THE WIRELESS WEEKLY

A Journal Devoted to the Interests of Wireless Enthusiasts both Amateur and Professional

OFFICIAL ORGAN OF THE AUSTRALASIAN RADIO RELAY LEAGUE.

Vol. 3. Friday, February 15, 1924. No. 19

Broadcasting and the Experimenter

During the months of bitter controversy over the sealed receiver question, Broadcasting has been the main topic of conversation. The experimenter and his doings have willy nilly been thrust into the background—so far as the public is concerned. The true experimenter, carrying on his ceaseless search after knowledge, is essentially modest and has little to say. Yet, night after night he goes on piling up fresh records, crossing the wide spaces with his little 10 watter, always seeking, seeking, seeking for better results. The high standard of present day Broadcasting is largely due to the discoveries of experimenters. One day the public will realise the big debt it owes.

Roster for Week ending 20th February, 1924

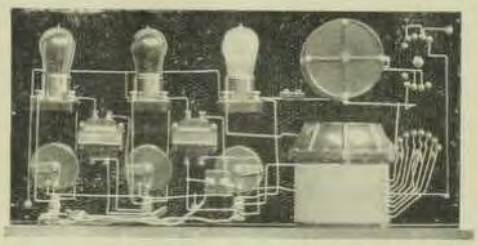
	7.30 to 8.0	8.0 to 8.30	8.30 to 9.0	9 to 9.30	9.30 to 10
Thur, Feb. 14	2 RA 2 GR	2 IJ 2 JM	2 AR ZC	2UW	2 YI 2ZZ
			2 AR	2 ZN ..	
Friday, 15	2 IJ 2 GR	..	..	..	.. ..
				.. ..	
Saturday, 16	2 RA 2 GR	2 IJ ..	..	.. ..	.. ..
Sunday, .. 17	2 RA 2 GR	..	..	.. ..	.. ..
Mon., ... 18	2 RA 2 GR	2 IJ ..	..	.. ..	.. ..
Tues., ...19	2 IJ ..	..	..	.. ..	.. ..
				2 ZN ..	
Wednes., ...20	2 RA 2 GR	2 IJ ..	2 VX	2 UW	.. ..

2 DS works with 2 CM as 2 CDM Testing on Trans-Pacific Test Set

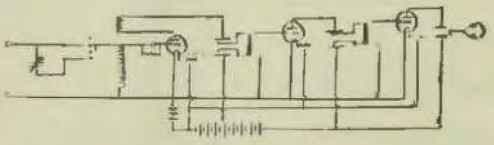
WIRELESS WEEKLY CUP COMPETITION

EXAMPLE SET

1. Completed Set



2. Interior of Set



3. Circuit Diagram

THREE VALVE EXPERIMENTAL SET.

This set consists of 24 x 12 Bakelite Panel; a vario-coupler, with a wave length range from 200 to 1500 metres; a .001 mfd. variable condenser, with vernier adjustment; series parallel switch, switch and studs for varying the wave length; one 6 ohm. rheostat, and two 30 ohm. rheostats; jacks and plugs to enable the use of one, two or three valves; 2 Jefferson transformers; one UV-200 radiotron valve and two UV-201A radiotron valves; 3 bezels, set in panel; 2-40v. Ever-ready high tension batteries are placed inside cabinet, the connection being made with flex and Morse clips; all insulation throughout is of the best Bakelite.

COUNTRY COMPETITORS

Reports from Radio Clubs and dealers in Wireless Apparatus indicate that several sets for the Wireless Weekly Cup Competiti on are in course of construction. Enquiries from a number of places in Victoria and N.S.W. have been received. Country radio enthusiasts appear to have made an early start. The closing date for entries will be announced later.

Intending competitors will be well advised to send their nominations early.

Photos. of sets should be printed on glossy paper and the diagrams of the circuit should be drawn in ink. The circuit of the set must be shown.

The diagrams need not be elaborate, but should show clearly the wiring and all necessary details.

What is Required.

Competitors are required to submit:

1. One photo. not less than 4in. by 3in., showing the set complete.
2. One photo. not less than 4in. by 3in., showing the wiring of the set.
3. An ink diagram not less than 4in. by 3in., showing the circuit and wiring.
4. A small paragraph of not more than 100 words describing the set.
5. The nomination form shown here, witnessed by a member of the committee of a radio club or any trader advertising in Wireless Weekly, or a local J.P.
6. Entries should be addressed to the Editor, Wireless Weekly, 33 Regent St., Sydney, N.S.W., and marked "Wireless Weekly Cup Competition" in the bottom left hand corner.

Great interest and enthusiasm is being shown in this competition, and the number of enquiries received from other States shows that much importance is attached to the result.

It will be not merely the general appearance of a set that will be judged, but also the method of wiring, placing of the various parts, and the efficiency of the circuit submited. In fact, the winning set will be as nearly perfect as is possible, so it is up to every competitor to put absolutely the best work into his outfit.

NOMINATION FORM

I ..... of

..... desire

to enter my ..... set in

Wireless Weekly Cup Competition. I agree to abide by the conditions set down by the proprietors, and I solemnly declare that I am a wireless amateur as defined in page 2 of W.W. No. 15, Vol. 3, of January 18, 1924.

(Signed) .....

Witness .....

WIRELESS TRAGEDY

Special Appeal to Experimenters

A Fund Inaugurated

Hardly any wireless experimenters have not heard of the unfortunate accident which occurred recently, and which resulted in one of the State's keenest wireless experimenters losing his life.

The fatality was all the more distressing owing to the fact that it was witnessed by his wife who was at his side during the carrying out of the tests, and almost within the hearing of his little daughter, who, in a childish way, always worked with her father.

The fund which has been inaugurated by Wireless Weekly in aid of the dependents of the late Mr. Moore has been well supported, but perhaps not to so great an extent as might be expected. There are thousands of wireless amateurs in the State and to these an appeal is again made for help.

Mr. Moore's death has left his wife and two kiddies in need of help. We are all proud of the wireless movement in Australia, we look upon ourselves as a body of men above the general average. Let us show by our practical sympathy that we are a solid and a sympathetic body of men.

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

No amount need be considered too small. Whatever your donations may be, send it along at once to either Wireless Weekly, 33 Regent St., Redfern, or to Mr. Phil Renshaw, Box 3120, G.P.O., Sydney.

The whole of the wireless apparatus belonging to the late Mr. Moore is on sale at the shop of Miss Wallace, Royal Arcade, Sydney, where all experimenters are recommended to call and see whether there they cannot find something they require and thereby help his dependents.

The Late Mr. F. L. Moore

If it is not sold at the auction sale on the 6th of this month, there will be a short wave receiving and transmitting 4 cage aerial for sale; 70 ft. complete with telescopic top mast; one of the finest in the State.

Contributions to date:

	£	s	d
Proprietors Wireless Weekly	5	0	0
United Distributing	10	10	0
Mr. Quaife	0	10	0
Wireless Weekly Staff ..	1	3	6
P. Renshaw	3	3	0
Mr. Jones	0	10	6
G. Taylor	1	1	0
J. W. Robinson	1	1	0
F. Basil Cooke	1	1	0
O. Sandel	1	1	0
Mr. Allsop	0	10	6
Mr. Saunders	0	10	6
Robert H. Doyle	1	1	0
Miss Day	0	10	6
A. F. Price	0	10	6
R. C. Marsden	1	1	0
A. Dare	0	10	6
M. McIntosh	0	10	6
Colville Moore	1	1	0
—. Herker	0	5	0
—. Sanders	0	1	0
Concord Radio Club	0	10	6
V. J. M. Darby	0	12	6
Wireless Institute	5	5	0
J. Usher	0	5	0
D. T. Hinchen	5	0	0
R. W. Faulkes	0	2	6
G. A. Taylor	1	1	0
A. Dixon	1	1	0
J. Lendlaw	1	1	0
C. Storm	0	15	0
H. Carter	0	5	0
A. Larkin	1	0	0
E. Mason	0	5	0
N. Ambrose	0	3	0
Total	£48	18	6

How to Learn to Send the Code.

By "Old Timer."

The following article was written by an ex-ship operator, who was one of the fastest and most copper-plate senders on the Australasian vessels. To those experimenters who are aiming at valve or transmitting licenses, this article will prove a real help.

Why are there not more "crack" senders about?

Why does it so often seem to the "Listener-in" that a great number of operators use a brand of Morse of their own, instead of adhering to the conventional symbols of the International Code?

When it is considered that there are but 26 letters in our alphabet it is a matter for regret that our telegraphy standard is not higher. But then, again when this efficiency standard is analysed, we find that the respective experimenters' acquisition of operating knowledge has been largely left to himself. He has had no one to point out the many pit falls that beset the path of the young operator, and the marvel of it is the fact that he had done so well in spite of the absence of competent instruction.

Now, naturally each and every one of us are keen to become expert operators, to be able to send "copper-plate Morse," to have the ability to transmit in such a way that 9ABC will say to 9XYZ, "Gee whiz, that man at 8JKL is a wonderful sender, isn't he?" And 9XYZ not only heartily agrees, but secretly is envious of 8 JKL'es ability to "punch" a key in a manner that causes such general admiration.

We can all be crack operators if we start right. So let us start in the proper way. Here's the secret.

When learning to send keep this thought ever before you—that the muscles and nerves of the wrist and arm have never been used before in the peculiar manner demanded of them when sending. Get that fixed—it is most important, because upon that foundation only can we erect our super-structure which in this case is to be a perfect sender. Then couple with that this fact. . . . That perfection in most cases is 99 per cent. perspiration, so be prepared to be advised to practice not only consistently, but in the proper way.

Now, to get down to "brass tacks." It is first of all very necessary that you should commit the code to memory. There are many different methods advocated, but personally I think that there are not so many letters in our alphabet to learn that by taking but six characters a day they cannot easily be mastered in four days. I have known dozens of enthusiasts who have had them all off "pat" in but twenty-four hours, so I am assuming that you already know your code, and are ready to make a start with the actual manipulation of the key.

One of, if not the most important rule, in sending is to "send slowly"; in fact if 99 rules for learning to send were drawn up, the first should be to "send slow" and rule 99 "send as slow as ever you can." You may well ask why. It all goes back to that fact that the muscles and nerves first spoken of. Anything that is calculated to produce any strain on the wrist and arm in the initial stages of sending must at all costs be avoided.

Take the case of an athlete training for a 3 mile race. Does he go out on the first day and run that distance? No fear. If he did he would get muscle bound. He knows that any abuse or strain of the muscles will inevitably re-act upon himself, so he gradually works up to that distance by easy stages until finally he arrives at the goal he originally aimed at. So it is with operating. Work up by very gradual stages to the ultimate goal of perfection. We have all experienced varying emotions when first we took hold of a key to send. After trying for about three minutes the arm felt as if it had been pushing a ten ton lorry about, so tired was it. Yes, look at the key, it's only a little thing, with a small spring but the fatigue it produces is ample proof that for a start we must proceed carefully. The very moment you feel the wrists tiring—stop. That is nature's danger signal that the wrist is tired and being strained, so the one thing to do is to rest awhile. By closely adhering to that rule you will find that the intervals of fatigue will become further and further apart until finally you will be able to send for hours without experiencing any symptoms of undue fatigue.

Listen carefully to your sending. Do not be satisfied with an imperfectly formed letter. Remember that it is easy to get into a slovenly style of sending and once the habit is formed so very hard to break. So start right. When you make a letter badly go back, keep at it until it is perfect. While listening carefully to your Morse you can tell when and where you are faulty just as though you had the very best teacher in the world seated at your elbow.

The Code itself as we all know is composed of dots and dashes, each letter possessing a characteristic cadence of dots and dashes peculiar to itself alone. Taking the dot as unity the dash is usually the length of three dots. It is desirable in practice to make the dash a little longer than the prescribed three dots, because this not only makes it an unmistakable dash, but gives the sender individuality which should ever be a characteristic of manual sending. Every dot and dash should be made firmly and with a separate movement of the wrist. Take hold of the key as though you mean business and are not there to trifle with the outfit. No hard and fast rule can be laid down regarding the proper method for holding the key, because everyone's hand differs in size. The orthodox way is to sit fair in front of the key, placing the index and second finger on top of the knob with the thumb lightly grasping the knob at the side, and with the remaining fingers drooped along the other side to give the hand the proper balance. Beginners will of course vary this according to the demands of their own hand. Now practice slowly. Do not lift the finger from the key from the time you start to make a letter until you have finished it. Listen to what you are doing. This is inserted to emphasise its importance. Stop when the wrist is tired, otherwise your sending will become heavy and sluggish. You should ever aim at being a bright, snappy sender, and this can only be brought about by observing those rules already enunciated. For a start do not practice for more than half an hour night and morning at intervals of five minutes. You will soon feel when you can do more, but that is

ample for the first fortnight. Above all do not worry about speed. Speed is only a secondary consideration. Remember that there is the man at the other end who has to read your signals, so the first thing is accuracy. It is ever so much better to be a perfect sender at 20 words a minute than an inferior sender at 33 a minute. The first is admired and talked about, while the second is often reviled and indeed is invariably the subject for jokes. So first of all be a perfect sender by always transmitting well within your limits.

Another one of the hall marks of a crack sender is the way he spaces. You have often heard it said "that you have only to put the pencil on the paper and the stuff writes itself down." That is largely because of good spacing. Make the space between your words of such a length that the receiver unconsciously will read by words, and not by letters. This not only makes it three times as easy for the receiver, but stamps you as being a first class sender.

Adapt yourself to the man at the other end. If he can only receive 15 a minute, don't send 20. A good sender is very patient with his less enlightened brothers and in any case it greatly expedites any work you might have to shift, not to mention the kindly feeling others will have towards you as being not only a good operator, but a considerate one, both greatly to be admired. By sending slowly, watching your spacing, listening to your sending, stopping when tired, refraining from speeding, and constantly practicing slowly, you will finish up a crack sender.

The Difference Between Spark and C.W.

By "Old Timer."

The main difference between spark and C.W. transmission lies in the fact that in the former the train of oscillations due to one spark, dies out after a few oscillations, whereas with C. W. the amplitude of the oscillations is kept at a steady value by a constant supply of energy. In the case of spark transmission the trains of oscillations occur at an audible frequency and when set up in a receiving circuit, need only to be rectified to produce audible sounds in a telephone.

With C.W. reception the oscillations are continuous and in order to make their effect audible in a telephone receiver, they must be broken up into groups by a mechanical interrupter or by superimposing on them a slightly different frequency of oscillations, so that together they will produce beats. These beats when rectified produce telephonic signals. This latter method is called the "Heterodyne."

Free Medical Advice to Seamen by Radio.

To the list of United States Public Health stations and the United Fruit Co.'s hospitals offering free medical advice to vessels at sea by radio has been added the United States Marine Hospital No. 14, at New Orleans, La. Calls upon the hospital may be made through the naval radio station at New Orleans, La., by vessels in the region in the Gulf of Mexico. Call signal, NAT.

It is now more than a year since the occasion of a Franco Czecho-Slovakia Radio Congress, Mr. Stranad, chief counsellor of the Czecho-Slovakian Ministry of Telegraphy, speaking in the City Hall at Prague, proposed a national radio central, which should be capable of connecting Czecho-Slovakia directly with all the other nations in Europe. Since then, work has been started, and the enterprise has been pushed with such speed that recently the smallest of the several transmitting stations has been opened for public service.

Soldering Flex Leads

Of all the little jobs that we are called upon to do when making repairs or alterations in the wireless set, that of soldering flexible leads is probably the worst done by the majority of experimenters. Yet it is really a very easy business if it is tackled in the right way.

There are of course two sorts of flex. The ordinary type consists of a number of strands of thin bare wire cabled together and provided with one or more layers of insulation. The other kind also contains numerous fine wires, but instead of their being bare each is separately insulated.

Now, whichever type of flex you may be dealing with it is important that all the strands should be soldered. This is particularly of moment in the case of "Litz," for if any strand is broken or left out of the joint, serious high frequency losses will result.

With ordinary flex it is easy to scrape off the outer covering and then to unwind the inner layer of silk which covers the wires. But Litzendraht cable is a different proposition altogether. To endeavour to bare each of its forty or more strands by hand is a task that is beyond the patience of most people. The best method is to singe this insulation, taking care not to use more heat than is necessary; it can then be rubbed off with the fingers.

Once the wires are bared they should be twisted together as tightly as is possible without breaking them; they must then be dressed with flux'te. Into an iron teaspoon put a quantity of small chips of solder and melt in the flame of a spirit lamp. When the solder runs plunge the twisted end of the flex into it, and withdraw. It will then be found that the strands are firmly bonded together with solder. It is the simplest matter to solder them thus united to the terminal or valve pin to which they belong.

R. W. H.

Ratification has been made of the contract between the French Compagnie General de Telegraphie Sans Fil and the Russian Electric Trust, according to cable advices from Trade Commissioner Butler, at Paris. The agreement provides for the installation of wireless stations and manufacture of apparatus in Russia.

A Super-Sensitive One Valve Receiver.

One of the most interesting and spectacular circuits for a single valve may be constructed for holiday use; it may be used in a car or at camp and requires little or no aerial. The circuit is the adaption of two Armstrong principles and really produces distance and clarity for a small constructional cost.

The success of any circuit depends upon the constants used, particularly this one which would seem to be a standard regenerative circuit, but is completely changed by a large tickler and variable grid leak.

Due to great flexibility, the circuit will work equaly well on phone, C.W., I.C.W., and spark, which will insure all classes of service no matter where you are.

This one valve circuit set up in a car with a 4ft. aerial is equal to a three stage radio frequency amplifier and detector. Due to the short aerial used it is possible to receive through bad static (QRN) and for this reason alone is of considerable value during the sumer months.

Description of Apparatus.

The two best valves to use are the UV-199 and UV-201A. The rheostat should be of that resistance advised by the makers of the valves. The "B" battery can be anywhere from 45 to 90 volts. The two fixed condensers .00025 and .002 should be of the mica type. The variable condenser should have from 17 to 23 plates (.0003 to .0005mfd.).

The variable grid leak is important and should be variable over a range of from 50,000 to 5 megohms. Several commercial types that were tried did not have the correct range, so it might be advisable to build your own, and for that purpose purchase a small roll of Dennison's Black picture binding paper tape the dull black surface of which is slightly conducting and can be readily lowered with a very soft lead pencil. This grid leak can be arranged with a sliding arm or switch and contacts, but it must be variable over a wide range and capable of fine adjustment.

Like the grid leak, the coupler is of special design and the following values should be adhered to. The best combination to use is the rotor and stator of a standard coupler wound as follows, the tube (stator) should be wound with as large a wire as possible, starting with 20 turns on the rotor side of the tube and tap off every 10 turns until you reach 120 turns, with 11 taps.

The rotor is also a real job, for it is tapped in a similar manner. Start on one side of the rotor with 40 turns and tap off every 10 turns until you have wound on 120 and you will have nine taps. These taps can be passed through the rotor shaft to switch points on the panel, or a switch may be mounted on the rotor. Fine wire may be used on the rotor to accommodate the 120 turns necessary.

A warning is issued against the use of shellac on the windings; firm windings may be obtained by drilling holes at each tap and binding the wires in them.

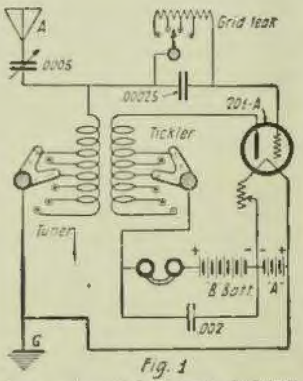


Fig. 1

This is an Improved Form of Ultra Regenerator in Which a Super Regenerative Action is Obtained. If Properly Adjusted, the Variation Frequency is Super-Audible.

Do not use honeycomb coils. Either double or single switch arms may be used, and 180 degree type of coupler. Do not tap the coils any coarser than 10 turns, but finer if desired.

Operation of the Circuit.

The best aerial or collector system is to connect the variable condenser at point A to a good earth; no other connection is necessary. There are five adjustments on the set:

1. The grid tuning coil; 2. The tickler coil; 3. The coupling between these coils; 4. The variable grid leak, and 5. The variable condenser. The filament rheostat is not critical, so this is not regarded as an adjustment.

As the tickler coil and grid leak are increased, a super-regenerative condition will be met with and the pitch of this note can be varied by the grid leak and should be adjusted until it is above the point of audibility, when only a slight hiss is heard on the phones. At this point a wonderfully sensitive condition exists for all classes of phone and C.W., and will tune in contrastingly clear as compared with any single tube circuit you ever operated.

A given wave-length is tuned in by means of the variable condenser and grid circuit tuning coil; the tickler and grid leak are merely adjusted to conform to this condition. The resistance of the grid leak should be so arranged that it will give out a screeching noise as it is increased and follow through an intermediate series of pure notes until it passes out of audibility with a range of adjustment on either side.

The right polarity of the tickler coil in the plate circuit will have to be tried out by reversing the leads until the best results are obtained.

This is a standard circuit and may be used as such with an aerial and earth by reducing tickler coil turns with the switch. With an aerial and earth the circuit can be used for transmission with a power valve and increased "B" voltage. All classes of "super" results may be obtained which makes it an ideal receiver.

There are several aerial combinations that work well; one of the most interesting is to connect the point G to the earth and touch the moistened finger to the point A. For apartment houses, two combinations can be used: 1—Connect the point G to earth and the point A to some metal object or a small aerial in the room, and 2—just connect the point A to the earth.

To operate the set in the car, connect the point G to the frame through the steering wheel and the point A to the metal top or a small aerial on the top of the car.

When camping out, the best collector seems to be a wire from the point A to an earth connection about six or eight feet from the set; a short aerial may also be used.

If this is a "super," it is far superior to anything you have ever tried be-

fore in that line, and it may be due to the fact that there are no large coils, condensers or resistances to impede the real action of what a "super" might be, if given a chance.

Mechanical Theory.

You have often turned the variable condenser of a standard regenerative set up to zero and received an awful howl in the phones and decided that the valve was spilling over. This is a negative charge that accumulates on the grid and leaks off in minute discharges which can be governed by a grid leak. These charges are negative so we can assume that the grid is negative most of the time and that an impressed E.M.F. on the grid circuit would tend to build to infinity during the time the grid was negative. This seems correct, as only a short aerial is required.

As the wave length is halved, the amplification is squared by virtue of the increased frequency as compared with the rate of leakage. This may account for the marked results on the shorter wave bands.

Ridiculous

The Klaxon sounds the knell of parting day,
Some late arrivals through the dust clouds creep,
And three hours after we have hit the hay
The noise calms down so we can get to sleep.

Save where, from yonder pennant-clad sedan
The radio set emits its raucous squeal,
And underneath a nearby light, a man
Pounds until daylight on a busted wheel.

Beneath those tattered tops, those patent tents,
Where falls the dust into each sunburned pore,
Each on his folding bed of slight expense
The rude explorers of the highway snore.

Let not ambition mock their creaky cars,
Their khaki clothes, of vintage obscure,
Nor grander view, with hauteur like a czar's,
The short and simple flivvers of the poor.

The boats of shiny paint, the pomp of power
And all that charms the motoristic fop,
Await like the inevitable hour—
The paths of touring lead but to the shop.

Can streamline hoods or silver-plated hubs
Back to its mansion call the missing spark?
Can plush upholstery foil the clumsy dubs
Who bang into your fenders in the dark?

Full many a boob of purest ray serene
Succumbs each summer to the touring itch;
Full many a car is doomed to blush unseen,
And waste its sweetness in a western ditch.

—"Spokesman's Review."

The Importance of a Good Earth

A part of the insulation much neglected by the beginner is the earth connection. In this contribution the writer explains the importance of obtaining a low-resistance connection to earth, and details some of the best methods of achieving this end.

It is surprising how little attention many wireless people pay to the earth. One finds quite often that though care has been lavished on the aerial and on the set itself, the earth is of the most elementary order. There seems to be an idea that anything will do for an earth. Nothing could be more erroneous. The highest and best insulated of aerials used with a first-class set will give only mediocre results unless the earth is as good as it can be made.

If the earth is a poor one an enormous amount of resistance is introduced, and the effect which results is analogous to that caused by fitting an exhaust pipe of too small diameter to the engine of a motor car, in which case back pressure is set up owing to the fact that the gases cannot escape freely after having done their work, and the engine works badly. In the receiving set a poor earth is a source of pronounced damping, and sometimes of a tendency to fall into self-oscillation that is most difficult to control.

Probably the commonest of a kinds of earth in use to-day is a water pipe inside the house. This is quite satisfactory so long as certain conditions are fulfilled. The lead from the set should consist of stout, well-insulated stranded wire—7/22's, or better still, 7/18's—it should be as short and as straight as possible, and its end should be attached to the pipe in such a way that sound connection is made. The best method is to solder the two together; failing this the earth wire may be soldered to one of those copper clips sold by garages for making radiator connections, and the clip tightly clamped on to a well-scraped section of the pipe. A third method is shown in Fig. 1. The pipe having been thoroughly cleaned, the brass strips, A and B, whose purpose is to protect the pipe from injury, are laid upon it. A third strip, C, provided with two 2 B.A. screws is then placed on A and wire is bound tightly round the whole. The earth lead is soldered to C. By turning down the screws, which tightens the wire bindings, a very firm contact can be obtained. Always choose a *main, cold-water* pipe. Hot-water pipes and those which lead upwards to the cistern are of very little use, since they make no actual connection with earth.

A gas pipe does not make a satisfactory earth, since the joints are sealed with a compound which offers a good deal of resistance. All indoor earths have one great drawback: they give very little protection from the effects of thunderstorms. If an earth inside the house is used for ordinary working, there should also be one outside, to which the lead-in may be shorted when lightning is about. The possibility of an aerial's being struck is remote, but it as well to take no risks.

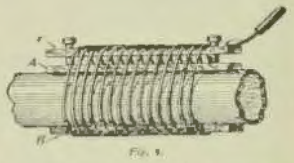


Fig. 1.—A good method of attaching the earth lead to a water-pipe.

For the outdoor earth, which will be found by far the best if a reasonably short earth-lead can be used, the chief requirement is that it should make good contact with the largest possible area of damp soil. Pumps, iron pillars, pipes that go underground, and many other ready-made connections may be pressed into service with satisfactory results. A coil of wire, a length of wire netting, an old spring mattress or a sheet of roofing iron buried three feet or so will all do well as artificial earths. Whichever is used it should be buried immediately below the aerial wires. The earth lead should be unstranded at its end for some distance, and each of its wires soldered to a different part of whatever metal connection is used.

An earth that I have found most satisfactory in use is illustrated in Fig. 2. It consists of an old bucket, or a disused zinc bath—a 7lb. biscuit tin with its paper covering removed makes a good substitute—with a few very small holes bored in its bottom and sides. The vessel itself is half-filled with finely broken coke, which, being strongly hygroscopic, serves to collect and retain moisture. The contrivance, with the strands of the earth lead soldered to its rim as shown, is buried about three feet below the surface, the surplus soil being piled up round the edges of the hole when filled in so as to form a kind of crater. In dry, hot weather, this hollow is filled with water every now and then, which ensures that the buried vessel makes contact with damp soil. The coke provides an inner moist connection whilst the water which leaks away through the holes wets the soil around and below. Such an earth will give good service for a very long time, though it is as well to dig down to it every six months or so in order to make sure that the iron has not rusted away at the places where the soldered joints with the wires are made.

To get the best results from outdoor earths they should be duplicated, which seems to lessen the directional effect of the aerial, and may make a considerable improvement in the reception of very weak signals. Fig. 3 shows a bird's eye view of an arrangement that will be found good. Here the earths are arranged in the form of a triangle. There might also be a water-pipe connection within the house, though it is not recommended that it should be used at the same time as the outdoor ground connections. For some reason it seems that indoor and outdoor earths do not work well in parallel: that, at any rate, has been my own experience, as well as that of many enthusiasts with whom the question has been discussed.

The last type of connection to be considered, is not, strictly speaking an earth at all, since it makes no contact with the ground. It is known as a counterpoise or capacity earth. Aerial and earth form between them the "plates" of a large condenser of small capacity. In the normal arrangement the lower plate is the ground itself. Though this is the most satisfactory system for general purposes, there are places in which it cannot be used with

Fig. 2. A very good type of earth connection.

good results; this applies particularly to localities in the near neighbourhood of tramways, electric railways and high power cables provided with an earth return. In such cases the performances of the wireless set often suffer serious interference from parasitic noises provided by stray earth currents.

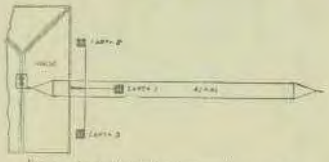


Fig. 1. An arrangement of three earth connections which gives good results.

The counterpoise earth provides an artificial lower plate for the condenser formed with the aerial wires, and thus largely, if not entirely, eliminates interference from such sources as those mentioned. Those who live in places where parasitic noises which cannot be traced to any fault in the wiring of the set or to the batteries are of constant occurrence, would do well to give it a trial if a clear space beneath the aerial is available.

One form of counterpoise consists of what is really a second aerial, slung between the masts at a height of only a foot or two from the ground. As it is important with a counterpoise that the capacity of the lower element should be at least as great as that of the upper, it should contain at the minimum as many wires as the aerial itself, and the strands of the former should be as thick as those of the latter. The counterpoise must be insulated as carefully as the aerial, and the earth-lead should be taken to it in the same manner as the lead-in, an insulating tube being used to keep it from contact with the walls and wood work of the house.

A Wireless Club for Ceylon.

A correspondent writing from Colombo states that a wireless club has just been formed, and is receiving strong support throughout the island. Permission to use wireless has not yet been granted by the Ceylon Government, but it is confidently hoped that this obstacle will soon be removed.

Two radio-telephone broadcasting stations were recently opened in Mexico City, Consul Thomas D. Bowman reports. Various efforts have been made in recent months to obtain concessions for the establishment of such stations, but it is only recently that the government granted permission. It is reported that other broadcasting stations are to be erected in Mexico.

FOR SALE—Valve and Crystal Sets, one or two valves. 92 Cathedral Street.

NEWS IN BRIEF

Mr. Labrowsky has just notified Mr. Givelet, president of the Radio Club De France, that he has a prize of 10,000 francs, to be distributed annually in amounts of 1000 to 1500 francs to inventors of radio parts. The inventions must be patented and a month has been given for inventors to present them before a committee that has been named to consider their worth.

A French amateur, Louis Schroeder, who has made a special study of acoustic questions, has just devised a special coating for metal horns. This is claimed to result in a perfectly pure tone suppressing the difference in phase between the diaphragm and the horn. Mr. Schroeder's process has been patented. In a general manner it makes use of a thick varnish made of pulverised resin and cork dust of varying fineness. In applying this mixture on the metal horn, Mr. Schroeder claims that he suppresses the resonance of the metal composing it, and as a result that the vibrations of the transmitter are heard with their original intensity and tone. This composition has also been tested on a telephone diaphragm with a great improvement in the clearness of the sound.

The United States Bureau of Standards has developed a very precise method of standardisation of radio wave lengths and frequencies. By the process used the frequency of radio waves is compared with that of an audible musical note, a tuning fork being mounted in such a way that it may be made to control the frequency of an oscillatory circuit. The frequency of another oscillatory circuit operating at much higher frequencies is then compared with it by means of a cathode-ray oscillograph. The latter instrument consists of the cathode-ray tube, a special kind of vacuum tube in which the narrow stream of electrons is subjected to the action of electric fields applied by the two alternating current generators. When neither generator is operating, the electrons impinging on the active screen at the end of the tube cause a single luminous spot. If one generator is connected the spot is deflected back and forth along the single line, horizontal or vertical, as it appears as a solid line. If both generators are applied simultaneously, the case may be, with such rapidity that the spot oscillates both horizontally and vertically, and appears in general as a blurred luminous rectangle. If however the frequencies of the two generators bear a simple ratio, such as four to one, the spot traverses and re-traverses a definite simple path, forming a figure by which the frequency ratio may be recognised. It has been found possible to compare frequency ratios as high as 21 to 1. The bureau is at present engaged in the standardisation of a high-precision standard wave meter by this means. A tuning fork of known frequency, approximately 1,000 cycles per second, is used as the basis of the standardisation. A low frequency generator is tuned to successive multiples of this frequency by means of the cathode-ray oscillograph, and corresponding settings of the wave meter are obtained. A third generator is similarly tuned to multiples of these frequencies, and thus by successive stages the standardisation is extended to include frequencies as high as 5000 kilo-cycles (60 metres) It is intended that this wave meter be used as the basic standard for the standardisation of commercial wave meters.

Subscribers are asked to notify Wireless Weekly of any change of address. Communications should be addressed to "WIRELESS WEEKLY," 33 Regent Street City.

Comments on Audio Frequency Transformers.

The most serious criticism of most amplifying transformers is their inability to accurately reproduce notes below middle C of the piano. This fault decreases the accurate reproduction of the bass saxaphone, violincello, bass baritone, bass of organs, and pianos, trombone and rums. Tinv music is not always caused by the loud speaker. It is traceable in many cases to a poorly designed amplifying transformer.

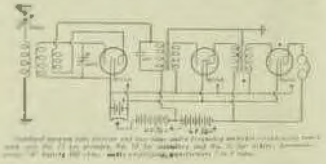
It is a puzzle to many radio followers whether to employ a high ratio transformer on the first stage and a low ratio transformer on the second stage or low ratio transformers on both stages. Some manufacturers recommend a high ratio transformer on the first stage and a low ratio transformer on the second step. They feel that the voltage on the first stage is low enough to warrant the use of a high ratio transformer without distortion. A high ratio transformer such as 9 or 10 to 1 is not recommended for the second stage, because it would so greatly intensify the voltage that distortion would result.

There is another group which advocates the use of low ratio audio transformers on all stages of the audio amplifier unit. They claim that if distortion results from use of a high ratio transformer on the first stage the distortion as well as the signal will be amplified by the second amplifier. The high ratio transformers may give superior amplification between certain frequencies, but, for best results on all frequencies, the low ratio transformers should be used on both stages.

When it is said that an amplifying transformer has a ratio of 5 to 1, the meaning is that the voltage of the secondary is five times as great as that applied to the primary. This step-up voltage increases the variation in the grid voltage. The grid voltage must not be increased too much because after a certain voltage is applied to the grid the tube reaches a saturation point. If a high ratio transformer is employed which increases the grid voltage past the saturation point the music or voice will be distorted.

The majority of audio-frequency amplifying transformers on the market to day operate efficiently on one particular frequency but do not do justice to other frequencies. A musical instrument produces many different sound frequencies, that is, the sound varies from low vibrations to high pitched tones. Therefore, if an amplifying transformer is particularly adapted to intensify the electrical current representing a particular frequency and is opposed to other frequencies, the music will be distorted. This misrepresentation makes little difference in the case of jazz because a certain amount of distortion adds to the syncopated effect.

Few transformers are made with an effective amplification greater than four, that is, if the voltage is applied to one side of the primary of the transformer it will be increased in strength four times after passing through the secondary. Most transformers rated with amplification factors of seven or eight are capable of such amplification only



at a particular frequency. Few transformers, even of the same manufacturer, prove capable of equal performance under tests.

More than two stages of audio-amplification are not practical because circuit noises and battery disturbances are also amplified, making it unpleasant to listen to the music.

An audio-frequency amplifier does not increase the range of the receiving set. If no signal is audible in the phones without the use of the audio-frequency amplifier it will not be audible even if two amplifier tubes are employed. If signals are faint, yet strong enough to actuate the detector they can be amplified by audio-frequency amplification. If one tube is capable of intensifying a signal twenty times, two tubes theoretically would be capable of amplifying four hundred times and three tubes eight hundred times.

The average radio enthusiast little realises the elaborate workmanship which enters into the standard audio-frequency amplifying transformer. One transformer on the market has 3,000 turns of No. 40 enamel wire for the primary winding. No. 40 wire is about the diameter of a hair. The secondary winding consists of 13,300 turns of No. 40 enamel wire and is separated from the primary by three thicknesses of .005-inch moleskin paper. The primary and secondary leads are sixteen strands of No. 38 bare copper wire stranded together and covered with a wrapping of green silk. The coil is impregnated under a vacuum process in a compound of beeswax and resin and then covered with a black cloth.

A transformer which will reproduce frequencies ranging from 100 to 4000 cycles with little distortion is ideal for audio-frequency amplification. However, it is difficult to obtain such a device, although a few transformers on the market will operate well on frequencies ranging from 300 to 4000 cycles. If a loud speaker is used it is well to have the transformers favor the higher frequencies. Transformers having a ratio ranging from 5 to 3½ to 1 have proved successful for general use.

The type of tube has considerable to do with the success of the amplifying transformer. If the tube has a high plate resistance it will have a tendency to distort at the higher and lower frequencies. If an audio-amplifying transformer is designed to operate with a particular tube and it is used with another type of tube the results will not be satisfactory.

When connecting the audio transformer in the circuit care should be taken to establish proper connections. The leads are usually marked so the correct connections can be made to the grid, plate and filament. If the wrong secondary terminal of the transformer is connected to the grid howling is likely to occur. All wire should be as short as possible, especially those leading from the grids and plates. By connecting the cores of audio transformers to the ground binding posts on the set howls are minimised. A .001 mfd. fixed condenser should be used across the primary of the first amplifying transformer to aid regeneration and help to eliminate howls.

RADIOCULOUS

For twenty years two business men in Vienna met every day at the Schnitzelplatz Cafe for luncheon, and after the dishes were cleared away they would indulge in a game of chess. And every day for ten years a young man, a stranger to both the players, would draw up a chair and watch them in silence.

Finally one day one of the old gentlemen failed to make an appearance, and, after waiting a decent length of time, the other turned to the young man who sat waiting for the game to begin, speaking to him for the first time since he had been a spectator: "My partner may not appear to-day. Would you care to play a game with me?"

"Sorry," the young man replied, "but I don't know the game."—"Metropolitan."

* * *

Sam was a coloured gentleman very popular with the ladies. One night, Mirandy his wife, was going through his pockets and found a card inscribed "Louise No. 27."

On inquiring from her spouse its meaning, she was informed it was the name and number of a racehorse. A few days later Sam was wakened from sleep by the stern tones of his wife, saying:

"Nigger, your 'boss' wants you on telephone."—Judge prize story.

* * *

A man had been in a public telephone box for half an hour. He appeared to be bored, and, though he held the receiver to his ear, he made no attempt to speak. At last one of the crowd outside, exasperated with waiting, opened the door and asked politely, "Are you speaking to anybody?" The silent one replied, "Yes, I am speaking to my wife."—Judge.

* * *

Five year old (castle building): "An' I shall have a footman of my vewwy own to stand behind my chair. An' he shall be dwessed in blue an' silver. An' I shall say to him, 'William, blow on my powwidge, will you?" London Daily Express. !

Bridge, bridge, bridge," stormed Mr. Wampus. "You'll die at the bridge table."

"Bury me with simple honors," said Mrs. Wampus, sweetly.—Life.

* * *

He was a cab-driver of the old sort, called as a witness in an action for damages incurred in a street collision, and, ignoring the jury, he persisted in relating his version to the judge. Ultimately the latter stopped him, and observed:

"Address yourself to the jury."

So turning awkwardly to the pew in which twelve tradesmen sat scowling, he smiled, nodded, reassuringly, and remarked:

"Mornin', gents; all well at 'ome, I 'ope?"—"Tit Bits," London.

* * *

Two Irishmen roomed in an eight storey apartment on the top floor and could not sleep on Sunday morning, as the sun would shine in the windows and wake them up. They bought some black paint and painted the windows and lay down to sleep. When they woke up they realised they would be late for work, as it was seven fifteen. They rushed to their jobs, and the foreman looked at them in bewilderment. Pat says, "Faith and what's the matter, boss, we're only twenty minutes late?"

The Foreman: "Twenty minutes, hell! Where were you Monday and Tuesday?"—"Judge."

* * *

Rev. Dr. Howley.—My dear sir, I am a minister of the Gospel, and, as I intend preaching a sermon against the stage, I thought I would ask you for a ticket of admission to your show, in order that I might see for myself the extent of this great immorality.

Manager (to the ticket-seller): Charlie, give the doctor a seat in the orchestra, and charge it to advertising. —"Harlem Life."

A taxi was standing on a cabstand with the front of the cab almost on the crossing. The driver was sitting on the seat waiting patiently for a fare. He had been waiting two hours. A man was crossing the road in deep meditation, when he suddenly caught sight of the cab. He jumped, glared at the driver for a moment, and then exclaimed: "Why don't you blow your horn?"—"Tatler," London.

* * *

"The boss offered me an interest in the business to-day."

"He did?"

"Yes. He said that if I didn't take an interest pretty soon he'd fire me." —A. H. Edwards, Statesboro, Ga., in the "Yellow Strand."

TO THE RADIO EDITOR, BINGLEVILLE BLAST IDAHO.

Q. 8769: Can an ordinary meat chopper be used to break up sustained oscillations?

Yes, in fact the whole set may be broken up in this way. Try it.

Q. 8770: What size pipe should connect the gas mains to a soft detector tube? I am twelve years old and can speak Chinese.

No. The negative lead must be disconnected.

Q. 8771: How is the grid, sir, cut?

Q. 8772: Please give me a diagram of hook-up to receive 4,00078 metres. I have two hatracks, three red pool balls, and a Canadian dime with a hole in it.

Use your head along with the other ivory.

Q. 8773: My antenna is 137 feet long and is connected to a 16,000-volt A.C. line at both ends. Why do I get a spark on the grid commutator when the phones are hung on the bathtub faucet?

Your 'phone cords are open-circuited. There is also probably induction from the A.C. primaries due to carelessness of the power company in running their lines near your aerial. Sue them for abduction.

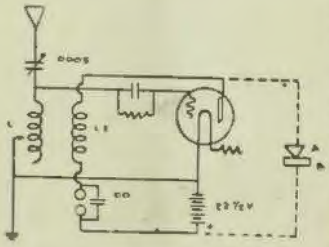
Combination Crystal and Valve

There comes a time in every experimenter's life when, due either to accident to the valve, or neglect in keeping the batteries in condition, his valve set is temporarily out of commission. It is in an emergency of this kind that the crystal detector will demonstrate its worth, and in many cases win a permanent berth with your valve receiver.

To guard against such an emergency as this it is advisable to have a crystal detector handy, but better still is a combination crystal and valve set especially built for the occasion. To make a combination receiver of this type requires but a few simple changes in your present set, as shown in the diagram of Fig. 1, and as explained in detail here.

Carry a wire from the valve socket plate terminal (or from nearest point on wire connecting the plate coil to plate terminal of the valve) to one side of a crystal detector stand (as shown at A). This stand should be mounted outside on the panel of the set near the plus B binding post. The stand should also be mounted where it will be accessible in order to adjust the catwhisker on a sensitive spot of the crystal.

When it is desired to use the crystal detector, turn off the filament current of the valve at the rheostat, disconnect



the B battery entirely from the set and run a "jumper" or wire from the plus B battery external binding post on the set to the terminal side of the crystal detector stand marked B.

The set is now ready for use as a crystal set. Tuning of the aerial circuit is accomplished in the same manner as when using the valve, but the secondary circuit is left untuned, variation of the rotor serving to control the coupling between circuits.

Note that when using the crystal detector its output goes to the same binding posts or jacks as used for the output of the valve. This makes possible the addition of audio amplification to the crystal or valve from the same output terminals of the set. If a two-stage audio amplifier be added to the crystal the volume from local stations should be sufficient to operate a loud speaker and the quality of the reproduction will be better than with a valve detector. Another advantage is less static and, of course, no battery expense for the crystal.

To change over to the valve set, simply remove the jumper connecting the plus B binding post of set and the detector stand, connect the B battery to its usual binding posts, light the filament and the set becomes the same old "single-circuit" again.

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

The N.S.W. division of the Wireless Institute is calling a meeting to be held at the Royal Society's Hall on Wednesday March 19th, 1924, to consider what steps shall be taken for the co-ordination and consolidation of amateur and experimental interests in N.S.W. Each club will be invited to send a delegate fullly empowered to act on behalf of his club. So that invitations may be issued to attend this meeting all club secretaries are requested to immediately forward their names and addresses together with the name of their club to the Hon. Secretary of the Wireless Institute, Box 3120, G.P.O., Sydney. This particularly applies to those in country centres.

The next meeting of the N.S.W. Division of the Wireless Institute of Australia will be held at the Royal Society's Hall, on Thursday, February 21st, 1924, at 7.45 p.m.

Business circles in Constantza are much interested in a projected wireless telegraph plant. The present radio station at Constantza is used for little more than the distribution of shipping intelligence. The bankers and shippers generally want not only telegraph and telephone (wireless) connection with Western Europe, but also with Constantinople, the Piraeus, and Odessa. The project for the construction of such a station has secured the approval of the Bulgarian Ministers of Communications, Finance, and Industry and Commerce, and, with a certain supply of German material new enterprise will soon take definite new enterpris ewill soon take definite form at a cost approximately Lei 800,000.

Plugs and Sockets for Tuning Coils.

For many uses it is desirable to be able to reverse the direction of the magnetic field from the coil. In the case of most standard arrangements of plug-in coils, it is not possible to do this without reversing the connections to the socket into which the coil is plugged. If, however, a different type of plug and socket is employed, it is possible to overcome this difficulty. Thus by using a plug and socket in which the two electrodes are concentric—similar to the concentric plug sometimes used on electric power circuits—the coil can be turned round without changing or breaking the connections.

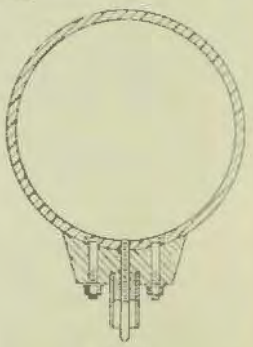


Fig 1

A simple attachment enables coils fitted with the ordinary plugs and sockets to be plugged into a holder fitted with concentric sockets, so that full advantage may be taken of this method of mounting without the necessity of replacing any existing coils. A cross-sectional diagram of one of the plugs is given in illustration above.

The Sealed Set Test

By R.C.M.

Hearing that the vexed question of "sealed" versus "open" sets was to be given a try-out, I ventured in a private capacity to Moss Vale, the scene of the trial. Arriving per car at the Royal Hotel, Moss Vale, at 8 p.m. last Friday, many familiar faces in the wireless world were to be seen; the majority belonging to the Association for the prevention of cruelty to valves. I gleaned from several that Messrs. Amalgamated Wireless had already been on the testing site for a week trying out the sealed set, and from what one could gather their results had been fairly good. The members of the association held a packed meeting at 11 p.m. on Friday, and after much talk and argument it eventually closed about midnight. On the following morning, about 10.30, the association journeyed out to a paddock opposite an old landmark known as the Mill, and there we saw the mobile station of Messrs. Amalgamated Wireless. A brief description may be of interest. The aerial consisted of a single wire 200 feet long, with the down lead in the centre. Directly under the aerial were copper gauze ground mats and a single length of 3/20 copper wire acting as a capacity earthing system. The sealed set, together with an unsealed one of the same breed was in the "tin lizzie" lorryette, also a three-coil American De Forrest set. The valves used were the R. type throughout. A switching arrangement was in force which allowed either one of the three sets to be switched on at will, without any necessity to change 'phones, etc. The comparison was in favour of the sealed set. . . . . Why? It was tested against a three-coil open American regenerative receiver of two valves, employing R. type valves. The sealed set consisted of a circuit utilising one stage high frequency detector and reflexed again through the H.F. valve—some comparison of sets, I don't think. Another firm alleged they could do better with an open set, and failed miserably, exactly what was to be expected. The Amalgamated Wireless outgeneraled the association, and the members of same realise it. The comparative tests were as follows: The sealed set employed one storage of high frequency detection and one audio reflexed, together with fixed regeneration. The American set consisted of one detector and one audio open circuit employing regeneration. There is no comparison on this at all, as any radio man with some knowledge will admit. What we want to see is a one valve sealed set built to the present regulations against a one valve open circuit, using regeneration or a sealed crystal against an open crystal set. Don't forget, it is the man in the street we want to get radio, and not a comparative few who can afford multi valve sets. To make a long story short, th etest was no test, and things were far from equal.

The Leichhardt and District Radio Society

The 16th business and 66th general meeting of members of the Leichhardt and District Radio Society, held at the club-room, 176 Johnston St., Annandale, on Tuesday, February 5th, was very well attended.

The chair was occupied by the President, Mr. H. Kirkpatrick and, after the minutes of the meeting held during the previous month had been read and confirmed, applications for membership from five local experimenters were placed before the meeting. All five applications were accepted unanimously, thereby increasing the membership to that extent.

Further consideration was then given to a proposal to establish a badge for the use of members, and it was decided to have a number manufactured immediately.

The Hon. Treasurer placed before the meeting the balance sheet in connection with the launch excursion held on January 19th, under the auspices of the Society, and a very satisfactory state of affairs was revealed.

It being thought desirable to establish a library under the control of the Society, several members offered to donate periodicals for that purpose.

The attention of members was drawn to the fact that the first of a series of lectures arranged under the new syllabus would be delivered by Mr. F. Thompson on the following Tuesday night, and that others would follow on the second and fourth Tuesdays of each month.

Other formal business was dealt with, and it was generally agreed that the meeting had been one of the most enthusiastic and successful to date.

The Society meets at the club-room, 176 Johnston St., Annandale, at 8 p.m. every Tuesday night, and all inquiries relative to its activities should be addressed to the Hon. Secretary, Mr. W. J. Zech, 145 Booth St., Annandale.

A fine performance was put up by 2JM on January 10th. Transmitting music and speech, he was clearly heard by 3AB (Christchurch, N.Z.), the latter using only one detector valve.

Illawarra Radio Club.

At the 40th meeting of the Club, held on the 29th January, Mr. C. A. Gorman delivered an interesting lecture on "Radio Frequency Amplification on Long and Short Waves." He dealt with the various methods of high frequency amplification, and explained the merits and demerits of each system describing what could be used to the best advantage for long or short wave reception. Those particularly dealt with were the transformer-coupled and the variometer methods. Circuits embodying the various accepted principles of radio amplification were shown in diagram and fully explained, and the lecturer also dealt with many questions from members arising out of the

subject under discussion. The subject was one which was very popular with most of those present, who gained a great deal of useful information from the lecture, which should help them considerably in their experiments along these lines.

The remainder of the evening was devoted to general talk on matters of club interest.

The next meeting of the Club will be held at the club-room, 75 Montgomery St., Kogarah, on Tuesday, 12th February, at 8 p.m., when a lecture will be given. Code practice from 7.30 till 8. All members and others interested are cordially invited to attend.

Information concerning the club will be supplied by Mr. W. D. Graham, Hon. Sec., 44 Cameron St., Rockdale, who is always pleased to hear from any prospective member.

Radio broadcasting station WGY at Schenectady, N.Y., is offering a prize of 500 dollars for the best "radio drama" submitted in competition during the three months period beginning September 1. The prize winning play will be presented during the winter months when transmission conditions are best.

Mr. C. Maclurcan Farewell Transmission

In response to many requests for a farewell transmission, Mr. Maclurcan will endeavour to give a final concert from 2CM on either Sunday, 17th or 24th.

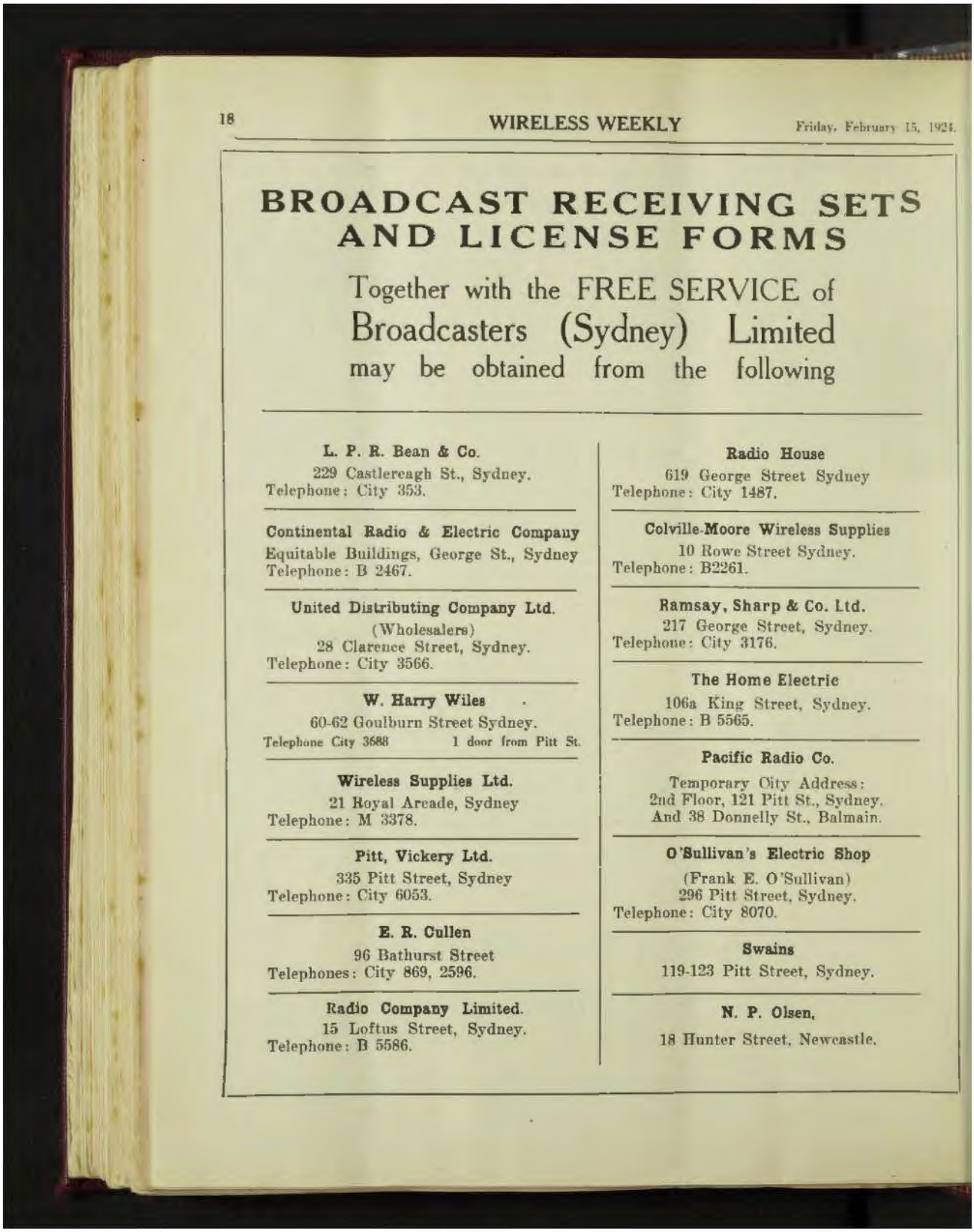
It must be borne in mind that 2CM station is in a rather muddled state at present, owing to preparations for the forthcoming Tahiti tests. It is hoped, however, to have everything ship shape again by Sunday 24th, at the latest.

TO RADIO CLUBS

Wireless Weekly will be glad to publish reports of meetings held by all Radio Clubs.

We would like copy to reach us before Friday in each week in order to ensure its publication in the ensuing issue.

Address all comunications to The Editor, Wireless Weekly, 33 Regent Street, Sydney.



BROADCAST RECEIVING SETS AND LICENSE FORMS

Together with the FREE SERVICE of Broadcasters (Sydney) Limited may be obtained from the following

L. P. R. Bean & Co.
229 Castlereagh St., Sydney.
Telephone: City 353.

Continental Radio & Electric Company
Equitable Buildings, George St., Sydney
Telephone: B 2467.

United Distributing Company Ltd.
(Wholesalers)
28 Clarence Street, Sydney.
Telephone: City 3566.

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

Wireless Supplies Ltd.
21 Royal Arcade, Sydney
Telephone: M 3378.

Pitt, Vickery Ltd.
335 Pitt Street, Sydney
Telephone: City 6053.

E. R. Cullen
96 Bathurst Street
Telephones: City 869, 2596.

Radio Company Limited.
15 Loftus Street, Sydney.
Telephone: B 5586.

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.

Pacific Radio Co.
Temporary City Address:
2nd Floor, 121 Pitt St., Sydney.
And 38 Donnelly St., Balmain.

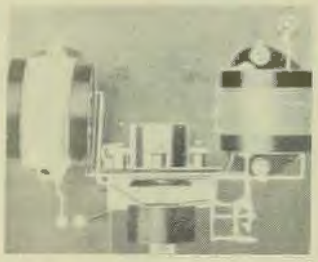
O'Sullivan's Electric Shop
(Frank E. O'Sullivan)
296 Pitt Street, Sydney.
Telephone: City 8070.

Swains
119-123 Pitt Street, Sydney.

N. P. Olsen,
18 Hunter Street, Newcastle.

Working a Loud Speaker on one Valve

There is an increasing desire on the part of radio experimenters and would be fans to receive on a loud speaker with as few valves as possible. We are going to describe a receiver that is admirably suited for this purpose, us-



ing one valve and the reflex circuit. This circuit has been tried and tested and gives amazing results.

Good parts are essential. To have a well designed receiver work properly and function with any percentage of efficiency parts that are electrically and mechanically efficient should be used. Make all leads as short as possible, arranging the component parts to take up as little space as possible.

Materials Used.

T1. Tuning transformer.

60 turns of No. 23 DCC wire wound on 2¾in. tume as secondary. Tape carefully and then wind 15 turns of No. 23 DCC wire as prmiary.

T2. Tuned radio frequency transformer.

60 turns of No. 23 DCC wire wound on 2¾in. tube as secondary. Tape carefully as in T1 and then wind on primary of 35 turns No. 23 DCC wire.

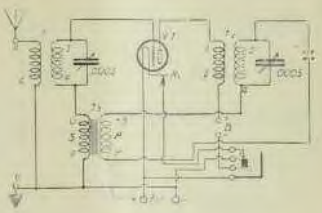
Use two .0005 23 plate variable condensers of standard make.

One open circuit filament control jack.

One audio frequency transformer of standard make.

Crystal detector using argentite crystal.

90 volts "B" Battery should be used. 30 ohms rheostat and socket for valve. Assemble with care, making solid and well soldered connections. For con-



venience and short leads mount T1 and T2 on the variable condensers placing at right angles with each other. (See Fig.)

By following the diagram carefully and making leads as short as possible, a very compact and efficient set will result. The wave band covered is approximately 200 meters to 550 meters. Use an aerial of from 80 to 100 feet long as a longer aerial tends to make the tuning very broad. The set has an excellent head-phone range and has worked a loud speaker in the summer time up to 100 miles. Radio golf is excellent sport and distant records can easily be made.

RADIO IN CZECHO-SLOVAKIA

The manufacture, sale, storage, and importation of radio telephone and telegraphic equipment in Czecho-Slovakia is only permitted under license from the State, says Trade Commissioner H. L. Groves, in a report to the U. S. Department of Commerce. The Ministry of Commerce, in co-operation with the Ministry of Posts and Telegraphs, are authorised to grant licenses for this purpose. The Ministry of Posts and Telegraphs also supervises and controls the manufacture, sale and storage of radio equipment and co-operates with the Ministry of Commerce in the granting of licenses.

Up to the present time only one company—"Radioslavia"—has obtained a license for the manufacture of radio equipment in Czecho-Slovakia. It has not yet started production. This company is understood to be affiliated or closely connected with the French Company, "Societe Francaise Radio-electrique." A German company—"Gesellchaft fur Drahtlose Telegraphie, System Telefunken"—is said to be promoting a company with Czecho-Slovak capital for the purpose of exploiting German wireless patents, but it has not yet been granted the necessary license.

The attitude of the Ministry of Posts and Telegraphs towards the granting of licenses to transmit as well as to receive radio messages is said to be favorable in the following instances: (1) Technical High Schools, for scientific purposes. (2) Industrial establishments which have obtained special licenses from the Ministry of Commerce to manufacture radio equipment. (3) Ships and aircraft. (4) Electric power stations, waterworks, and other establishments of public utility, under special conditions. (5) Companies which have been authorised by the State to broadcast matter of general interest, such as news statements, exchange reports, agricultural reports, concerts, lectures, etc.

Licenses for the operation of receiving sets only will be granted to institutions, companies, and those regularly taking the reports transmitted either by the State Telegraph Office or by companies authorised by the State to transmit such messages.

Published by W. J. Maclardy, of 58 Murdoch St., Cremorne, for the Proprietors and Printers, Publicity Press Ltd., 33/37 Regent St., Sydney.