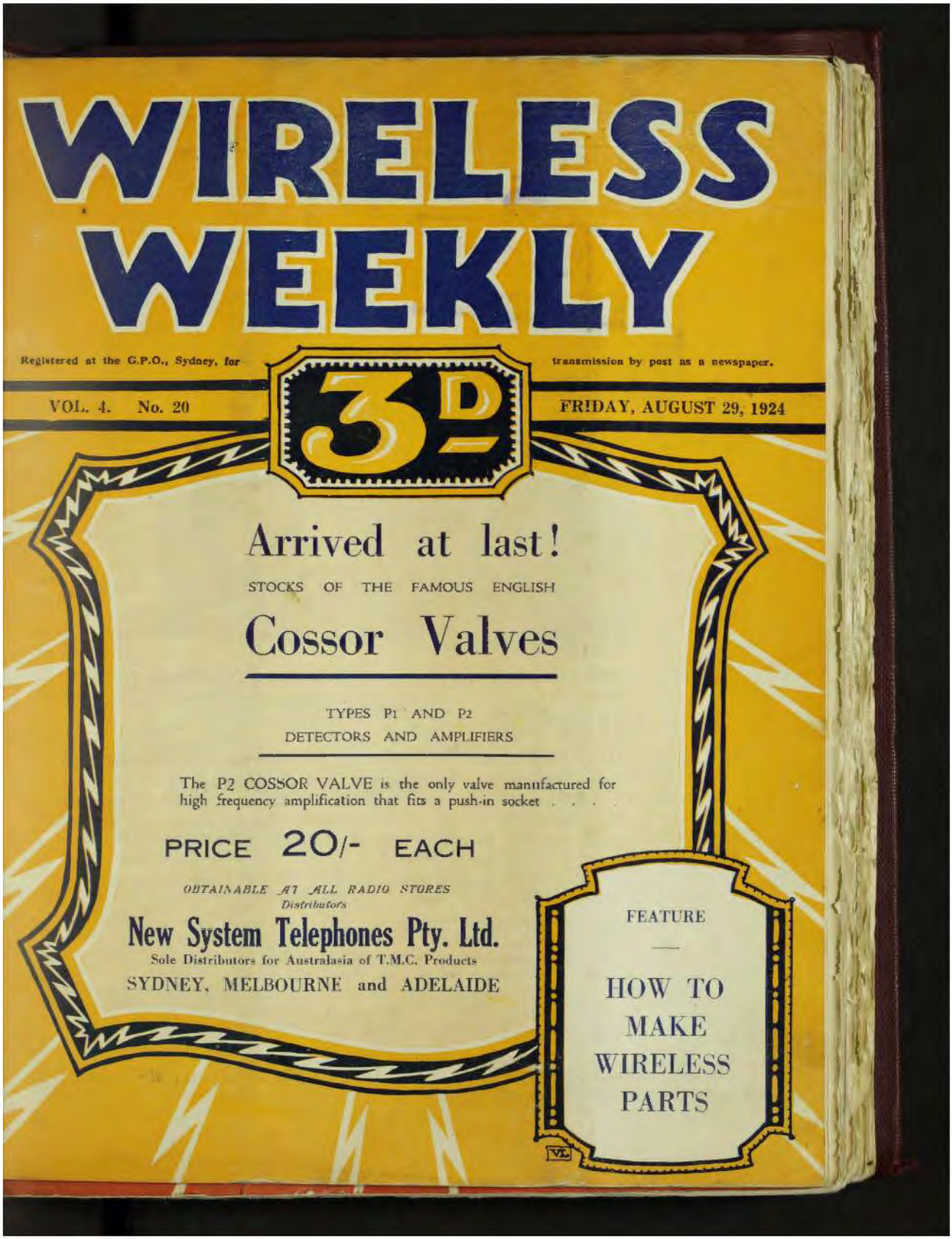
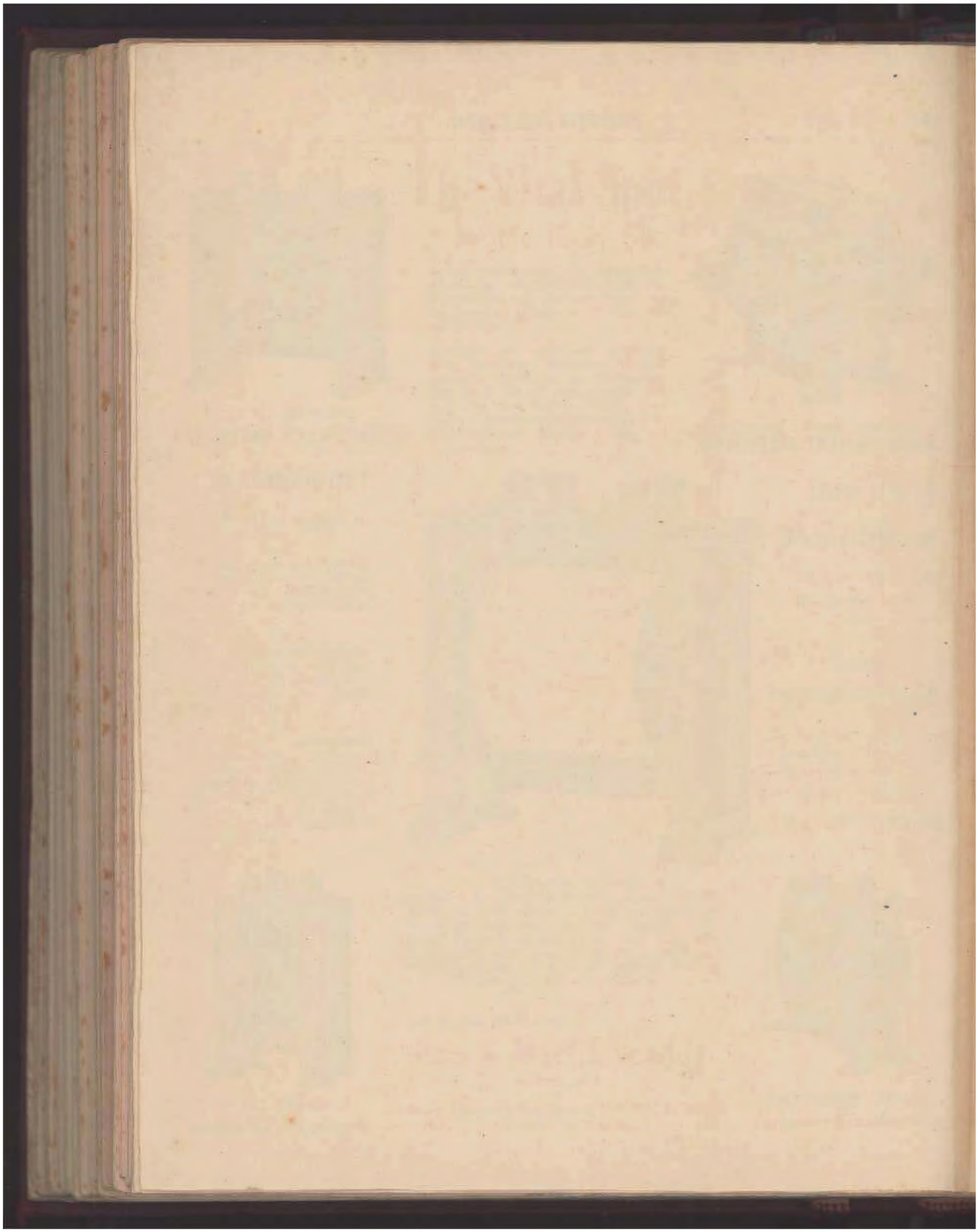
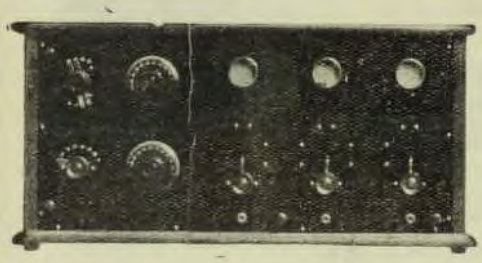




Make this 3 Valve Receiving Set YOURSELF

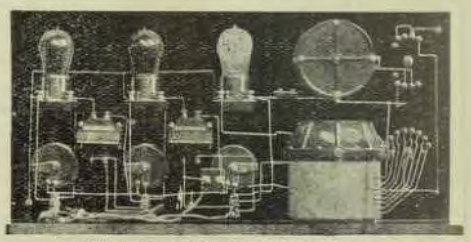


—or you can purchase this 3 valve Experimental Set, complete with Baldwin Phones, Radiotron Valves, all batteries, aerial wire, insulator, etc., Amplion Loud Speaker. Price £42/10/-.

Country residents have no difficulty in picking up K.G.O., San Francisco, on a COL-MO Receiving Set.

Complete List of Parts required to build this Set as illustrated.

3 N.P. Bezels	0	3	9
Piece of Bakelite, 20 x 9 x 3/16	1	0	0
Vario Coupler R.P.M.	1	12	6
(Gilfillan Coupler if desired)	2	18	0
Knob and Dial	0	2	6
.001 Vernier Condenser	1	12	6
3 Rheostats	0	15	0
3 Radiotron valves	5	5	0
(3 Valves, English, if desired)	3	3	0
3 Radiotron Sockets	0	18	0
(3 valve sockets, English, if desired)	0	6	0
Series Parallel Switch and Studs	0	6	0
Selected Switch and Studs	0	4	6
3 Jacks	0	3	0
1 Plug	0	2	8
Wiring Wire and Terminals	0	4	0
1 6-volt 60 amp. Accumulator	3	18	0
1 80-volt high tension Battery	1	5	0
1 Grid Condenser	0	1	6
1 Pair COL-MO Phones	1	12	6
100 ft. Aerial Wire	0	2	9



SHOWING INTERIOR OF SET

8 Insulators	0	2	0
1 Lead-in Insulator	0	1	3
Quantity of Lead-in Wire	0	1	0

NO FURTHER CHARGE is made for supplying a diagram of circuit. Also the panel will be drilled to suit either the Radiotron or English Valves, free of charge.

ALL THE ABOVE AND 250,000 OTHER PARTS OBTAINABLE FROM

COLVILLE-MOORE

WIRELESS SUPPLIES LIMITED

10 ROWE STREET (HOTEL NEAR AUSTRALIA) SYDNEY

Phones, Redfern 964 and 930.

Official Organ of the New South Wales Division of the Wireless Institute of Australia.

VOL. 4. No. 20. AUGUST 29th, 1924.

CONTENTS:

	Page
EDITORIAL	12
"INSULATOR" TALKS ON AERIALS	14
THE WIRELESS INSTITUTE	16
REDUCING THE STATIC NUISANCE	18
THE CONSTRUCTION OF WIRELESS COMPONENTS	20
WHAT'S WRONG CHART	34
AMPLIFICATION WITHOUT DISTORTION	35
THE 5 B.G. CIRCUIT	36

EDITOR: A. W. WATT — The Editor will be glad to consider Technical and Topical Articles of interest to Australian Experimenters. All Manuscripts and Illustrations are sent at the Author's risk, and although the greatest care will be taken to return unsuitable matter (if accompanied by stamps), the Editor cannot accept responsibility for ts safe return. Contributions should be addressed to the Editor, "Wireless Weekly," 33/37 Regent Street, Sydney, N.S.W.

SUBSCRIPTION RATES — Twelve months (52 issues), 13/-, post free. Six months (26 issues), 6/6, post free. Single Copies, 3d. each, or post free, 4d.

QUESTIONS and ANSWERS DEPT. — Except in the case of subscribers, all Technical Questions, or those entailing research work or drawings, must be accompanied by a postal note or stamps to the value of 1/-.

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

All accounts should be made payable to Publicity Press Ltd., 33/37 Regent St., Sydney

EDITORIAL

WHO WILL JOIN IN?

SOME months ago, with the object of rendering a service to local transmitters, we organised a transmitting test week, and published a complete schedule of the times of transmission of each station. At the same time a request was made that country and interstate listeners send us their reports so that we could check them up and send on the information to the operators of the transmitting stations. Results, unfortunately, were very, very poor, partly due to the regulations in force at that time, partly to the counter attractions offered by the broadcasters, and probably in no small measure, to the apathetic attitude which seems to be chronic with Australian experimenters.

Now, a test of this kind is made with no light object. If carried out properly, it can produce results which may be of enormous value, not only to the transmitters themselves, but also to the science of wireless, and after all, this latter is the more important point. Such a test could easily result in the location of so-called "Dead Spots," the checking up of fading effects, static belts, and a host of other hindrances to the smooth passage of electro magnetic wave.

The other point is this. Deep down in his heart, every owner of a transmitter nurses a secret conviction that his outfit is well in the lead, from the point of view of efficiency, of all the others. This feeling is natural—we all get it at times—but there can be no doubt that it has the effect of inducing us to bowl along in the same old groove. It requires a practical and competitive test to show us just where we are—so to speak. It is a well known fact that, on certain occasions, signals, which are Q.R.Z. in Victoria, are heard Q.S.A. as far away as North Queensland, while one transmitter reports that his signals were read easily at Adelaide, but were barely audible at Deniliquin. In this case the receiving instruments, which were in the hands of hard bitten experimenters at both those points, were almost identical. Now, scientists have given us the reason for all these things, and if their deductions are based upon theories—well, that doesn't alter the fact that they happen.

It may, perhaps, be wandering away from the point a little, to mention that the Australian Coast is famous for dead spots, and there are positions, notably the point just south of the Leeuwin, and at another point midway between Sydney and Brisbane, where a ship experiences the utmost difficulty in getting through the "blanket" of dead atmosphere, if we may so term it, and raising a coast station.

The station at Colombo (V.P.B.) is notoriously hard to raise, on account of the bad screening at points all round the coast of Ceylon. During the war, the naval authorities detailed a special patrol ship for the purpose of observing these fading effects, with the result that a chart was issued to all merchant ships showing the actual positions from which V.P.B. could not be worked. This chart was of the utmost value, in that it saved a great deal of useless calling, and cut down the possibility of jamming other ships' messages.

Now, to come back to our test. What we have in mind is something aside from the customary "Your signals are Q.S.A." sort of thing, which, in most cases, is merely a mark of courtesy, and is really of no value. Let us depart from this and aim at something constructive; something that will be of real value to the transmitter as well as the receiver, and that will add some additional data to the vast amount already collected by experimenters.

Does the idea appeal to you, experimenters? If so, will you join in? Co-operation is all that is necessary to put this test over properly; co-operation between transmitters and receivers. Three well known experimenters have already strongly endorsed the suggestion: Phil. Nolan (2YI), Traffic Manager of the Radio Relay League; R. C. Marsden (2JM) and L. E. Forsythe (2BF). These transmitters will co-operate.

It is proposed that a week, to be known as "Wireless Weekly Transmitting Test Week," be set aside at the beginning of October, from the 1st to the 7th inclusive. Each night, commencing from 10 o'clock (after Sydney Broadcasting Stations have closed down), transmitters will send out speech and C.W. signals, the period allotted to each depending upon the number taking part in the test.

WHAT ARE FROST LINES? SEE PAGES 2 and 3.

It will be appreciated that the more there are the better, so will those who want to co-operate, kindly write and tell us. In order to properly organise the arrangements, we must have these names, together with the wave length particulars of the stations, by the 7th September. Any transmitter in N.S.W. is welcome, and we want to see everyone playing an active part. If the number of participants warrants the finalising of arrangements then an independent committee will decide upon the schedule of transmissions.

And now a few remarks to all those people, country and interstate, possessing receivers. Will YOU co-operate? It doesn't matter where you are; in the town or out in the bush; you can help. If you read these lines and you have a receiver, no matter of what type, sit down right away and write us a note telling us you are prepared to listen in, and to send us a report on the test. These notifications should reach us by September 14th. When we are assured of reasonable support from both transmitters and receivers, then the committee will get to work and fix things up for what we want to make the most complete test ever put over in Australia; a test from which we hope to derive results which will be of material advantage to the progress of amateur wireless in Australia.

So once again, readers, will you join in?

SPECIAL NOTICE.

Since the above was written, Mr. C. D. Maclurcan (2CM) has signified his intention of taking part in the test.

The Editor,
"Wireless Weekly,"
Regent Street,
Sydney,

11 Queen Street,
Croydon,
21st August, 1924.

Dear Sir,

Regarding Mr. E. T. Vear's (2BM) letter in the last issue of Wireless Weekly, wherein he states that he has been receiving Q.S.L. cards, and that he has not been operating his station for some time—in all probabillty the signals that have been heard are from Mr. Forsythe's station 2BF, situated at Northbridge.

While on the subject of misunderstood call letters, I would suggest that the different experimenters announce the letters as they should be, viz.: A—ACK; B—BEER; D—DON; J—JOCK; M—EMMA; P—PIP; S—ESSES; T—TOC; V—VIC, etc. As an example, I recently logged 3 x F, but took his call down as 3 x S, only to find that there was no such call at present.

Yours etc.,
C. LUCKMAN, 2JT.

(Continued on page 41)

Who is Insulator?

This is something which quite a number of our readers want to know. At great expense and at no little trouble our representative managed to secure the only available photograph of him from the family Bible. So here he is. Little Willie, aged 11.

QUEENSLAND WIRELESS EXHIBITION

We have received a copy of the programme issued in connection with the Wireless Institute's (Queensland) Exhibition at the recent Brisbane Show. Reports indicate that the affair was a huge success, to which the asssitance rendered by Amalgamated Wireless (A/sia) Ltd. contributed largely. Although the Queensland Institute has long been famous for the uncanny silence surrounding its proceedings, it seems, from the programme that on this occasion it has come out of its shell and carved a niche in the Hall of Fame—a financial return.

A. N. Stephens is mentioned as the party responsible for the successful organisation of the exhibition. A big man's job—well and truly done.

"INSULATOR" TALKS ON AERIALS

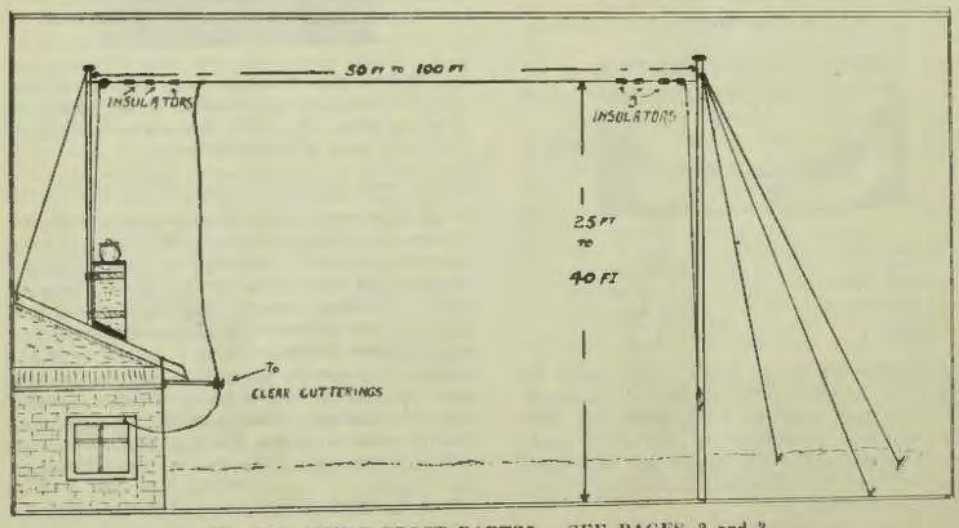
THE subject of aerials is perhaps one which I have more or less neglected. But in common with most people I have quite developed what may be termed an "aerial eye." You know what I mean—being a wireless man. I'll take on hand to say, I'll pick out an aerial when quite a long distance from it, and even without looking for it. And it is strange how you pick another person with the "bug" if you happen to be near an aerial. The "bugee" always looks up and perhaps inwardly criticises the aerial.

I always criticise an aerial and sad to say in most instances my criticism is adverse. My work takes me round most suburbs and the majority of aerials I see are open to improvement. How in the name of Dickens reception can be accomplished is more than I can understand. Some aerials look quite nice, suspended on nice white poles sometimes 50 feet high, but having the lead in wire fouling the gutter of the house. That is a sight which always makes me shudder. Those who are guilty of this please rectify it, if not for your own sakes then for mine, as I don't like shuddering, particularly after having the flu.

Certainly keep well away from gutterings and down pipes and also as far as possible from iron roofs. Leakages will creep in particularly on wet nights and no one can afford to waste any of the very small portion of energy with which your aerial is charged.

Most aerials I have seen are not sufficiently well insulated. Invariably when a single wire is employed most people seem satisfied with one insulator at each end. Personally nothing short of three each end would meet with my requirements. Insulators are cheap so why not make certain of having sufficient insulation by employing half a dozen.

Always endeavour to get as high as you can. A wonderful difference will be noticed by the crystal user when he increases the height of his aerial. It surprises me to think that very few people will spend a few shillings and erect a decent aerial. Phones, sets etc. they don't mind paying for, but for the aerial—well they balk. And the aerial is perhaps the most important.



ARE YOU USING FROST PARTS? SEE PAGES 2 and 3.

I have also noticed a number of people when starting wireless mention that they don't want an outdoor aerial, but yearn for a frame type inside the house. It takes quite a lot of energy to advise them that a frame aerial is only suitable for a multi valve set and that their crystal set needs an outdoor aerial. Passing by their homes at a later date the aerial can be seen poked away in any old place seemingly, but actually from an old piece of 3 x 2 batten about 12 feet high nailed to the back fence the aerial is brought to a point in the house immediately under the guttering. Brown, when he meets you next time tells you that "this wireless business is not so good after all,—too faint,—can't move at home if you want to hear anything."

Show him how to paint up his 3 x 2 batten and tie this up to the chimney. Advise him to spend 10/- or so on a piece of 2 x 2 hardwood 35 feet long. Stay it up and so on and Brown rushes up to tell you he got some long distance signal, probably K.G.O., on his crystal set, and that Uncle George can be heard in the room with the phones on the table.

Another question which is often asked me is "What is the best aerial to use, a single or a double wire?" For receiving purposes I should recommend a single wire. If a double wire is erected, see that the two wires are at least 4ft. apart; 7ft is much better actually. Don't expect the addition of another wire to make up for the deficiency in height of your single wire. It simply won't. I know it is quite nasty but it won't, that's all there is to it.

Nothing of particular advantage is gained by having your wires always under a severe strain by being kept too taut. A slight "sagging" is perhaps to be preferred, but don't over do the sagging. It looks untidy.

A glance at the drawing will show you how I should erect an aerial with a view to maximum efficiency for a small outlay. To erect one of the type I suggest should not cost you more than £1 and it is a pound well spent: The guys to hold up the pole need be only No. 12 or 14 galvanised iron wire which is obtainable at Anthony Horderns in small rolls. Only 3 are necessary for the long pole—one immediately behind and one on either side. These guys are taken from the very top of the pole. The pulley is cheap enough and the halyard need be ordinary hemp rope which also can be obtained at Anthony Horderns. If using hemp rope, every month lower your aerial, cut away the piece of rope which doubles over the pulley, and rejoin a fresh bit to the aerial. This will keep your aerial from coming down after a rain storm.

A single guy is all that is necessary on the pole which is lashed to the chimney. This guy should be immediately behind the pull of the aerial wire itself and no harm will result. Don't think you are putting too great a strain on your chimney. You really are not, as there is nothing to catch the wind. My own chimney supports a pole 30ft. long and I often climb up on top to view the neighborhood. It supports my weight O.K. Therefore, don't you fear.

Should a chimney not be available, another pole of from 30 to 50 feet long may be pressed into service. I will not attempt to tell you how to erect a pole, just start and do it yourself, and you will find your neighbours keenly watching—watching, mark you; not helping—you and giving you sufficient advice to erect a dozen poles. At least such has been my experience.

I will say this, all the same, by way of advice. There is no necessity to dig a 6 or 10ft. hole in the ground to hold the pole. A hole 12 inches deep is all that is required, provided your guys are alright. Also for receiving don't worry about putting insulators in your guys. It is not necessary unless you think it improves the appearance.

The gauge of wire employed doesn't really matter much. In the course of my experiments, I have used all gauges from No. 36 to 7/20, and must say that I have noticed very little difference on local broadcasting. There are many different claims made for stranded and braided aerial wire. I know, but take my advice, forget all about them. No. 3/20 is good as it is quite easy to handle. Failing a supply of this, use either 14 or 16 gauge of copper wire. Just as good! You hear of some people who receive on a clothes' line. Perhaps they can, but what strength do they get? I have never found it worth while.

When making joins always solder them, and never use spirits of salts. Buy some good brand of resin cored solder. Myself I use Keyster brand and find it the best of all.

It may interest some to know that certain aerials will receive better from one direction than another. The aerial illustrated, for example, will receiver better from the direction behind the lead in wire. This type is known as an inverted L. When the lead in comes from the middle it is then known as a T type.

(Continued Page 17, Col. 2.)

WIRELESS INSTITUTE OF AUSTRALIA

NEW SOUTH WALES DIVISION

THE monthly general meeting of the Wireless Institute of Australia, New South Wales Division, was held at the Royal Society's Rooms, 5 Elizabeth Street, on Tuesday, August 19th, at 8 p.m.

Mr. Stowe occupied the chair, and after the preliminary business had been transacted, Messrs. W. L. Hamilton, W. L. Carter and G. Maxwell Cutts were unanimously elected members of this Division. These three gentlemen are well known in experimental circles and it is confidently anticipated that owing to their usual thoroughness in any matter they undertake, the Institute will benefit in having them on its roll. Incidentally it may be mentioned that these three gentlemen were elected by the Delegates' Council as a sub-committee to deal with lectures and sundry matters relating to the various clubs, and Mr. Hamilton as convenor of this sub-committee will be glad to get in touch with all Affiliated Club Secretaries with a view to arranging a roster of lectures, thus enabling the best brains of the wireless movement to be made available to the various clubs in the way of lectures and debates.

It might also be pointed out here that this arrangement will have a very beneficial effect from another point of view in that the interchange of ideas and interests between one club and another will strengthen that bond of comradeship which is essential if the experimental movement is to forge ahead. We have undoubtedly gone through many difficult times in the past, but it is not a propitious moment for resting on our oars. It is very necessary at this stage for every member of a radio club whatever the status of that club may be, to support his organisation by every means in his power. It has been a problem in the past for Club officials to maintain the interest of their members in the various club activities. The attendance at meetings has a habit of dwindling, which besides being very discouraging to the lecturer, has a reflex action on the members themselves in that they are losing the benefit of interchange of ideas, which is one of the most valuable assets of the club movement.

Even if the subject may be perfectly familiar, the man who has the interest of his club at heart will always attend the meetings. It is doubtful whether any experimenter to-day has such a knowledge of matters relating to radio, that he can learn absolutely nothing at any lecture he attends, but even were this the case, it is then his clear duty to attend the meetings and by taking part in the discussions which follow the paper, add to the store of knowledge of his fellow experimenters. The discussion which follows the paper is in some respects even more valuable than the paper itself, as the lecturer may sometimes inadvertently convey a wrong impression by his choice of words, but this will be rectified by the discussion which follows. We should all be open to pick up any hints from our fellow experimenters, and the club meetings form a most important part with regard to a transfer of knowledge in this direction.

Mr. Renshaw's paper was received with great enthusiasm and his explanations and diagrams made matters exceptionally clear. The text of his paper will be published in next week's Wireless Weekly, but the remarks which were passed at the close of the meeting gave many valuable hints to those who were present. In his remarks after the reading of the paper, Mr. Stowe emphasised the assistance that the old and experienced experimenters could be to the new men by listening in to local transmission and reporting on its quality when asked to do so. Many new experimenters who have not yet been able to reach out into the field of D.X. work have experienced considerable difficulty in getting reports from those near at hand. It should not be beneath the dignity of any experimenter to receive local transmission, as this may be adding considerably to the fund of wireless knowledge by helping the new man, than he would be doing if he restricted his energies to long distance work, which has already been proved to be a practicable scheme.

Relay League Activities.

The organisation of the Radio Relay League is progressing satisfactorily, and the link with Brisbane seems to be securely established. It is desired, however to get in touch with our brethren of the south, and we trust that Victorian and South Australian transmitters who can reach N.S.W. will get into touch with the Secretary of the League, Box 3120, G.P.O., Sydney, without delay. Even the smallest contribution in the way of time and energy will form an important link in the League's activities, and readers are urged not to consider

PAGES 2 and 3 TELL YOU ALL ABOUT THE FROST LINES.

that their efforts would be too insignificant to be of value. While it is certainly desirable that those who can should work as frequently and as long as possible, so that communication may be maintained for the greatest possible period, the shortest time which can be given will be welcomed. Half an hour a fortnight, or even per month, given regularly, and in such a way as to be depended on, will be invaluable. The potentialities of the League are beyond the conception of even the most sanguine experimenter and the wonderful organisation which has been produced by our American cousins can not only be reproduced in Australia, but can be far excelled. We have the men, we have the apparatus. The distance can be covered—this has been proved. Are Australians going to be backward in enthusiasm in a good cause, or will they with their usual whole-hearted sportsmanlike attitude, throw themselves wholely into the movement, and produce an organisation which will astonish the whole world? There could be only one answer to this question. Australia will do it—therefore, do it now!

Certificates.

Those who are entitled to the certificates issued by the Wireless Institute of Australia, are reminded that these are now available at the Institute Headquarters, 82 Pitt Street, between the hours of 10 to 12 a.m., and 1 to 4 p.m., and they should make a point of collecting them at the earliest possible moment.

Judging by the numerous complaints at the unavoidable delay, these certificates are valued by those who received them, and no doubt the anxiety which has been manifested to obtain them will be reflected by their quick collection.

A. H. PERRETT,
Publicity Officer.

SOUTH AUSTRALIAN DIVISION

The monthy general meeting of the South Australian Division of the Wireles Institute of Australia, was held in the Prince of Wales' Lecture Theatre, Adelaide University, on Wednesday, 6th August.

Mr. R. B. Caldwell (President) occupied the chair.

This being the last meeting of the financial year, nominations of officers for the coming year were called for, and the following were received:

President: Mr. R. B. Caldwell.

Vice-Presidents (2): Mr. H. L. Austin, Mr. J. M. Honner, Mr. C. E. Ames and Mr. T. S. Bagshaw.

Treasurer: Mr. K. H. Milne and Mr. K. Wadham.

Hon. Secretary: Mr. C. E. Ames and Mr. K. J. Wadham.

Hon. Assitant Secretary: Mr. F. E. Earle.

Council (5 wanted): Messrs. W. Honner, T. S. Bagshaw, L. C. Jones, R. M. Barker, C. R. Churchward, H. A. Kauper, J. M. Honner, W. J. Bland, H. L. Austin and T. Morris.

Librarian: Mr. H. Hawke.

Library Committee (3): Messrs. H. L. Austin, L. C. Jones, W. Honner.

Messrs. J. M. Honner and H. Hawke were elected as Auditors for the ensuing year.

Discussion took place on the new regulations and dissatisfaction with the treatment of the experimenters was warmly expressed.

Mr. R. M. Barker gave details of a circuit which he has been testing on very short wave lengths with excellent results.

The annual meeting will be held on Wednesday, 3rd September, when the election of officers will take place. A full attendance is requested.

(continued from page 15)

Lightning arrestors as a rule are nuisances. In fact I hadn't one on my aerial at all until recently, as I couldn't find a decent arrestor. Now visitors to my home will see a Magnus Lightning Arrestor installed, as I know it to be splendid. All other types I have tried up to the present interfered with signal strength. Not so with the Magnus, hence my recommendation.

Using a single valve set I have conducted quite some interesting experiments, using an indoor aerial. This took the form of a length of 26 gauge enamelled wire run along the picture rail. You single valvers, give it a fly; you'll be interested, I know.

Summing this up, keep these facts well in mind:

(a) Get as high as you can up to 60 feet.
(b) Be as long as possible up to 100 ft.
(c) Use 3 insulators each end.
(d) Keep away from gutterings, down pipes, etc.

Follow out these few rules and you will get splendid results.

PAGES 2 and 3 TELL YOU ALL ABOUT THE FROST LINES.

REDUCING THE STATIC NUISANCE

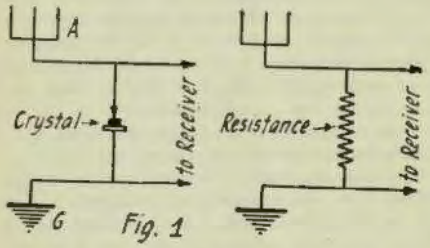
BY L. W. Hatry, in "Radio News."

EVERYONE is trying by the use of various ideas and devices to eliminate as much as possible static at the smallest cost in signal strength. If the strong signal that is unreadable through heavy static can be worked into a medium signal that is readable through the static left with it, satisfaction will result. So, we leave the signal as strong as possible, and leave the static as weak as possible in any of the devices that follow.

The ideas given here are not cure-alls for QRN troubles, but merely a panacea for the inconvenience which only clear, cold weather ever eliminates.

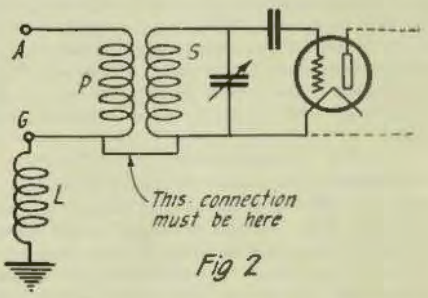
Use of a Shunt Resistance

Two old methods embody either the use of the crystal or the grid leak (high resistance), and are fairly effective with most receivers, although



Isolated crashes of static can be reduced by connecting a crystal detector or a resistance from antenna to ground.

they will not work with all. The first method consists in shunting the crystal across the aerial and ground binding posts of the receiver (see Fig. 1) and adjusting it for best static reduction point. The crystal should be a carborundum with a heavy, firm contact so that once adjusted it may be depended upon for a time. A little practice is necessary to obtain the best results, but little trouble will be experienced in making it work at first trial. The grid leak method is to shunt a high resistance across the aerial and ground binding posts of the receiver. As it is necessary to test for the correct value, it is best to use a home-made leak made of a fibre strip and pencil or indian ink markings. The crystal, however, is the better of the two, These methods are both particularly good when the static manifests itself in strong, isolated crashes that are interposed with silent or comparatively silent spaces. Neither system will work with the single-circuit receiver, they must be used



A large inductance connected in the ground circuit will also reduce static.

with apparatus involving capacitative or inductive coupling between the antenna and the secondary circuit.

Loose-coupling properly handled is also of great benefit in bettering static-signal ratio, and, if the coupling control of your receiver is unused, an excellent method of eliminating static noises is being neglected. Familiarity with the coupling only comes with practice.

A great many of us have our transmitters comparatively close to the receiver, usually from two to five feet away. This permits a very simple method of reducing QRN. On bad QRN nights, by tuning my receiver on or around the same wave, leaving the aerial on the transmitter and having only the ground connected to the receiver, a notable decrease in the QRN is evident. With this arrangement I have been able to copy 5's, 8's and 9's up to 1,000 miles without difficulty and to work them, when with the aerial connected to the receiver, static interference would not allow reading even the locals within a couple of hundred miles.

This system is dependable for short distance work during bad weather. The method is, in effect, a loose coupling system, but it does not have the sharp peak that true loose-coupling provides in the tuning; instead, it is possible to receive effectively 30 to 40 metres of the actual transmitted wave A carefully built low-loss receiver is best for this work and most others give indifferent results. Two different stations using this arrangements can work a very effective break-in with no difficulty.

In Fig. 2 is shown another simple method that, at least, works. The coil L may be any large inductance that is wound with a couple of hundred or more turns. It should be preferably of heavy wire (No. 18 to 20) and an ordinary type of coil; bank or honeycomb wound coils will not work well. Fig. 3 shows another connection of the coil that brings in more QRN and stronger signals; the weather should determine which is used. In operating the receiver on one of the afflicted nights, do not work at the edge of oscillation, as is

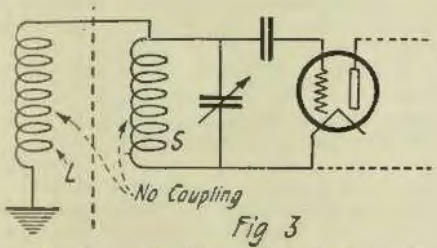


Fig 3

This scheme will reduce static somewhat while allowing strong signals to come through.

usually the case. Instead, go noticeably deeper into oscillation. This reduces the volume of the C. W. chirp, but it also deadens QRN very effectively.

A single turn of wire used as the receiver primary with no further coupling or loading devices, instead of the usual tuned circuit, will give a better static-signal ratio. For the best results it is necessary for the receiver secondary and its components to be constructed from the low-loss viewpoint. Also, the antenna should have its fundamental wave outside of the range of the tuner of the wave range to be covered with this arrangement.

A low antenna, not too long, nor of too great capacity, is helpful in avoiding static. A good specification is 20 to 25 feet high and 75 to 100 feet long, or less. It should be of the single wire type and of low resistance. The simplest way to achieve the low resistance is to make the single wire of several strands of large wire, say No. 14, twisted together and soldered every two feet. The low resistance and height will give a better static-signal ration than many another aerial. Some locations will not permit this, however.

In Fig. 4 is an arrangement that partakes of the resonance wave-coil idea and allows normal, or nearly normal signal strength, with proper adjustment. This is the test of all the systems detailed. The coil L must be wound with heavy wire and may be supported on a 3 or 4-inch form, preferably of paraffined cardboard; 400 turns are needed and No. 16 D.C.C. wire will work nicely.

The coil may be mounted so that easy control of the metal piece, A, is available. This slide is moved over the coil for best adjustment. The metal piece may be of brass, aluminium or copper, and should be wide enough to cover about one-third the circumference of the coil, over a width of six or eight turns. The copper strip, of course, does not come in contact with the wire on the

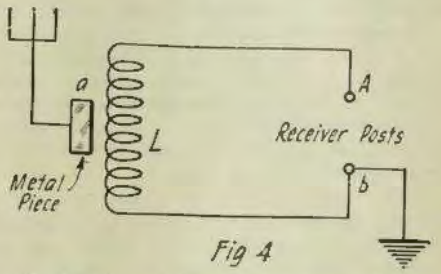


Fig 4

An adaptation of the resonance wave coil idea will prove beneficial in reducing QRN.

tube, but is merely placed in close relation to it. This provides a condenser effect and is the principle upon which the operation of the unit is based. The tuning is a little difficult to describe, but lies in adjusting the receiver to approximately the wave desired and then moving the metal strip for best adjustment of both C.W. reception and reduction of static. The actual resonance point will be well defined and trial will make the action very clear. The adjustments are, however, not very critical and the system is well worth installing.

The Construction of Wireless Components

By O.J.R. in "The Broadcaster."

A simple example of a condenser having a variable capacity is shown in diagram A. Two metal plates Y are placed between sheets of glass or other insulating material X, so that one of the plates will slide either in or out. When both plates are in exact alignment and one is directly over the other the maximum capacity of the condenser is obtained, but if the bottom plate is drawn out so that only about one half of its area is exposed to the other plate, it naturally follows that the capacity of the condenser (or the stored up energy) is also reduced to about one half. If these two plates could be conveniently supported about ¼in. apart we could dispense with the glass sheets and utilise the air as a dielectric.

This theory has been introduced in the modern variable condenser we are all so well acquainted with, but instead of having sliding plates it has been found more convenient to make each plate a semi-circular shape and arrange the moving plates on a spindle to rotate about 180 degrees. The parts required to construct a 19-plate condenser are shown in Figs. 1 to 10. This condenser having ten fixed and nine moving plates, or "vanes," as they are sometimes called, will have a capacity of approximately .0003 mfds. This, of course, is the maximum capacity which can be varied to any lower capacity down to zero.

The plates should be of copper, brass or aluminium, and are too well known to be described. They can be purchased with spindles and other necessary parts very cheaply, so cheaply in fact that it does not pay to make them. The three holes in the fixed plates (Fig. 1) should accommodate lengths of 4BA screwed rod (Fig. 5) and a small spacer washer is placed over the rods between each plate. The plates, equi-distantly separated by the small spacer washers, are then held firmly in position by means of six 4BA nuts—one on the end of each rod. The spindle (Fig. 4) for the moving plates (Fig. 2) is usually made from ¼in. square brass rod turned down and threaded at each end. The square portion of the rod fits tightly in the square holes provided in the plates and a large spacer washer is placed over the rod between each plate, final adjustments being made by means of a nut and lock-nut at each end. Should the rod be too long for the purpose required, it will only be necessary to pack up to the top of the squared portion with extra spacer washers. Fig. 6 and 7 show respectively section of spindle and 4 BA rod with spacer washers.

The end plates are made of ⅛ or ¼in. sheet ebonite and should be large enough to support the

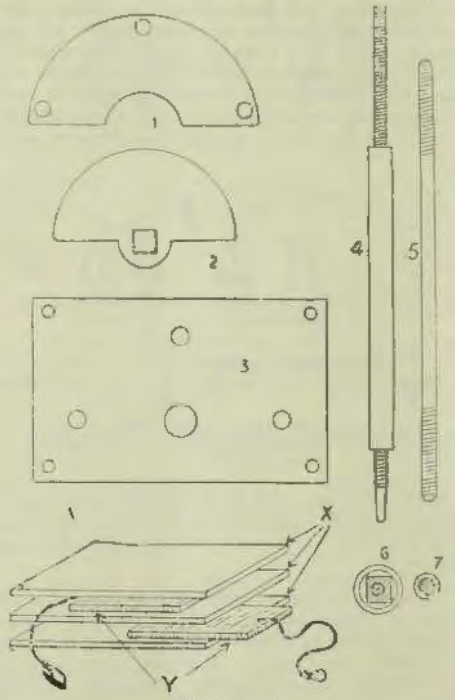


Diagram A.

assembled plates, the holes for the three rods being marked off from one of the fixed plates used as a template. The large holes are for the brass bushes which form the two bearings for spindle. All holes must be drilled absolutely accurate. A small hole at each corner may be drilled in the end intended for the top of condenser for the pur-

pose of fixing same to the panel of receiver. If the condenser is to be mounted in a box and used as an auxiliary unit the ends should be either round or square and not oblong as shown.

The general arrangement of the condenser will be easily understood by referring to Fig. 8. The top bush (Fig. 9) should be screwed or bolted to the ebonite and the bottom bush (Fig. 10) is usually tapered slightly to correspond with the tapered end of spindle. Where the end of the spindle is not tapered a spring washer should be placed between the bottom lock-nut and bush. It will be clearly seen that the distance between the fixed and moving plates can be readily adjusted by means of the nuts which determine the position of the ebonite ends carrying the spindles and moving plates.

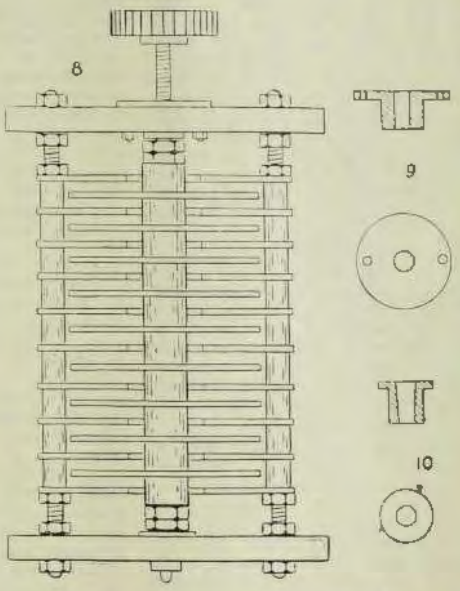
Connections are made from any one of the three rods supporting the fixed plates and from the top of bottom bush, or better still, from a piece of soft flex or a spiral of copper foil soldered to one of the lock-nuts. The condenser is now complete with the exception of a manipulating device which is usually an ordinary ebonite knob screwed firmly to the top of spindle. If desired, a 4in. length of 1/8in. round ebonite rod can be screwed into the edge of the knob. This type of handle is to be recommended on account of the fact that by its use there will be no "capacity effects" caused by the hand of the operator being too near the instrument.

The parts required to construct this condenser can be purchased very cheaply from any wireless dealer, and comprise: 10 fixed and 9 moving plates, 1 spindle and 3 lengths of 4BA rod to suit, 4 nuts for spindle, 18 nuts for rods, two ebonite end plates, one top bush, one bottom bush, one ebonite knob or handle, pointer and scale, 10 large spacer washers and 27 small spacer washers.

A table showing the number of fixed and moving plates required for condensers of various capacities was published in Wireless Weekly of August 15th.

Vario-Couplers.

A vario-coupler may be described as a tuning device having a small coil arranged to rotate inside a larger coil. The small coil is called the secondary or re-action coil and the large one the primary coil. The outer or primary coil (Fig. 11) should be about 2½in. long by 3¾in. in diameter, and the inner or secondary coil (Fig. 12) about 2in. long by 2½in. in diameter. The most usual type of vario-coupler is shown in the diagrams, Figs. 11 to 13, where the spindle carrying the rotating coil passes through the centre of the windings. A space of about ¾ inch is left on the centre of each coil, the winding in each instance being in one piece and in one direction. Two small spacer washers as used for building variable condensers are fitted into the sides of the primary coil to form bearings for the spindle. These should be secured with a little glue. The spindle is made from a 5in. length of 4 BA screwed brass rod and fitted at one end with



an ebonite knob or other manipulating device. A scale and pointer may be included if desired.

The holes in the sides of the secondary coil are made just large enough to allow the spindle to pass through. The coil is clamped to the spindle by means of four nuts as shown in Fig. 13. Both coils should be wound with No. 22 or 24 double cotton covered wire and connections must be made direct from the ends of the secondary winding and not from the spindle or one of the bearings. To effect this, solder on two short lengths of soft flex and connect the ends of two terminals as shown in Fig. 13. The pieces of flex should be long enough to allow the coil to rotate through about 180 degrees and they should be as light as possible.

(Continued on Page 24)

SEE THE FROST LINES ON PAGES 2 and 3.

VICTORIAN NOTES

From Our Special Correspondent

IT is regrettable that the W.I. of Vic. is more brimful of good ideas than of time to materialise them. In our last notes we mentioned that a monthly Tea was to usher in future monthly talks. Well, the Tea is still in the future, and the Talk nearly joined it there. Counter attractions at St. Kilda and elsewhere distracted the "heads" on the auspicious occasion of the All-Clubs meeting for July, and the result was that only a score of the faithful were in attendance. They were well rewarded by an interesting lecture by the one and only Mr. T. P. Court on The Musical Reception of music. Mr. Court proved pleasantly reminiscent of his early days in the Navy and told us almost as much about himself as about the other interesting parts of his lecture. He is at present engaged on research into the best means of receiving music without distortion, and he meanwhile strongly advocates the old loose-coupler for tuning and the resistance coupling between valves.

The new regulations have been accepted in a spirit of resignation among Victorian amateurs and ci-devant experimenters. It appears that now we must all write B.C.L. after our names and relinquish the once proud name of Experimenter to the chosen few who can claim to have made some "contribution to science". As doubtless even the genial Mr. Malone himself can hardly claim such a distinction, at any rate not as an annual affair, it will be with bated breath that we scan the next lists of Experimenters as by Law Appointed. Some master of tactics, either before or behind the scenes, appears to have once more hoodwinked those whose pleasure it has been to represent experimenters in official discussions, for were we not all assured, and reassured, that the position of "experimenters" would be safe under the new regulations? And so it is, but the "experimenter" is not even as you and I, O brother, but is some highly distinguished individual who has made some contribution to science. If you haven't made a contribution to science then you must make a contribution to the Broadcasters. This is all rather unfair. Wireless amateurs all over Australia have labored and those that now enter into their labors seize the official opportunity to disfranchise and to penalise them. The name of "Experimenter" is very precious to those of us who seek to understand this newest of sciences and to help it forward, however humbly. It is not to save 15/- that we resent the impertinence of being classed among mere purchasers of sets to listen-in, yet few of us can claim to have risen to the giddy eminence of inventors and scientists for whom alone the Regulations provide reserved seats for £1.

Just as we are all a little bit tired of KGO as a test reception news comes to hand that the inevitable Mr. Cox (3 BD) has got through to the Atlantic side of Uncle Sam's auditory organs. He was using a very low wavelength (below 100) on which he had already successfully reached New Zealand. Confirmation of his results is not yet however forthcoming. If such a distance has actually been achieved it will be the more remarkable as the Americans themselves find it difficult to get across their own continent per via the ether. It is of course likely that with a longer "take off" some ethereal obstacle may be surmounted.

A modest young man named Vanselow, assistant secretary of Canterbury Club, was listening to static and other strange noises the other Sunday night when as he twirled his condenser a little piping note spoke up. Getting on to the edge of it, what should he hear but 6 CGW signalling to a neighbour in California about some chemical formula, a dose for the blues. 6 CGW is not unknown to an Australian audience, but Mr. Vanselow is a new comer into Wireless, and it is significant that he makes neatness and accuracy a great feature of his work. Reception is not the whole of Wireless, but it plays the chief part in the public use of it, and while learning morse is irksome its reward is very welcome when an achievement like Mr. Vanselow's results.

A similar reception is reported from Kyneton, where Mr. Doran heard K. GO on 2 valves. These new names are refreshing, as the "old hands" must now be impelled to seek further afield for their laurels. What is to hinder some novice hearing England before the wise ones do?

With that mercurial temperament so appropriate to the head of Amalgamated Wireless Mr. Fisk is likely to prove interesting at the Adelaide session of the Science Congress where he is set down to deliver an address on Recent Advances in Wireless. It strikes one as curious that no wireless amateur is likewise set down. Quite possibly Mr. Fisk will include in his survey some account of Mr. MacLurcan's achievements, for example, not to mention our own galaxy of Victorian transmitters who have been oscillating the ether right through to the Atlantic, but one would rather see some representative from our own Wireless Institute of Australia at the distinguished gathering.

Preliminary work on the research into "fading" and "dead spots" which the W.I.V.E.S. are conducting in collaboration with the Meteorological Department, has reached another stage. (Perhaps the initials W.I.V.E.S. look rather matrimonial, but they in the present instance stand for "Wireless Institute of Victoria, Experimental Section.) The W.I.V.E.S. spent a recent week-end at Macedon and found contrary to anticipation, that the screening so conspicuous nearer Melbourne was absent, and they got reception very clear in all directions. This of course, only goes to show that screening is ephemeral and that the research work undertaken will be valueless unless spread over a long period as well as over a big area. Arrangements to this end are still in the preliminary stage.

Can anyone prescribe an infallible test to distinguish between direct and re-radiated reception? Recent successes on single valves and reflex crystal-valve sets having been discounted by

statements that they depend on re-radiation the rejoinder has been made that no re-radiation could possibly transmit carrier-wave and music without distortion for any length of time. If it could, the problem of cheap reception would appear easy, since all that would be necessary to operate simple crystal sets from here to the Never Never would be a master-multiple-valve set every ten or twenty miles, installed by the local authority perhaps, as they now instal transformer-stations for lighting. With these to boost up the original transmission as the B.B.C. boosts the Transatlantic telephony throughout Great Britain who would need anything more expensive in the way of sets than a crystal set with perhaps a power-valve attachment? This will no doubt be the problem of future broadcasting, with automatic re-radiating substations, say in all big towns.

In the meantime and apropos of the above can anyone come forward with an infallible test as to whether any given reception is direct from the original transmitter or merely the crumbs from some rich man's aerial nearby?

Our grandfathers in Great Britain are now being confronted with the same problem as we in Australia are now very needlessly and imitatively setting ourselves, namely the reception of broadcasting of widely-divergent wavelengths on one simple domestic set. It ought to be obvious to the authorities (but isn't) that it is merely making opportunities for dealers when wavelengths of 480 and 1720 are allotted to the two classes of stations.

In England the high-power longwave broadcasting has some little excuse, but in Australia none at all. When amateurs with 10 watts have been heard on 200 metres all over the Eastern States for the last 2 or 3 years, why are the authorities allowing themselves to be dragooned into longer waves on higher power—or is there some sort of notion in the official mind that wavelength must increase with power? The designer of a set for a suburban home which desires simplicity and robustness of apparatus must find it difficult to ensure the reception of Farmers and Braybrook and 3 BI, and 3 AR as well as the many amateur transmitters of music (even of gramophone music) who willingly and freely give great pleasure for the simple listener-in. It is evident that some simple control is needed that will change over (as easily as changing a record and winding up a spring) from transformer coupling to tuned-anode and from low to high wavelength coils. There is no reason why some amateur should not direct his attention to this very pressing need of the present movement.

Perhaps the view taken by many amateurs on this side is not entirely representative of Australian feeling, but it seems to be held here that the transmitter of morse is a cut above him who transmits music. Working American and English amateurs in morse seems to be taken as the hall-mark of genuine experiment, though why this is so passes the understanding, since professional operators do the very thing daily and with ease. Moreover the transmission and reception of morse is rather calculated to unfit an experimenter for good results in telephony, as witness the divergence of opinions between two such giants as T. P. Court and Max Howden. Mr. Court speaks disrespectfully of the Super-Hetrodyne, while Mr. Howden has just strongly urged on the Canterbury Club that it should scrap all preconceived notions of reproducing even his own DX set as a Club set, and concentrate on a 7 valve Super. In Mr. Howden's enthusiastic words "We will be able to log Yanks all night on a frame aerial!" The question before the house is whether this eternal logging of Yanks is not getting a bit out of date, like the sets they were logged on. Enthusiastic Yankee loggers care little about generator hum, reaction, static, and distortion which are the Four Beasts of Telephony. So which are we to have, Morse without Re-morse; or Telephony without cacophony?

Slighting reflections are sometimes cast on the gramophone artists who up till lately have been delighting or otherwise affecting diligent searchers of the ether, but to give the gramophone and other eminent folk their due they are more interesting to more folk than those who punctuate and disrupt the ether with dots and dashes full of sound and fury but signifying not much. It is said that the word Code is derived from the name of the notorious Colonel Cody who used to make dashes at his enemies and other targets and fill them full of dots. This may be so, and certainly many of his wireless confreres are still in their dot-age, and it is significant that when two "key thumpers" get into "click" with each other (to use their own debased language!) and by way of variety rise into the heights of ordinary speech they can think of little better to say than "Hullo" with a big D.C. after it (*da capo*, not direct current) and then enquire affectionately "How do you like my Modulation?" As if any person with ears of normal length could possibly judge modulation from the vain repetition of one inane dissyllable! For perfectly scientific testing the gramophone record stands alone, and when transmitting can be done so well that a tune played in the 'reception room' is hardly distinguishable from the same one played at the transmitting end at the same time there should be some applause cards circulating. One of the best in this line locally is undoubtedly 3GI, and especially so when Commander Cresswell takes the helm, but so far nobody here has instituted formal tests of vocal and instrumental reproduction on lines of strict phonometry.

In the matter of nomenclature we are still as a nation undecided whether to call undulating oscillations in the ether by the name of "wireless" or 'radio." I referred to this indecision in my previous notes. Let me like a good electron return again to the charge! The new Victorian W. I. monthly organ has been dubbed "Experimental Radio," but its publishers prefer to call themselves "Wireless Publishers." Similarly the new regulations function under the "Wireless Telegraphy Act," but mere dealers have to exhibit a conspicuous sign claiming to be 'Licensed Radio Dealers," while operators are to be certified proficient in "Radio Telegraphy," and although the certifying officers is a "Radio Inspector" yet his head is Chief Manager of Telegraphs and Wireless." Thus is confusion worse confounded. It is worth while quoting from an authoritative source (Chadwick: Radioactivity and Radioactive Substances) that Radioactivity is that property of a radioactive substance by which it "emits spontaneously an alpha or beta radiation." Since we are not concerned with these radiations in wireless communication, it is evident that the use of the prefix radio ought to be relinquished to those who have a prior scientific claim on it. The Commonwealth Department would be well advised to look into this question of consistent nomenclature more closely, and not continue to mislead the mere experimenter. In science the question of names is not as unimportant as Juliet declared it to be in

(Continued on Page 26.)

(Continued from Page 21.)

The ends of the primary winding are also connected to terminals as shown, or arranged in any other convenient way.

The method of assembling the two coils is as follows: Place the secondary coil in position inside the primary, attach the ebonite knob to one end of the spindle, push the spindle through one of the bearings (right-hand bearing in diagram) so that only a small portion is projecting through the inner side, slip on an ordinary washer or spring washer (determined before hand by noting thickness of nuts and distance between coils) and screw on one of the nuts. As the spindle is pushed through the right-hand side of secondary coil, this nut must be screwed up towards the bearing and another nut placed on the spindle inside the coil. Continue this operation until the coil and nuts are in the correct position, then tighten up the nuts each side so that the coil will rotate with the spindle. The primary coil can be attached to any suitable base by means of small brass angle pieces riveted to the outside of the former, in the position indicated in Figs. 11 and 13.

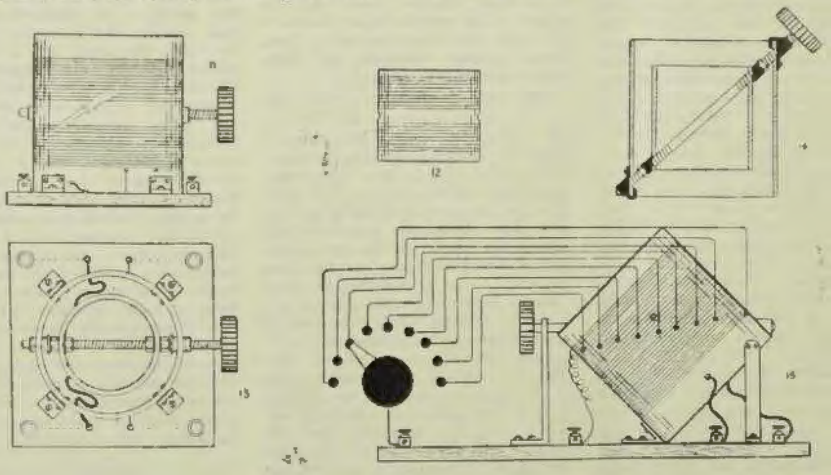
An alternative method of arranging the coils, is shown in the sectional diagram Fig. 14. This is more efficient since the continuity of the windings on either coil is not affected by the spindle passing through their centres as in the case of the method just described. The winding can be continuous and wound to about ¼in. from the ends of each coil. The spindle is attached to the secondary coil at opposite points on the opposite circumference and rotates in bearings similarly situated.

The sectional diagram represents the complete instrument cut through its true diameter and shows the position of spindle in relation to the coils. The bearings are made from small spacer washers, having one end filed down to an angle as shown, and soldered to small brass clips for attachment to the edges of primary coil. A second pair of spacer washers are shaped in the same manner and placed over the spindle between the secondary coil and the nuts which hold same in position.

What is probably the most efficient type of vario-coupler for use as an aerial tuning inductance is indicated in Fig. 15. The primary coil is mounted in the position shown and has a series of tappings taken off to a multiple switch. A convenient way of arranging this instrument would be to mount the coils in a suitable cabinet with the control knob projecting from one end and attach the contact studs and switch arm to an ebonite panel at the top. A ball type rotor which can be turned out of any hard wood, or purchased ready-made, is recommended for use as the secondary. The winding should be started at each end and wound upwards towards the spindle, the two ends then being joined together. A secondary coil similar to the one shown in Fig. 12 can be fitted in place of the ball type rotor if desired. The connections are clearly indicated in the diagram.

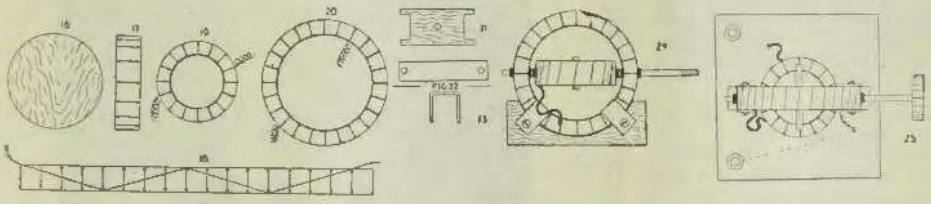
Variometers.

The variometer is another kind of tuning device, and consists of two coils connected in series and wound in the same direction, arranged in a similar manner to the coils of the vario-coupler.



Two honeycomb coils each about ½ inch wide form the two main parts of the instrument. Before going into constructional details, it will first be necessary to describe the method of making the coils. This simple method will apply to all honeycomb coils, whether used for variometers or for any other purpose. The former, for winding the coils on, consists of a cylindrical wooden disc (Fig. 16) ½ in. wide and for the outer or primary coil it should be 3½in. in diameter.

A strip of paper ½in. wide is cut long enough to go round the circumference of the disc, marked off into seventeen equal parts, and then gummed round the edge of the disc. Two ordinary pins are then pressed into each division opposite to each other and about a 1/16in. from the edge of the disc as indicated by the dots in Fig. 17. No. 24 or



26 double-silk or cotton-covered wire should be used for winding the coils. Take the former containing the thirty-four pins in the left hand and commence the winding in the following manner. Wind a few turns of wire round one of the pins and mark this pin No. 1. Then mark off the other pins No. 2, No. 3, and so on, in succession round the periphery until Nos. 1 to 17 have been clearly indicated. Leave about six inches of wire at the end for connecting up purposes. From pin No. 1 take the wire across the edge of the former and round the outside of pin No. 5 in the opposite edge, then cross to pin No. 9, from No. 9 across to No. 13, No. 13 to 17, and so on, bridging four sections each time alternately and going across to the opposite fifth pin all round the former. The method is clearly shown in the diagram, Fig. 18. Continue the winding until the coil is about ½in. in thickness and, if possible, count the turns and make a note of it. This can be easily done by tying a small piece of cotton or wool round one of the pins near the head and by counting one every time this pin is passed.

When the winding is complete, soak the coil and former in shellac varnish or melted paraffin-wax and allow it to dry thoroughly. If shellac varnish is used, it may be placed in a moderately heated oven for about ten minutes. When it is quite dry remove the pins and the former and bind the coil round with adhesive tape to prevent the ends from slipping. Figs. 19 and 20 indicate what the finished coil should look like.

There should be a clearance of ¼in. between the inside of the outer or primary coil and the outside of the inner or secondary coil, and if each coil is wound to a thickness of ½ inch, the diameter of the wooden former for the inner coil must therefore be 2 in. This is prepared, wound and finished off in precisely the same way as the outer coil, care being taken to see that the winding is in the same direction. The beginning of the outer coil winding is then electrically connected to the end of the inner coil winding by a short length of flexible wire which, of course, should be soldered. The two remaining ends—one from each coil—may be ignored until the coils are ready for mounting.

The spindle is made from a 6in. length of 3-32 in. round brass rod and threaded at one end to accommodate an ebonite knob. Four pieces of systoflex or thin ebonite tubing large enough internally to slip over the spindle are pushed through the sides of the coils at their true diameters, as shown in Fig. 24. These form bearings for the spindle in the primary coil and at the same time insulate all the windings from the metal spindle. Ebonite rod may be used in the place of brass if desired, in which case it would only be necessary to employ two pieces of systoflex, one in each side of the primary coil, to act as bearings and to prevent the spindle wearing away the insulation of the wire. The inner coil, of course, is made fast to the spindle.

A small piece of wood or sheet ebonite is cut to the shape shown in Fig. 21 and forced into the inside of the inner coil. The distance between the insides of the small projections should be equal to the width of the coil plus the tape, and the hole should be drilled accurately central and large

(Continued on Page 37, Column 1.)

WHAT ARE FROST LINES? SEE PAGES 2 and 3.

love and perfumery. To call an absent substance ammonia when it is really a rose, does not alter its smell, but alters the inclinations of a lot of people who would otherwise turn aside to smell it!

Speaking rather as an Australian than as a Victorian, one is led to enquire whether there is in sober fact a Wireless Institute of Australians as yet. Judging by the numbers of new wireless papers springing up in every State there must be hundreds of local amateurs seeking to share their joys and sorrows with a wider public, but to knit these into a vigorous whole requires a vigorous campaign; that is not localised in its origin. In Victoria the Institute is exclusively Victorian, and so it is in New South Wales, and so on in every State. To read "Experimental Radio," for instance, one would suppose nobody experimented or wrote anything except at Victoria's instigation. Reading Wireless Weekly one gets a somewhat broader view, while if one turns to that interesting Commonwealth serial, The amended Wireless Regulations, there is a distinct impression that Amalgamated Wireless is like the shadow of a great rock in a somewhat weary land. If there is to be any overshadowing the Wireless Institute ought to tackle the job straightaway, and not wait until the sun is low and the shadows lengthen and wireless comes into full commercial operation.

The ineradicable failing that dealers have, even when licensed, of putting odd hands on to do odd jobs such as fitting parts together, needs to be nipped in the bud in wireless construction. The sight was recently witnessed at a shop where they sell the excellent "Home Construction" sets all ready put together, of a thoroughly efficient counter hand soldering up the very neatly bent wire connections with the aid of a candle for flux. As many of us know, by watching the street vendor of tin kettle mending outfits, the grease of a candle works wonders in soldering, but when used on copper wire it leaves an undesirable legacy of verdigris which ultimately tarnishes and corrodes the wire, to the detriment of the set. Good old resin is undoubtedly the best and safest of all fluxes for wireless purposes, and incidentally the showy soldered butting of joints where one wire tees into another is most inefficient. The best contact and neatest joint is made by flattening the end of

(Continued on Page 27, Column 1.)

Personalties in the Wireless World

(Mr. A. R. Mancer, Superintendent of Marconi Schools of Wireless.)

Mr. Mancer is a New Zealander, having been born at Wanganui in 1892. Educated at the Wanganui and Waverley, N.Z. High Schools, in 1908 he joined the New Zealand Post and Telegraph Department as Cadet Telegraphist.

After serving five years in the department he decided to enter the services of Amalgamated Wireless (A/sia.) Ltd., and found a post as Wireless Officer on the R.M.S. "Moana," then running in the San Francisco Mail service.

He afterwards carried out the duties of Wireless Officer on several vessels, including the R.M.S. "Tahiti," "Makura," "Willochra," "Warilda," "Wimmera," and the S.S. "Empire"—the latter carrying lead to Vladivostock to be used in the manufacture of ammunition for the Russian Government. His last term of sea service was as Wireless Officer on the H.M.A.T. "Kyarra," A55, when that vessel was torpedoed in the English Channel.

Upon his return to Australia in 1918, Mr. Mancer was transferred to a shore position as Assistant Superintendent at the Marconi Schools, and the following year was made Superintendent, and since then has instructed hundreds of Australians in the mysteries of wireless telegraphy. Students of the school carrying out wireless duties on ships throughout the world keep a kindly remembrance of their early instruction days at the Marconi School of Wireless, and of the advice and assistance rendered them by the genial Head-master, if one may so use the term.

SEE THE FROST LINES ON PAGES 2 and 3.

(Continued from Page 26.)

the free wire and rolling it once round the wire it tees on to, and then soldering. Buyers of "Home Construction" or any other sets would be well advised to look well into this soldering matter, and to prefer that system of wiring that makes exclusive use of terminals as the junction points of wires.

Many master-minds in wireless have an aversion to switches in the set, and assert that inefficiency is greatly due to their excessive use. Even a pair of twisted wires, well cleaned, makes better contact than many a switch, and that is why a "junk" set often functions better than the highly polished cabinet article. One of the best forms of contact is the ordinary valve leg and socket, and one of the worst is the ordinary tumbler-switch. Some of the highly priced anticapacity switches leave a lot to be desired in the way of efficient contact, and so do the rotary contacts of rheostats and tapping studs of tuning coils. A rubbing contact is best when the rubbing is frequent, but when only occasionally used a stud is apt to tarnish more at the place that has been rubbed bright, and so becomes deteriorated for next contact. A butting contact, employed in many multiple jacks is only tolerable when the contacts are of untarnishable metal such as platinum or nickel. Silver contacts sound alright, but are liable to be affected by fumes from adjacent ebonite, accumulators or dry cells, all of which may impair their conductivity.

EXPERIMENTAL TRANSMITTING LICENSES.

QUEENSLAND.

(Complete to July 31st. Wavelengths not known).

4AA—W. H. Bright, Hume St., Toowoomba.
4AC—L. Waters, Rankin St., Innisfail.
4AE—Wireless Institute, Brisbane.
4AKK—J. Wilner, "Beswick," Kelvin Grove.
4AW—E. M. Gibson, Kirkland Av., Brisbane.
4AP—T. W. Budger, River Rd., Hamilton.
4AU—W. Finney, Arthur Terrace, Red Hill.
4BI—Junction Park Radio Club, "Carlyle," Long St., Fairfield.
4BK—C. O. Randell, Esplanade, Innisfail.
4BO—N. F. Odgers, Ann St., Charters Towers.
4BW—A. Couper (Jnr.), Byrnes St., Nareeba.
4CC—C. N. Isles, Charlton St., Ascot.
4CG—A. N. Stephens, Railway Parade, Clayfield.
4CH—A. E. Dillon, "Electra," Brown St., New Farm.
4CM—V. McDowall, Preston House, Queen St., Brisbane.
4CK—E. L. Norris, Hume St., Toowoomba.
4CS—J. A. Geraghty, C. B. College, Townsville.
4CV—N. E. Husband, Alan St., Charters Towers.
4CW—A. T. Buck, Geebung.
4DO—A. L. Hobler, Lennox St., Rockhampton.
4EG—E. Gold, Lindsay St., Toowoomba.
4EI—J. W. Smith, G.P.O. Brisbane.
4EZ—Q'land Inst. Radio Engineers, Wickham Terrace, Brisbane.
4FE—Y.M.C.A., Edward St., Brisbane.
4FJ—J. C. Price, Bardon Estate, Paddington.
4FK—F. T. Matthews, 57 Annie St., New Farm.
4GC—Maryborough Wireless Club, Richmand St., Maryborough.
4GE—C. Fortescue, Arthur St., Toowoomba.
4GF—R. H. Dixon, Veitoria Hills, Herbert River.

THE PASSING OF THE ROSTER.

THE Roster on the Editorial page of "Wireless Weekly" has been a feature for so long that its origin is almost lost in antiquity. Those who have looked for it from week to week will see it no more. It is our desire to present nothing that cannot be regarded as absolutely accurate to our readers; in this mainly lies the reason why we have discontinued the publication of the list of times when transmitters may be heard.

Once upon a time, when the number of transmitters was limited to a very few, the Roster had a definite and decided value, since it provided readers with a sure means of knowing just when 2GR or 2JM or the few others could be heard.

Mr. J. S. Marks, under whose control the schedule of transmissions was placed, made a wonderfully successful job of it, considering the great amount of work entailed in checking up from week to week—and, by the way, hundreds, perhaps thousands, of listeners-in have this experimenter to thank for many hours of entertainment. Credit where credit is due. The transmissions from 2GR have always been consistently good, and we know that hundreds of experimenters will endorse our remarks when we say that the movement in general owes much to the valuable and unselfish work done by 2GR.

However, with the advent of many newcomers into the transmitting field, and with the atmosphere, so to speak, crowded out, the keeping of the Roster represented a task beyond human scope. Therefore, since it would be impossible to publish a weekly forecast of *all* amateur transmissions, on the advice of Mr. J. S. Marks we have decided to cut it out.

It is, perhaps, unnecessary to assure experimenters that the columns of the paper are always open for the announcement of particular tests; or, for that matter, any item of interest to experimenters.

Mr. A. W. HEMMING,
Secretary,
Marrickville and District Radio Society.

ARE YOU USING FROST PARTS? SEE PAGES 2 and 3.

INTERSTATE NOTES

SOUTH AUSTRALIAN NOTES

AT last things are beginning to move in South Australia. An aerial has been erected on the roof of the Grosvenor on North Terrace, Adelaide, opposite the Railway Station by the South Australian Radio and Broadcasting Company, who are to conduct an A Class broadcasting station at these premises. A 100-watt transmitter is being installed and the company expect this to be in operation during the coming week. In the course of a few weeks the power is to be increased to 500-watt, and a 5000-watt transmitter is expected to arrive from England about Christmas time, when the station will open up on full power.

5DN.—A Private Broadcasting Station.

During the week, a private broadcasting station which has been erected at the direction of Mr. E. J. Hume, at Park Terrace, Parkside, has commenced operations, and some very fine gramophone selections have been heard from this station, the call sign of which is 5DN. Beginning on Monday evening, testing out experiments have been carried out during the week, Messrs. L. C. Jones and Fred. Williamson, being the operators, and on Saturday, the voice of Mr. Harry Kauper (well-known to many Interstaters), was heard announcing from this station. It is understood that Mr. Hume's present intentions are to broadcast three nights a week—Tuesdays, Thursdays and Saturdays, and some fine programmes, which will consist of orchestral and vocal items, will be contributed by local artists.

5AH Closed Down.

Experimenters and listeners-in will regret to hear that Mr. Fred. Williamson, of Kent Town, (5AH) has closed down his station indefinitely. No doubt Mr. Williamson intends to spend much of his time at Mr. Hume's station, so that his voice will be heard occasionally over the ether.

5AI.

Experimenters in this and other States, have been wondering what has become of Mr. Henry Lloyd, 5AI, who has not been heard for about a month. They will be sorry to hear that Mr. Lloyd has been kept away from his wireless work through illness. However, he is now on the road to recovery and in a very short time should be on the ether again.

Mr. Fisk's Lecture to be Broadcast.

The Association for the Advancement of Science is holding its seventeenth Conference in Adelaide during the week, commencing 25th August, and on Wednesday, the 27th August, Mr. E. T. Fisk is to give a lecture in the Adelaide Town Hall on Recent Development in Wireless Communication. An aerial has been erected at the Town Hall, and a set is being installed by Amalgamated Wireless (A/sia) Ltd., for the occasion. The South Australian Division of the Wireless Institute is to be represented at this Congress by Mr. J. M. Honner, A.S.A.S.M. (one of the Vice-Presidents).

2RJ Comes in Strong.

During the last few weeks, one Interstate transmitter has been the talk of the town. This is 2RJ, and almost anyone with any fairly decent valve set has been able to log him either on phone or C.W.

His C.W. simply rocks in and his phone is quite as strong as 2FC. His music is clearer than 2FC, on account of static not being so bad as on the higher wave lengths.

5AD Received in New Zealand on one Dull Emitter Valve.

Mr. A. R. Snoswell, of Exeter (5AD) has received word from Mr. Dawson of Ashburton, New Zealand (3AL) that his signals have been heard over there on one valve (detector). This was a UV-199.

This is good work, both on the part of the transmitter and the receiver, and speaks well for the type of valve used.

WESTERN AUSTRALIAN NOTES.

From our Special Correspondent.

HAVING perused the very interesting editorial re the coming boom in all matters appertaining to radio broadcasting, in a recent issue of Wireless Weekly, I cannot help but mention that this atmosphere is most noticeable at the time of writing in the State of Western Australia. Everyone is

SEE THE FROST LINES ON PAGES 2 and 3.

talking about wireless. Whilst listening during the lunch hour period to the playing of the visiting Australian Imperial Band, a stroll around the attentive groups of people brought forth the interesting discovery that, following the rendering of a popular piece of music, practically everyone was talking about "I heard it on the wireless last night." So there you are!

Increased interest is circling around the recently arrived additional apparatus of the Westralian Farmers Ltd., to carry on their broadcasting on a power of 5 k.w., under the able supervision of Mr. S. Trimm, formerly of the Applecross Radio Station. The work of assembling is proceeding briskly. Some controversy was rife concerning the radio voice of the announcer at the station, Mr. Wells, but upon invitation being issued to subscribers requesting their valuable assistance, many complimentary letters were received praising Mr. Wells.

A considerable revival is on foot to establish increased interest in the radio clubs throughout this State, although amateurs as a whole will not approve of the proposal recently put forward by one of our societies, to eliminate broadcast listeners from the privileges of membership. Happily, I am informed that this peculiar scheme has been abandoned. Attention is being centred upon the coming visitation of Interstate delegates to the Experimenters' Convention to be held in Perth in May (1925). Many schemes have been proffered with respect to suitably entertaining the visiting men. It is the intention to hold lectures, with the idea of raising sufficient funds; the assistance of prominent men in the scientific world will be secured, and a small entrance fee charged the public.

The Affiliated Radio Societies of W.A. recently held their second meeting, but owing to the rather poor attendance of delegates from local clubs, and the absence of the President, Mr. B. Holt, much of the business was postponed until the next meeting. Sydney Farmers are being received with comparative ease by listeners in on the 2 valve "Mulgaphone," sold by the Westralian Farmers. Many traders are developing a habit of guaranteeing their sets to receive Sydney broadcasting, but this claim cannot be supported as several things have to be taken into consideration; the varying climatic conditions, the presence of atmospherics, and the lengthening of the daylight hours. It requires a set carrying a goodly number of valves to obtain satisfaction at so long a distance.

A novelty of a very interesting aspect, coursed its way from 6WF's aerial last Wednesday night, 13th August. Speeches before the Primary Producers' Annual Conference, held in the building of the Westralian Farmers Ltd. Social Hall, were relayed to the studio, and adjoining instrument apartments above, and broadcasted over the State. Loud applause, handclapping, etc., incorporating the proverbial „'Ear, 'ear" was heard with success. Owing to the event being held in the open hall, echo effect was most noticeable. Goff's Choir continue to please the Sabbath listeners with their choral renderings on Sunday evenings. Some 60 persons compose the choir's personnel, comprising, of course, members of both sexes. Mr. Roland Parsons, and Miss Gladys Edwards may be deserving of particular mention as the elite of the assembly, the former, a rich bass voice, and the latter, high soprano. There is no orchestral accompaniment, as supposed by an experimenter at Adelaide, the sole supporting instrument consisting of the piano. Saturday night, is generally regarded as being "jazz" night. Many bands and orchestras have been engaged in the past to dispense this invigorating "tonic." However, the management of the station have secured the services of local musicians in a combination of their own, and will in future take sole possession from next Saturday night, August 23rd.

The installing of receiving sets in the many homes, hospitals and other institutions in this State is engaging attention. The plant at the Old Men's Home, of which mention has been made, was graciously donated by the Managing Director of the Westralian Farmers, Ltd., Mr. Basil Murray. It is regarded as the largest sub-station in this State and has a very comprehensive aerial system. Mr. Coxon, the Advisor to 6WF together with many influential political and social personages were present at the opening night. Free use of whatever matter broadcasted is available, and rumour has it that the Old Women's Home, Fremantle, will be the next. Discoursing again on Western Radio popularity, practically every large emporium has a radio department, every electrical house carries large supplies of components, and all of the "All-Wireless" firms have agents for their respective sets distributed throughout the many little towns in this State. Every farmer intends, thanks to the publicity given to the science, to instal a radio set in the very near future. At least 400 farms are supplied with receiving sets, and listen nightly to the broadcasting service. The radio bug having bitten many of the aforesaid deeply, they are inclined to twiddle the controls of their sets and try for Sydney, etc., with success.

LIST OF ABREVIATIONS USED IN WIRELESS TELEGRAPH TRANSMISSION.

The following are extracted from the International Radio telegraphic Convention:—

Abbreviation. 1.	Question. 2.	Answer or Advice. 3.
— . — . — — . —	(CQ)	Inquiry signal employed by a station which desires to correspond.
— . — —	(TR)	Signal announcing the sending of indications concerning a ship station.
— — . — — —	(I)	Signal indicating that a station is about to send with high power.
PRB	Do you wish to communicate with my station by means of the International Signal Code?	I wish to communicate with your station by means of International Signal Code.
QRA	What is the name of your station?	This station is.....
QRB	How far are you from my station?	The distance between our station is.....nautical miles.
QRC	What are your true bearings? ..	My true bearings are.....degrees.
QRD	Where are you bound?	I am bound for.....
QRF	Where are you coming from? ..	I am coming from.....
QRG	To what company or line of navigation do you belong?	I belong to.....
QRH	What is your wavelength? ..	My wavelength is.....metres.
QRJ	How many words have you to transmit?	I have.....words to transmit.
QRK	How are you receiving?	I am receiving well.
QRL	Are you receiving badly? Shall I transmit 20 times . . . — . so that you can adjust your apparatus?	I am receiving badly. Transmit 20 times . . . — . so that I can adjust apparatus.
QRM	Are you disturbed?	I am disturbed.
QRN	Are the atmospherics very strong?	The atmospherics are very strong.
QRO	Shall I increase my power? ..	Increase your power.
QRP	Shall I decrease my power? ..	Decrease your power.
QRQ	Shall I transmit faster?	Transmit faster.
QRS	Shall I transmit more slowly? ..	Transmit more slowly.
QRT	Shall I stop transmitting? ..	Stop transmitting.
QRU	—	I have nothing to transmit.
QRV	Are you ready?	I have nothing for you.
QRW	Are you busy?	I am ready. All is in order.
		I am busy with another station (or with .....; please do not interrupt).
QRX	Shall I wait?	Wait. I will call you at..... o'clock (or when I want you).
QRY	What is my turn?	Your turn is No.....
QRZ	Are my signals weak?	Your signals are weak.
QSA	Are my signals strong?	Your signals are strong.
QSB	Is my tone bad?	The tone is bad.
QSC	Is my spark bad?	The spark is bad.
QSD	Is the spacing bad?	The spacing is bad.
QSF	Let us compare watches. My time is ..... What is your time?	The time is.....
QSG	Are the radiotelegrams to be transmitted alternately or in series?	Transmission will be in alternate order.
QSH	—	Transmission will be in series of five radiotelegrams.
QSJ	What is the charge to collect for ....?	Transmission will be in series of ten radiotelegrams.
QSK	Is the last radiotelegram cancelled?	The charge to collect is.....
		The last radiotelegram is cancelled.

Abbreviation. 1.	Question. 2.	Answer or Advice. 3.
QSL	Have you got the receipt? ..	Please give a receipt.
QSM	What is your true course? ..	My true course is.....degrees.
QSN	Are you communicating with land?	I am not communicating with land.
QSO	Are you in communication with another station (or with.....)?	I am in communication with..... (through the medium of.....).
QSP	Shall I signal to ..... that you are calling him?	Inform .... that I am calling him.
QSQ	Am I being called by.....? ..	You are being called by.....
QSR	Will you dispatch the radiotelegram?	I will forward the radiotelegram.
QST	Have you received a general call?	General call to all stations.
QSU	Please call me when you have finished (or at.....o'clock)	I will call you when I have finished.
QSV	Is public correspondence engaged?	Public correspondence is engaged. Please do not interrupt.
QSW	May I increase the frequency of my spark?	Increase the frequency of your spark.
QSX	Must I diminish the frequency of my spark?	Diminish the frequency of your spark.
QSY	Shall I transmit with a wavelength of.....metres?	Let us transfer to the wavelength of.....metres.
QSZ	.. ..	Transmit each word twice. I have difficulty in receiving your signals.
QTA	.. ..	Transmit each radiotelegram twice. I have difficulty in reading your signals, or Repeat the radiotelegram you have just sent. Reception doubtful.
QTB	.. ..	Number of words not agreed; I will repeat first letter of each word and first figure of each group.
QTC	Have you anything to transmit?..	I have something to transmit. I have one (or several) radiotelegrams for

When an abbreviation is followed by a mark of interrogation it applies to the question indicated in respect of that abbreviation.

In addition to these signals, which, it will be observed, are uniform in construction, the following signals of the International Telegraph Code may be used in these communications:—

. . — — . . "Repeat" sign (as well as mark of interrogation).
. . — . — Understood.
. — . . . Wait.

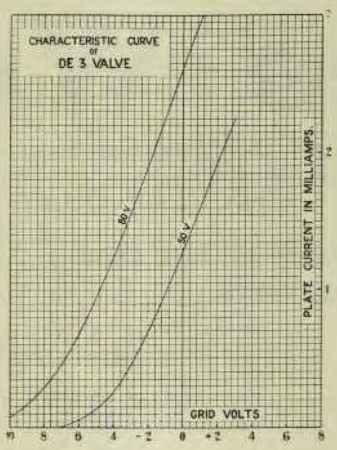
EXAMPLES.

Station.		
A	QRA?	..What is the name of your station?
B	QRA Campania	.. This is the Campania.
A	QRG?	To what company or line of navigation do you belong?
B	QRG Cunard. QRZ	I belong to the Cunard Line. Your signals are weak.

Station A then increases the power of its transmitter and sends:—

A	QRK?	How are you receiving?
B	QRK	I am receiving well.
	QRB 80	The distance between our stations is 80 nautical miles.
	QRG 62	My true bearings are 62 degrees. etc.

D.E. 3 Valve



The D.E.3 is of the modern dull emitter type, and with an ordinary dry battery the valve works very successfully and at a very low cost compared with the accumulator heated valve filament. The voltage required on the filament of the D.E.3., is 2.4 to 3, and an ordinary 3-cell dry battery may be used. This will last about 800 hours. The D.E.3., can be used as a detector, H.F. amplifier, or note magnifier. When used as a detector the anode voltage should be 30-45, as an H.F. amplifier 45 volts and as an L.F. Amplifier 60-80 volts.

The low impedance of the valve renders it particularly suitable as an L.F. amplifier and it gives very good results when used in conjunction with a loud speaker.

Type	Filament Battery Voltage	Filament Voluts	Filament Amps	Anode Volts	Socket Type
			0.6	20-80	"R"
D.E.3	(3 dry cells)	3			
Bulb 25 m/m.		Length 110 m/m.		Socket type "R"	

IS GOULBURN A BLIND SPOT? *MR. EVANS SAYS, NO.*

Recently Mr. Ray Evans, the Radio Engineer and Manager of the Firm of Wireless Supplies Ltd. of 21 Royal Arcade, Sydney, being desirous of ascertaining the correctness of many statements to the effect that Goulburn was a blind spot and that little practical reception could be carried out there, sent his demonstrator to make tests. These tests proved so successful that a prominent grazier Mr. A. R. Maple-Brown of Gunda Plains (just outside Goulburn) had a set installed in his residence.

On completing the installation the demonstrator was able to ring Mr. Evans at Sydney and let him hear the loud speaker working on 2 FC's afternoon program per medium of the lead line. The speaker was about 30 feet from the telephone.

The set used was a "Volmax" 4 valve guaranteed range receiver using a stage of radio, detector, and two stages of Audio.

This disproves the Blind spot Bogey.

NEW APPARATUS DISPENSES WITH MANY AERIALS.

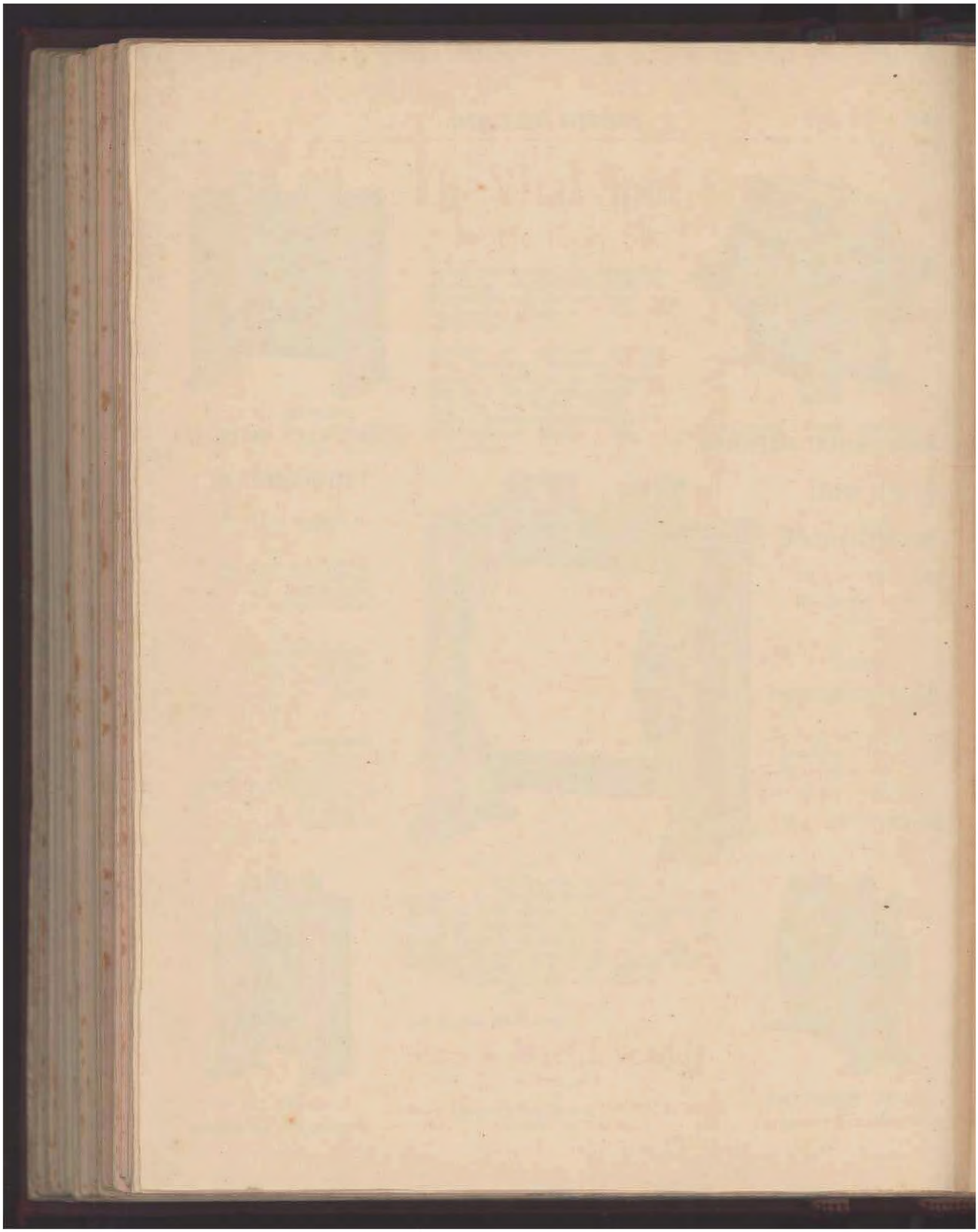
New York is covered with a network of copper wires hanging over the roofs of apartments, all because each receiving set requires an individual antenna. This great copper web may soon disappear, as naval radio experts have developed a "coupling-tube unit," which allows one antenna to serve several receiving sets. It is reported that this device will be available to the public shortly after June 1.

Inventors of the device are Dr. A. H. Taylor and L. C. Young, of the Naval Laboratory, at Bellevue, Md. After the apparatus was perfected it was tested on board the U.S.S. Colorado. A coupling-tube unit, connected between each receiving set and a single antenna, enabled operators to copy simultaneously incoming messages from stations using different wave lengths and at the same time the battleship's transmitter was in action.

Patents on the new device are pending, and it is understood that exact hook-ups and details of construction will be available as soon as patents are granted.

In general, it is said to include a coupling resistance, so high that the strength of the incoming signals are reduced considerably, requiring at least a three or four tube set. A radio frequency step in the form of a radio frequency trap, which eliminates any regeneration, is required, and a receiving set with a detector tube. Louder signals are obtained with two tubes of audio frequency amplification.

The military value of the coupling unit to the navy is very high, since it enables a vessel or station to carry on several times as much business or traffic as has heretofore been possible without interference. The navy holds the rights for military use. It has become a part of battleship standard equipment. To the general puhlic its chief interest will be that it will permit the use of a single antenna on an apartment house or hotel, wherein each tenant wants to operate his own set independently of others. A lead-in can be run into each apartment or suite, the owner specifying that each tenant must use a coupler unit. Many antennae on housetops can thus be eliminated. A number of radio manufacturers are said to have made overtures to Dr. Taylor for permission to manufacture the units, but to date the name of the manufacturer has not been released.



The Name to Know in Radio

Wiles' Wonderful Wireless

and Electrical Stores

60-62 GOULBURN ST. (1 door from Pitt Street)
384 PITT ST., (Near Goulburn Street)
23 PITT STREET, - - CIRCULAR QUAY

SAME QUALITY.
SAME PRICES.
SAME SERVICE.

THE HEART OF YOUR RADIO SET IS A GOOD PAIR OF HEADPHONES.

Mel Single Handphone	£1 0 0
Murdoch's 2000 ohms	1 7 6
Murdoch's 3000 ohms	1 10 0
Kilbourn & Clarke's 2000 ohms	1 12 0
Trimm's Dependable	1 12 6
Frost's 2000 ohms	1 12 6
New System's 4000 ohms	1 15 0
Ediswan 4000 ohms	1 17 6
Radiola 4000 ohms	1 19 6
Rendle's Matched Tone	2 0 0
Dictograph 3000 ohms	2 2 6
Stromberg Carlson	2 2 6
Sterling	2 4 0
Western Electric	2 4 0
Brown's Featherweight	2 7 0
Trimm's Professional	2 5 0
Brown's 8000 ohms Adjustable Diaphragm	6 15 0

Complete Parts to Make Your Own Crystal Broadcast Receiving Set.

Single Slide Parts	20/-
Double Slide Parts	21/6
Loose Coupler Crystal Set Parts	30/10

SPECIAL ANNOUNCEMENT OF NEW GOODS.

Litz Wire, manufactured especially for Loop Aerials, 3/- yd.

A.P. Double Filament Amplifying Valves can be used from A.C. Lighting Supply, each 30/-.

Crystalite Crystals, extra sensitive, each 1/6.

Pareros Loud Speakers, excellent tone, each £5/10/-.

Complete Parts for Amplifying your Crystal Set in order to use a Loud Speaker.

1 Stage Amplifier Parts Complete	£4 17 0
2 Stages do.	7 17 0

CRYSTALS ALL GUARANTEED TESTED.

Galena, mounted in metal	1/6 & 2/- each
Galena, unmounted	1/- & 1/6 "
Iron Pyrites	1/6 "
Copper Pyrites	1/6 "
Magnetite	1/6 "
Q.S.A.	1/6 "
Crystalite	1/6 "
Carborundum	1/6 "
Manganese	1/6 "
Molybdenite	1/6 "
Bornite	2/- "
Zincite	2/- "
Hertzite	2/- "
Arsnite	3/- "

We employ a technical staff to assist our customers.

Please write us for any technical information—our service is free.

OUR GUARANTEE

It is our intention that every article in this list shall be truthfully described. Therefore, we guarantee everything you buy from us to be satisfactory to you in every detail. You take no risk whatever in sending us your order, for unless you are completely satisfied with the goods and your savings, you may send back everything you buy from us and we will promptly return your money and all transportation charges you have paid.

W. Harry Wiles

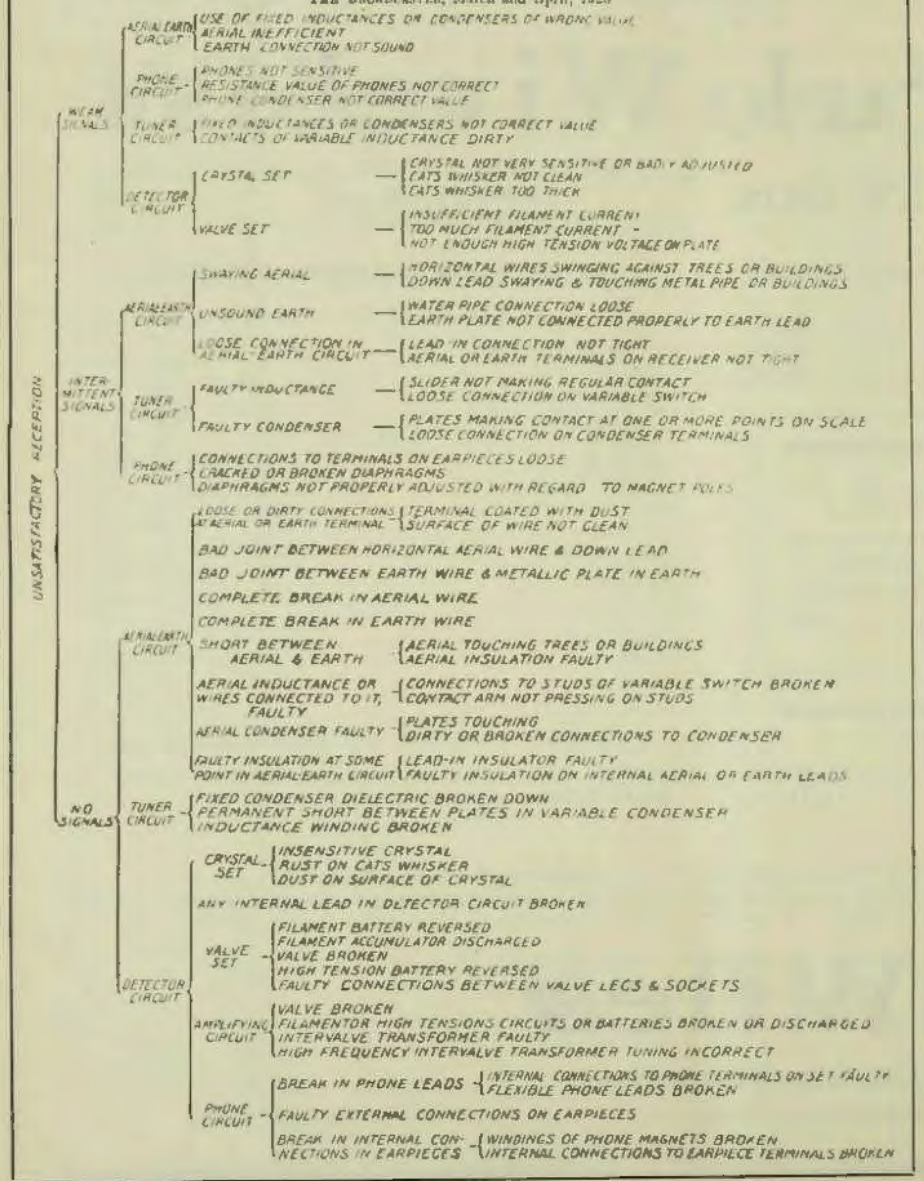
Radio and Electrical Supplies, 60-62 Goulburn-st., Sydney

ESTAB. 20 YEARS

Please address all communications to our Head Office, 60-62 Goulburn Street.

WHAT'S WRONG CHART

Compiled from "Fault Tracing and Maintenance," by Michael Egan
THE BROADCASTER, March and April, 1923



PAGES 2 and 3 TELL YOU ALL ABOUT THE FROST LINES.

AMPLIFICATION WITHOUT DISTORTION

By W. A. Stewart.

AT some time you are bound to hear that a crystal set gives sweeter music than a valve set; that regeneration distorts music, and that loud speakers are inefficient.

Let us study the first case. A crystal set at any time does not deliver deafening volume and the reason it appears to deliver sweeter music than a valve is that it is not giving nearly the same volume as the valve. If you had a crystal set capable of working a loud speaker, without resorting to amplification of any sort, the music would be no better in quality than any valve set delivering the same volume. It is my candid opinion that a carefully handled valve set will equal anything any crystal set can put out.

Concerning regeneration, let me say that in a vast number of cases the cause of poor quality music is usually an overlarge re-action coil, filaments too bright, and incompetent operating.

People who build sets commercially, invariably use a huge re-action coil so that the receiver will oscillate violently at all times. Now this is far from efficient, as a set with a large re-action coil will not tune to the shorter wave-lengths because the re-action coil takes a large part in the tuning. If you have a receiver that oscillates violently, turns should be removed from the tickler until the set just oscillates, and can be made to start and stop oscillating at any point. Low B battery voltages should be used, and the filament should be burnt as low as possible, as this not only prolongs the life of the tube, but also makes the set less critical to handle.

Now that the regulations allow regeneration within limits (don't forget, Penalty £20), more and more regenerative circuits are making themselves heard, and judging by the noise some of them make, it is doubtful whether some of the listeners can be getting very wonderful reception.

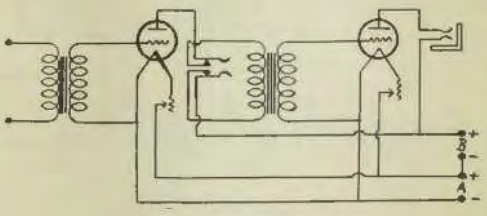
A regenerative circuit is no harder to handle than a non-regenerative one, providing you go about it the right way.

In tuning a regenerative set, leave the tickler fairly closely coupled, and adjust the A and B batteries until the set oscillates. Oscillation is denoted by tapping the grid condenser with a wet finger; if the set is oscillating, a distinct double click will be heard in the phones.

Loosen the tickler coupling until the set just oscillates; adjust the switch arm, and turn the condenser until the carrier wave of the station is heard. With one hand loosen the tickler coupling, and increase the condenser reading until the carrier gives place to music.

If you find that when you touch the phones, or lift your feet from the floor the music is distorted, the coupling is too tight and must be loosened a little and the condenser increased until this effect is not noticed.

These instructions were for single circuit sets (as the majority are). If the set is a two circuit one, the aerial circuit will have to be tuned first, and the same adjustment carried out on the secondary circuit.



This practically eliminates the distortion that crops up in single valve sets, and we can now turn our attention to multi-valve sets.

A large condenser across a B battery is an advantage as far as keeping down noise is concerned, and a good type of grid leak is also valuable for eliminating noise.

You will notice that I am not keeping strictly to short waves; but an amplifier is a piece of apparatus which may be used on any receiver, and I do not think it will be out of place to discuss amplifiers in general.

(Continued on page 38.)

FROST LINES ARE SHOWN ON PAGES 2 and 3.

THE 5BG CIRCUIT

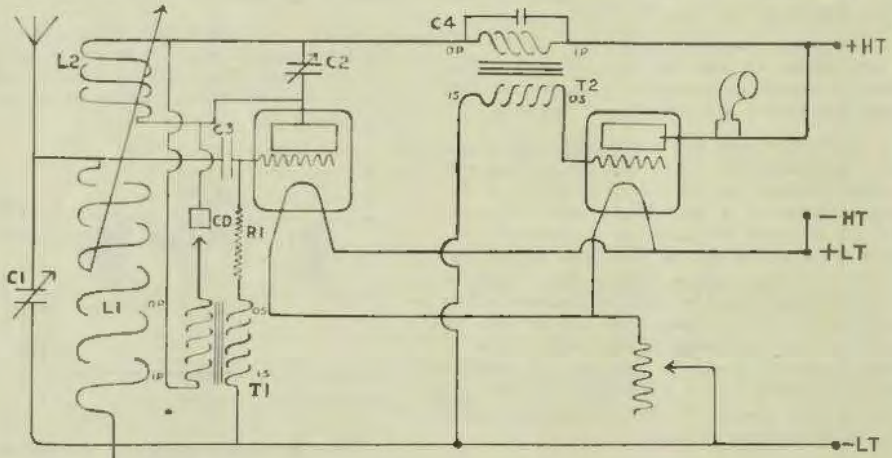
Designed by Harry Kauper, Adelaide.

MR. HARRY KAUPER (5BG) has, during the past year, constructed a number of receivers using the S.T. 100 circuit, and the results have been very gratifying, the amplification on local signals being enormous, while the circuit is extremely sensitive for bringing in stations several hundred miles away. In Adelaide, however, there has been noticed an objectionable A.C. hum with the S.T. 100 circuit and also, the audio frequency transformers have to be carefully selected to prevent howling.

To eliminate these troubles, the circuit shown here was evolved by Mr. Kauper, and the results obtained are excellent.

A set using this circuit was used at the Radio Ball held in the Palais Royal in June, under the auspices of the S.A. Division of the Wireless Institute, when no aerial whatever was used for the reception of Mr. Austin's transmission.

Referring to the diagram, it will be seen that the first valve is a radio frequency amplifier, the plate circuit of which is tuned by C2. The output of this valve is rectified by the crystal, and the resulting audio frequency current is passed along to transformer T.1; again through the same valve, and thence through the second audio transformer T.2 to the second valve, the whole process being



R1 · 80,000

CD · ARCOLITE OR HERTZITE

C1.	=	·0005
C2.	=	·0005
C3.	=	·0003
C4.	=	·001

	170 - 350	350 - 690	
L1 =	25	35	1100 To 1500
L2 =	35	50	100
			150

WHAT ARE FROST LINES? SEE PAGES 2 and 3.

equivalent to one stage R.F., detector, and two stages of audio frequency.

Many types of audio transformers have been tried in this circuit and while some functioned slightly better than others, no great difference was noticeable using various ratios and makes. The resistance R.1. is not critical and a 250 turn Honeycomb coil, or an iron cored choke of 10,000 ohms, may be used. Condensers C.3 and C.4 must be of the mica dielectric variety.

A table is given showing values of inductances L1 and L2 for different wave lengths when using an average aerial.

For local amateurs who transmit around 200 metres, a condenser of .0003 M.F. capacity placed in series with the aerial, will sharpen up the tuning. This condenser need not be variable and may be shorted when using the set above 350 metres.

The remarkable feature of this circuit is that it will give loud speaker results on local transmitters without using any aerial or ground of any kind, L1 in this case acting as a small loop aerial.

Enormous volume is obtained by using the earth only, which, by the way, should be connected to the grid leak end of L1. If it is desired to use a loop aerial, this may be accomplished by connecting one end of the loop to the grid end of L1, and leaving the other end of the loop disconnected.

Astonishing results have been had from distant stations. Farmers, of course, are the best and can be heard on the loud speaker 100 feet away. 2BL and 3AR come in at comfortable strength and on several occasions the new Perth Station has been heard, also on the loud speaker; in fact, head phones are never used with this set. In order to obtain similar results it will be necessary to use 201A radiotrons or DV6 A De Forest tubes and Hertzite crystal and the crystal detector must be connected the right way round.

The set is mounted in a cabinet about 10 x 8 x 8in., the panel being of bakelite, 10in. x 8in.

(Continued from page 25.)

enough to permit a tight push-on fit over the spindle. The two coils may now be assembled. Commence the operation in a similar way to that described in the assembling of the vario-coupler coils, and having completed it, apply a little glue or seccotine round the spindle and the hole in the small wooden bridge, and round the outsides of the systoflex bushes. The coils are now ready for mounting.

From a piece of thin soft sheet brass, cut out two strips each about ⅛in. wide and 2in. long, drill a hole at each end (see Fig. 22) and bend at right angles at the dotted lines, so as to form two clips as shown in Fig. 23. The distance across the insides of clips should be equal to the width of the coil so as to fit tightly over same. Next obtain a piece of hardwood, ⅜in. in thickness and about 5in. long by 2in. wide, and cut out a circular recess of the same radius as the outside of outer coil. Fit the coil in same so that it stands perfectly upright, place the clips in the position indicated in Fig. 24, and secure them to the sides of the wooden support with ordinary round-headed wood screws. Attach this firmly to any suitable base-board (Fig. 25) and connect the two remaining ends of the windings to terminals as shown. The original end left over from the outer coil winding may be connected direct to one terminal, but a short length of flexible wire will be required between the other inner coil end and the other terminal to allow a perfect rotating movement.

When the two coils are in the same plane with the windings running in the same direction the maximum coupling is obtained. Small variometers are rapidly replacing variable condensers and they may be made up to cover any range by varying the size of the coils. They should always be connected in series with the existing coil. If the variometer is required for use with very low wave lengths, both coils must have an equal amount of inductances, i.e., less turns must be wound on the primary coil to balance its greater diameter.

(Continued from page 35)

It is a good plan to build an audio amplifier or note magnifier in a separate cabinet, as it may then be attached to any receiver, either long of short wave.

There are numerous ways in which the output of the receiver may be amplified at low, or audio frequencies; that is, after they have been detected.

Before going further let me say a few words concerning audio and radio frequency, or as it is sometimes called high and low frequency.

Radio, or high frequency is the band of frequencies outside the range of the ear, while audio or low frequencies are those which, as their name implies, are the audible frequencies which we can hear.

A radio frequency amplifier is one that amplifies the incoming oscillations from the aerial circuit, before they are detected by the valve or crystal.

An audio frequency amplifier is one that amplifies the signals or music, after they have been detected and made audible.

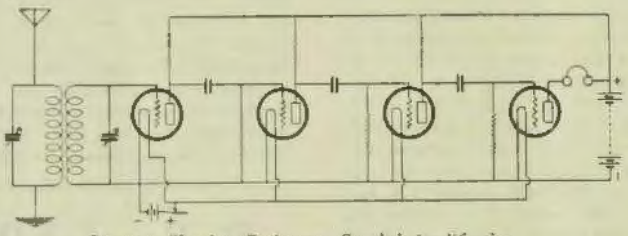


Diagram Showing Resistance Coupled Amplification.

If loud results are required, an audio amplifier is used, but if long distance results are sought after, then radio amplification is resorted to. A moment's thought will show that radio amplification will bring in stations too weak to operate the detector valve. The signals can then be amplified to work the loud speaker by an audio amplifier, but they must be first received on the detector before they can be so amplified.

I will now discuss various types of audio amplifiers:

First of all there are resistance coupled amplifiers. These are amplifiers employing resistances and condensers, and are used quite a lot in Navy receivers. Once the correct resistance is found, they are very quiet and pure in operation. They do not give the step-up of a transformer coupled amplifier, and it usually takes about three stages of resistance coupled audio to give the results of two stages of transformer coupled audio. They are very cheap to build, however, and are very quiet and clear in operation. An article concerning these amplifiers was published in this paper some time ago and this should be referred to for detailed information concerning them.

The most popular and effective means of audio amplification at present is that employing transformers.

These audio transformers are specially designed, having a primary and secondary winding of very fine wire wound on a laminated iron core. The primary is connected to the output of the detector valve, while the secondary is connected to the grid and A battery of the amplifier valve.

The standard amplifier circuit is shown in Fig. 1, and jacks are provided so that 2 or 3 valves may be used.

In choosing a transformer for this work, see that it is not too small, and that there is plenty of iron in the core. There is usually a closed iron core, but some of the larger power amplifiers, for instance, the Magnavox, employ open core transformers of quite large proportions. The large amount of wire is necessitated on account of smallness of the core.

The ratio of the number of turns of the primary and secondary is usually between three and ten to one.

If a single stage only is going to be used, a ten to one will do the job, but if two stages are being used a five to one can be used in the first stage and a three to one in the second. If another stage is to be added a three to one or even less should be used.

To prevent distortion and noise, transformers should be kept well apart and mounted at right angles. Where possible, it is a good plan to shield and earth all transformers with thin sheet zinc or brass and the cores can also be earthed at the same time.

A separate B battery is also a valuable adjunct, to prevent distortion, while a separate A battery is even better. Although rather expensive, it goes a long way in keeping the amplifier free from noise, which is what we are aiming at.

Large valves should be used and hard valves are best as they will stand plenty of B battery. An ideal valve for this work is the UV-210A which is at present very hard to get. There is, however, a valve made by the De Forest Company having the same characteristics, which will serve equally as well. Don't overload the tubes, as this is one of the most common ways of making the amplifier noisy.

Use a separate rheostat for each valve, as it will often be found that some valves are very critical as far as filament current is concerned.

A "C" or grid biassing battery is also an advantage. It usually consists of a small battery of about 10 per cent. of the B battery voltage inserted directly in the grid return.

It will sometimes be found that a grid leak across the secondary of the second transformer will greatly improve the volume of the set.

If a loud speaker is to be used, a fixed condenser, having a capacity of .01 or even larger across the output terminals will also help to improve the tone of the music. It is a good plan to use the one make of transformer throughout.

Some of the English transformers, instead of being marked P and B + on the primary and G and F — on the secondary, as all the American transformers are, are marked IP and OP on the primary, meaning inner and outer primary, and IS and OS on the secondary.

In this case connect the one marked IP to the plate and the terminal marked OP to B+ on the detector valve. Connect IP of the secondary to the grid of the amplifying valve, and the one marked OS to the filament of the same valve.

The very latest in amplification is what is known as "push pull" amplification, which uses two valves in parallel and also special transformers, having centre taps. Such a circuit, which works on both halves of the cycle is used in any power amplifier where great volume is desired. An excellent arrangement is a detector, one stage of audio and then a "push pull." This will give unlimited volume with a minimum of distortion. In a "push pull" circuit a C battery is essential, and plenty of B battery is needed.

I do not recommend the use of dry cell tubes for amplifiers or for any other purpose as they have not the punch of a battery valve, and if consistent work is to be done, a battery valve will have to be used. Use only the best fixed condensers, as a bad condenser will cause a lot of noise.

Should the amplifier become noisy for no apparent reason, the B battery should be looked to and if it shows any signs of voltage dropping a new one should be put in. A burnt out transformer will also cause noise like static; only much more pronounced.

If the amplifier shows a tendency to howl, it indicates that the transformers are too close together or that they need shielding. Howling is also often caused by the valves being too close together.

I have found that reflex circuits are noisy, and if quietness is to be aimed at, straight circuits should be kept to.

Grid and plate leads should not run parallel as they cause howling. A set that is properly designed should be absolutely quiet at the end of each item, and if these instructions are followed out the amplifier will be as quiet as it is possible to make it.

On a properly designed amplifier, any good loud speaker will give good results, and a lot of the harshness that is noticed with loud speakers will be lost.

In choosing a loud speaker one that has a horn which does not resonate should be chosen. The loud speaker unit itself should be large and the diaphragm should be adjustable. A good way to test the horn of a loud speaker is to tap it with your finger and if it is a good speaker it will give a dull, dead sound.

I think that is about all concerning amplifiers, and if these few hints are adhered to, better, clearer, music will result.

By next week I hope to have some facts concerning a short wave receiver that will go down to any wave length irrespective of the size of your aerial, and at the same time being very selective.

In using the receiver described last week, you may find that on one adjustment it will not oscillate for a few degrees on the condenser. This will be found is the natural wave length of the aerial, but if the aerial coupling is loosened, the set will oscillate again.

WHAT ARE FROST LINES? SEE PAGES 2 a nd 3.

THE LEICHHARDT AND DISTRICT RADIO SOCIETY

Members of the Leichhardt and District Radio Society rolled up in good force to the 94th general meeting, which was held at the club-room, 176 Johnston St., Annandale, on Tuesday, August 19th.

In accordance with arrangements previously made, a debate was conducted between members of the Society, "Dull-Emitter Valves v. Other Types," being the subject for discussion. Members put their whole heart into the debate, which was pronounced a great success. The arguments put up for and against by both sides were many and interesting, and on a vote being taken, members polled overwhelmingly in favour of dull-emitters. The main points in their favour were economy, portability and service, and members expressed their opinions in no uncertain manner.

Next Tuesday night the Society will hold its 23rd monthly business meeting, when a number of new applications for membership will be dealt with, and other formal business disposed of.

The third lecture of the syllabus will be delivered on Tuesday, September 9th, when H. F. Whitworth will talk on "Crystal Detectors and their Action."

Information regarding the activities of the Society may be obtained on application to the Hon. Secretary, Mr. W. J. Zech, 145 Both St., Annandale.

MARRICKVILLE AND DISTRICT RADIO CLUB

The above club held its usual weekly meeting at Marrickville School of Arts, on Monday, the 18th inst.

The membership of this club has been to date confined to experimenters. Realising that now, everybody is more or less interested in radio, it has been decided to open an associate membership. For those who desire first hand information, write to Mr. A. W. Hemming, 23 Central Avenue, Marrickville.

Mr. W. L. Hamilton gave a demonstration with the ST 100, with a stage of radio frequency in front of it. This set proved to be all that is claimed, local stations and distant stations coming in with wonderful clearness and great volume on the loud speaker. Although this set has only been made up in its present form a few days, it has already brought in K.G.O. Mr. Hamilton is to be congratulated on his success with this circuit, which has meant so many hours of experimentation and is believed to be the first in Australia.

SYDNEY HIGH SCHOOL RADIO CLUB.

The usual general weekly meeting of the Sydney High School Radio Club was held at the Sydney High School on August 14th, 1924.

No business was transacted, but the meeting was chiefly concerned with the new set which is being constructed and the best method to lay out the panel, etc.

As it had been decided at a previous meeting to construct a set which could be used for experi-

mental purposes, it was necessary to design it accordingly.

The meeting, which had opened at 3.15 p.m., closed at 4 p.m.

CROYDON RADIO CLUB.

The usual weekly meeting of the Croydon Radio Club was held on Saturday, August 16th, at the Club Rooms, "Rockleigh," Lang Street, Croydon, at 7.30 p.m., when all business in hand was quickly finalised.

The average attendance for the present year has been indeed very pleasing, and it is hoped that it will continue.

Although there was not a very large display of home made apparatus, great credit is due to the exhibitors for some very fine instruments were shown.

A prize was awarded to the best exhibitor (Mr. Lucas) as decided by the Club.

The remainder of the evening was devoted to buzzer practice, and the meeting closed at 10 p.m.

All intending members are respectfully invited to communicate with the Hon. Secretary, Mr. G. M. Cutts, "Carwell," Highbury St., Croydon.

WAVERLEY RADIO CLUB.

The attendance at the meeting of the 19th August was smaller than usual, owing to the unfavourable weather.

At Mr. E. Bowman's invitation, the members visited his experimental station, where he gave a demonstration of the "push pull" method of amplification with remarkable success. Great volume was obtained by means of a "push pull" unit with no signs of distortion. Specially designed American transformers were used.

The members were unanimous in voting the "push pull" system of obtaining volume with clearness one of the most revolutionary steps in wireless of recent times.

(Continued from Page 13)

Koo-Wee-Rup,
Victoria,
18/8/'24

Editor Wireless Weekly,

Dear Sir,

I have been greatly interested in the D.X. reports, especially the crystal records, in your paper, which has made a wonderful advance since it started.

The following is the result of listening on my single valve home made set. Last Friday night I tuned in a broadcasting station with a wave length of about 1250 metres. I am convinced it was 6WF (Farmers), Perth, because he goes from about 10 p.m. (Melbourne time) to 12.15 a.m. From 10.45 p.m. to 12.6 a.m. I heard 18 items, including piano solos, orchestral items, 3 songs, recitations and the efforts of a comedian.

The atmospherics were very bad and I could not get what the announcer said. The music was strong enough to recognise the tunes and different instruments. On Saturday night he was the same strength and so was the static. He closed down at 12.30 a.m.

2FC (Sydney) comes in very clear every night and the news items, etc. are good.

The airline distance from here to Sydney is 480 miles and Perth 1760 miles.

I also receive the following commercial stations (readable strength): VIA, VIE, VIP, VIS, VIB, VIT, VIH, VLW, VLD, VIM, also VIO (once). I cannot get down to amateur W.L. at present.

I am using the ordinary re-action circuit with a UV-199 valve taking 2 volts on filament, and 10 to 12 volts on plate, variable grid leak, basket coils and a T aerial, 190 feet long, 50 feet high.

Yours etc.,... ... ...
D. J. MICKLE,
Experimenter No. 902.

THOSE LIMERICKS.

Have you listened to those gems
Of our old pal, 2 C.M's?

They come through in slow Morse on 225 metres every Sunday evening. As a valuable prize is offered to the listener who correctly writes down every word, don't fail to tune in next Sunday night. The prizes awarded for last Sunday's limerick were: 1st, A. Gumdrop; 2nd, A. Knuckleberry. To those who happened to miss the limerick, here's what it was:

LINES TO 2 J.M.

There was a young man of Bellevue,
Whose transmitting tubes numbered two,
But 'tis sad to relate,
When the volts on the plate,
Blew the two, the air was blue too.

NEXT WEEK

an article by Mr. W. P. Renshaw, (Hon. Secretary of the Wireless Institute of Australia, N.S.W. Division), entitled "Spark Coil Valve Transmitters" will be a feature of Wireless Weekly.

The Experimenter and the Regulations.

HAS HIS WORTH BEEN RECOGNISED?

By A. Burrows

THE technical experimenter in Australia has never been given that freedom—and encouragement—which other countries have always extended to their own particular amateur. Until recently, in fact, when the change of attitude on the part of the authorities due to the march of events became essential, the experimenter here was always more or less a thorn in the side of the Government. It was inevitable, however, that such a change should at last be shown; and now the wireless experimenter is accepted as a necessary part of the community.

Exactly the size of the part he is going to play in any civilised country in the near future is difficult to gauge. His worth from a national point of view has been stressed again and again; and this phase of his work cannot be too greatly emphasised. It merely needs a crisis of some warlike character to demonstrate this.

But now that the life of the ordinary public is so closely interwoven with wireless and its works; now that wireless is an integral part of everyday life, just as telephones or motor-cars are, the experimenter's scope of general utility is broadened to a vast extent. To know that in every block and every street lives an expert will be a comfort indeed to many who are liable to look askance at something new, and, for them, untested.

His worth in this way appears to have been tried out in many cases already, as many experimenters know to their great inconvenience. The requests, "Will you make my set work?" and "What d'you think's wrong with this?' is familiar in these broadcast days to every experimenter whose fame has crept beyond his threshold. However, it is seldom that a suppliant is turned away—the freemasonry of the radio fan is too strong for that.

Experimental Status.

And so, in this way and many others, is the chap who calls himself an experimenter, and "bites' if you mention "broadcast-listener" in his presence, finding a niche in the life of everyone.

But in spite of this his lot doesn't seem to improve greatly; indeed, under the late regulations he was better off in some way than he is now He paid 10/- then (it was £2 in the dim past), and now he is under the obligation of a license fee of £1 to 15/-, of which, however, only 10/- goes to the Government, if he can derive any satisfaction from this fact. The balance goes to the broadcasting stations, which is a tacit admission that experimenters do occasonally listen to broadcasting.

The possession of an experimental license at present means little beyond a certain status which is considered a cut above the ordinary broadcast-listener. There is only 15/- difference in the cost of the broadcast license, and neither places any restriction upon what set can be used—regeneration is allowed, so long as it does not cause "undue interference." This is a vindication of the attitude taken from the first by many—that the howling valve in many ways was a bogey. This, wherever the regulations fall short elsewhere, is certainly a progressive step, for previously regeneration was prohibited—a prohibition, by the way, which was more honored in the breach than otherwise.

To obtain an experimental license it is necessary to pass an examination, which costs 2/6, conducted by an authorised officer. This in most cases will mean a radio inspector, although probably an official of the Wireless Institute will in due course be empowered to decide the fate of would-be experimenters — not, however, by means of an examination.

For those who desire a transmitting license —and this is the aim of every real experimenter —a fairly stiff examination, almost equal to that prepared for a ship's operator, must be passed, and the experimental license (which normally is only for receiving) will be so endorsed. This, however, is a coveted honor which only a comparative few will be able to gain.

Those Log Books.

The fact that experimenters "may" be required to keep log books is hotly resented by

those to whom it applies. Both the principle of this regulation, which imposes a needless obligation upon license-holders, and its indefinite wording, are condemned by nearly every amateur. Whether the "log" referred to is simply an account of the station's traffic—similar to ship's logs — or is a detailed description of the license-holder's experiments, is not mentioned, although it is probably the latter. If it is, the absurdity of such an imposition is apparent. What proof would there be that the log, if it were kept, was not simply a rigmarole compiled to meet the regulation? Experimenters would welcome an official explanation concerning this doubtful point, and the vague wording, which neither makes it clear if it is incumbent upon every experimenter to keep the log, or states what special circumstances if it doesn't apply to everyone, make the log necessary.

If the owner of an experimental license renders himself liable to lose his license, he is confronted with the dreadful alternative of closing down completely or taking out a broadcast-listener's license. This is a contingency which is difficult to imagine, as once an experimental status is gained, the owner has nothing to acquire and a lot to lose in relinquishing it. It is of interest to holders of both classes of licenses under the old regulations to know that their licenses will last the full period, irrespective of subsequent regulations.

Those who have recently renewed their experimental licenses at the cost of 10/- can therefore congratulate themselves on having at least gained a few shillings by their foresight.

——::——

PERSONAL.

The many friends of Mr. W. G. Keogh will be pleased to learn that he has opened a most up-to-date Radio Shop at 503 George Street, opposite the Crystal Palace Theatre. Mr. Keogh is one of the pioneers of Radio in N.S.W. In 1919 he made a tour of the U.S.A., which lasted over two years, and whilst there he made a close study of the reception and transmission of W.T.

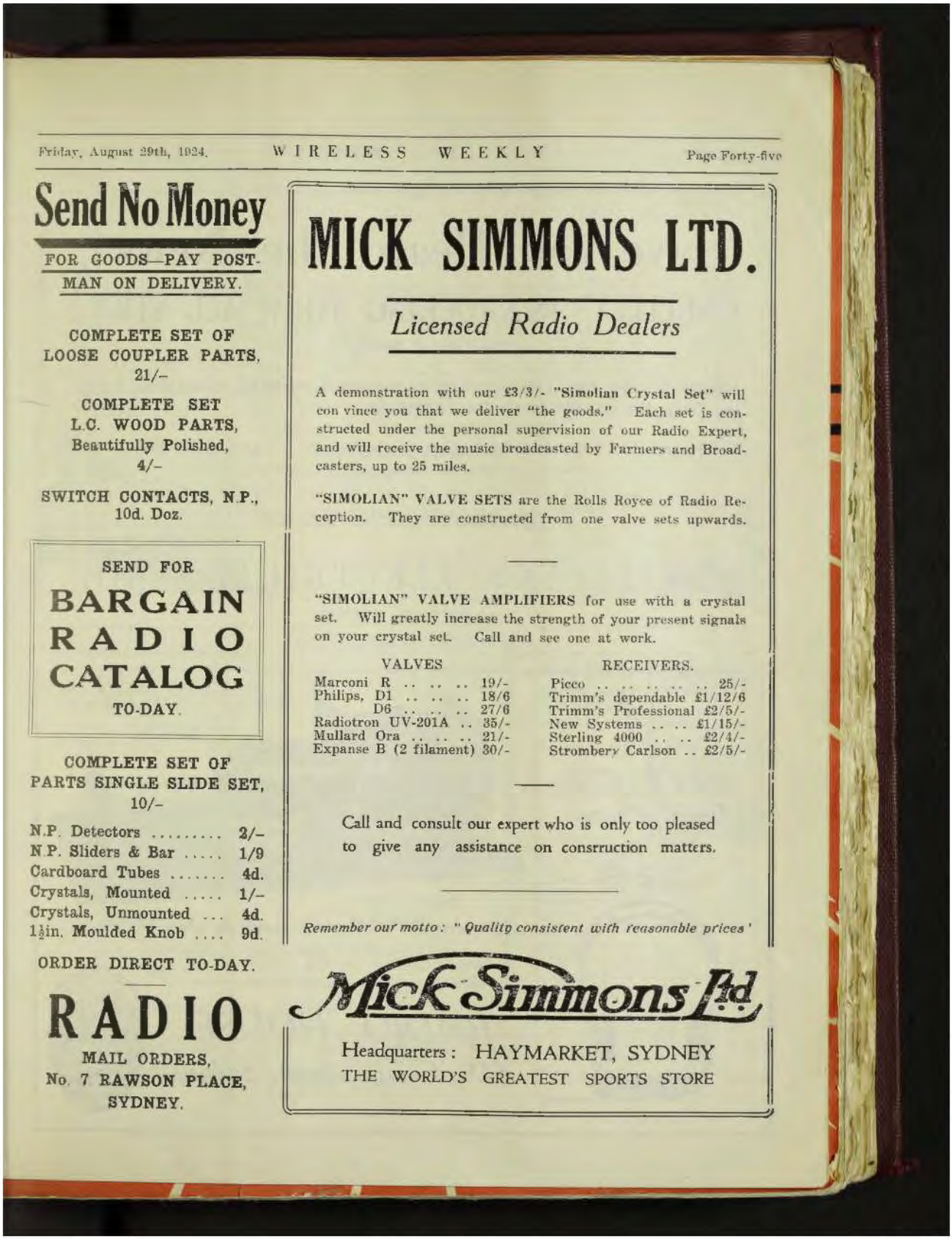
On his return he was engaged by Messrs. Grace Bros. Ltd., and placed in charge of their radio department, and he will be remembered by many for his valuable advice and assistance which was at all times readily given. Associated with Mr. W. Veitch, he installed the first transmitting set to be used in a commercial house in Australia, and which proved a marked success. At the latter end of last year Mr. Keogh installed a magnavox voice amplifier for the Union Theatres Limited, Sydney and Melbourne, which proved a great boom as an advertising medium.

At the beginning of this year he transferred his activities to Anthony Horderns & Sons, but subsequently left to tour the country with a Multi valve receiver, which proved very successful. After installing receiving sets at various places in the outlying districts, he should be in a position to know the wants and requirements of the man on the land.

It is due to this result that Mr. Keogh has decided to establish himself in the city, and to this end he has installed the most up-to-date machinery for the production of the best radio receiver possible.

Mr. Keogh is not only an expert in his profession, but a most genial and pleasant person to deal with. To those fans with radio troubles his advice is well worth seeking.

Type of 3-Valve Receiver produced by New System Telephones Pty. Ltd.



An electrician having arrived home at 1 am., was preparing to undress when his wife glared at him and said:

"Watt's the matter? Wire you insulate?"

Framingham Potentiometer.

DeVeau Gold Seal Radio Head Set Cat. No. 843.

Framingham Inductance Switch.

Framingham Vernier Rheostats.

Framingham Series Parallel Switch.

DeVeau Two-Circuit Radio Jack Cat. No. 25.

Framingham "All Tube" Universal Rheostats.

WHOLESALE ONLY

ANNOUNCEMENT.

AGENTS FOR—

Jefferson Elec. Mfg. Coy.
Framingham Products.
Premier Electric Coy.
Molesworth Crystals.
Deveau Goods.
Russell Fraser Wire Coy.
D.A. and Dutilh—Paris.
Electrad Grid Leaks.

SOLE N.S.W. SALESMEN FOR—

Baldwin 'Phones, Loud Speakers and Units.

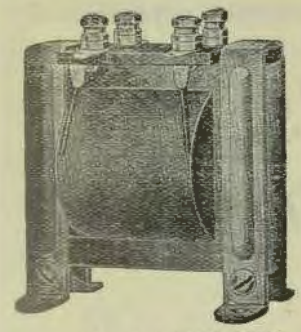
New York Coil Coy.—Condensers.

Complete Stocks of all Radio Goods.

FOX & MacGILLYCUDDY LTD.

DAILY TELEGRAPH BUILDINGS, SYDNEY.

BRISBANE AGENTS: WIRELESS HOUSE, ADELAIDE STREET, BRISBANE.



"No. 41" JEFFERSON
AMPLIFYING TRANSFORMER

The Vital Spot
In the Radio Set

is the transformer. The advantages of using JEFFERSON TRANSFORMERS are acknowledged by hundreds of thousands of users the world over.

Stability of operation; Freedom from Distortion; Maximum Amplification! Those are the characteristics demanded of transformers, and they are the qualities which have made JEFFERSON TRANSFORMERS the most popular among experimenters!

Introducing Jefferson "STAR"
AMPLIFYING TRANSFORMER

FOUR REASONS WHY!

1st.
A Jefferson is scientifically designed.

2nd.
The windings are carefully calculated to produce 100 per cent. amplification —they are not built up to a ratio.

3rd.
The Jefferson line embraces a variety of amplifiers to meet every demand — six Audio and two Radio Frequency types.

4th.
As pioneer transformer manufacturers, Jefferson Engineers designed audio amplifiers long before Radio reached its present popularity. You will appreciate Jefferson's extra years of experience.

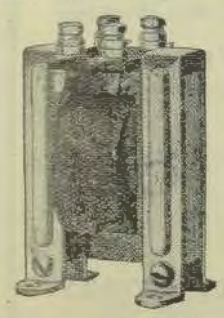
Buy an Amplifyer

For what it will do—
The Service it will render—

The tone and volume it will produce—

Results Count!

You introduce 100 per cent scientific efficiency into your set when you instal
JEFFERSON'S



"No. 45" JEFFERSON
Amplifying Transformer

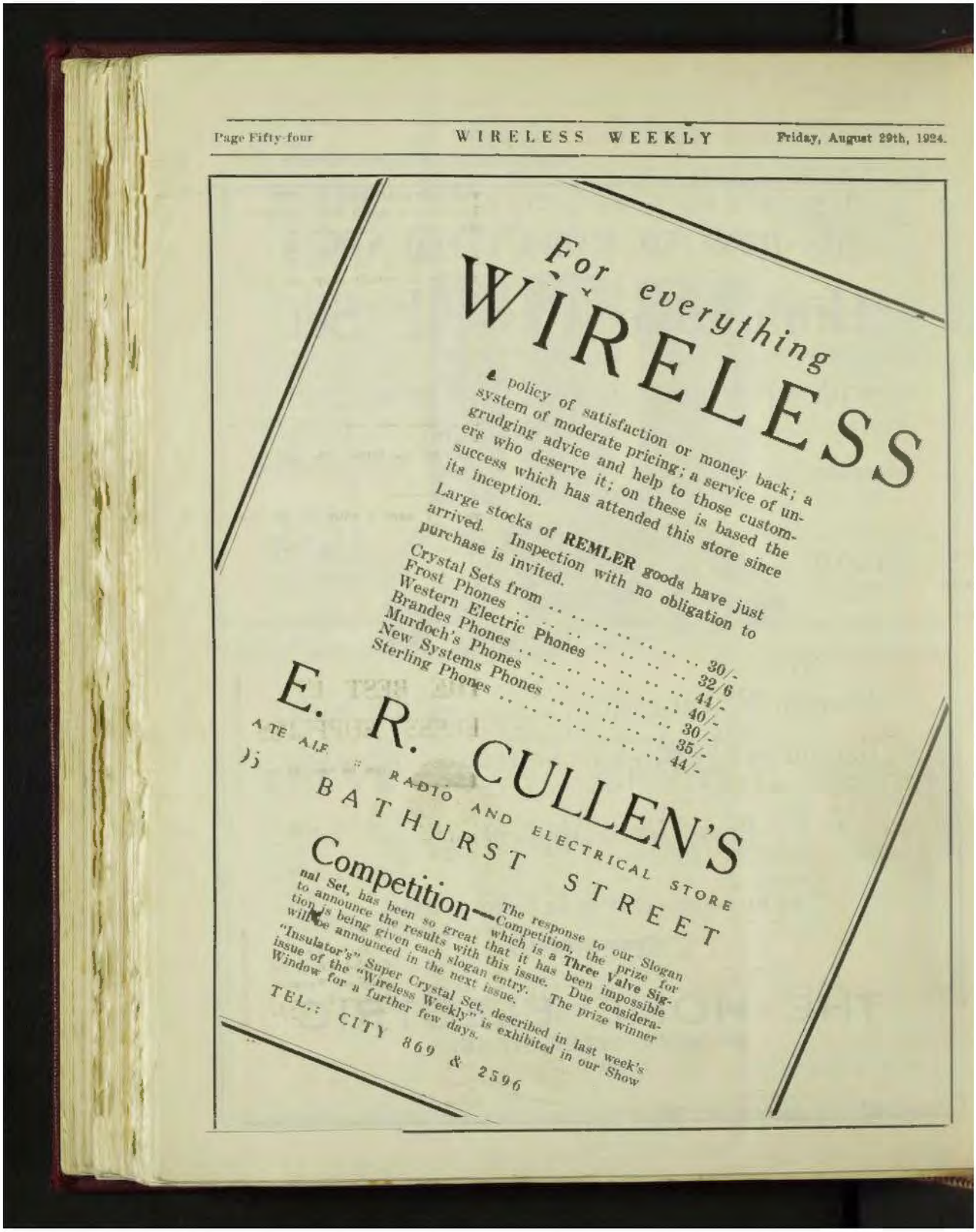
Fox & MacGillycuddy
Limited
Sole Agents for Australia (Wholesale Only)

Daily Telegraph Buildings KING ST., SYDNEY
'Phone: CITY 3062.

World's Leading Transformers

stocked by Colville-Moore, Radio House, Radio Co., A. Hordern and Sons, Ramsay Sharp, Universal Electric, Wireless Supplies Ltd., Harry Wiles, David Jones Ltd., Mark Foys Ltd, Homecrafts, Melbourne; J. C. Price, Brisbane; Adelaide Radio Co.; Burgin Electric Co., Harringtons Ltd., Norris and Skelby, Melbourne; and all Leading Wireless Stores throughout Australia.

JEFFERSON RADIO
Frequency Transformers



Radioculus

Harvard Graduate—The members of my class who have married have had an average of a little less than two children.

Vassar Graduate—Isn't that remarkable? The married women of my class have averaged almost three. I wonder what that proves?

Harvard Graduate—Oh, not much. Simply that women have more children than men.—Life.

"Willie," asked the teacher, "what is the plural of man?"

"Men," answered the small pupil.

"And what is the plural of child?"

"Twins," was the prompt reply.—Central Wesleyan Star.

An Indianapolis dealer in tyres and tubes advertises as follows:—

"Invite us to your next blow out."—The Progressive Grocer.

A banker with wide experience in pulling firms out of the difficulties into which the late deflation had brought them says that his best aid was a certain story. Whenever he said a thing must be done and the owners of the crippled business said they couldn't do it—which happened often—the banker would tell the following story:—

A man was telling his son a bedtime story about an alligator. It was creeping up behind a turtle, with its mouth wide open. Finally it was within reach, but just as its great jaws were snapping shut, the turtle made a spring, ran up a tree and escaped.

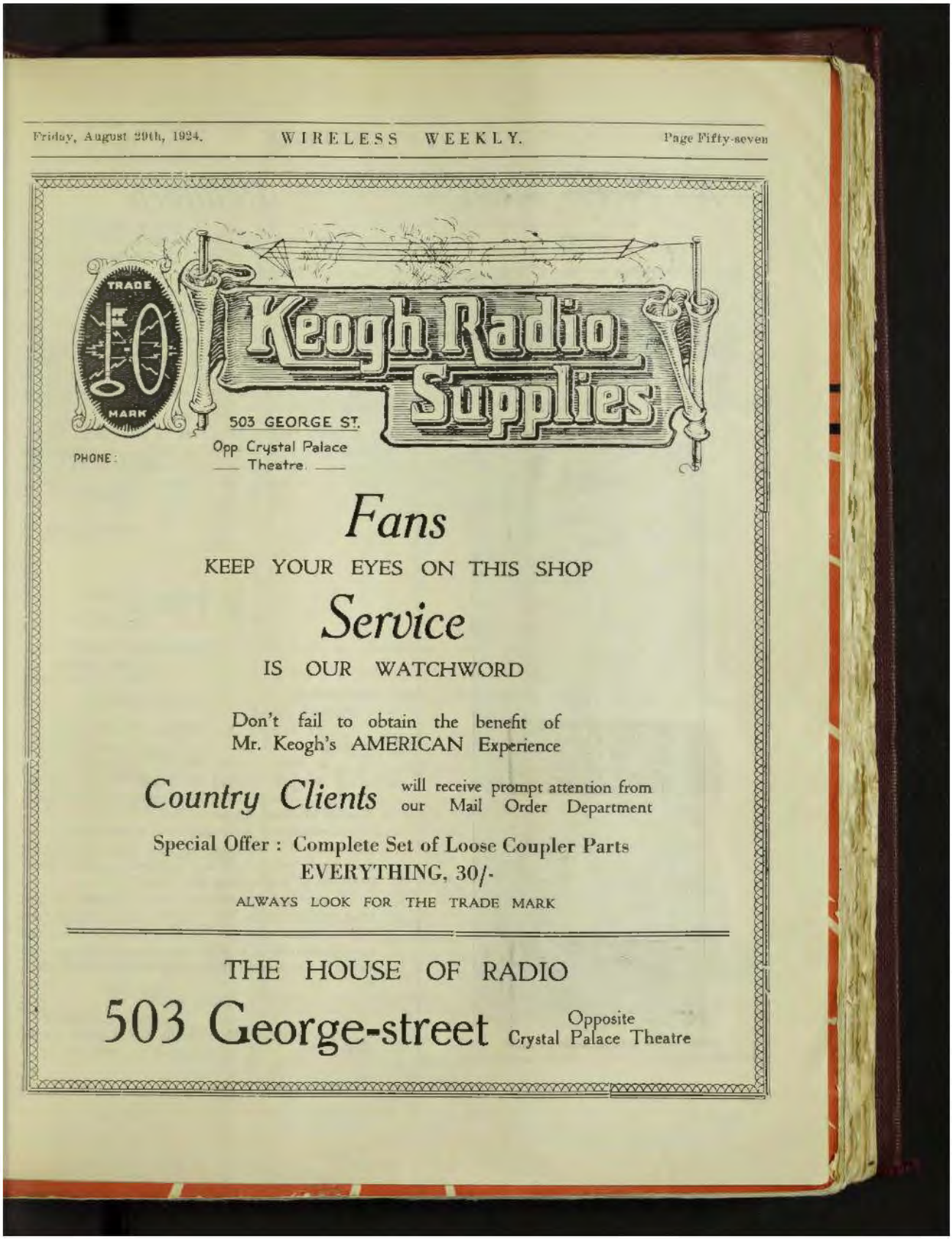
"Why, father," said the boy, "how could a turtle climb a tree?"

"By gosh," replied the father, "he had to."—Wall Street Journal.

Mrs. Newlywed—I want a shirt for my husband.

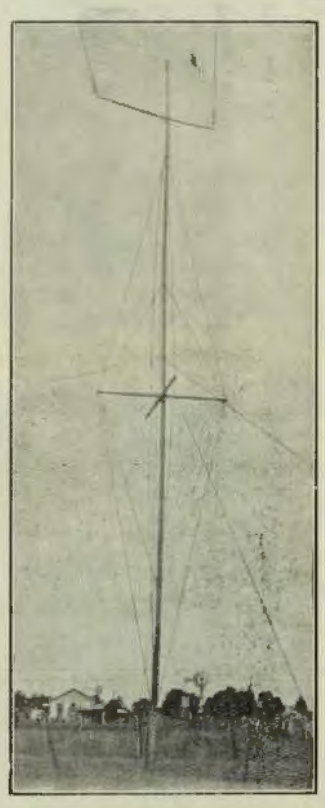
Clerk—Is he a big man?

"No, he's just a book-keeper now, but he's going to be."—Life.



A New Mast

A new mast, erected by Mr. C. Walker, Clifton, Q. Height 43 ft. The aerial has 11 reel and shell insulators on each end, making a total of 22. Further particulars of Mr. Walker's station will appear next week.



Readers

In a recent issue we mentioned that, except to subscribers, a charge of 1/- would be made on all questions entailing drawings or research work. We have been requested to define the definition of the word "subscribers." It applies to those who have sent in a yearly or half-yearly subscription to ensure Wireless Weekly reaching them by mail every week. Incidentally we may mention that we mail direct to subscribert in every State of the Commonwealth, to New Zealand, and even as far abroad as the West Indies.

Some readers have sent us more than the 1/- mentioned, and to these and others we would like to point out that the Department is not carried on for profit—merely as a service—and so long as the bare cost is covered, we feel more than repaid.

A Tribute

186 Livingstone Road.,
Marrickville,
23rd August, 1924.

The Editor,
Wireless Weekly,
33/37 Regent St., Sydney.

Dear Sir,

Re Super Crystal Set, by "Insulator."

I have constructed the super crystal set according to details given by "Insulator" in Wireless Weekly of 22nd August, 1924.

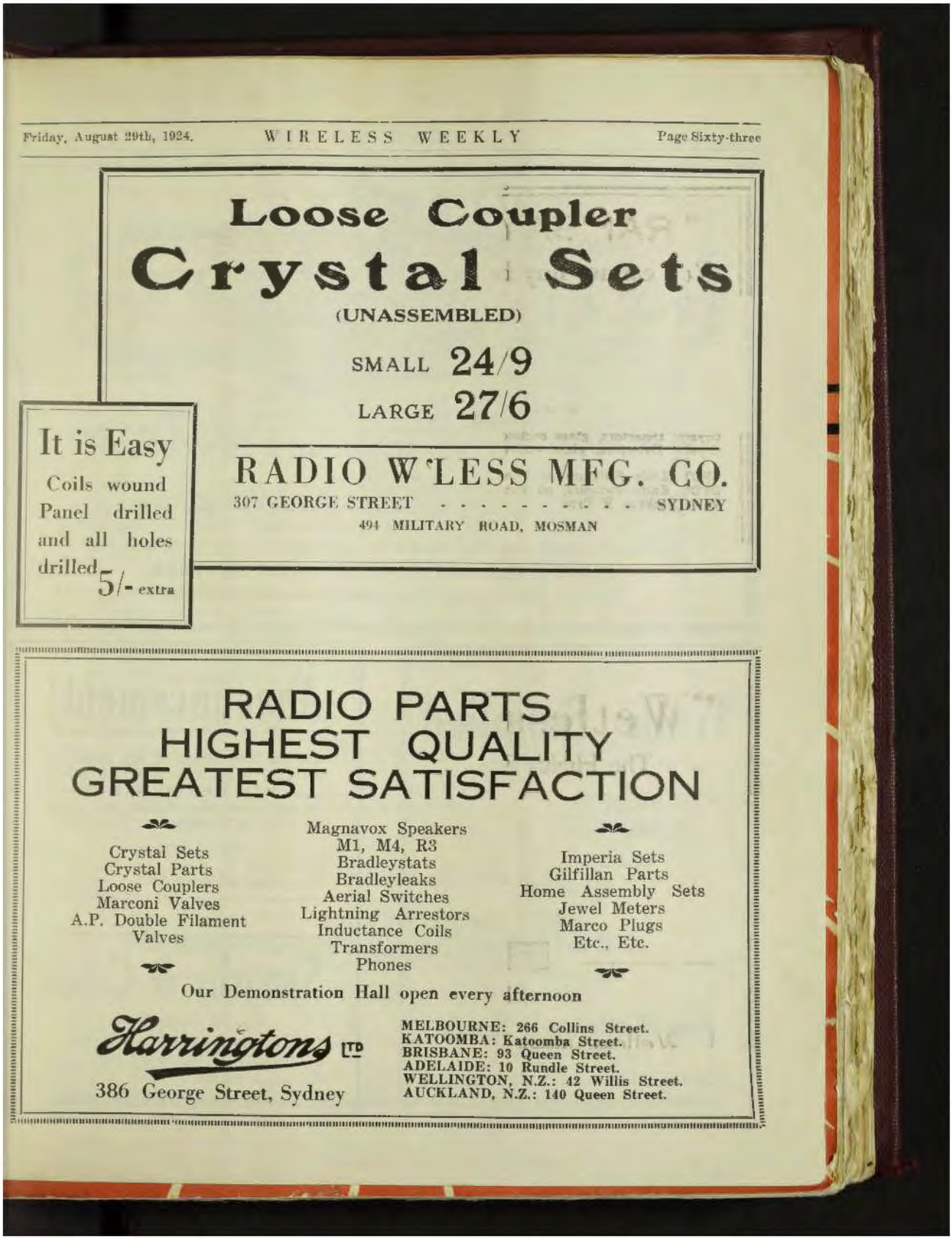
I was more than surprised at the results obtained in the reception of 2FC and 2BL, which was much better than any previous results I have obtained with a crystal set.

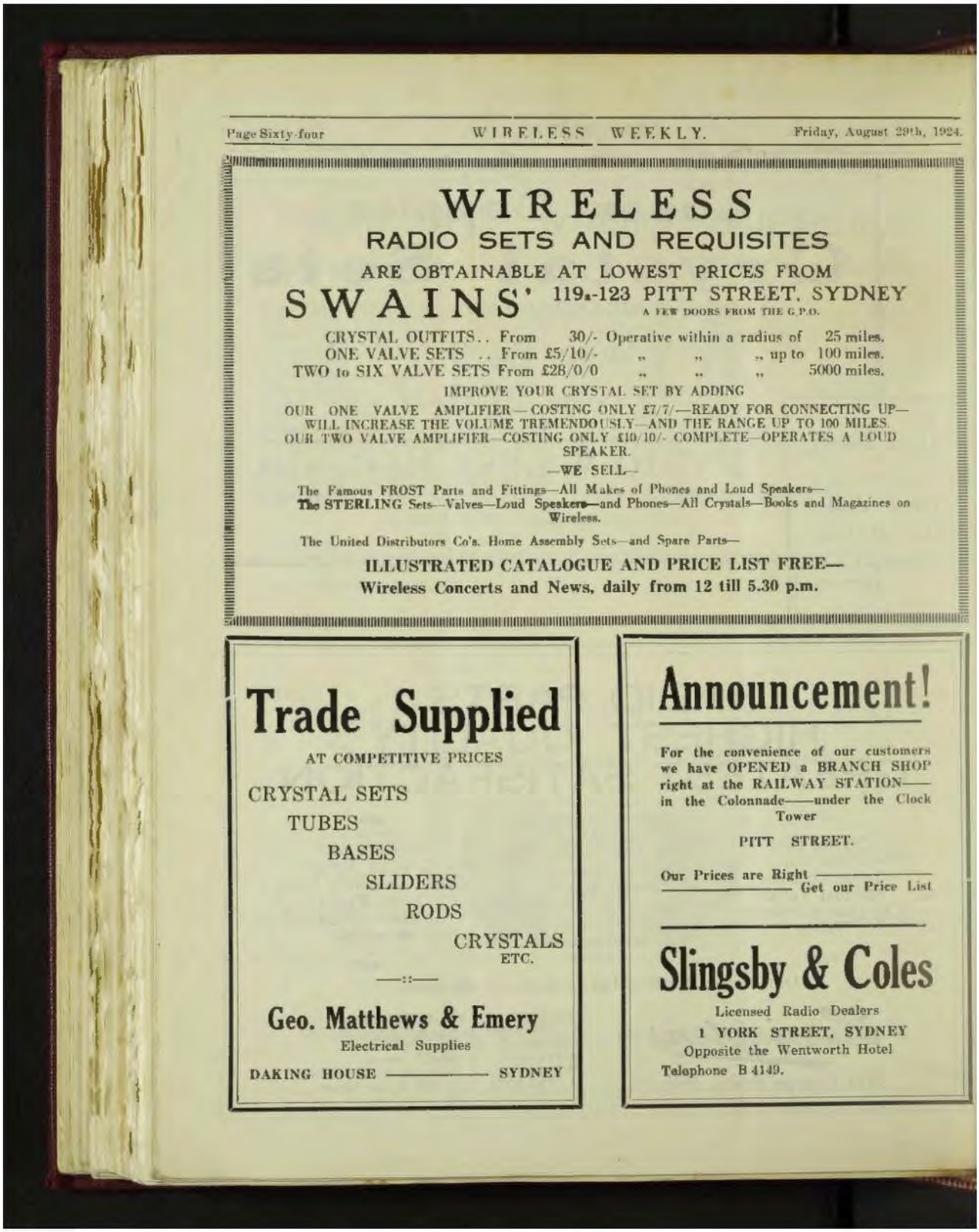
I can heartily endorse your remarks at the head of the article with regard to the comparison with a single valve set (without re-action) and am sure its simplicity and low cost of construction must strongly recommend it to many broadcast listeners-in.

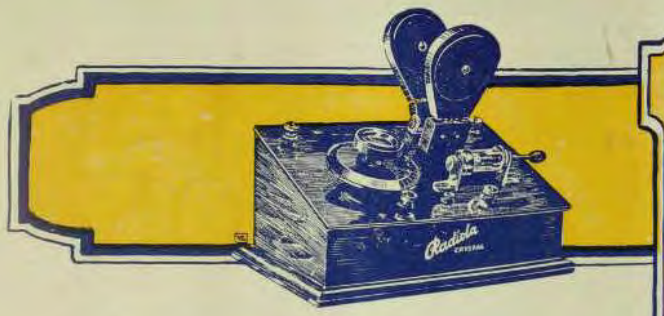
Yours etc.,

R. J. STIFFE,
Vice-President Marrickville and District Radio Club.

ARE YOU USING FROST PARTS? SEE PAGES 2 and 3.







Special Features

Can be operated by anyone not possessing technical knowledge.

Glass enclosure protects Crystal from dust and dampness.

Spring clip crystal holder allows quick changing of crystal and ensures perfect electrical contact.

Highly selective tuning by reason of coupled circuits.

Price :

£4 . 5 . 0

with one set of special ebonite covered coils, or £4/15/- with an additional coil.

Radiola Crystal Receiver

This set is of the highest quality workmanship and design, while the trade mark "A.W.A." on each instrument is a guarantee of performance. It can be depended upon to give good results over a distance of about 12 miles when used with a good aerial.

The crystal and spiral contact wire are enclosed in a glass tube, which protects them from dust and dampness and ensures permanent adjustment.

The use of variable inductive coupling ensures selectivity and freedom from atmospheric disturbances.

The tuning coils are interchangeable, so that by using coils of suitable values, any required wave-length may be obtained. The cabinet is of handsome appearance, while the instruments are mounted on best quality bakelite, thereby ensuring high insulation.

The set is self contained and only needs connection to an aerial and earth system, and the attachment of a pair of telephones to be ready for immediate use.

AWA

Procurable from all Radio Dealers

Amalgamated Wireless (Australasia) Ltd.

WORLD WIDE WIRELESS

Clarence Street, Sydney

Collins Street, Melbourne

RADIO DEALERS KINDLY WRITE FOR TRADE PRICE LIST