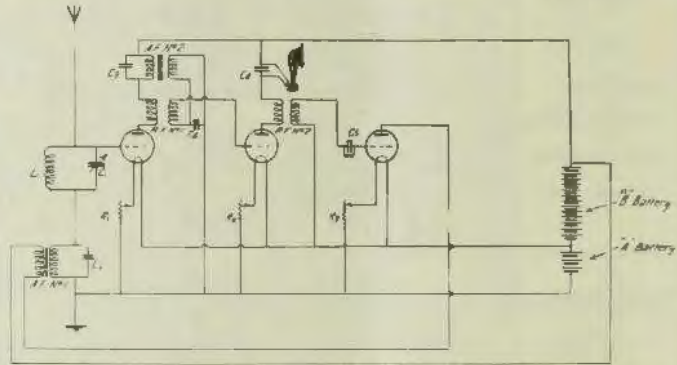
After much experimenting and testing, Messrs. W. Harry Wiles have produced a 3 valve double reflex receiver which it is claimed has given some wonderful results. The diagram shows the hook-up. L1 is a honeycomb coil; C1 a .001 M.F. variable condenser, with Vernier; C2 a .001 fixed condenser; C3 and C6 are .002 M.F.; C4, .05 and C5, .0003.

Here is a list of parts required to build such a receiver:

1 Remler coil mount.

- 1 .001 condenser and vernier.
- 2 Audio transformers.
- 3 Rheostats.
- 3 Valves.
- 3 Valve holders.
- 1 6-volt, 60 amp. accumulator.
- 2 45-volt B batteries.

- 1 Grid leak and condenser.
- 2 R.C.A. radio transformers.
- 4 Fixed condensers.
- 1 Pair phones.
- 1 Loud speaker.
- Honeycomb coils: 25, 35, 50, 75, 100, 135, 150, 200 turns.



Bride (to butcher): "What sort of toast do you think would go well with a perfect darling of a blue and white dinner set?"—"Life."

"He never completed his education, did he?"  
"No, he died a bachelor."—"Tit Bits."

### ASK YOUR RADIO DEALER FOR

TRIMM "PROFESSIONAL" HEADSET 3000 Ohms 45/- per set

TRIMM "DEPENDABLE" HEADSET 2,400 Ohms 32/6 per set

BAKELITE—SHEET ROD AND TUBE—FOR PANELS, KNOBS, ETC.

Higher Insulator than Ebonite, is mechanically stronger, can be machined, takes a high polish, does not crack, warp or discolour with age, and stands the Highest Electrical Test.

WIRES BELDEN MANUFACTURING CO.'S PRODUCTS.

COPPER—Beldenamel DCC SCC DSC, for general purposes and panel wiring.  
Resistance—1A1A, 193 Alloy, Nichrome, etc., for Resistances and Rheostats.

INSULATIONS—MICANITE & INSULATORS Coy. Ltd. PRODUCTS

Empire Cloth and Silk, Leatheroid, Friction Tape, Terminals, Resin Cored Solder, and Fibre Sheet, Rod and Tube.

Obtainable in Sydney from all Wireless Supply Houses or wholesale from the Australian Agents

**O. H. O'BRIEN & NICHOLL (Sydney)**

Phone: City 3302. 37-39 PITT STREET, SYDNEY Phone: City 10592.

OUR STOCK OF "MAR-CO" PARTS IS WORTHY OF YOUR INSPECTION.

**Rado comes to Barraba.**

"Wiles' Wonderful Wireless" is a phrase very well known in the radio world, and recently at Barraba, Mr. R. J. Wiles, of the firm of W. Harry Wiles, demonstrated the wonders of the art which up to the time of his visit had been practically a mystery to the folks in the district. In fact some of them were frankly sceptical and it required a great deal of persuasion and explanation before they were fully convinced that the sweet voice coming out of the mouth of the loud speaker really emanated from a singer in the broadcast studio, over 350 miles away in Sydney. Many and varied were the questions asked and at times Mr. Wiles was hard put to it to explain certain points in language that could be understood. For instance when tuning in amateurs, and the various stations were named one after another, the point over which the listeners were mystified was just how it was possible to tune one particular station in and not hear all the others at the same time. Just try and explain this to someone absolutely ignorant of even the most elementary principles of wireless and you will realise you have tackled no easy problem.

The receiver which Mr. Wiles had with him was the famous 4 valve inverse duplex which is an improvement on the 3 valve receiver described elsewhere in this issue. The aerial was a temporary affair consisting of insulated wire thrown over the bough of a tree and having a height of only 18 feet. Yet on this, the French commercial station at Cayenne (HZA), South America, was heard at loud speaker strength at 2 o'clock in the afternoon. This in a location entirely surrounded by mountains containing large deposits of iron ore was pretty good going.

The local residents were entertained by radio music, and at night danced to the items from 2BL, which were clear and distinct at over 80 yds. from the speaker. The news of these wonders spread quickly all over the district and some of the visitors travelled over 25 miles to hear broadcasting for themselves. The station of the Riverina Wireless Supplies Co., at Waagga (530 miles airline) came in plainly on the loud speaker, and N. S.W. and Victorian amateurs were easily copied.

It is interesting to note that, using the 4 valve inverse duplex receiver, and a loop aerial on a moving car,

Mr. Wiles copied 2BL on a loud speaker as far as Penrith in daylight.

**AMATEURS**

- Prices that will interest you. These are a few of our lines.
- Double Head 'Phones, 2,000 ohm, guaranteed . . . . . £1/5/-
  - Variable Condensers, all sizes in Stock—
  - .001 Vernier . . . . . £1/5/-
  - .001 Plain . . . . . 18/8
  - .0005 Vernier . . . . . £1/4/8
  - .0005 Plain . . . . . 17/-
  - Rheostats, all sizes in stock—
  - 35 ohms, Vernier . . . . . 6/6
  - 35 oms, Plain . . . . . 4/6
  - 6 ohms, Vernier . . . . . 6/6
  - 6ohms., plain . . . . . 4/6
  - Dials—
  - 2 1/2 in., to fit 1/2 in shaft . . . . . 1/8
  - 3 1/2 in., to fit 1/2 in. shaft . . . . . 2/-
  - 3 in., to fit 1/2 in. shaft . . . . . 1/9
  - Crystal, complete, mounted on ebonite bar . . . . . 3/3

POSTAGE FREE.

**GRAY & DIXON**

241 RAMSAY STREET,  
HABERFIELD.

'Phone: U3441.

**FEDERAL APPARATUS**

**NEW SHIPMENT JUST ARRIVED**

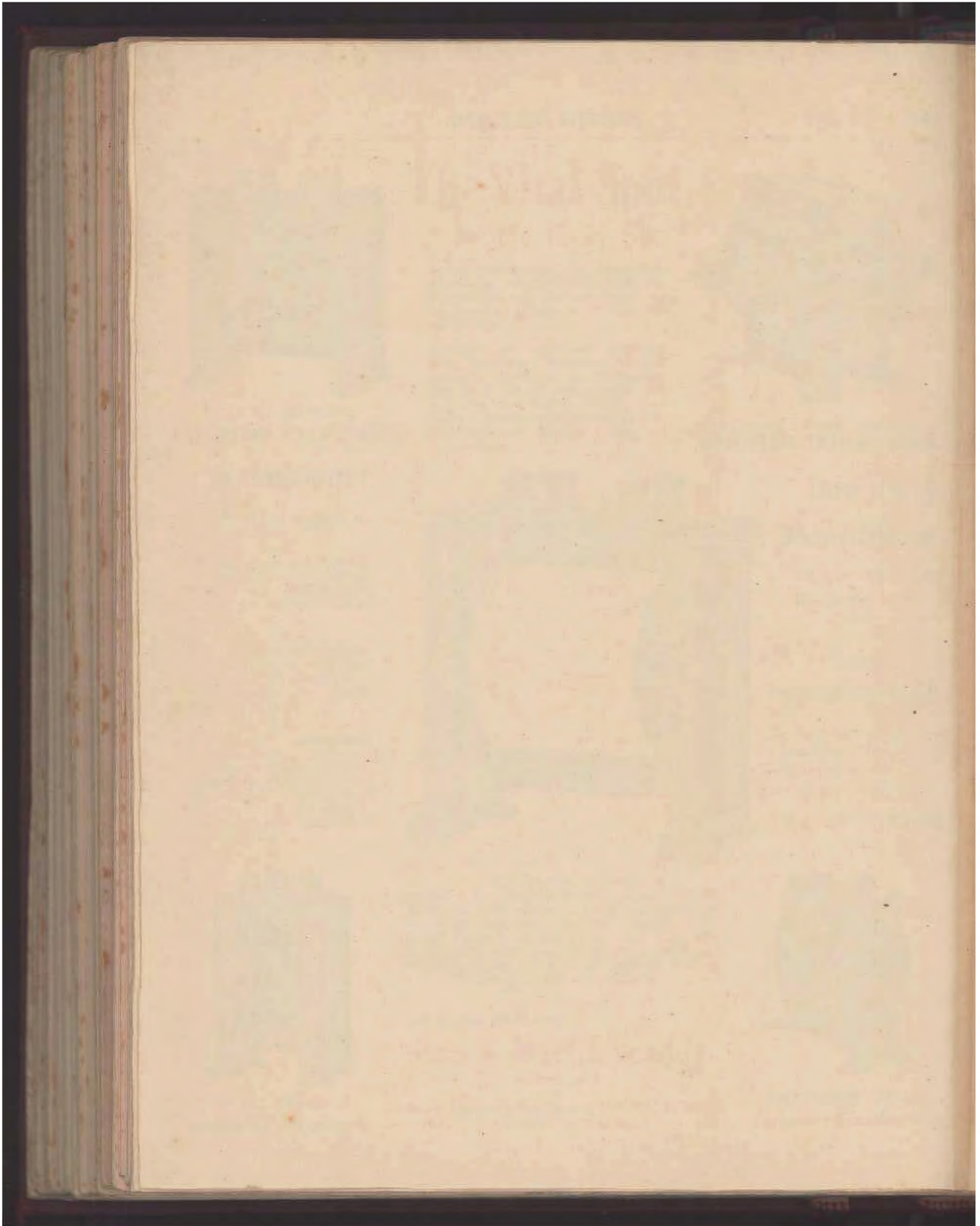
Sockets, panel mounting . . . . . 9/6	Jacks, open circuit, filament control . . . 6/10
Potentiometers . . . . . 9/6	Jacks, double circuit, filament control . . . 8/-
Condensers, 11 plate 26/6; 21 plate 30/-	Transformers, Audio . . . . . 37/6
43 plate . . . . . 39/6	Transformers, Radio 175-600 . . . . . 42/6
Plugs . . . . . 6/6	Knob and Dial, 4in. . . . . 9/-
Jacks, open circuit . . . . . 5/-	Variometers . . . . . 45/-
Jacks, double circuit . . . . . 6/6	Head 'Phones, 2200 ohms . . . . . 55/-
Manhattan Head 'Phones, Special Price . . 30/-	

We also carry **FEDERAL** Meters, Microphones, Chokes etc., for transmitting.

**THE HOME ELECTRIC**  
106a KING STREET SYDNEY

Phone: B 5565

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



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**CONDENSERS VARIABLE**—De Forest, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300, 310, 320, 330, 340, 350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 790, 800, 810, 820, 830, 840, 850, 860, 870, 880, 890, 900, 910, 920, 930, 940, 950, 960, 970, 980, 990, 1000.

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**CRYSTAL DETECTORS**—Kohleg, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300, 310, 320, 330, 340, 350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 790, 800, 810, 820, 830, 840, 850, 860, 870, 880, 890, 900, 910, 920, 930, 940, 950, 960, 970, 980, 990, 1000.

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## BATTERIES.

(By W. J. Zech.)

There are three known methods of producing a current of electricity. The oldest, but one which is of little use except for laboratory purposes, is that of producing an electric charge by means of friction between two suitable substances, such, for instance, as amber and silk. Electricity may also be generated by means of apparatus known as dynamos and generators, but such are beyond the scope of this lecture. The third method, and one with which we propose to deal on this occasion, is by means of chemical action. This chemical action takes place within what are termed primary batteries on the one hand, and secondary batteries on the other. There are numerous types of the former, the best known being, perhaps, the common dry cell. The dry cell consists, essentially, of a negative element composed of a sheet of zinc which forms the outside container of the rest of the cell, and a positive element which takes the form of a carbon rod inserted in the centre of the cell, and separated from the negative element by a paste by means of which the desired chemical action takes place. Between this paste and the negative element an absorbent material is placed, and this has the effect of reducing the internal resistance of the cell, and, at the same time, more or less insulating the negative element from the paste, and thus preventing local action of a destructive nature from taking place.

The paste itself usually consists of a mixture of carbon or graphite, zinc chloride, manganese peroxide, and sal-ammoniac, sufficient water being added to form the mixture into a paste of the right consistency. The cell is filled with this paste to within half an inch of the top, covered with sawdust or blotting paper, and a thin layer of pitch to hold the contents of the cell properly in place. Some makers of dry cells leave a small vent hole in the pitch to allow the escape of any free gases which may be generated by the cell. The approximate voltage of most dry cells is rated at 1.5.

In addition to dry-cells there are also primary batteries of the "wet" type, and the best known cell of this kind is, perhaps, the Leclanche, very commonly used in connection with the ordinary landline telephone. It consists of a glass jar containing a solution of sal-ammoniac, in which is immersed a

zinc rod which forms the negative element of the cell, and a porous pot which contains the positive element in the form of a carbon rod, which is surrounded by a paste similar to that contained in the dry cell just described. The porous pot allows the sal-ammoniac solution to slowly percolate through to the paste enclosed within it thus setting up the chemical action which causes the cell to generate the electric current. Another type of wet cell is the bichromate cell. In this type the negative and positive elements consist of zinc and carbon as before, but the electrolyte is a solution of sulphuric acid and bichromate of potash. The voltage generated by the bichromate cell is a little higher than that of the dry cell, and the Leclanche, and may vary between 1.8 and 2.1. As the actual voltage is dependent, to a certain extent, upon the amount of the negative element which is immersed in the electrolyte, the former may be regulated by providing a means of raising or lowering the elements at will. An important fact regarding this type of cell, and one which should always be kept in mind is, that when not in use, a certain amount of chemical action takes place within the cell, and if this is allowed to continue unchecked, it will eventually destroy the zinc plate.

Therefore, when the cell is not in use, the elements should be withdrawn from the solution altogether.

We now come to another type of battery which takes the form of a secondary cell, storage battery, or accumulator, as it is variously called. Whilst primary cells such as dry and wet cells are manufactured for the purpose of obtaining a certain amount of electrical energy, after which is obtained the cell is of no further use, the secondary cell, or storage battery on the other hand, provides a means of storing electricity, as it were, to be drawn from the cell as desired. An accumulator consists of two or more metallic plates insulated from one another by what are known as separators, and contained in a suitable container, such as a case composed of celluloid or ebonite. The plates are immersed in a solution of sulphuric acid of a certain specific gravity of which more will be said later.

The plates contained in a lead-plate accumulator are composed of lead sul-

phate, and are of two kinds, positive and negative. These positive and negative plates are placed in the container in alternate positions side by side, each with an insulating separator between it and its neighbour, and the number of negative plates is always one more than that of the positives. All the negative plates are connected together at the top, the same is done with all the positives, and each connection is brought to a separate terminal on the outside of the container. To distinguish the positive and negative plates from one another, the terminals to which they are connected are mounted on coloured bases, green for the negative and red for the positive. Also, some makers of accumulators place a red positive sign (plus) alongside the positive terminal, and a green negative sign (minus) alongside the negative terminal. Another method of distinguishing between the plates is to note the colour, the positives being brown and the negatives the familiar greyish lead colour.

When a current of electricity of a suitable amperage is applied to the terminals of an accumulator requiring charging, lead peroxide forms on the surface of the positive plates, and the negative plates become more or less spongy. This action continues until the accumulator becomes fully charged, when a voltmeter test should show the voltage to be in the vicinity of 2.5 per cell whilst still on charge. Immediately the charging current is switched off the voltage of the cell commences to fall until it reaches about 2.2. Then, by connecting the positive and negative terminals to the filament of a valve, to the terminals of a buzzer, or to any other apparatus which it is desired to operate, a current of electricity may be drawn from the accumulator. As this current is drawn away the voltage of the cell commences to fall slowly until it reaches approximately 2 volts, after which the drop is more rapid. When the voltage falls to 1.18 it is time for the cell to be recharged. Any attempt to draw current from it after the voltage falls to 1.18 will probably result in the accumulator being damaged, and, perhaps, ruined altogether. This point is an important one, and should always be kept in mind. The sulphuric acid solution with which an accumulator is

*Continued page 20. Col. 2*

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**HOBART NOTES.**

The "sealed set" is still on everyone's tongue over in little Hobart, but a whisper that the sealed set has "sealed its own fate" has caused great jubilation among all interested in broadcasting and wireless generally.

Hobart now boasts of its "first real wireless shop," as on 7th of May, Mr. J. A. Cooper, opened up an "all radio" shop at 19b Liverpool Street. He deserves great credit for his enterprise and judgment in the selection of his stock. It's just what Hobart has been waiting for—a real live radio man with all that is latest and best in the world of wireless. Mr. Cooper is well known in Hobart, having served as wireless officer on S.S. "Kanna," between Hobart and Sydney during the past 16 months.

During the last few weeks the Hobart branch of the Wireless Institute has been getting some excellent results with loops.

All Sydney stations and Wagga come in very well on a 4ft. loop, made up by Mr. Doubtkin, one of the Institute's most live members.

Mr. R. D. Omay, another Hobart experimenter, has created a great stir among local experimenters by copying Bordeaux (LY) using a piece of "Q.

**BORDEAUX ON CRYSTAL.**

Mr. R. D. Omay, of experimental station 70M, Bellerive, Hobart, Tasmania, had the unique experience of copying Bordeaux (LY) on a crystal detector on several occasions during the past few days.

On Monday morning May 12, Mr. Omay was experimenting with a Cunningham C299 valve and the set was not oscillating when "LY" was being heterodyned by another high power station and was very strong. He (Mr. Omay) switched off his valve and cut in the crystal detector, using a piece of "Q.S.A." crystal, and was surprised that "LY" was almost as loud on it as when the non-oscillating valve was in. Mr. Omay again reports the same results on crystal on morning of 14th, and was able to copy "LY" again strongly. He is willing to illustrate it to anyone should "LY" be working, and the other stations in at the same time to get the "heterodyne" effect. It is about 4 times later that Mr. Omay has had this result and it ought to be easily repeated by anyone caring about getting out in the early hours these frosty mornings. Genuine experimenters only, do not fear such obstacles.

S.A." crystal alone. LY was being heterodyned by another station at the time.

We all await the new regulations, and the turning on of Farmers' long promised 5000 watts of music, etc.

**A CRYSTAL HINT.**

C. Hume, Cremorne, contributes the following.

Owners of Q.S.A. crystals usually find that the crystals lose their sensitivity after being used for some time. When this happens, place the crystal in a dish and put on a gas stove. Apply a fair amount of heat to it and when the crystal turns a little darker in color, remove it and it will be found to be quite as sensitive as when new.

**QUESTIONS AND ANSWERS.**

R.S.H. Campsie: We see no objection to the use of a two electrode valve by a crystal licensee. However we would advise you to write to the Radio Inspector.

Mr. W. C. Hughes, the founder and late Secretary of the Campsie and District Radio Club, has severed his connection with the club, on account of removing his residence from the district.

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**THE LEICHHARDT AND DISTRICT RADIO SOCIETY.**

There was another big attendance of members of the Leichhardt and District Radio Society, at the Eightieth General Meeting, held in the club room, 176 Johnstone Street, Annandale, on Tuesday, May 13th.

The main business of the evening was the delivery of the 7th lecture of the syllabus, Mr. W. J. Zech being called upon to deal with the subject of "Batteries." The various types of primary and secondary batteries were dealt with in detail, and at the conclusion of the lecture members showed their appreciation of Mr. Zech's efforts by accordng him a vote of thanks by acclamation.

It was announced that a "sale and exchange" evening would be conduct-

ed on the following meeting night, when members would be at liberty to bring along with them any gear which they wished to sell or exchange.

On Tuesday next, Mr. F. Lett will lecture on "Radio Frequency Amplification," in accordance with the syllabus, and in addition to the lectures already arranged, Mr. R. C. Caldwell has stated his willingness to lecture on "Tuning," an offer which will be availed of by members in the near future.

Inquiries addressed to the Hon. Secretary, Mr. W. J. Zech, of 145 Booth Street, Annandale, will receive prompt attention.

**ILLAWARRA RADIO CLUB.**

At the 47th meeting, held on 6th inst., a further report was made on the progress of arrangements for the club's forthcoming wireless demonstration. Permission has now been obtained from Messrs. Farmer and Company for the use of their broadcasting service for the demonstration, and the Western Electric Company will instal complete receiving gear, including their special system of loud speakers for the occasion, and are also lending the services of their expert to operate same. The club has good cause to

congratulate itself upon having been able to make such excellent arrangements, which point to an unqualified success resulting, as under these conditions the demonstration will be one of absolutely first class order in the way of broadcast entertainment, and it is doubtful whether a demonstration under similar conditions has ever been held outside the metropolitan area before. The entertainment, which will comprise wireless music from Farmers and Wireless, and everything is in training for a most successful issue. Tickets and handbills have just come off the press, and will be out for sale and distribution in a day or two. A special meeting has been called for the purpose of forming working parties of members for the purpose of making a thoroughly systematic canvass of the district for sale of tickets and distribution of bills, and in view of the objects at stake it is

The necessary Departmental permission has, of course, been obtained from the Chief Manager of Telegraphs and Wireless, and everything is in training for a most successful issue. Tickets and handbills have just come off the press, and will be out for sale and distribution in a day or two. A special meeting has been called for the purpose of forming working parties of members for the purpose of making a thoroughly systematic canvass of the district for sale of tickets and distribution of bills, and in view of the objects at stake it is

Continued on page 18

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## FROM THEATRE TO YOU VIA RADIO "2BL."

By R. A. McIntosh.

Compared with reported progress in other countries, broadcasting has scarcely commenced in Australia, but yet a little "peep behind the scenes" at 2BL will no doubt be of interest to the many experimenters and listeners-in who read *Wireless Weekly*.

Most people know that, in plain language, broadcasting is actually the collecting of sound and, we might say, scattering it far and wide by wireless so that it might be heard by anyone possessing the necessary apparatus. But how many times do you think those original sound waves are actually transformed before they finally are heard by you in the form of a wireless broadcast concert?

At the Lyceum Picture Theatre, suspended in mid-air, just forward of the dress circle, is a small round object which is the microphone.

This microphone's special duty is to convert all air vibrations or sound waves which come its way into electrical impulses, varying in strength and proportion in exact accordance with the nature of the sounds which generate them. And when it is considered how small a proportion of the total sound in the great hall is used by the microphone to generate these electrical impulses, you may imagine how very sensitive it must be!

The placing in position of the microphone—the heart of the broadcast station, so to speak—is quite an important item, and in a theatre, many obstacles need to be overcome before good clear music and speech will result.

Not the least of these troubles may be caused by echoes from walls and ceiling and articles in the building and at times these echoes produce what resemble false notes and discords to the listener-in.

In the broadcasting station's studio, the ceiling is draped and the walls are covered with two or three thicknesses of heavy curtain, while the floor is heavily carpeted. This all helps to deaden sound and thus prevent any echo and consequent distortion. But not so in the theatre, however, and as a result, broadcasters, the world over, are experiencing the same great trouble which indeed makes the perfect reproduction of theatre music rather difficult.

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That this fault will eventually be overcome is the belief of the writer, and in the very near future a microphone may be evolved which, so long as it is placed where any human ear can hear distinctly, will perform its duties without undue care being taken to select special positions.

At the Lyceum Theatre the leads from the microphone conduct the feeble electrical impulses to an amplifier of special design which, of course, is hidden from view for convenience of operating. This amplifier is designed to magnify, with as little distortion as possible, these minute microphone currents before they are transmitted over a private telephone line leading direct to the broadcast station switchboard.

At present three valves are used in this amplifier, but results, although as yet merely of an experimental nature, seem to indicate that at least four valves will be needed to give the strength required to operate the transmitter. In fact experiments already completed prove that for clearest transmission even greater amplification at the theatre would be preferable as the static and stray noises picked up by induction on the land line would then be relatively weaker than the transmitted music, when received ready for being broadcasted.

At the station the Lyceum line, together with others from various places, terminate at the line control board. Here, by means of a system of plugs and switches, the announcer can hear what is happening on any line he chooses. Besides this board in the studio, a little lamp glows and indicates that 2BL is on the air. A red lamp illuminates a sign "silence," and borrowing the announcer's phones we realise the need for these precautions.

Every sound in this studio can be heard in the phones; even the rustle of clothes or breathing or the faintest whisper. The very air itself seems alive, and we feel the living presence of thousands of listeners who are tuning in ready for the night's entertainment.

Between items broadcasted from the studio, a line becomes "alive." Chatter of many voices and laughter is heard and a boy calls "Eskimo Pie—

Ice and chocolate-ice-cream blocks, etc."

It is one minute to eight and snapping a switch the announcer speaks: "2BL here—the Lyceum will now entertain you."

Another switch and Lyceum is "on the air."

In another room close by is the wireless transmitter itself. Practically no sounds are heard here either, except, perhaps, the hum from outside in the motor house, where a generator supplies the high voltage current to operate the station.

Numerous measuring instruments and bright lights tell us plainly that the ether waves are at work, carrying their messages of speech, song and music to the unseen audience, and the operator nearby, listening in on a small testing instrument, lets us hear distinctly the sounds as they would be at our own home!

Once leaving the studio, the electrical impulses must again be further amplified enormously before they are capable of modulating the continuous train of waves being sent out by the transmitter. The effect of this now greatly magnified microphone current is really to strengthen or weaken this continuous train of waves leaving the aerial-earth system in exact proportion to the original air vibration at the theatre, and it is this variation in the strength of wave that you receive at home that allows you to hear that which your receiver has converted into sound or air waves once more.

### BOOKS ON WIRELESS

**More Practical Valve Circuits**, by J. Scott Taggart. Price 4/10, posted.

**Wireless Sets for Home Construction**, by E. Redpath. Price 3/9, posted.

**500 Wireless Questions Answered**, by C. Kendall. Price, 3/9 posted.

**Pictorial Wireless Circuits**, by O. Rankin. Price 2/3, posted.

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Continued from page 16.

confidently expected that every member will put his best efforts into the movement, as it is something which is in every respect, "worth while."

If the show is the great success—which it has every indication of being—the Illawarra Radio Club need never look back, for it will then be in a position, financially and otherwise, of forging ahead strongly and more rapidly than ever, and of being of some real and practical service to its members and the experimental movement generally—so, "here's hoping."

At this meeting Mr. Graham (delegate) reported the result of the last meeting of the Radio Association, when the affairs of that body had been wound up, in view of need for one central body and the fact that most of the clubs in the Association had now interested themselves in the Wireless Institute's affiliation scheme. Mr. A. Atkinson (Association Secretary), also spoke of the Association's activities during its term of existence. He said the Association had well filled the gap in the absence of some better

scheme, and had accomplished a lot of good in a quiet way. He endorsed the Institute's scheme, which would carry on where the Association had left off, and he thought that every confidence could be placed in the Institute to look after experimenters' interests under the affiliation, which he considered would bind the whole experimental movement together and result in much good.

The syllabus of lectures was again discussed, and many endorsed the necessity for a scheme of this kind being put into operation, whereby the whole subject of wireless from the elementary to the advanced stages could be dealt with in proper sequence by a progressive syllabus of lectures. Owing to the committee being fully occupied at present with the entertainment, the syllabus has been temporarily deferred, but it has been decided to put same into operation immediately the Club entertainment is over.

The remainder of the evening was spent in buzzer practice and general discussion.

The next meeting will be held at

the club-room, 75 Montgomery Street, Kogarah, on Tuesday, 20th May, at 8 p.m. All members are particularly asked to attend, especially in connection with the approaching demonstration.—W.D.G.

#### CONCORD AMATEUR RADIO CLUB.

The above club held its usual weekly meeting at the club room, Euripides, Wallace St., Concord, on Thursday, May 8, at 8 p.m., when a very interesting evening was spent by all present.

The attendance at this meeting was again excellent. The Vice-President, Mr. Stephenson, took the chair and business was proceeded with briskly.

The management committee held a meeting on the 7th May at Station 2CM, where it went to obtain latest details on construction of transmitters. We have to thank Mr. C. D. Maclurean for the presentation of a set of chemical rectifiers for our transmitter.

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Mr. Macfarlan showed us the latest American tracer which he collected while over the other side. We also received a few hints on aerial construction, aerial outfit and radiation current.

All communications should be addressed to W. H. Barker, Wallace St., Concord.

**CAMPBIE AND DISTRICT RADIO CLUB**

A well attended meeting of the above club, was held on the club-room "Graveyard Hall," Beamish Street, Campsie, on Wednesday, 7th May, at 8 p.m. The President, Mr. R. Shelton, occupied the chair.

The minutes of the previous meeting were read and confirmed.

Mr. Rogers, a local experimenter, then commenced the first of a series of lectures on Elementary Electricity and Magnetism, which proved very interesting and instructive.

Mr. Rogers then operated his 3 valve receiver on the Club's aerial, reception being all that could be desired. The meeting closed at 10.15 p.m.

The Hon. Secretary, E. R. Manson, "Daisydale," Wonga Street, Campsie, would like to hear from local experimenters.

**THE WIRELESS INSTITUTE OF AUSTRALIA.**

South Australian Division.

The monthly meeting of the South Australian Division of the Wireless Institute of Australia was held in the Prince of Wales Lecture Theatre, Adelaide University, on Wednesday, May 7th.

There was a large attendance of members and friends. Mr. R. B. Caldwell (President) occupied the chair, and in opening the meeting said that he was pleased to see so large an attendance.

The resignation of Mr. G. A. Miller Randle from the Council was received with great regret by all present, and the Secretary was instructed to for-

ward to Mr. Randle a letter thanking him for his past services.

A letter was received from Mr. McLeod, of Red Hill, Brisbane, stating that he had heard music on the 22nd inst., at about 9 p.m., and had reason to believe that it was transmitted from a South Australian or a Victorian station. A voice was heard announcing that the programme was being transmitted from "Wireless (static) Commonwealth Buildings," static drowned the rest of the speech.

At the termination of the programme the announcer called for a report from Mr. Harper, after which he called 5BQ and suggested arranging a time for a test.

It is believed that this transmission was from the experimental station of Wireless Supplies, Ltd., Commonwealth Buildings, Sydney.

A letter was received from the Secretary of the Western Australian Division, stating that the Dr. Clapp's expedition, which is preparing to explore the Kimberly District, W.A., in search of oil, is equipped with a 1/4 K.W. Marconi quenched spark transmitter, the call sign is 6EB, and wave length 600 meters. We shall be pleased to have reports from anyone hearing this station.

A letter was also received from the N.S.W. Division, stating that with our co-operation the restrictions on the use of regeneration may shortly be modified.

Two new members were admitted and four more applications received.

Mr. T. S. Bagshaw was elected to fill the vacancy on the council caused by the resignation of Mr. Randle.

Mr. Harry Kauper, 5BG who recently returned from a visit to Europe and America, gave a very interesting lecture on the ST100 circuit.

Mr. Kauper took great pains so as not to miss any of the minor details of this circuit and his explanation of its many tricky points were given with the thoroughness that is characteristic of Mr. Kauper.

During the course of his lecture he stated that he had given up buying ebonite panels for receiving sets, as this comes too expensive when one is always wanting to try some new circuit, when wanting a new panel he knocks the end out of a petrol case and uses this, other experimenters might well try this.

At the close of Mr. Kauper's lecture the President stated that it had come to his notice that Mr. Kennedy, the State Engineer to the P.M.G.'s Department, W.A., was present as a visitor and a hearty welcome was extended to Mr. Kennedy, who in reply stated that he thought that he was un-

known at the meeting, but was pleased to receive so hearty a welcome.

Mr. Kennedy illustrated some points in the ST100 circuit on the blackboard and gave some of his experiences with transformers.

A hearty vote of thanks to the speakers, brought to a close a very interesting and instructive meeting.

**WIRELESS INSTITUTE OF AUSTRALIA.**

New South Wales Division.

**ALL EXPERIMENTERS' NIGHT**

*Important Preliminary Announcement.*

Experimenters will welcome the news that Mr. Ales Hector has consented to give another lecture under the auspices of the Wireless Institute of Australia, N.S.W. Division, in the Assembly Hall of the Education Building at an early date.

The subject will be: "Radio activity—its educational value." The precise date will be announced at the earliest possible moment and all experimenters and members of radio clubs are cordially invited to attend.

Watch carefully for the next announcement of this popular lecture.

The monthly meeting of the New South Wales Division of the Wireless Institute of Australia was held at the Royal Society's Hall, on Thursday, 15th May. Dr. W. G. Woodnough, D.Sc., delivered a most interesting lecture on "Waves, electrical and otherwise." He explained the source and action of waves of various natures, and drew attention to the great scope existing for experimental investigation in connection with electro-magnetic waves of the length usually used in connection with radio. The complete success of this meeting which was the first of the present session, leads us to look forward to a particularly successful year and while last year was by far the most important in the history of the Institute in connection with both its activities and with its success, indications are that the next year will far surpass the last session in every respect.

*Delegates' Council.*

In connection with the meeting of the Delegates' Council, which has been called for Tuesday, 27th May, at the offices of the Wireless Institute, 2nd floor, 82 Pitt St., Sydney, at 7.30, it is well to draw attention to the fact that matters are now on sound footing and the affiliation scheme is going rapidly ahead. Many of the radio clubs have already completed their bonds of affiliation and are therefore entitled to representation on this council, and those who have not yet finalised matters are urged to do so at the earliest

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possible moment so that they may take part in the deliberations from the start.

The affiliation scheme has been chosen to enable every experimenter to express his opinion in connection with any matter that may effect the status of experimental wireless, and although this movement has been fostered by the Wireless Institute of Australia, N.S.W. Division, it must not be thought that the Institute will endeavour to coerce experimenters in any way. The Institute has always stood for the best interests of wireless and will continue to use its power and influence to protect the interests of the amateur. So that they may not be unrepresented in any action which may be taken in the early stages of the movement every experimenter is urged to see that his club becomes affiliated under the scheme and that his delegate is present at the first meeting.

*Continued from page 12*

filled, should be of a specific gravity of about 1.2, but this varies somewhat with different makes of cells, the manufacturers of which usually state on the outside of the accumulator the specific gravity of the acid to be used. The plates should always be well covered with the acid solution, and any reduction in same caused by evaporation should be made up by adding pure distilled water to the cell. On no account should ordinary tap water be added, as this frequently contains impurities which would be detrimental to the well-being of the accumulator. In the event of any of the acid being spilled through the upsetting of the cell, then more acid should be added to make up the deficiency. To prevent corrosion of the accumulator terminals due to the action of the acid, it is a good plan to coat same with a very thin covering of vaseline.

The capacity of an accumulator, that is the amount of current with which it may be charged, and, consequently, the amount of current which may be drawn from it, is measured in what are known as ampere-hours, and depends upon the number and size of the plates which it contains. For instance, a cell having a capacity of 20 ampere-hours will give a current of one ampere for a period of 20 hours provided that the rating of the accumulator provides for continuous use for

that period. If the rating be ignition or intermittent the capacity of the cell is approximately doubled. In actual practice it will be found that the rating is somewhat overestimated as to draw a current of 1 amp. for a period of 20 hours, from 20amp. hour accumulator, with a continuous use rating, would mean totally discharging the cell, which, as has already been pointed out, would ruin it. Also, there is a limit to the amount of current which may be drawn from an accumulator at one time, this limit being about ten per cent. of the total capacity of the cell. That is to say, if an accumulator has a capacity of sixty ampere-hours, not more than six amps. should be drawn from it at one time.

There are other types of secondary cells, amongst them being the Edison cell, which consists of plates composed of nickel immersed in an electrolyte of caustic potash, and the Fuller's Block accumulator which, although a lead-plate accumulator, is of different construction to that described already. The Exide people also make a storage battery consisting of cylindrical lead plates, this type being made up in a number of units sufficient to supply a more or less high-tension voltage for use in the plate circuits of valve sets.

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