

WIRELESS WEEKLY

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transmission by post as a newspaper.

VOL. 5. No. 20.

FRIDAY, MARCH 13, 1925.



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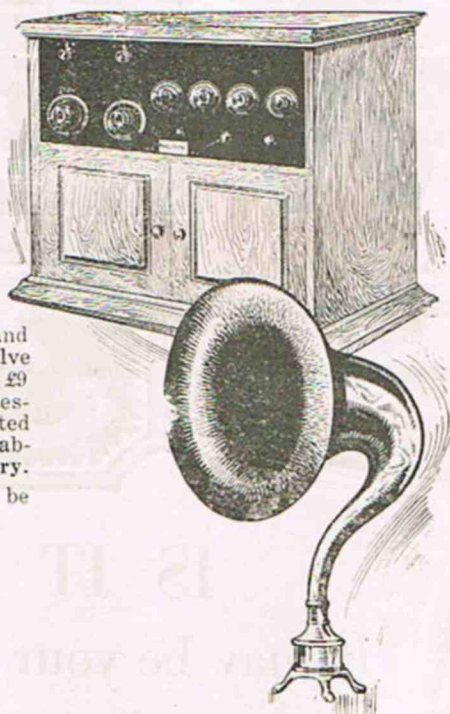


4-Valve Receiving Set

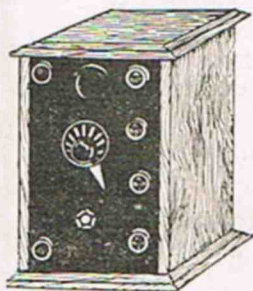
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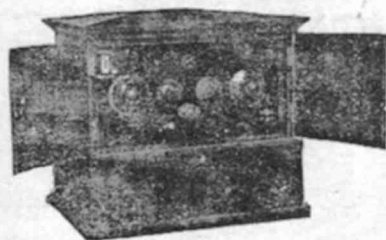
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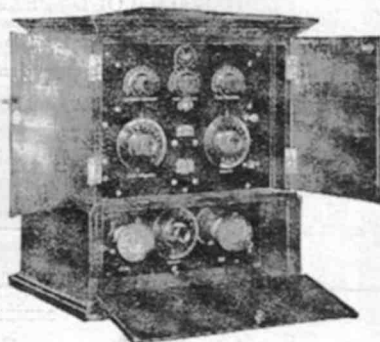


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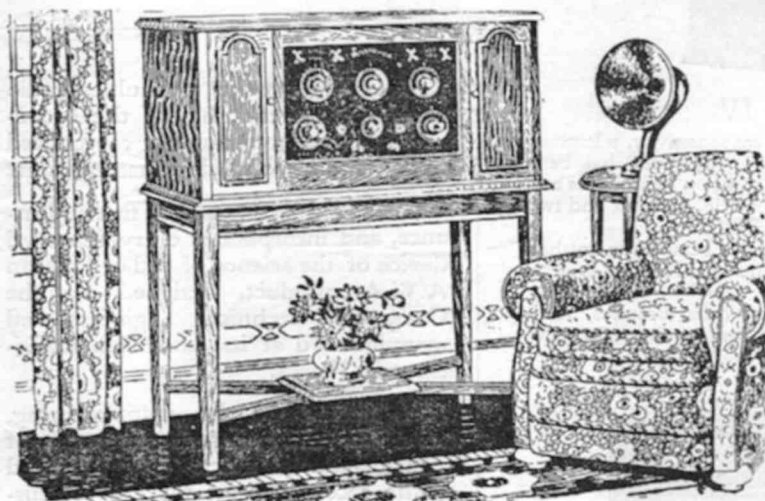
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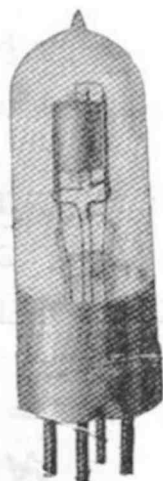
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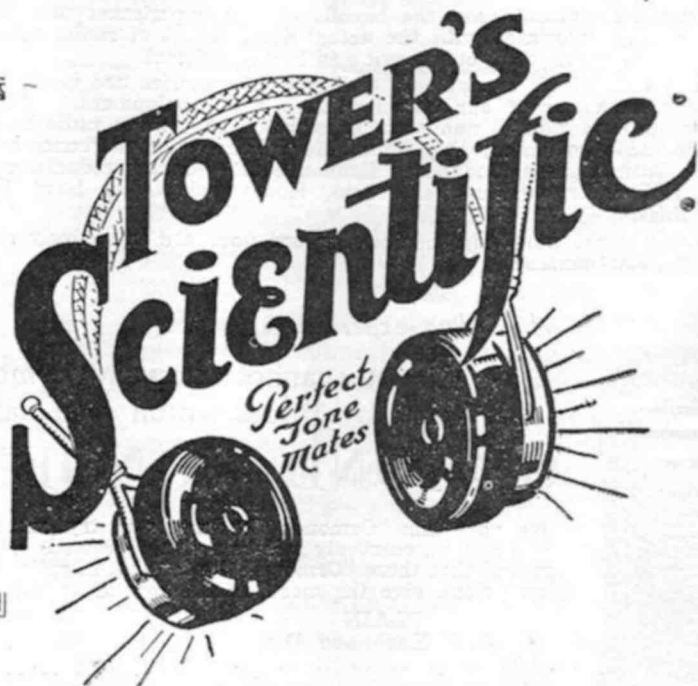
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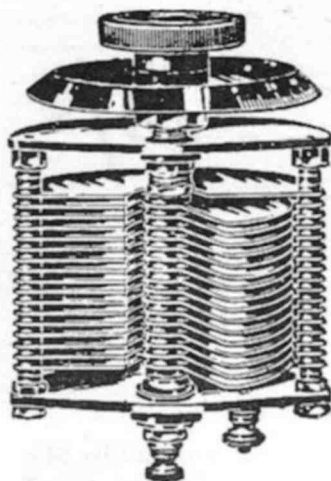
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Wireless Weekly

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VOL. 5 No. 20

MARCH 13, 1925

Editorial

LOOKING around the trade, it is extremely gratifying to note the increasing amount of high-grade radio goods now available on the market. The last few months have witnessed a remarkable upward trend in the quality of goods sold to the radio public, and a definite increase of production of Australian-made apparatus, which compares very favourably with the imported article, more particularly with regard to transformers, condensers, and even valves.

There has always, to a certain extent, been a slight prejudice against radio goods of Australian manufacture, but if the present rate of progress is maintained there is no doubt that this will gradually disappear. At the same time, it must be remembered that both British and American manufacturers have set a very high standard, and that this standard is constantly being raised, so that if the local manu-

facturer expects to enter into active competition with the imported article he must continually improve the quality of the local product. The radio public generally is becoming more and more anxious to ensure the highest efficiency in their receivers, and are rapidly being converted to the idea that the best is always the cheapest in the long run. Generally speaking, also, it is realised that the nationally advertised product is always backed up by efficiency, and that nothing can long exist that does not measure up to the standard demanded by present-day conditions.

With the industry rapidly becoming stabilised, and with the undoubted spread of radio into the country—development which is being observed day by day by this paper—everything points to big business during the winter.

WHO'S NEXT?

A VICTORIAN experimenter has worked a station in Persia, and others have established on frequent occasions direct working with England and America. It seems that the limit has been reached so far as telegraphy is concerned, so the next logical step is to endeavour to cover these distances on phone.

It is very interesting to note that a prominent Sydney experimenter is at the moment working hard in the direction of perfecting his phone transmissions on short wave, and we cannot doubt that his object is to eventually reach out abroad on phone, leaving the Morse code to others. According to the daily papers, 2YG has already been reported O.K. on phone in the United States, and we may look for further results very shortly. Experience in the past has shown that it always seems the function of one or two to lead the others. In this matter, at least, let ALL experimenters co-operate in the direction of getting phone across to America and England, rather than leave the initial work to one man and then all pile in afterwards.

Bell (N.Z.) and others have already heard amateur phone signals from England, and, according to latest advices, Z4AA is making strenuous attempts to be first across. Let's get that record here. There is no doubt that if a few of our leading transmitters got together and concentrated upon this important problem it would be successfully overcome.

There would be no individual glory, but the credit would go where it belongs—to the Experimental movement.

HEADQUARTERS
Royal Society's House
5 Elizabeth St.
SYDNEY, N.S.W.

Wireless Institute of Australia

N.S.W. Div. Inc.

Incorporating the Affiliated Societies and The Australian Radio Relay League

Phil. Renshaw, Hon. Sec.
Box 3120 G.P.O. Sydney
Phone B2235
A.H. Perrett, Publicity Officer.

Standard Calibration Signals.

Mr. H. A. Stowe, radio A2CX, notifies us, that owing to structural alterations in the station necessary before short wavelengths can be transmitted, it may be some little time before the 60 to 130 metres band of standard wavelengths is transmitted.

Those who have been privileged to witness the work being done at this station alone can realise the enormous amount of work entailed in transmitting these standard wavelength signals, and it is indeed a credit to this enthusiastic worker that these signals go out with such regularity and precision. There is no doubt at all as to the accuracy of the signals being transmitted. No less than three independent checks on each signal is made, and this in addition to the calibration of the transmitter itself. The final check on these transmissions is referred to the standard wave metre belonging to the Wireless Institute of Australia, New South Wales Division, and as this instrument has an accuracy of one in ten thousand, the accuracy of the standard signals can be relied upon. These standard transmission will continue regularly every Tuesday night, commencing at 10 p.m.

The announcement will first be made on 180 metres and then a series of signals will be transmitted depending on the particular band in use on that evening. The bands covered will be as follows: (a) 60 to 130 metres; (b) 130 to 200 metres (c) 200 to 250 metres. Each particular standard wavelength will be announced by phone, followed by the particular code letter for that wavelength on buzzer, transmitted for two minutes, followed again by the same code letter transmitted on C.W. also for two minutes.

The follow code letters have been selected for the various wavelengths and are not repeated each evening so that careful note should be made of these code letters:

(a) 250 metres — — — —

- (b) 220 metres — — —
- (c) 200 metres — — —
- (d) 170 metres — . . —
- (e) 150 metres — . —
- (f) 130 metres . — .
- (g) 100 metres . — — .
- (h) 80 metres . . — — .
- (i) 60 metres . — — .

Radio 2CX will be pleased to have reports on these standard transmissions particularly from experimenters in other States.

Delegates' Council Meeting.

The Delegates' Council Meeting will be held at Institute Headquarters on Friday, March 13, 1925, at 7.30 p.m. Delegates are particularly asked to note the time and attend punctually as there is much important business to be dealt with, and punctual attendance greatly facilitates the despatch of business.

All Clubs' Night.

Particular attention is drawn to the fact that the Wireless Institute of Australia, New South Wales Division, has made arrangements for another "All Clubs' Night." This is to be held at the Royal Society's House, 5 Elizabeth St., Sydney, on Monday, March 30, 1925. On this night two films will be shown. One will be dealing with wireless and the other with light. The close relationship existing between light and wireless should render the former film particularly interesting, and will probably clear up many of the misconceptions existing with regard to wireless phenomena.

As this will be the first occasion on which these films will be exhibited in Australia it is anticipated that there will be a large roll up. All members of the Wireless Institute and of Affiliated Clubs are given a hearty welcome.

Australian Radio Relay League.

On Thursday, March 5, 1925, the re-constituted committee of the Australian Radio Relay League held its first meeting. A lot of preliminary spade work was done, and it is now definitely

announced that the next committee meeting will be held on Monday, April 6th.

A definite syllabus and agenda will be drawn up, together with a scheme for working the relay work, which will be presented to a mass meeting of those eligible to join the League. This mass meeting will be held at Royal Society's Hall, 5 Elizabeth St., Sydney, on Wednesday, April 22, 1925. Notice is particularly drawn to the change of date. This was originally arranged for the evening of Wednesday, April 15, but owing to the fact that the annual general meeting of the Wireless Institute of Australia N.S.W. Division, falls on 16th April, it was found necessary to postpone the general meeting of transmitters until Wednesday, April 22. All members of the Wireless Institute of Australia and Affiliated Clubs will keep this date in mind, and make a strenuous effort to be present on this occasion.

General Meeting.

The next general meeting of the Wireless Institute of Australia, New South Wales Division, will be held on Thursday, March 19, 1925, at 8 p.m. Mr. O. F. Mingay will deliver a lecture. The versatility of this lecturer is well known, and an interesting evening is assured.

QRM.

If you have a reputation, live up to it!

3BD looking just as young as ever, has been over getting points from the Sydney-siders, to improve the experimnetal status in Melbourne. He said he came for a holiday.

2YG will soon be on the move back to the North Shore Line.

2CM has visited 2YG and 2YG has visited 2CM. All within a week.

2CI has gone to Camara for a fortnight's holiday. During this time he is going to act the "Good Samaritan," at a most important radio station, transmitting and receiving, at Urunga.

Mr. Les. Moore has returned from Bananalnd. Rumour has it "Colmo" is making a raid on Brisbane.

Mr. J. W. Robinson, Manager of the Queensland Government Broadcasting Station, reports to the effect that things are going well, and the station will soon be on the air. We hope he does not mean literally because we are advised that the station is being built on the roof of one of the highest buildings in Brisbane. We would advise that the station be equipped with parachutes.

2GC (Challenger to wit) has not been living up to his name of late.

2DE reports 75 per cent. of the residences at

Great Mackrell Beach are equipped with aeriels. The local progress association will not permit a house to be erected without suitable provision for the reception of wireless.

2DE also reports that a cruise between Brooklyn and Newport on Sunday last revealed the fact that of 25 motor cruisers and launches which were observed, only two were not equipped with aeriels. The publicity officer asked Mr. Renshaw how he knew that these two did not possess loops.

"Sleepy Hollow," better known as Brooklyn, was observed last week end to have taken a complete grip on radio. Every house almost without exception sports its aerial.

Apologies are offered to 2GM for any reference to his mast in last week's notes. It was not meant to imply that his mast was in any way unsafe, but the object was to point out the danger existing in many cases where masts are erected without due regard for the fundamental principles of mechanics.

A. H. PERRETT,

Publicity Officer.

Round the Clubs

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

THE LEICHHARDT AND DISTRICT RADIO SOCIETY.

Members of the Leichhardt and District Radio Society held their 121st general meeting at the club-room, 176 Johnston St., Annandale, on Tuesday, March 3rd.

There was the usual good attendance, and the main business of the evening was the screening of three cinematograph pictures by kind courtesy of the Australian General Electric Co., per Mr. Buckley. The first picture to be shown was entitled "The Little Busybody," and depicted in a very clever manner the assembly and use of an electric motor. The second subject screened bore the title, "The Light of a Race," and during its showing those present were treated to a very interesting resume of the evolution of artificial lighting apparatus commencing with the stone and flint produced spark of the stone age, and concluding with the up-to-date electric lighting methods of the present day. Probably to those present the third picture screened was the most interesting of all as its title, "The Wizardry of Wireless," would suggest and the principles of radio communication, particularly those incorporating the

action of the valve, were depicted in a remarkably clear and interesting manner. The meeting concluded with a vote of thanks to the Australian General Electric Co., for the use of the films, and to Mr. Buckley for his kindness in screening the pictures. To the Society goes the honour of being the first public body to view the screening of "The Wizardry of Wireless," and of this fact members are particularly proud in view of the value of the picture as an educative agent.

Next Tuesday evening the Society will hold its 123rd general meeting, when a Sale and Exchange evening will be conducted, and at the following meeting to be held on Tuesday, March 24th, Mr. H. F. Whitworth, B.Sc., will deliver the 5th lecture of Syllabus No. 2, under the title of "The Principles of Electricity and Magnetism."

The Society is anxious to see an increase in its already large membership, and persons interested are invited to address their inquiries to the Hon. Secretary, Mr. W. J. Zech, 145 Booth St., Annandale, who will be pleased to supply any information required.

CROYDON RADIO CLUB *

The usual weekly meeting of the Croydon Club was held on Saturday, February 28th, 1925, at the club rooms, "Rockleigh," Lang St., Croydon, Mr. C. W. Slade occupying the chair. There was a good muster of members present to hear a lecture by Mr. Hamilton. Unfortunately this gentleman was unable to be present, so we had to fall back on our own devices—Morse practice and questions. The questions are each week wuss and wusser, as the members appear to be putting some of the old posers which have gone the rounds for a few years, in a new form.

It was decided that a congratulatory letter be forward to the Institute to mark the club's appreciation of the standard wavelength transmissions by 2CX. Two of the club members have made wavemeters by working by data supplied by Mr. Stowe, per medium of this paper and have calibrated them by means of the transmissions.

Owing to the Club's Secretary, Mr. G. M. Cutts (2GM) having so many calls upon his time it was decided to give him assistance. Mr. Wilkinson, our latest member, volunteered to act as Minute Secretary. Mr. Wilkinson's offer was gratefully received.

Mr. Meads was elected Assistant Librarian, to assist Mr. Craig, who through ill health may have to take a prolonged rest.

The club's transmitter is nearing completion, and we shall soon be "on the air."

At 9.30 we adjourned for refreshments, and after more business, the meeting was officially closed at 10.15.

A special Morse class for beginners has commenced, and is held at the club-rooms on Saturdays, at 7 p.m.

All applications for membership and enquiries should be addressed to the Hon. Secretary, Mr. G. M. Cutts, 25 Malvern Av., Croydon.

By the way, did you hear that 2 Gee Emma's masterpiece, "it ain't gonna rain no more," got wet on Tuesday night, and has "gone phut"?

RAILWAY AND TRAMWAY RADIO ASSOCIATION.*

The Railway and Tramway Radio Association held its usual weekly meeting in the club room at the Railway Institute on 4th March, 1925. The club lecture roster was commenced with a lecture on the "Installation and the Maintenance of a Wireless Receiver," by Mr. Clark. At the conclusion a vote of thanks was accorded to the lecturer, and the listeners stated that they had gained much useful information.

On Monday, March 2nd, a party of members visited the station of Mr. Percy Sewell (2CJ), and spent an enjoyable evening.

Enquiries regarding the association's activities should be addressed to the hon. secretary, Mr. W. L. Carter, 139 Phillip Street, Sydney.

STRATHFIELD RADIO CLUB.*

The ordinary weekly meeting of above club was held at the club rooms on Monday evening, 2nd instant.

The usual good attendance of members turned up and the President M. A. F. Jacob, occupied the chair. The Hon. Secretary detailed at length the arrangements made at last committee meeting (briefly referred to in last week's report) regarding the formation of the new Technical Committee and its duties, at the conclusion of which members freely expressed their pleasure at the arrangements made, and the manner in which the General Committee was working in the interests of the club.

In the course of a few weeks this new committee, which meets weekly will be in a position to render very useful service, and excellent instruction in wireless subjects to members whose co-operation of course is required in order that the committee's plans may be facilitated.

The enthusiasm of members is such however, that no trouble is anticipated in this direction.

Arrangements are in hand for modifying the lay-out of the club's apparatus to make it more convenient for demonstration purposes, and individual members have signified their willingness to bring along various component parts as required and in this way excellent demonstrations of various types of circuits and their characteristics can be staged under the supervision of experienced practical operators.

This committee will also conduct Morse classes for members who desire to learn the code, and a free information bureau for all members. Any technicality which cannot be satisfactorily dealt with at ordinary meetings will be submitted to the committee, who will undertake to secure the information required from reliable sources.

An interesting discussion on general and technical subjects followed the Secretary's report, after which Mr. T. Harris, with the aid of various parts, brought along by members connected up a stage of audio amplification to the club's single valve P1 circuit receiver and demonstrated the correct method of operating same in order to receive music and speech from local broadcasting stations, at good volume and reasonably free from distortion.

The demonstration was very successful and evoked much interest.

These practical demonstrations will be a regular feature of future club meetings, except when visiting lecturers have the floor. All the popular circuits will be taken in turn, and their respective characteristics explained.

Mr. J. G. Reed, well known as the owner of experimental station 2JR, his excellent contributions to radio literature, and his good work in the experimental movement generally is coming along to lecture on "Short Wave Experimental Transmission and Reception" at the meeting to be held on Monday evening, 16th inst.

With the approach of winter wireless is sure to gain in popularity as the ideal form of home entertainment, and those whose thoughts are tending in that direction, and are frightened to venture on the assumption that wireless apparatus is too complicated for the average person to handle, will be cheerfully assisted if they care to come along and make use of the service our club provides. Our membership fees are ridiculously low and the more members we have the better service we can provide.

Correspondence on the subject addressed to Hon. Secretary, Mr. K. Campbell, 44 Bayard St., Mortlake, will receive prompt attention

CONCORD AMATEUR RADIO CLUB *

The usual weekly meeting of the above club was held on Thursday, 26th February, at the club room, "Euripides," Wallace Street, Concord. The President, Mr. Stephenson, occupied the chair.

After the general business had been dealt with Mr. James, of Rosemont Avenue, Summer Hill, and operator owner of 2XA, gave a very interesting lecture on radio frequency for low waves. This lecture was given under the general roster of the delegates' council. A visit to Mr. James' station at Summer Hill, will be made on Tuesday, 3rd March.

The club transmits on a wavelength of 165 metres every Tuesday, Thursday and Saturday nights, after 10 p.m. QSL's on these transmissions will be gratefully received. Correspondence should be addressed to W. H. Barker, Hon. Secretary, "Euripides," Wallace St., Concord.

BRIGHTON SECTION OF THE WIRELESS INSTITUTE OF AUSTRALIA.

At the last meeting of the above club, held in the club rooms, Higinbotham Hall, Brighton Library Buildings, Bay Street, North Brighton, on Thursday evening, February 26th, a number of members of the Essendon Radio Club were present. The main portion of the evening was devoted to a debate on the grading scheme as proposed by the central council. Many different views on the subject were given and other ideas were brought forward. The result of the debate will be announced at the council meeting to be held on March 3rd.

The work of decorating and installing the apparatus at the new club rooms is now almost completed, and an official opening night will be held in the near future.

The technical committee of the section, under the direction of the chairman, Mr. C. K. Kennard, has prepared a complete roster of lectures for the next six months. Everything appertaining to the subject will be lectured on. Members of the section cannot afford to miss any of these lectures.

Interested persons are asked to get in touch with the hon. secretary, Mr. W. Kerr, at the club office, 241 Bay Street, North Brighton—X 4861.

R. SURRIDGE, Publicity Officer.

Telephone B 5925

CHARLES D. MACLURCAN
Consulting Radio Engineer

Pratten Building,
26 Jamieson Street,
SYDNEY

The Construction of a Power Transformer

By WIRELESS WEEKLY.

FOR the next two or three weeks we intend to instruct our readers in the construction of valve transmitters; we commence this week with transformer. Probably the more advanced experimenter will recommend you to purchase an assembled transformer which has been made by a skilled mechanic. This, besides being more costly will probably give no more service or any higher efficiency than the home made one.

We quite realize that some of our readers will wish to design their own for a given power output, and to those we have endeavored to give advanced knowledge which is absolutely essential in transformer design. For readers who do not wish to go so deeply, we have described the construction of a 200-250 watt transformer, which is ample for supplying filament and plate current for a 10 watt transmitter.

Fig. 1 shows the diagrammatical sketch of a transformer. The iron core is made up of thin sheets of stalloy iron or silicon steel No. 29 gauge, the thickness of which is .014 in. On one side of this iron core, the primary is wound and on the other the secondary. In a well designed transformer practically all the flux due to the current flowing through the primary will cut every turn of the secondary winding also. From this it follows that the E.M.F. induced in each turn of the secondary is equal to that induced in each turn of the primary, so that the ratio of the total primary to the total secondary E.M.F. is simply equal to the ratio of the number of primary turns to the number of secondary turns. In this way both step up and step down voltages can be obtained from the secondary coils in accordance with the ratio of turns primary to secondary.

Example.

The primary has 100 turns and the secondary 1000 turns, and an E.M.F. of 200 volts is applied to the primary; an E.M.F. of 2000 volts will be induced in the secondary, the ratio being 10 to 1. If the primary current is 50 amperes the secondary current will be 5 amperes. From this we learn that the transformer is capable of converting alternating current of low voltage and comparatively large current, to alternating current of higher voltage and smaller current and vice versa. The primary turns may be obtained from the for-

mula following, which is the fundamental equation of transformers:

$$TP = \frac{EP \times 10^8}{4.44 \times A \times B \times N}$$

Where TP=primary turns

EP=primary voltage

a=cross sectional area of the core in square inches

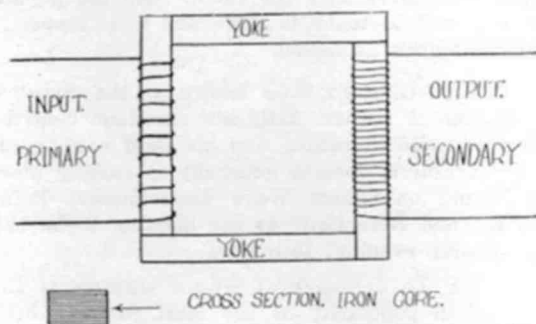
B=flux density per square inch of core cross section.

N=primary frequency.

Hence E=240. $10^8=100,000,000$, $a=1.75 \times 1.75=3.0625$, $B=60,0000$, $N=60$.

$$TP = \frac{40 \times 5000}{4.44 \times 3.0625 \times 600000 \times 60}$$

It should be noted that the number of turns depends solely upon the E.M.F. Flux and Density and Frequency of A.C.. The size of the wire is determined by the capacity of the transformer; for transformers up to a maximum of 200 watts



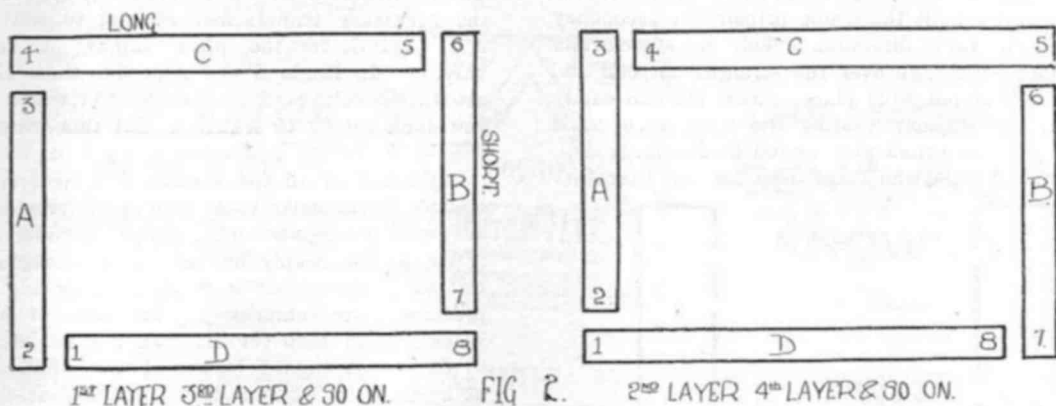
22 d.c.c. is quite O.K. The wattage of a transformer based on the above figures using 555 turns for primary, would be $\frac{1}{2}$ k.w. or 500 watts. Here, of course larger wire must be used, nothing smaller than 18 or 20 d.c.c. As soon as the primary turns have been calculated, it is a simple matter to work out the ratio of step up or step down for secondary coils.

Constructing a 200-250 watt Transformer for a 10 watt Transmitter.

Purchase sufficient stalloy iron to make up a core 9in. x 6in. x $\frac{1}{16}$ in. cross section. This can

be obtained already cut for about 25/-; both sides of each strip should be coated with a thin shellac and set up on edge to dry. The core should now be assembled as shown in Fig. 2. The short strips

without removing the other yokes, and with the aid of a strong knife and a little patience, these are placed back into position one by one. (See Fig. 3.)



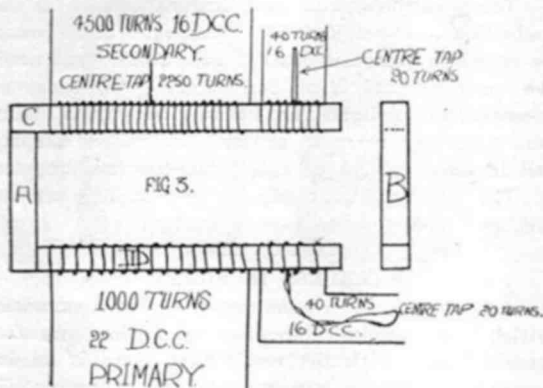
of the yokes of the core are shown as A and B, and the long strips by C and D.

It will be readily seen from Fig. 2 that the end three of strip A is placed against the side 4 of strip C, the end 5 of strip C against the side of 6 of strip D, the end 7 of strip B against the side 8 of strip D and the end 1 of strip D against the side of strip A. As shown in the right hand of drawing of Fig. 2, the next layer overlaps the bottom layer in much the same manner as you would build up bricks. When the whole of the laminations have been stacked up, A, C and D yokes

Winding the Coils.

The winding space available with a transformer of these dimensions is $7\frac{1}{2}$ in. x $4\frac{1}{2}$ in. This gives ample room for both step up and step down voltage coils and also provides a very small magnetic leakage which is not at all detrimental from the radio experimenter's point of view. The quickest and most efficient method of winding the coils for primary and secondary is to make a wooden former $1\frac{1}{2}$ in. x $1\frac{1}{2}$ x $1\frac{3}{8}$ thick. Drill a hole in the centre to take a $\frac{3}{8}$ in. bolt; next place two pieces of flat wood on either side of the former. Drill the same size holes in these and pass the bolt right through the lot, clamping them tight by means of the nut and washer. The bolt should now be clamped tightly in a lathe or drilling machine.

The primary wire, 22 d.c.c. is then given one or two turns around the former and then the lathe kept in rotation at slow speed until 250 turns have been placed on the former. As soon as you cut the wire after the 250th turn is completed, tie a knot in the top layer end which you have just cut. Next knock out the former and bind the whole of the coil with empire tape, passing the tape inside and round the wire neatly. Wind four of these pies or coils. The secondary wire, 26 d.c.c. is wound on the same former in an identical manner, but you must now place 1,125 turns on each of the four pies or coils.



should be firmly and evenly taped to keep them together. Remove yoke B for placing the primary and secondary windings into position. After these coils are placed, the yoke B is rebuilt into position

A Word of Warning.

When connecting the pies together the end with the knot must be soldered to the plain end. You will find it is a golden rule to place a knot on the end turn of wire so that no mistake can be made. If you do this you can be assured that the current throughout the whole primary or secondary flows in the same direction. This pie system has a distinct advantage over the straight out coil and should a burn-out take place, a new pie can easily be replaced, without wasting the other wire, as is the case if the primary is wound in one large coil. The smaller coils which are used for the filaments

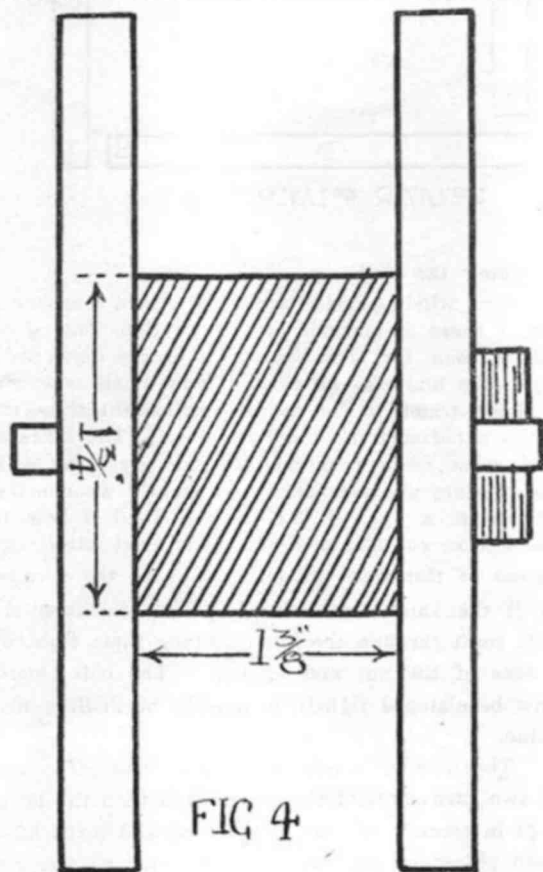


FIG 4

of the transmitting valves have to carry fairly large currents; nothing short of 18 d.c.c. should be used for these. The same former may again be used. This time only 40 turns is required with a tapping half way, viz., 20 turns. Two of these are required; one should be placed alongside the last primary pie and the other alongside the last H.T. secondary pie. It is a good plan to place a small sheet of prespan between each pie. A good transformer will last you a lifetime, so don't be in too much of a hurry to test it, but you will find it absolutely O.K. if you have followed these instruc-

tions. The writer has found much more interest in building transformers than in building the most intricate radio receiver.

After this series of articles on the transmitter are completed we intend to instruct our readers in the construction of valve rectifiers, together with the necessary transformer chokes, to convert the A.C. to D.C. for the plate supply of receiving valves. In England and America, these rectifiers are extensively used, so please don't think because you don't intend to transmit that this transformer will be of no use to you.

We are at all times pleased to hear from our readers, particularly those who are interested in the advanced articles which appear from time to time. If we go too deeply or not deeply enough, please tell us. Remember it is your paper and we appreciate your remarks. The aim of Wireless Weekly is to keep the Australian experimenter up to date with regard to the advancement of radio at a minimum expense to himself and at the same time to instruct the beginners who join the ranks of radio amateurs daily.

A NEW BRITISH TRADE PAPER.

Australian radio traders will find a wealth of invaluable information in the pages of "The Wireless Export Trader," a new and attractive trade journal produced in London.

"The Wireless Export Trader," published by The Trader Publishing Co., Ltd., 139-140 Fleet Street, London, E.C.4, is a monthly journal designed to keep overseas importers and dealers in touch with the development of radio industry in Great Britain, and also supplies of British goods for re-sale in all the world's markets.

The publishers, who have had experience in the production of trade journals extending over 30 years, are confident that this journal will meet a real need. The world demand is all for reliable productions of up-to-date design, and the British industry is doing more than any other to supply this, and is keeping well in the forefront of radio research and progress.

The world-wide subscription rate is 10/- per annum, post free.

WIRELESS IN EGYPT.

According to a recent report from Alexandria, British and European broadcasting stations are frequently heard, with the result that there is an increasing demand for wireless sets and apparatus. It is thought that a three-valve regenerative receiver, with at least one stage of amplification, will prove the most satisfactory. The issue of wireless experimental licences has lately been stopped by the Egyptian Government, but it is probable that this measure is only temporary.

A Low Loss Frame Aerial

By C. J. GRAY.

THIS particular type of aerial has been found to yield excellent results on low wavelengths. Amongst the experimenters "junk" will generally be found a frame aerial, and this can easily be converted into a low loss type if the following details are carefully noted:—

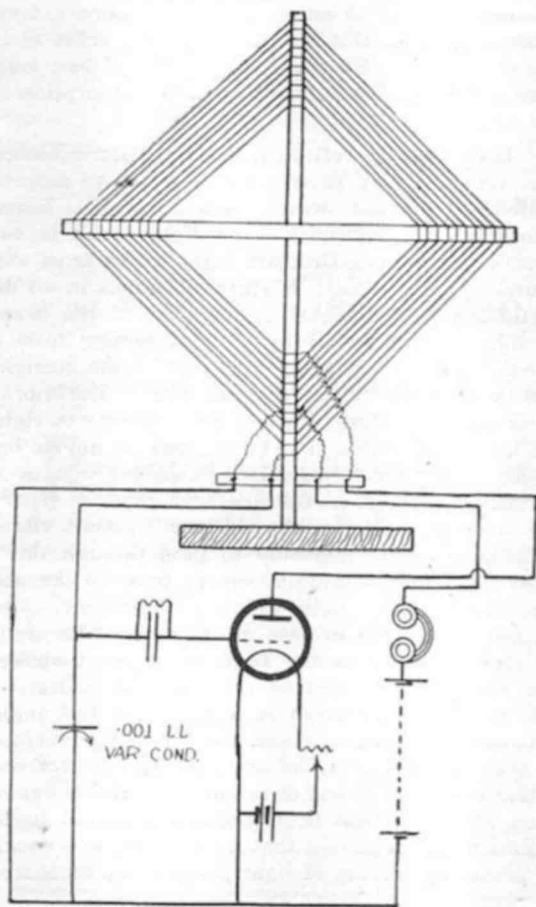
The materials required are:

$\frac{1}{2}$ lb. No. 16 gauge d.c.c. wire.

4 phone terminals.

1 piece of radion or bakelite, $5 \times 1 \times 3/16$.

Take the old wire off the frame and wind on 4 turns of No. 16 d.c.c. for the primary, and connect to the two phone terminals. For the reaction coil, wind on another 6 turns on the inside of the frame and connect to the other two terminals. The terminals are first mounted on the panel. The two on the left-hand side for primary and right-hand side for reaction. The following is a diagram of connections, which explains itself:—



NEW ZEALAND NOTES.

TRANSMITTING to America now on a single five-watt tube is getting to be quite a habit, and in a few short weeks will be considered a common occurrence. Last Friday evening Mr. Collier, of 2AP, worked American 3CHG with an input of less than 25 watts. The American station is almost on the Atlantic coast, so this means very good work for 2AP.

Mr. Dawson is also keeping his end up at 3AL. Since the first time he "got over" he has been heard on several occasions, and he has not increased his power, either.

Mr. Bell, operator of the famous 4AA, is now experimenting with a view to getting into communication with America and England by radio-phone. Both he and Mr. Slade at 4AG on a few occasions have heard speech clearly from a couple of English stations, so it is quite likely that Mr. Bell's voice will be as well known in Europe as his code signals.

Last Friday evening local 3AF heard British 2SZ calling American 6BUW. No sooner had he logged the former than his highly-prized detector tube (Phillips D1) blew up, along with the amplified tube. Evidently the strain imposed on it by the long-distance reception proved too much for the valves! I believe the remainder of the set was undamaged.

Mr. Jack Orbell, well known as 3AA and 1AX, returned to New Zealand recently. He was in Christchurch last week-end, and went up to the North Island on Monday evening. While he was in town I managed to examine the log of signals he heard on the set he took with him to England on the s.s. Port Curtis. It made very interesting rading. It was Mr. Orbell's original intention to allow the log to be published, but, as greater work has been done since, it may never appear in print.

GERMAN EXPORT TRADE IN WIRELESS APPARATUS.

Recent statistics show that the exports of wireless apparatus from Germany have grown considerably during the past three years. Monthly exports increased steadily from January to April, 1924, but decreased in May and June. In the January to June period of 1924 Germany's exports of wireless equipment to Great Britain amounted to 223 metric tons, Sweden received 86, Argentina 24, the Netherlands 23, Denmark 13, China 10, and the United States 9. The exports to all countries amounted to 520 metric tons, as against only 289 metric tons in the corresponding half of 1923.

THE BEAM SYSTEM

By E. JOSEPH

SO much has been heard of the Beam System of radio transmission during the last few months that it is pardonable to think that it, together with the short wave transmission which alone makes it possible, is a new development. Actually it is as old as our knowledge of wireless and the wavelengths we now designate as "short," viz., below 100 metres are really quite long when compared with the wavelengths used by early experimenters in their investigations of the properties of the then newly discovered electric waves. Maxwell first propounded the electromagnetic theory of light many years ago, and during the last 40 years there have been ample proofs of the accuracy of his theory. This means that there is no essential difference between electric waves and light waves except that of length.

Electric waves may have any wavelength from a minute fraction of a millimetre to many thousand metres. Certain lengths cause the waves to directly affect our senses. Thus, if the wavelength lies between .00043 and .00075 milli-metre (corresponding to frequencies of 700,000,000,000 and 400,000,000,000 per second) they affect our eyes and we know them as light. Waves .00043 give us the sensation of violet light while those of .00075 gives red. Waves rather longer up to perhaps a millimetre or two do not affect our eyes, so we do not call them light waves. They affect our skin and give us the sensation of heat. Waves shorter than .0004 are the cause of dyed materials fading. They promote chemical action, are used in photography, and cause "sunburn." Waves longer than 2 millimetres do not directly affect us in any way. From 2 m.m. upwards they are lumped together as electric waves.

Heinrich Hertz in the years prior to 1888, studied these waves. Starting with the assumption that they were identical with light waves, he reasoned that they should be amenable to the same treatment. It would be possible to reflect them, to refract or bend them by means of prisms and lenses and so on. Dr. Fleming repeated all Hertz's experiments with improved apparatus. Hertz used waves only a few centimetres long, and Dr. Fleming used waves 8 inches or about 20 cms. in length. Both the above scientists—and they were scientists in truest sense of the word, because they did not try experiments haphazard—applied mathemat-

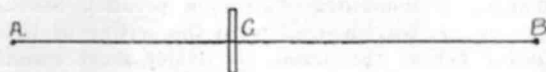
ical reasoning on the subject, made up their minds what should occur under a certain set of conditions and then tried the conditions and found just what they had expected.

I do not propose to delve into the history of the subject, but wish to make it clear that, electric waves being identical with light waves, if we consider the latter we may learn something about the former. There is no good reason to believe that if our atmosphere was removed the sun would appear blue. The thicker the layer of air—or the denser the atmosphere, the more red does the sun appear. Note its appearance at sunset, at sunrise, and in a fog. This is because the components of sunlight of shorter wavelengths—the blue light—is absorbed, the longer waves—red light—are not absorbed to anything like the same extent. Reasoning from this we should expect short electric waves to be absorbed more rapidly than long ones. This is the case although the absorption is not so marked.

Light may be reflected; so may electric waves. The reflector may be so constructed as to concentrate the returned waves into a parallel beam. There is one peculiarity about light which is not generally known. Ordinary light waves from any source of light consist of ether vibrations in all directions at right angles to the path of the beam of light. Consider a ray of light coming from a candle entering the eye. The path is the straight line joining the candle and the eye. The vibrations occur all along this line in directions at right angles to it, vertical, horizontal, and all angles between. It is not possible to indicate this in a diagram drawn on a flat piece of paper. There are some natural crystals which will permit vibrations in one direction only to pass through them. They cut off all vibrations except those in the one direction. When light falls on a reflector, it is turned back more or less on its track. The angle of incidence, that is the angle at which it strikes the reflector, is equal to the angle of reflection, i.e., the angle at which it leaves. If the angle between the light ray and the reflecting surface is a small one the reflector is able to reflect the vibrations lying in one direction to a greater extent than others. That is, it reflects polarised light. It is a remarkable fact that we have not any means of producing a beam of light polarised at its source

but can only polarise it afterwards, whilst we have no means of producing any other than a polarised beam of electric waves.

Imagine A Fig. 1 to be a source sending a ray of light to B. The vibrations are in all directions at right angles to the line AB. Up and down on

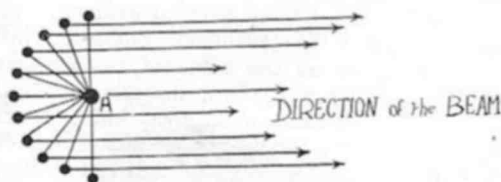


the paper and in and out through the paper. If a crystal of certain materials is placed at C, the space between C and B is robbed of all vibrations except those in one direction, say lying in the plane of the paper. Try to conceive a picture of this. A rope lying along the ground may have a wave transmitted along it from one end to the other. Every child plays at this. The wave is usually vertical. With a little practice it is possible to send a wave of vibrations in several directions along the rope. Imagine that somewhere along its length the rope passes between two sticks standing vertically. It will be impossible to cause any but vertical waves to pass the sticks.

Such a wave is called a polarised one. Polarised light affects the eyes in exactly the same way as unpolarised light. All our methods of generating electric waves in the ether are such as to generate a polarised wave. The waves passing in the ether are polarised vertically. A polarised light wave cannot be reflected in any other plane than that at right angles to the one in which it is polarised. A vertically polarised light wave therefore can only be reflected horizontally. This must also apply to an electric wave, but it is found possible to cause electric waves to pass round the curvature of the earth. This curvature is a "bump" 2000 miles high between Australia and England, yet waves pass over it and bend down. Why? It is generally considered that light moves in straight lines but this is not rigidly true. Light waves bend round the edges of opaque obstacles. That is why a shadow is not always sharply defined. Notice how the shadow of a pencil standing on end gets blurred as we recede from the lower end. Clearly some light must bend round to blur the edges by lighting them up. The amount of this bending or diffraction depends upon the wavelength. Waves of longer length may bend more than short ones. Electric waves being so very long, will clearly suffer an enormous amount of diffraction and it is due to this—amongst other causes—that wireless transmission is possible between continents far removed from each other. If short waves were diffracted as much as long ones, and if they suffered no greater absorption than long ones, it would be possible to signal over

great distances by means of searchlights. The reflector used for light waves consists of a highly polished body. That is, one which is as smooth as possible. However smooth it is, it must be fearfully rough and rugged compared with the tiny wavelength of the waves falling upon it. For the longer the waves—with which we are concerned, the reflector usually takes a somewhat different form. A frame carrying a number of vertical wires acts as a screen or as an opaque body to electric waves, if the wires are parallel to the plane of polarisation. A sheet of metal effectively screens a receiver from all radiation, because it may be considered as consisting of wires lying in all conceivable directions in its plane. A grid of vertical wires placed behind an aerial will effectively shield the aerial from all radiation coming from behind. Any radiation coming from the front, however, is not affected. A similar grid placed behind a transmitting aerial will prevent any waves travelling past it and will throw back or reflect a large proportion of the waves falling on it.

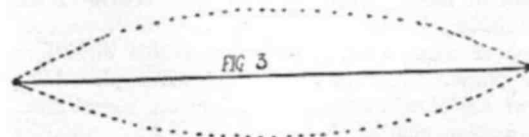
If therefore we arrange the wires so that they surround the aerial on three sides, then the latter will radiate waves only in the direction of the open or fourth side. The shape of a reflector for ordinary light appears to be part of a spherical surface. It is so very nearly, but not quite. It is of a peculiar shape known to the mathematician as parabolic. A parabola is a curved line of a special shape easily designed and drawn, and any section of an ordinary reflector should be a parabola if it is intended to reflect a parallel beam of light. If the light is polarised then it is useless to attempt to reflect it except in one plane, so that a reflector like a vertical section of a cylinder standing on end is sufficient. The grating of wires is therefore set behind the aerial so that the wires stand on a parabola and the waves falling on it all are reflected in the same direction—that is, back towards the aerial and beyond it. Fig. 2 is an attempt to indicate the arrangement.



It is a plan of a vertical aerial, A, and a parabolic grating of vertical wires behind it. Dotted lines indicate the radiation.

It will be evident that for use in such a reflector only a vertical aerial is possible. A horizontal part is useless. This is one reason for the use of very short waves—as radio waves go—in

beam transmission. For the waves must not, if efficiency is aimed at, be very much greater than the natural wavelength of the aerial. This is rather more than 4 times its length for an ordinary earthed aerial. Actually it is not 4 times, but twice the length. Every earthed aerial has an image of itself in the earth and it with its image vibrates naturally (or oscillates) at a fundamental wavelength which is twice its length. It is somewhat like a violin string which vibrates as a whole like Fig. 3 between its supports.



In "beam transmission" it is possible therefore to use an unearthened aerial. This again limits us to short waves. The reflector again must have dimensions depending upon the wavelength, and mechanical considerations in its construction again limit the wavelength. It is fairly easy to see why such a grating acts as a reflector. Every transmitting aerial is radiating two component waves, neither of which can exist without the other. These are the electro-static wave and the electro magnetic wave. The electro static wave is a vertical wave, and is the one usually depicted in diagrams showing waves departing from or arriving at an aerial. Travelling with the vertical electro-static waves are horizontal rings of magnetic force. Visualise a stone thrown into a pond. The undulations are the electro-static waves, the concentric rings are the magnetic lines of force. Whenever a line of magnetic force cuts a conductor, a difference of potential or pressure is induced, which causes a current to flow in the conductor. This current is always in such a direction that the lines of magnetic force due to it are opposite in direction to those causing it. The lines of magnetic force travelling from the aerial therefore, are obstructed by the vertical grid and their passage beyond it is prevented. Some of their energy is absorbed by the wires of the grid and utilised to generate a current, the magnetic field of which repels the remaining lines and they accordingly move towards their source. Owing to the dimensions of the grating and its distance from the aerial, they arrive near it in time to augment another "batch" of lines and accordingly the field travelling outwards in the only direction open to them is increased.

The beam consists therefore of radiated energy which is directed just as are the waves radiated from a "Marconi bent" aerial consisting of an inverted L with the horizontal tap very long as com-

pared with the height. The concentration of energy into one path is very much more marked with the short wave reflector than is the case with the long wave — aerial, so that notwithstanding the greater absorption of the short waves, a larger amount of energy may reach the receiver. If the radiation is concentrated into a parallel beam, which by the way depends upon the setting of the reflector behind the aerial, the latter must stand at a point called the focus of the parabola. If it stands closer in than the focus the beam is divergent and if further out the beam is convergent. If then we have a parallel beam, very careful adjustment of the direction of the beam must be made. Assume that the beam is exactly parallel. It clearly can only be a few yards wide. If 1000 miles separate the receiver from the transmitter, then an error in the direction in which the beam is thrown of only one degree will cause it to fall about 17 miles to one side of the receiver. Means for accurate adjustment of the direction must be provided. The whole reflector must be capable of rotation around the aerial. This limits its size and therefore the wavelength which may be used. Due to the fact that tuning has a far greater effect in enhancing the currents and voltages at high frequencies than at low, we are able to construct receivers which will give good signal strength with the minute amount of energy picked up by the small aerial used for these short wavelengths.

WIRELESS APPARATUS FOR THE BELGIAN CONGO.

Tenders were lately opened in Brussels by the Belgian Ministry of the Colonies for the supply of three wireless installations for the Belgian Congo. Offers were received from manufacturers in four countries, viz., Sweden, Germany, Belgium, and Great Britain (Radio Communication Co., Ltd., London), the lowest being that of the Societe Belge Radio-Electrique of Brussels, who quoted 493,700 francs.

It is interesting to learn that the lives of the men on lightships and remote lighthouses are being brightened by means of modern wireless. The Marconi Company, to the order of Trinity House, is gradually providing "sea guardians" with apparatus, and as there are no regulations to prevent lightshipmen from "tuning in" the broadcast programmes, instead of hearing no voice but their own for weeks at a stretch, they will soon have all the variety and amusement of the broadcast studio.

In addition, the Northern Lights, the authority which controls lightships off the Scottish coasts, has supplied special apparatus to some of these vessels to enable them to listen to Aberdeen and Glasgow.

Will this interest the Director of Navigation?

BRINY REMINISCENCES

By "BRASSO."

"Yo! ho! ho! and a bottle of rum—um—um!" Thus quoth "Rat" as he settled into his seat at the head of the table, grabbed the menu and prepared for a little teeth exercise. "Why the devil don't you bring the toast in before the meal begins?" he asked courteously of the saloon steward and in the same breath, to me, "Well, what the heck are you grinning at?" These two queries were a time-worn formula; he always asked the saloon waiter the same question; his manner of asking always amused me, and I always grinned. To his query I invariably returned a blank uncomprehending stare, whereat he would stare back in equally inane fashion, make a face at me and then embark upon one of those priceless stories which made the meals at the saloon table very popular with us on the "Barunga"

Captain R. A. T. Wilson (need I explain from whence that name "Rat" was derived?) was the ideal skipper; stern and unbending when the occasion demanded; a holy terror to Liverpool—Irish firemen who developed Bolshevik tendencies on the high seas, yet with a heart as big as the world and with a sympathy and consideration not usually associated—in fact, rarely encountered—with the commander of a big ship. To him his officers, deck, engine and wireless were at once his pride and his trouble. He demanded the utmost efficiency of everyone but on the other hand he was quick to realise impossibilities and to tactfully refer in the presence of the other officers to some particularly good stunt pulled off in the engine room, the chart room, or the wireless cabin. At the table he was like a big boy, larking and joking and spinning his yarns to the accompaniment of a running fire of chaff from the rest of us; yet never once overstepping the bounds of good breeding. Little wonder therefore, that we set him upon a pedestal and loved him for the man he was. I never hope to see a more gallant figure than my last memory of "Rat", standing calmly on the bridge of his ship while she slowly went down under him. No picture that Marriott or Captain Shaw ever painted would have done him justice. I used to mentally compare him with Hawkins and Drake and all those other figures in sea history.

The rest of the crowd on the "Barunga" need little introduction; there wasn't a nark amongst them. The chief officer was a genial Scotchman,

named, quite naturally, "Mac." The second, who was a great believer in the Darwinian theory, and certainly looked it, was one upon whom the solemnity of Pharaoh had been conferred at birth, a priceless attribute which he guarded jealously. In the logical sequence of events, he was christened "Gloomy." The third, with a weakness for pink striped pjamas, answered to "Pem," while the purser, at one time feather weight champion of N.S. W., sacrificed his dignity to the nick name "Erb." All chief engineers are referred to as "Chief." For no sane reason and certainly not by virtue of the color of my thatch, they called me "Bluey," and this title, despite my strenuous efforts to have it changed, stuck like a dog to a meat waggon. The junior op., John Darley, perhaps on account of a somewhat aristocratic bearing and a natural aptitude to be courteous to everybody, was somewhat overburdened with the material things of this world and had a skin that used to make me quite dubious about introducing him to my lady friends. When he wasn't monkeying with the brasswork of the beautiful 2½ k.w. Telefunken set (the "Barunga" was an ex-enemy vessel), or devising weird and wonderful one valve circuits, he used to sprawl in his Bombay singlet and white drill trousers on my bunk, long legs poking out the end and dangling perilously over the wash basin. And I used to pitch him some pretty tall ones, all of which he swallowed well, with all the deference due from an insignificant junior op. to a much travelled and briny toothed senior. Probably John had me mentally classed as a blood brother of old Ananias, but the only time he ever forgot he was a gentleman was when Oscar spilt the butter in his white shoes about twenty minutes before John stepped into them. Oscar was a young and callow steward who used to "do" the wireless operators, and was the source of much amusement to me, until he left in London—with him went also a nice water color of that painting, "Off Valparaiso," belonging to me, a few blankets and some loose watches and spare coin. Still, in his respectable moments he looked after us nobly and was on time with everything. To Oscar was given the lowly task of trotting up the supper for "Pem" on the bridge, and myself in the room fur drathlose telegraphie. "Pem" was rather partial to salads, so nightly at ten Oscar

(Continued on page 22)

INTERSTATE NOTES

VICTORIA.

"So this is Grading!"

THE statement made to Wireless Weekly by the Victorian Council primarily illustrates what a force this paper is in wireless affairs. Although nearly four months have elapsed since grading became law, no such complete statement has hitherto appeared, not even in the local organ of the Victorian Division. However, it is well recognised that "Wherever there is wireless, there is Wireless weekly!" so the Council adopted a wise course. As for grading itself, the statement frankly admits that there have been misconceptions, but nothing so far has been done to remedy the effects. It is certain that the Institute has lost members it can ill spare, and has done nothing to recover them. To fling together in one class such a heterogeneous collection as small boys, beginners, broadcast devotees, and experimenters others than transmitters is an error of judgment that will take a lot of rectifying on the part of the Council. It has been obvious for a long time that unless a member of the Institute is a transmitter he is not thought much of, in spite of placatory remarks to the contrary. Now that Associates are defined as those that have a knowledge equivalent to that required for an experimental operator's certificate, the Council has shown its hand. Associates in a word, must be amateur transmitters only. Some sections are already trying to cloud this over by nominating all original members for associateship, but this is clearly unconstitutional. Unless you are qualified to hold an experimental license you are a student. Of course, this definition is merely mental laziness on the part of the Council. There was a desire to shirk an original definition and to keep in line with the Departmental requirements, but this could have been done by other means that would have broadened and made plain the amateur and experimental bias of the Institute. Some of the hash foundries heard nightly on the ether necessarily hold experimental licenses, and are thereby at present entitled to be Associates of the Institute, yet judging by the foolish questions and answers they make public, their knowledge is as wobbly as their wavelengths. On the other hand, there is a great body of wireless enthusiasts who are only interested in perfecting reception and leave transmission to those who can better afford it. Why these should be dumped among the mere

students is a question that will take a lot of answering. With regard to the fellows, the same lack of vision is evident. The wording of the definition is "one who is eligible to be an Associate and has made some experiments in wireless telegraphy." This, of course, cuts out anyone who is so modern that telephony is all he cares for, and it illustrates yet another tendency on the part of the Council to lay too much stress on the Morse Code as evidence of wireless experience. This, of course, is merely following the Departmental lead, since of necessity an official operator is more concerned with telegraphy, but that is not necessarily the chief concern of an amateur.

"Associate Member" is another example of verbal infelicity. It is extremely confusing to call those who know a lot, by the name of "Associate," and those who know perhaps less than a student by the name of "Associate Member." The more correct name would be "Patron" or "Honorary Member."

Discordant Harmonics.

In tones of deepest feeling, Mr. Masters, the forceful secretary of the W.I.A.V.D., referred at the All Clubs' Meeting recently to the trouble arising from the multitudinous wavelengths employed by certain local stations, one of them professional, other amateur, and one that he characterised as "neither." The President pointed out that to approach the P.M.G. would be futile until a strong protest could be made from the next Federal Conference to be held in Perth next year. Meanwhile there is reason to suppose that such matters will be taken in hand by the Department, owing to the pressure of unorganised public opinion, and the Institute will protest well after the nuisance is abated. Even if protests are futile they should be made at the time when need for them first arises, and the public can then judge for itself whether the P.M.G. actually does turn a deaf ear to the Institute, though listening intently to those outside and will want to know exactly why.

Country Amateurs.

Scattered all over this vast continent, or, to be less expansive, dotted about at intervals of from forty miles to four hundred from the central cities of the States the outposts of wireless are not at present well looked after in Australia. To them wireless must be a much more expensive and less remunerative hobby than it is to those amateurs

month in all amateur transmissions. Who knows but they might happen to be heard in Czecho Slovakia or somewhere equally as far, and lead to further business! In pronouncing Esperanto every vowel is sounded, there are no silent letters, and "j" is pronounced like the English "y." Thus the enquiry, "keil setas miaj signaloj?" which means "How are my signals?" is pronounced keell estahs, me-i signahay, the 'a' in Esperanto al-

ways having the broad sound of ah, as in glass, and 'j' being the plural termination sounded as 'y.' Through the great interest shown by Mr. Rawson the following useful list of many of the most usual expressions heard during amateur transmissions has been compiled exclusively for Wireless Weekly, and amateurs are urged to cut it out and paste it up in a conspicuous place over their sets:

WIRELESS PHRASES IN ESPERANTO.

Code	English	Esperanto.
CQ	Hullo	Hullo! or he!
QRA	What station are you?	Kiu stacio estas la via?
QRH	What is your wavelength?	Kiam estas via ondolongeco?
QRK	How are my sigs.?	Kiel estas miaj signaloj?
QRM	Interference is strong.	Interfero estas forta.
QRN	Atmospherics are strong.	Atmospherajoj estas fortaj.
QRS	Transmit more slowly.	Sendu pli malrapide.
QSA	Your sigs. are strong.	Viaj signaloj estas fortaj.
	How is my modulation?	Kiel estas mia modulo.
	This is Experimental Station 2WW	Tio ci estas eksperimenta stacio du W.W.
	Half a moment, please!	Post duonmomento, mi petas.
	This is test number —	Tio ci estas provo numero.
	One, two, three, four, five, six, seven, eight, nine, ten.	Unu, du, tri, kvar, kvin, ses, sep, ok, naŭ, dek.
	I will now put on another record.	Mi surmetos, alian diskon.
	I will be pleased to receive a report from any local or Interstate listeners-in.	Placoz al mi ricevi raporton, de ui toka au Interstate enauskultantoj.
	My telephone number is	Mia telefona numero estas
	I thank you Mr..... for your report.	Nu dankas vin Sinjora for via report.
	Closing down for a few minutes.	Fermigas dum kelkaj minutoj.
	Now closing down.	Nun fermigas.
	Closing down and changing over.	Fermigas kaj komutacas.
	Good Night!	Bonan nokton!

BRINY REMINISCENCES.

(Continued from page 19)

bore a plateful of sandwiches, two mugs of coffee, and a big bowl of salad, which latter course "Pem" munched during his prowlings up and down the bridge, quite scornful of my tender enquiries concerning how cockroaches went with tomatoes. Up there in the dark you couldn't see what you were eating, and I always preferred a little light on the subject. Oscar, for some reason or other, wore heavy, hobnailed boots, and I could easily follow his progress up the ladders, from below.

The bridge was on top of the wireless cabin and I well remember one night when Oscar, having deposited my share of the banquet, departed for the bridge bearing "Pem's" sandwiches and coffee in one hand and a bowl of salad in the other. His heavy boots clumped up three or four steps—there was a slip, a horrid pause, and then a dull, sick-

ening thud. When I reached the deck, Oscar was sitting in the salad, but still triumphantly bearing aloft the mug of coffee, a feat that any vaudeville artist might well be proud of.

During that long trip across from Wellington to Panama, our little old one valve receiver and the bar magnet behaved splendidly, and used as we had been to the humble crystal, we put up some wonderful records. We held Melbourne and Adelaide time signals up to 4500 miles at night and as at that time Awanui was pumping out war news on 2000 metres, we copied him almost all the way across to Balboa. The night after leaving Wellington we picked up a 600 metre spark station sending a war warning—static invariably drowned his call every night regularly, but his signals were always there at the exact hour G.M.T. As we neared Panama he became louder, but it was not until we cleared Colon that we identified him as the Naval Station BZQ, situated at Christiana, Jamaica.

After losing Wellington radio, our next point of contact was F.O.P., the French station at Paapeete, whose rooster-like chirp came in at definite times with "no warning issued." V.P.D. Suva radio thumped in well, and the booming note of K.H.K., Honolulu we heard frequently right across the Pacific. Tenderly we nursed the audion, wrapping it around with cotton wool to avoid any chance of jarring it. Twice daily, in accordance with the Admiralty instructions, we earthed the aerial, started up the big generator and thumped out a few dots and dashes just to see that everything was jake. About that time, it was rumoured that a raider was prowling around the Pacific, so that at night the ship was shrouded in funereal gloom.

Situated about 130 degrees west and 25 south is the famous Picairn Island, the history of which, and its old association with the mutineers of the "Bounty" are familiar to every school kid, and here we made our first call. Unfortunately, the Island was enveloped in mist and a decent view was unavailable. As we stood well off the beach, the

islanders toddled out in their small boats, clambered aboard, and barter commenced. Beads, necklaces and a host of useless ornaments changed hands for cash and for old clothes; books and papers were bestowed upon our guests, and with a final toot of the siren, the ship proceeded on her journey, leaving these lonely Pitcairn folk to solitude until the coming of the next steamer, perhaps months later.

We had one passenger aboard that trip—Frank Anstey, recently leader of the Opposition Party or whatever they call the bunch who are agin the Government in the Federal House. I've seen some pretty tough things written about Frank Anstey, but I always remember him as one of the most lovable and strong personalities I ever met.

On that trip he was fighting against a nervous collapse and slept very badly, so I fell into the habit of dropping down to his cabin when I went off watch at midnight and there I sat yarning to him until perhaps two or three in the morning. He was a most emotional speaker and when he embarked upon the cause which no one can doubt he has genuinely at heart, I have seen the tears streaming down his face and his hands clenched as though the plight of the unfortunates whose uplift has been his life's work, was affording him physical anguish. At once a lonely and dignified figure, he constitutes one of the most remarkable personalities one could meet. His only schooling was that of the hard one of life, and the story of his career, commencing from the days of his childhood spent in the slums of London, thence to the foc'stle of a sailing ship, rising steadily up from the slough of his environment to a big position among men, will, if ever it is written, provide most fascinating reading. No one can fail to admire and to appreciate the success of a man whose whole life has been a hard fight against adversity, the drawbacks of an unhappy childhood and a total lack of education.

In the company of Frank Anstey I dined at Jenaros in Soho, with Kerensky, the deposed leader of the Provisional Government in pre Bolshevik Russia—and some months later, fate and a German torpedo found Frank and I together again, but this time I was his fellow passenger on a vessel returning to Australia round the Cape. At Jenaros, the small Bohemian cafe, a stone's throw from Shaftesbury Avenue, Kerensky was a familiar visitor for some time, but very few people were aware of his identity. A tragic figure and one not easily forgotten, except perhaps by his own countrymen.



Oldest Inhabitant of Pitcairn.

(To be Continued)

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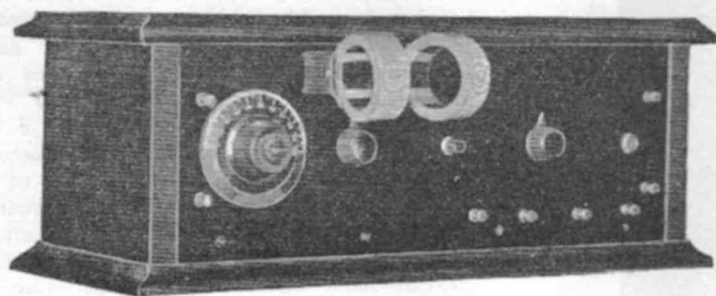


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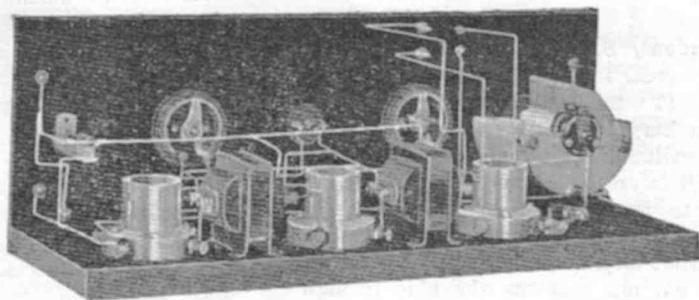


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WITH OUR READERS

(To the Editor)

Dear Sir,—When listening in on Sunday, 29th February, between 3.15 and 4 o'clock, I heard a distant station, but unfortunately missed his call sign through static and other interference caused by the local commercial station VIA, which is on spark. What I heard was this: "Pianoforte solo" on a pianola, a lady singer, "Hullo, hullo, hullo," call sign blurred, piano or bell solo, hullo, hullo, hullo, call blurred. "Don't waste your money on them or save your money." It was something referring to money. I would be exceedingly pleased if any of your N.S.W. or Victorian or even N.Z. transmitters who were on the job would let me know if it was them on the job on Sunday, February 29th.—Yours, etc.,

D. G. ANDERSON.

c/o J. H. Elton,
Price Weir Avenue,
Allerby Gardens, S.A.

— — — — —
** (To the Editor)

Sir,—2JR in his new role as abuse merchant is sure some howling success. Were it not for the fact that 2JR is an experimental station in the same category as those he slings off at, things would be looking bad. Our high and mighty friend does not know what an experimenter is. He has an idea that he is not one and has the hide to sign his letter with an experimental call sign. Possibly it is news to him, but all decent concerns like Westinghouse, American General Electric, Edison & Swan, Marconi's and hosts of others carry an experimental staff and as for the experimenter picking crumbs from the professional's table, believe me, there are no crumbs. 2JR, you can take it from me that the professional gets his bread and butter by exploiting the results of experimenters' experiments. Now regarding what he says of "poor old 2CM." That may be 2JR's feelings in the matter, but I have yet to meet the experimenter who begrudges 2CM the results he has achieved. These results were arrived at before 2CM entered the game commercially, and prove again that 2JR is howling up the wrong tree.

Yours, etc.,

PERCY L. SEWELL.

362 Victoria Street, Darlinghurst.

(To the Editor)

Sir, — "Who owns the ether?" Your editorial and 2CX's letter on this subject in the current issue opens up a problem which has agitated the world as we know it from time immemorial, and will so continue to do so until the millennium. The subject includes the question, "Who owns the sea, and the earth?" Henry George in his work, "Progress and Poverty," lays down as an incontrovertible axiom that the sea, the air and the land constitute the undeniable birthright of every unit of creation born on the planet, and that no person or persons have a moral right to ownership of any person of the elements. Accepting this axiom as a truth, then the answer to your question is quite a simple one, viz., "The people own the ether." That being so any persons or persons who attempt to control the air for personal gain or pleasure are a menace to the Community and should be rigorously attacked.

With regard to the land it is of course obvious that any attempt to wrest it from the octopus of private ownership would be futile until such time as human nature changes and the eternal doctrine of the brotherhood of man is recognised. The sea and the air, however, because of the difficulty of apportionment and subdivision are still the property of the people, and if wisely governed will never be filched from them as was the land. Now in regard to the ownership of that imponderable element called "the ether," the existence of which is problematical, the people are face to face with the biggest of all problems and its skeleton will continue to clank its dry bones until such time as men with wisdom are placed in the high positions of governmental control. The present state of chaos in wireless control is due solely to the lack of wisdom and the failure to grasp and benefit by the mismanagement in other countries. The amateur experimental position pregnant with bitterness, jealousy, sarcasm, and ignorance, could easily have been avoided had the authorities realised the potential magnitude of wireless enterprise and the amateurs themselves wrongly advised as to their true position in the economy of things are not to blame for their part in the existing chaos. The question of who made broadcasting possible, or who has done any scientific work may be of some historic value to descendants, but is of no consequence to those people who are quietly working in the great interests of human progress and happiness and who naturally

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NEW SOUTH WALES.

HERE is the list right up to date:—

- 2 AJ.—W. Short, Campbell St., Kirribilli.
 2 AL.—A. E. Cooper, "Edale," Cecil St., Ashfield.
 2 AP.—A. W. Peek, "Bayview," Yowie Bay.
 2 AR.—W. H. Hudson, 1 Terrace Rd., Dulwich Hill.
 2 AT.—F. C. R. Swinburne, 39 Parkview Rd., Manly.
 2 AV.—A. W. Thurston, Argyle Rd., Penshurst.
 2 AY.—J. P. Cureton, "Maruna," Burwood St., Burwood.
 2 BB.—E. B. Crocker, 14 Roseby St., Marrickville.
 2 BC.—N. J. Hurl, "Stratheona," Northcote Ave., Killara.
 2 BF.—L. E. Forsythe, "Hoylake," Sailor's Bay Rd., Northbridge.
 2 BH.—Broken Hill Technical College (F. J. Branagan).
 2 BK.—F. N. Leverrier, "Lorette," Wentworth Rd., Vaucluse.
 2 BN.—F. W. Kimpton, Brunswick St., Ballina.
 2 BV.—Waverley Amateur Radio Club, 82 McPherson St., Waverley.
 2 BY.—E. C. Arnold, Carthage St., Tamworth.
 2 CJ.—P. J. H. Sewell, 362 Victoria St., Darlinghurst.
 2 CL.—G. Caletti, 252 Nelson St., Annandale.
 2 CM.—C. D. MacLurean, Agnes St., Strathfield.
 2 CS.—L. T. Swain, 135 Beaumont St., Hamilton, N.S.W.
 2 CU.—D. D. Campbell, Ulmarra.
 2 CW.—J. Beer, 21 Bland St., Ashfield.
 2 CX.—H. A. Stowe, "Rawene," Royal St., Chatswood.
 2 DE.—W. P. Renshaw, "Waimea," Lord St., Roseville.
 2 DH.—E. R. Mawson, "Daisydale," Wonga St., Campsie.
 2 DJ.—F. B. Cook, Namoi Rd., Northbridge.
 2 DK.—R. P. Whitburn, 7 Hathers St., Leichhardt.
 2 DN.—G. E. Blanchard, 60 Bligh St., Newtown.
 2 EG.—E. C. Crouch, 26 Spencer Rd., Mosman.
 2 EH.—E. H. Miller, "Broadway," Ness Ave., Dulwich Hill.
 2 EM.—E. J. T. Moore, 6 Lower Wycombe Rd., Neutral Bay.
 2 FP.—E. J. Baker, 62 Estelle St., Maryville.
 2 FS.—A. C. Smith, 38 Cheltenham Rd., Croydon.
 2 GM.—G. M. Cutts, 25 Malvern Ave., Croydon.
 2 GP.—C. S. Mackay, Urunga.
 2 GR.—J. S. Marks, Ritz Flats, Salisbury Rd., Rose Bay.
 2 GU.—R. Dunn, 324 Anzac Par., Sth. Kensington.
 2 HF.—F. Thompson, 119 Curtis Rd., Balmain.
 2 HH.—Wireless Institute of Australia, Royal Society House, 5 Elizabeth St., Sydney.
 2 HS.—Messrs. Hooker and Sturman, 42 Jersey Rd., Woollahra.
 2 HT.—H. K. R. Thomas, "Radiowa," 149 Wycombe Rd., Neutral Bay.
 2 JM.—R. C. Marsden, Victoria Rd., Bellevue Hill.
 2 JR.—J. G. Reed, 29 Kensington Rd., Summer Hill.
 2 LM.—L. M. Wilson, Corran, via Marsden.
 2 LP.—L. P. R. Dean, 86 Mustan St., Mosman.
 2 LR.—Lismore and District Radio Club (R. H. Atkinson), Keen St., Lismore.
 2 LY.—R. H. Shaw, 129 Grafton St., Woollahra.
 2 MR.—J. E. Stewart, Gorriek St., Mayfield, Newcastle.
 2 OB.—L. W. Mashman, "Gresley," 8 Donnan St., Bexley.
 2 OI.—A. T. Whitaker, 31 Railway Cres., Banksia.
 2 QY.—E. A. Williams, Crown St., Wollongong.
 2 RA.—K. J. Vickery, Kolbridge St., Hurlstone Park.
 2 RG.—E. C. Reading, Charelotte St., Bangalow.
 2 RT.—R. J. Turner, 250 Sloane St., Goulburn.
 2 SS.—A. E. Wright, Main Rd., Scarborough.
 2 SX.—C. W. Slade, "Rockleigh," Lang St., Croydon.
 2 TS.—A. W. Gill, "Illaroo," Greengate Rd., Killara.
 2 UI.—Illawarra Radio Club (C. A. Gorman), 75 Montgomerie St., Kogarah.
 2 UR.—A. A. Creamer, 10 Hereford St., Glebe Point.
 2 UU.—R. G. C. Roberts, 9 Church St., Ashfield.
 2 UW.—O. Sandel, Mooramie Ave., Kensington.
 2 VX.—D. G. McIntyre, Livingstone Ave., Pymble.
 2 WE.—Western Electric Co., 200 Castlereagh St., Sydney.
 2 WN.—F. J. Lett, 176 Johnstone St., Annandale.
 2 WS.—W. S. Breden, Kitchener Par., Newcastle.
 2 WU.—W. H. Morey, Rangers Ave., Watersleigh.
 2 WW.—"Wireless Weekly" (A. W. Watt), 15 Cairo St., Suspension Bridge.
 2 XA.—H. K. James, 12 Rosemount Ave., Summer Hill.
 2 XL.—A. Craig, 22 Irrara St., Croydon.
 2 XX.—O. F. Mingay, Kuringai Chase Rd., Turramurra.
 2 YB.—Croydon Radio Club (G. M. Cutts), Lang St., Croydon.
 2 YF.—F. P. R. Clarke, "Winona," Laudervale Ave., Manly.
 2 YG.—R. C. Allsop, 14 Byron St., Coogee.
 2 YH.—W. H. Hannan, 23 Prince Alfred St., Mosman.

- 2 YI.—P. Spencer Nolan, "Monesk," 152 Bellevue Rd., Double Bay.
 2 YJ.—R. H. Sainsbury, "Kermanshah," 6 Wallaroy St., Concord West.
 2 YP.—M. W. Bergin, "Keera," West Maitland.
 2 ZB.—Balmain District Radio Club, 18 Clifton St., East Balmain.
 2 ZC.—F. M. E. Lavington, 48 Fletcher St., Bondi.
 2 ZD.—S. F. Brain, 85 Bland St., Ashfield.
 2 ZJ.—A. W. Simpson, Duri.
 2 ZK.—S. Marsh, Carrington St., West Wallsend.
 2 ZL.—W. Otty, Hirst Villa, Killingworth.
 2 ZN.—J. W. M. Cottrell, 23 Dolphin St., Randwick.
 2 ZO.—T. R. Willmott, Coramba Rd., Sth. Grafton.
 2 ZR.—W. J. S. Perdriau, 47 East Esplanade, Manly.
 2 ZU.—N. S. Gilmour, 156 Kurraba Rd., Neutral Bay.
 2 ZW.—D. R. Huggins, 13 Yeo St., Neutral Bay.

NOTES ON AMERICAN CONDITIONS.

DUE to systematic campaigning, the old bug bear that radio will always go dead in summer has been effectively killed in America, states Mr. W. J. O'Brien, of the Pacific Electric Company Ltd. (Sydney), in a letter to us from New York by the last American mail. Mr. O'Brien is on an extended business trip covering the whole of the United States, and is closely observing the progress of the radio industry over there.

That there is no slackening of business is shown by the fact that one New York jobber sold in the month of December, a quarter of a million dollars' worth of Freed-Eisemann neotrodyne sets which are very popular with broadcast listeners. The wonderfully high standard of broadcasting maintained is the surest guarantee that the industry will continue to expand. Grand opera singers are broadcast every week and on New Year's night, John McCormick sang to an unseen audience of millions, with the result that his newest record, "All Alone," has sold about twice as well as was expected. The music trades have completely got over their antagonism towards radio; they very wisely saw that it was impossible to fight it, so most dealers are carrying phonographs and radio set also, and the ideal set now is one combining radio and phonograph in one cabinet. A new selling field has been opened up by the fact that some of these machines are now equipped so that items received by radio may be recorded and played on the phonograph at leisure.

Unfortunately there are a great deal of cut throat methods used in the trade in New York, but conditions are very much better in the West where the jobbers co-operate very nicely and con-

sequently the public gets a fairer deal.

In his journey by car from Seattle to Washington, Mr. O'Brien met with an accident which put him in hospital at Tacoma for ten days, with a broken collarbone. However, he recovered quickly and was in time for the Radio Show at Chicago.

ROYALTY LISTENS IN.

Broadcasting, a common denominator of pleasure, interest, and education to both king and peasant, can now include yet another Royal home among its devotees.

Their Majesties the King and Queen of Italy have installed receiving apparatus in their private residence, the Villa Ada, on the outskirts of Rome, while at the Quirinal, their official palace in Rome, the auto-broadcast system is in course of installation. This system, the most up to date of all receiving apparatus, affords control in each room by means of a switch. The apparatus is placed in a convenient and secluded part of the house, and wired to each of the rooms to loud speakers. These are operated by a switch on exactly the same principle as electric lighting, the switch in this case controlling the valves.

The honour of this command has fallen to a British firm, Burndep Limited, of Aldine House, Bedford Street, Strand, W.C., and the apparatus installed in the Villa Ada is their standard model, the ethophone V, mark IV, with their loud speaker, the ethovox.

The auto-broadcast which is being installed in the Quirinal is also a Burndep system.

A further ethophone V has been ordered for the special use of the Prince of Piedmont.

Sir Henry Thornton, who at one time was the general manager of the Great Eastern Railway, has now become president of the Canadian National Railways. He has launched a scheme whereby various broadcasting stations along the company's routes, which cover 22,000 miles, shall be erected. In addition to this, the scheme includes the purchase at cost price of radio receiving sets, for the use of 100,000 employees.

The idea of this most generous gift is mainly to keep the spirit of good-will between the heads of the company and the workers.

All the trains running on the transcontinental route of the Canadian National Railways are now equipped with receiving sets.

(Continued from page 26)

become exasperated at the hideous gramophone cataclysm which has saturated the ether on every wavelength and the inane conversations in relation to the efficacy of this and that new dodge being tried. There is really no necessity for dodge after dodge to be tried out and such devices will never lead to advancement of wireless science which after all is the simplest of all the electrical activities. The inductance and capacity of all circuits can be mathematically calculated to a thousandth part of a microhenry or microfarad. The wavelength is under exact control and given the working conditions required in any positions a few minutes' close calculation will unerringly give the exact length and circumference of coil or coils and the exact number of turns and gauge of wire to produce the required effect. It will thus be seen how annoying it must be to the educated experimenter hearing every moment of the night the deplorable ignorance of the so-called experimenters broadcasted throughout the universe, and all genuine experimentation throttled at every point. I have carefully read the many articles emanating from the Wireless Institute and deplore that even from that source incorrect and misleading ideas are broadcasted. The wireless authorities know of hundreds of experimenters within the service who have done more to advance the science than the whole of the outside world combined, and amateurs may at once disabuse themselves of the idea that they are public utilities and will be called upon to help the nation in emergency. Such is not the case. Amateur experimenters are tolerated as harmless people who may be humored in these peaceful days, but if ever war loomed up on the horizon would find themselves ordinary citizens compelled to take their place in the ranks, whilst their expensive gear would be called in and all their weird and wondrous aerial contraptions dismantled. Amateurs seem to forget that the whole of Australasia is wirelessly pegged out and that the Government is and has been for years, thoroughly equipped to take immediate wireless action without the aid of amateurs or their installations. As a matter of fact the use of amateurs would be fatal to defence policy.—Yours, etc.,

S. A. MACROW.

55a Brown Street,
Paddington.

6/3/25.

(To the Editor)

Sir,—As was expected my letter of 27/2/25 brought upon my head that torrent of personal abuse and insinuation typical of the mental calibre of the majority associated with amateur radio.

Your editorial was particularly offensive, in fact it was an example of yellow journalism of the deepest dye to so prostitute the privileges afforded your position. You must be excused, however, as gentlemen do not engage in personalities.

In the letter from 2CX the same old amateur platitudes are chewed over. To the superficial reader it would appear that the amateur is the salt of the earth; a kind of scientific watch dog to see that the professionals—technically speaking—do not get away with any "body in the bag" business. Possibly like the little pup scratching in the sand near the scene of a murder an occasional corpse or two is dug up and shamefully passed off as the original work of the excavator. As an example, take the rehash and plagiarism of coil windings and circuits appearing in every journal by and for amateurs.

As for the "wonderful" achievements of the amateur in long distance working, their "contribution" in this direction is more of a hindrance than a help to the science of radio engineering. Actually they succeed in exchanging a few signals and a QRA, and with much blowing of trumpets and newspaper publicity proceed to live on the reputation of their five minutes' achievement for the remainder of the year.

Judging by 2CX it would appear that I am hopelessly opposed to the appearance of a microphone on the short wave, when as a matter of fact I have given every possible assistance in this direction to several of the GENUINE Sydney experimenters.

It is the individuals who engage in frivolous drivel per medium of the ether who jeopardise the hard-earned status of the experimenter. I am sure that had the Radio Inspector tuned in on about 150 metres to a certain triangular conversation a few weeks ago, between individuals by no means obscure members of a small club, three black marks would have been entered in Mr. Malone's Doomsday Book.

Judging by the hash—both technical and oral—which escapes from aerials around about 150

(Continued on page 34)

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Information

Conducted every week. Except in the case of subscribers a fee of 1/- is charged for not more than four questions. Questions will be answered by mail in the order of priority, and when considered of sufficient general interest, will be published under this heading.

A.G.P. (Ipswich, Queensland):

Question: (1) I intend to build a two valve low loss set. Please furnish me with a diagram and also a complete list of parts required. (2) Would it be possible for such a set to tune in all the Australian stations by inserting low loss coils of different values? (3) Will the dull emitter type of valve function O.K. in this set? (4) Is it possible to obtain low loss coils of different values which will plug in like the ordinary honeycomb coil?

Answer: (1) The three coil regenerative set which has been described several times in Wireless Weekly during the last few weeks, will function O.K. (2) This circuit would tune to any reasonable wavelength by inserting different sized coils. (3) Dull emitters are quite O.K. (4) To the best of our knowledge you could not obtain a full range of such coils, but you might write to one of our advertisers on the matter.

R.P.O. (Temora):

Question: I have a single valve three coil receiver which I want to convert into a Flewelling receiver similar to that described in your issue of January 2nd, but as stated in that issue, the P1 2-coil circuit was used. Would it therefore be necessary for me to change my set into a two-coil directly coupled to aerial, or would my present arrangement suffice? (Circuit submitted is the ordinary 3 coil regenerative circuit with untuned primary.)

Answer: You will need to convert your aperiodic aerial tuning to the ordinary P1 circuit. We don't think you could satisfactorily handle this hook-up unless the grid coil is directly connected to the aerial coil which, owing to the resistance of the aerial reduces regeneration somewhat. However, it would be an interesting experiment to try using the three-coil circuit that you now have.

W.J.P.M. (Murray Bridge, S.A.):

Question: Asks for a list of coils required in a 4-valve tuned anode receiver to get down to 65 metres, also for 2BL and other stations.

Answer: With regard to getting down to 65 metres with an ordinary receiver not employing low loss coils, see article published February 27th. For the other stations you will require the following coils:—

Station.	Primary.	Secondary.	Tickler.	Tuned Plate.
2BL	25	50	75	50
2FC	100	150	200	150
3LO	150	200 or 250	250	200 or 250

SMALL POWER FOR LONG DISTANCES.

The following extract from a letter from Leo C. Cusack, Port Moresby, Papua, to the Wireless Institute, dated February 15, 1925, will be found interesting:—

I feel rather surprised at the local amateurs' impression of short wave work. With my short experience of tropical conditions and short wave working I feel quite convinced that with efficient transmitters and receivers, a five-watt valve is all that is necessary for efficient communication over 1500 to 2000 miles under really bad conditions, and I think there would really be no limit in good weather.

With the completion of our local power supply and good conditions I hope to be able to carry out some tests with New Zealand and Australian stations, and find out really how much power is needed for good signals.

The above remarks, of course, apply to waves from 120 metres down; above this I find fading very evident and conditions far worse.

List of stations heard other than those given in last list who can be heard any time working:—

AUSTRALIA.	GREAT BRITAIN.
A 3JU, stgth. 7 : G 5NF, stgth. 5 : G 2LZ, stgth. 6	A 2DS, stgth. 8 : G 2OD, stgth. 6 : G 2KZ, stgth. 6
A 2IJ, stgth. 7 : G 2KF, stgth. 6 : G 2SZ, stgth. 6	A 3JM, stgth. 7 : G 5MA, stgth. 5 : G 2NM, stgth. 6

Atmospherics have been exceptionally bad during the month.

(Editor's Note.—Mr. Cusack's assumption is borne out by the practical results of 2GQ, who has worked U.S.A. on one five-watt tube.)

At the recent London Exhibition, orders for Amplion loud speakers reached an unprecedented total exceeding 150,000 instruments.

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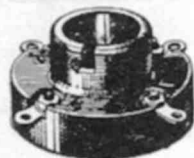
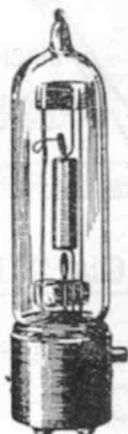
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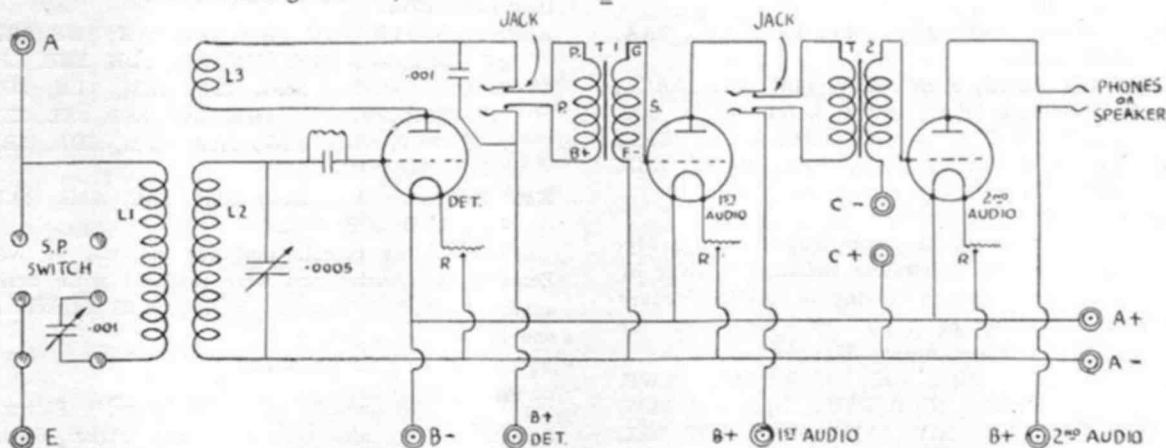
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	£	s.	d.
1 Bakelite Panel, 18 x 7			
x 3/16	0	13	2
1 3-Coil Holder (United)	0	12	6
1 Variable Grid Leak & Condenser	0	8	9
1 .001 Variable Condenser (Master) & Dial	1	7	6
1 .0005 Do. Do.	1	5	0
3 Valve Sockets (Nutmeg)	0	10	6
3 35-ohm Frost Rheostats	0	16	6
2 Signal Transformers	2	2	0
2 D.C.C. Circuit Jacks, Silver Contact	0	9	0
1 Single Do. Do.	0	4	0
1 S.P. Switch	0	2	0

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STATIONS HEARD.

Mr. D. G. Campbell, Kyogle, on a two tube low loss, logged the following in six nights:

Australia: 2YT, 2JT, 2YI, 2GQ, 2CX, 2DS, 2CM, 2CP, 2JR, 2ME, 2BK, 2JM, 2VX, 2RK, 2AY, 3OT, 3BD, 3HH, 3BP, 3TM, 3BL, 3JT, 3EF, 3BQ, 3LW, 4FA, 4AN, 4AG, 4CM, 4ED, 4CU, 5CM, 5JC.

New Zealand: 2AC, 2AP, 3AL, 1AO, 3AF, 4AA, 4AK, 4AG.

U.S.A.—1BV, 2AG, 3CHG, 4DV, 4TW, 4RK, 5ACL, 5AKN, 5ZAI, 5BAR, 5ATZ, 6ANB, 6BUR, 6OI, 6CGO, 6CMU, 6JP, 6CBB, 6AC, 6CTO, 6CHL, 6AJI, 7FQ, 7ADF, 7GR, 8ER, 8ALY, 8GZ, 9DEL, 9ZT.

Canada: 5GO, 5BA.

The following stations were logged on a newly-constructed, two tube, low loss Reinartz receiver by E. Salamy, Warrnambool. Owing to bad QRN every night, the majority of these were logged in the course of a few hours, during daylight:—

American.—1BV, 1BBE, 1RR, 1CAB, 1AF, 2AWF, 2AAY, 2RK, 2IO, 2CUB, 3AUV, 3QV, 3SN, 3LW, 3OE, 3TE, 5SD, 5OV, 5AFU, 5ZAI, 5AK, 5OX, 5AIC, 5ATU, 6UA, 6BMO, 6BQL, 6AWT, 6BCP, 6WC, 6BPF, 6CSW, 6BVE, 6AKW, 6BUR, 6BVA, 6CMU, 6OI, 6EA, 6CB, 6AAO, 6CMD, 6VQ, 6CBB,

6CTO, 6BNI, 6CGC, 6CAL, 6BBQ, 6CSO, 6WP, 6AMM, 6JP, 6CTY, 6EB, 6CHL, 6AC, 6RN, 7FO, 7ALD, 7GR, 7FQ, 8CBP, 8PL, 8DGP, 8CWU, 8BWW, 8BCH, 8ER, 8BAU, 8EW, 9BDU, 9ARK, 9CTG, 9DQU, 9CGN, 9AND, 9BVO, 9ZT, 9DZ, 9MIT, 9NQ.

Mexican.—1X.

Canadian.—5BA.

Australian.—2YG, 2WC, 2HM, 2FP, 2VX, 2WS, 2BK, 2YI, 2JM, 2CS, 2DS, 2YN, 2JR, 2DE, 2ME, 2JS, 2CP, 3JU, 3AP, 3XO, 3BD, 3EM, 3TM, 3OT, 3BQ, 3CB, 3UI, 3IY, 3HH, 3XF, 3EF, 3EL, 3ZE, 3YY, 3YC, 3BL, 3YX, 3AD, 3PM, 5DA, 5BF, 5AH, 5BG, 5JC, 4AN.

New Zealand.—1AA, 1AO, 2AP, 2AC, 4AG, 4AK, 4AA, 3AB, 3CB, 3AL.

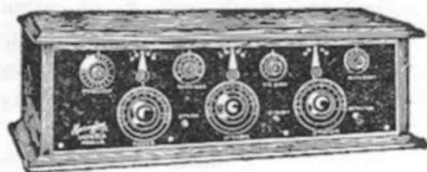
Mr. Salamy reports that the majority of New Zealand and Australians were readable with aerial earthed. On 28th February he logged 28 Yankees in one hour.

W. L. Woolnough, of "Callabonna," Florence Street, Killara, also reports another rather decent evening's reception of DX stations, using one valve only. On Wednesday, 25th February, he succeeded in copying 58 U.S.A. amateurs and one Canadian,

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WELLINGTON, N.Z., 42 Willis Street.

making 59 in all. These consisted of—

5	from the first district
5	second district
3	third district
8	fifth district
18	sixth district
6	seventh district
6	eighth district
6	ninth district

Also NQG, and Canadian 5BA. The total number of Americans now been heard by Mr. Woolnough is 164, of which five are Canadians and three are Mexicans. He also reports that he copied nine Europeans and one Asiatic on the morning of 16th February. The Asiatic was GIIHI, of Mosul Iraq, as to whose QRA there has been much speculation lately. He has now logged fourteen Englishmen, three Dutchmen, two Italians, two Finns, one Frenchman, and two unknowns. He states having intercepted Mexican IAA the other night giving his QRA, which is—Box 2205, Mexico City, but did not mention his name.

Blown Up

SITTING up at his radio station until 5 a.m., an hour when most radio fans have gone to sleep after the usual period of DX hunting, R. B. Bourne, of West Hartford, U.S.A., was rewarded by hearing the call of an amateur in New Zealand. In great excitement he reached for the key of his transmitter and pounded an answer in the International Morse code. In a moment he was listening again, and heard the New Zealand Ham acknowledge his call.

Half an hour later he stood looking at the remains of what had been a first-class station. Enthusiastic over making the contact, Bourne had used all the power available, with the result that an explosion occurred, which temporarily dismantled his equipment. The accident happened as Bourne was in the act of sending a message addressed to his brother, Rolf Bourne, in Singapore. He expected the message would be relayed by amateur radio to Australia, from which point it would be forwarded by mail to its destination.

The temporary loss of the station was compensated for, in his opinion, by the half-hour in which he had been able to maintain reliable communication with the New Zealander. He is the second amateur in Connecticut to "work" that country. The operator with whom Bourne had conversed was Frank Bell, of Waihemo, one of the most successful New Zealand amateurs. His call, 4AA, has been heard in

England and France, as well as widely distributed sections of the United States and Canada.

In addition to the New Zealand work, Bourne has communicated with eight amateurs in Great Britain and three in France. Both operators are members of the American Radio Relay League.

During the winter storms throughout the Northern States of America railroads depended largely upon radio to aid them in dispatching train service when communication by ordinary methods became impossible. When all other means fail, radio is practically certain of getting through to the desired points with a minimum amount of delay.

Amateur radio scored again recently, when G. W. Bergman, owner and operator of station 9CA at Dwight, Ill., handled important messages for the Chicago and Alton Railroad. Due to the heavy snow, the railroad telegraph lines were inoperative, so Bergman was asked to establish communication between Dwight and Chicago. Station 9CA got "on the air" immediately, but was unable to "raise" any Chicago stations. He managed finally to relay some messages through 9AZN, the station of A. D. Sanial, in La Crosse, Wis.

By this means Bergman got into communication with R. H. G. Mathews, central division manager of the American Radio Relay League, who warned local amateurs to listen for Bergman's signals. He also asked the Chicago broadcast stations WEBH, WGN, and KYW to have their listeners notify amateurs to get in touch with 9CA.

In a short time 9CA "raised" 9AAW and 9BE, the stations of W. E. Schweitzer and M. H. Romberg, both of Chicago, and the traffic for the Chicago and Alton was then handled direct from Dwight to Chicago by means of amateur radio telegraphy.

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" Double Circuit Jacks	3/6	" Variable Grid Leaks	10/6
" Single Filament Jacks	3/9	R.P.M. Amplifying Units, Moulded, in	
" Double Filament Jacks	4/3	Brown Bakelite, Wired	£3/5/-
" 30 ohm Rheostats	7/-	R.P.M. Detector Units as above	£1/17/6
" Inductance Switches, 7 point		FOOTE Variotectors	10/-
to 11 point, from 8/9 to 10/6		" Fixed Dectors	8/-

Write for Catalogue No. 16.
Parts.

Special Discounts to Dealers on Marco
Write or call to

Ramsay Sharp & Company Limited

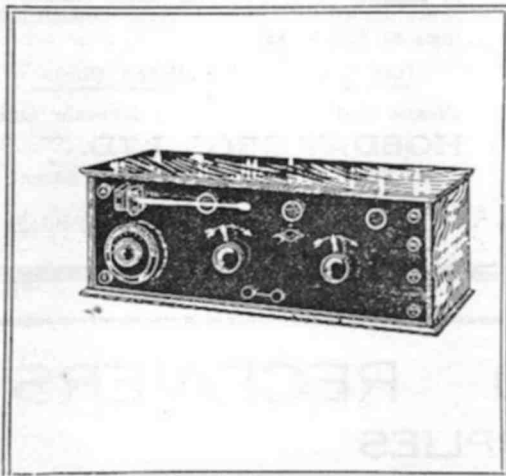
RADIO ENGINEERS,

217 GEORGE ST., SYDNEY.

COL-MO

READY TO WIRE SETS

Genuine Radio Sets that will work



Our Ready-to-Wire Sets are complete with wiring diagrams.

No previous experience necessary to wire a COL-MO Ready-to-Wire Set.

Wiring takes Time and Time is Money

DO THE JOB YOURSELF AND SAVE MONEY

ONE VALVE SET:

Complete with Cabinet

£2/15/0

TWO-VALVE SET:

Complete with Cabinet

£4/10/0

THREE-VALVE SET:

Complete with Cabinet

£6/5/0

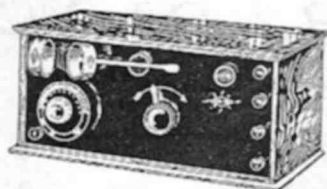


COLVILLE-MOORE

WIRELESS SUPPLIES, LIMITED.

10 ROWE STREET (NEXT HOTEL AUSTRALIA) SYDNEY

COL-MO LITTLE GIANT SETS

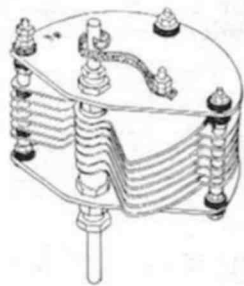


The Little Giant Sets are sold complete with all accessories, including aerial wire. The three valve Little Giant is complete with all accessories and Loud Speaker.

One Valve Set £7/10/-
 Two Valve Set £12/10/-
 Three Valve Set £24

THE LITTLE GIANT ALWAYS LIVES UP TO ITS NAME. A GIANT IN TONAL QUALITIES, EFFICIENCY AND SIMPLICITY OF OPERATION ARE FEATURES NOT SURPASSED IN LARGER HIGHER-PRICED INSTRUMENTS.

Col-Mo Low Loss Condensers



It is interesting to note that at last a GROUNDED ROTOR brass plate condenser of the LOW LOSS type has been constructed in Sydney. The construction is entirely of brass, having brass ends common to the Rotary plates, and electrically connected thereto by a pig-tail connection of brass flex. Absolutely no body capacity effects are possible with this condenser for in addition to the earthed end plates, the fixed plates are further screened by two extra Rotary plates. Designed on a straight line principle to facilitate accurate tuning.

COLMO LOW LOSS CONDENSERS are made in one capacity only .00025. This obviates the necessity of a vernier, thereby reducing high frequency losses. PRICE 16/-

Colville - Moore
Wireless Supplies, Limited
 10 Rowe Street (Opposite Hotel Australia) Sydney

A FORTUNE IS WAITING

for the man who can eliminate STATIC, but the inventor of **TRUE BLUE VALVES** has discovered that half the supposed Static annoyance was in the Valves.

Anybody can write advertisements, but read the **EXPERT OPINION** of a Sydney Radio Editor, who tested

TRUE - BLUE NON - MICROPHONIC VALVES

"Dear Sirs,—This is my candid opinion of the **TRUE BLUE VALVES**:—

They were first of all used in a **LOW LOSS SHORT WAVE RECEIVER**, and although no more sensitive they have an **UNDOUBTED SUPERIORITY** in the fact they are **ABSOLUTELY NOISELESS** in operation. This is a feature which cannot be too highly recommended, because in the reception of long distance amateur Stations, one of the chief essentials is that the receiver itself must be as noiseless as possible. With certain makes of American Valves, oscillation over the full range of the Condenser is somewhat difficult to control without the characteristic known as "howling" occurring.

The "**TRUE BLUES**" have not the slightest tendency to "howl," and this can be attributed only to the excellence of their manufacture. Tried in an **ST100 BROADCAST RECEIVER**, the results with "**TRUE BLUES**" were **EXTREMELY GRATIFYING**, and they can certainly be **HIGHLY RECOMMENDED** for use with this most popular type of Broadcast Receiver. Their absolute silence in operation, and **TOTAL ABSENCE OF MICROPHONIC NOISES**, makes them **IDEAL** for use in receivers employing **LOUD SPEAKERS**, where any microphonic noises due to the Valves are faithfully reproduced in the speaker itself.

Added to these excellent features must also be considered the attractive appearance and the beautiful way in which the Valve is finished. Mechanically they **ARE PERFECT**.

Trusting the above will prove of interest, and **PREDICTING A BIG SALE** for these Valves.—Yours truly,"

SO DON'T BLAME STATIC for those Microphonic noises in your Speaker. It's in your Valves.

TRUE BLUES are the only Non-Microphonic Valves in the World. Two to three times **LONGER** average filament **LIFE**, and consuming less current, they **SAVE MONEY IN BATTERY CHARGING**, consequently are **CHEAPEST IN THE LONG RUN**, and better all along.

USE TRUE BLUES FOR LOW LOSS. They are wonderful Valves.

TAKE SOME HOME TO-NIGHT and hear real music, instead of "bad gramophone" noises.

Sole Agents: **PARSONS & WHITTEMORE LTD.**

30 MARKET STREET, SYDNEY.

Standard Quality

RADIO Accessories

At Keen Prices.

To receive successfully distant stations, such as **KDKA**, is now the aim of every Radio enthusiast, and with this in view special attention should be paid to the selection of all wireless accessories. **David Jones'** offer an unique opportunity to secure radio parts of the highest quality at exceptionally keen prices

Gilfillan vario-coupler, for 2 BL and 2 FC. Price, 5/-

A new shipment of **C.299A** & **C.301A** Valves with Bakelite Bases. Price, 30/-

Phillip's Valves at lower prices, **B 11** & **D VI.** 22/6
D.IV & **D.V.** Price .. 15/-

Sterling Baby Loud Speaker.
Price £4/15/-

Amplion Junior Loud Speaker. Price ... £4/-

DAVID JONES'

for Radio Service

22 YORK STREET, SYDNEY.

" Got It at Smith's "

CHEAP! Look in Our Windows

SMITH'S
RADIO STORES

3 VICTORIA ARCADE :: (Opp. Hotel Australia)

This stock must be cleared AT COST !

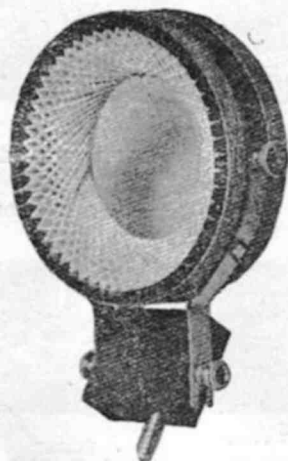
On behalf of RADIO CO., LTD. in Liquidation

SPECIAL TRADE DISCOUNTS FOR CASH.

PRICE LISTS ON APPLICATION

COUNTRY INQUIRERS WILL RECEIVE IMMEDIATE ATTENTION

EDWARD FAHEY & COMPANY, 2nd Floor, 88 Pitt St., Sydney



DIAMOND SUNFLOWER
LOW LOSS COILS

But the expert buys only the "DIAMOND SUNFLOWER," because—

1. Their inductance and sharpness of resonance touch 100 per cent., aiding long distance results.
2. Their self-capacity is practically nil.
3. Their high-frequency resistance lowest yet obtained.
4. Loss through Dead Ends cut clean out. Windings calculated to decimal of an inch, and all connections positive.
5. Maximum tuning possibilities obtained owing to the numerous angles available.
6. They are almost indestructible, being wound inside a robust ebonite former, but at the same time being neat and effective in appearance.

Obtainable from—

Farmers Ltd., Humphries Ltd., Electricity House, Radio House, and all
High-class Retail Stores.

Coil against Coil, "Diamond Sunflower" comes in first every time.

Sole Agents **EDWARD FAHEY & COMPANY, 88 Pitt St., Sydney**

Agents wanted everywhere.

UNITED'S GUARANTEED RADIO PARTS

YOUR DEALER CAN SUPPLY YOU AT THESE PRICES



"PICO" HEAD PHONES.
Strong, light, durable, fully guaranteed, give you the programmes at their best.



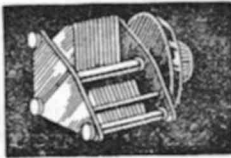
"UNITED" HOME ASSEMBLY SETS.
One to four valves; can be put together with screw-driver and a pair of pliers. Prices, 5 to 11 guineas.



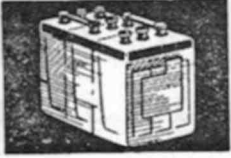
"SIGNAL" AUDIO FREQUENCY TRANSFORMER.
Made in Australia. As good as the most expensive imported. Guaranteed 2 to 1, 3½ to 1, 5 to 1, 7½ to 1 ratio, 21/-.



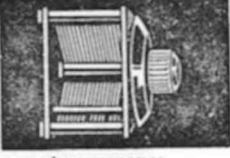
"THE MUSIC MASTER."
The de Luxe Loud Speaker. Has an amplifying bell of resonant wood. Price, £12.



FIBROC VARIABLE CONDENSER.
True insulation. Accurate, Reliable. Plain or Vernier. Cheap. . . .



"UNITED" BATTERIES.
Made by the Clyde Engineering Co., Ltd. Announcements later. . . .



"SIGNAL" CONDENSERS.
Distance and volume assured. All capacities. Plain and vernier.



"ATLAS" LOUD SPEAKERS.
The "Musician of the Air." Clear, mellow, true. Price, 27/10/-.



UNITED CRYSTALS.
Galena, Midite, Hertzite, Pyrites, Claritone, Zincite 1/3 Mounted 1/9



"UNITED" COILS.
Guaranteed, correct, efficient, true inductance. Prices, 2/- upwards. Mounted & unmounted.



STATIC LIGHTNING ARRESTER.
Efficient. Fulfilling requirements of the Underwriters. Price, 2/6.



QUICKHEAT GRID LEAKS.
13 different capacities. 10,000 to 100,000 ohms. ½ meg. to 5 meg. Accurate.



"SIGNAL" DIALS.
Best grade bushings, absolutely true. Inlaid with fast white enamel.



BRANDES TABLE TALKER.
Strong and distinct. As mellow in tone as an old violin. Price, 24/15/-.



"SIGNAL" FIXED CONDENSER.
Grid and phone. Guaranteed. All capacities. .0001 to .004. Price 1/6



"SIGNAL" PUSH AND PULL POWER TRANSFORMERS.
—for more amplification. £3/3/- the pair.



DE LUXE COIL PANEL & COUPLING PLUGS.
Genuine Bakelite. True connections. Perfect fit. Easy adjustment. Price 3/6



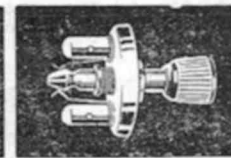
"ECHO" LOUD SPEAKER.
Strong and clear. Special shape and construction. Price, 24/15/-



FROST PHONES.
2,000 ohm. Aluminium ear pieces . . . 32/6
3,000 ohm. Aluminium ear pieces . . . 37/6
3,200 ohm. Maroon Bakelite ear pieces, 45/-



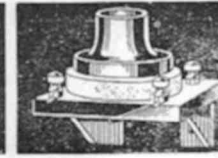
FROST RADIO 607-610 CONTROL UNIT.
Combination of Rheostat and Potentiometer, called "Pot-Rheo," 17/6.



FROST RADIO 608.
Fresh Pull Battery Switch. Price, 4/-.



FROST RADIO RHEOSTATS & POTENTIOMETERS.
Nos. 650-2, Maroon Bakelite, 6 & 35 ohm. rheostats 7/3
Nos. 651-3. Same with vernier 9/6



FROST RADIO No. 617-618.
Sponge base shock absorber sockets. For 201A and UV199, 6/3



"COLUMBIA" GEARED THREE COIL MOUNTING.
Bakelite. Mounts on 4 screws. Positive connections. Eliminates body capacity .. 36/-



"COLUMBIA" MOULDED BAKELITE VARIOMETER.
Bakelite. Green silk wire. No metal bearings post in front or rear .. 40/-



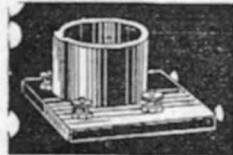
"COLUMBIA" ALL-METER 180° COUPLER.
Bank wound inductance. Tapped for wave lengths up to 2,600 metres. Green silk windings .. 55/-



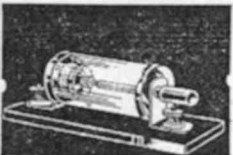
"FALL MALL" 180° VARIOCOUPLER.
Superlatively variable inductance. Genuine Bakelite. Green silk wire. Fitted with dial.



"UNITED" COIL MOUNTING.
Perfectly made for outside panel mounting. Good fitting plugs. Nickel plated shaft. Attractive knobs.



"STANDARD" SOCKET.
No. 107 combination surface and panel mounting socket. Genuine Maroon Bakelite, 5/-



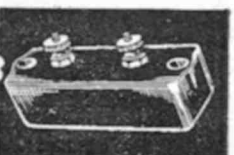
"FORTEVOX" CRYSTAL DETECTOR.
Glass enclosed, nickel-plated on ebonite, 1 inch barrel, 4/9. Many other styles available.



"RELIANCE" DE LUXE LOW LOSS CONDENSER.
Brass or aluminium plates. Grounded end-plates. Self-centring bearings. Adjustable rotor. All capacities.



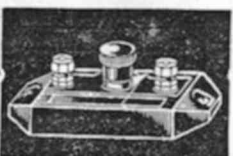
"MUTER" FIXED CONDENSERS.
—with or without leaks, first quality. Tested. All capacities.



"MUTER" LIGHTNING ARRESTER.
Reliable, handsomely finished in brown porcelain. Passed by the Fire Underwriters.



BRADLEYSTAT.
An ideal rheostat for every type of tube. Also Bradleak, Brakelohms, Bradleyohmmeters.



"FRESHMAN" VARIABLE RESISTANCE LEAK & CONDENSER.
—for either base or panel mounting. Without condenser, also with .0025 condenser.



"UNITED" AMPLIFYING UNITS.
Two valves. Added to any set increases strength of signals. For Crystal Sets, 24/4/- Power for Valve Sets, 25/5/-



THE C.H. 30 OHM RADIO RHEOSTAT.
The scientific rheo.—for control of the 1/2 amp. UV 201A-C301A type receiving tubes, & the UV199-C299 type.



THE C.H. VARIABLE GRID LEAK.
A Cutter-Hammer precision instrument. Mount valve on the grid post. Maximum efficiency. No "body" noises.



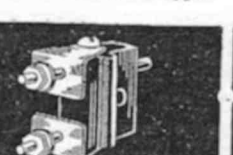
"FRESHMAN" ANTENNELLA.
Eliminates static. Fits any electric light socket. No aerial needed.



"FORTEVOX" SWITCHES.
Double throw. Double and single pole switches. Nickel plated. Mounted on ebonite. Suitable for use on panels or separate.



DE LUXE LOW LOSS COIL PLUG.
Genuine moulded Bakelite. Perfect fit. Special spring sheath contacts.



DE LUXE LOW LOSS PANEL PLUG.
Genuine moulded Bakelite. Highly polished. Perfectly fitting contact points with special spring sheaths.



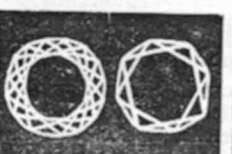
DE LUXE LOW LOSS COUPLING PLUG.
Genuine Bakelite. Low dielectric loss. No contact trouble. Swivel ends, do not unscrew.



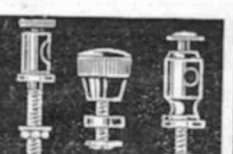
PORCELAIN INSULATORS.
Barrel type, medium size, well glazed surface, providing splendid insulation. Very strong.



INSULATED METAL LEAD-IN STRIP.
Well insulated, very thin, bends to shape of window. No boring necessary.



DE LUXE LOW LOSS COIL.
Minimum Self-capacity. Maximum Inductance. Minimum Resistance. Maximum Air-spacing.



TERMINALS AND BINDING POSTS.
Metal insulated. All sizes and all styles.



PORCELAIN INSULATORS.
Small "Egg" type. Perfectly glazed. Uniformly smooth. Very strong.

UNITED DISTRIBUTORS LIMITED

WHOLESALE ONLY

72 CLARENCE ST.,
SYDNEY.

592 BOURKE ST.,
MELBOURNE.

27 CHESSER ST.,
ADELAIDE.

847 HAY ST.,
PERTH.

Cr. JERVOIS QUAY
& HARRIS ST.,
Wellington.

Want to hear more stations ?

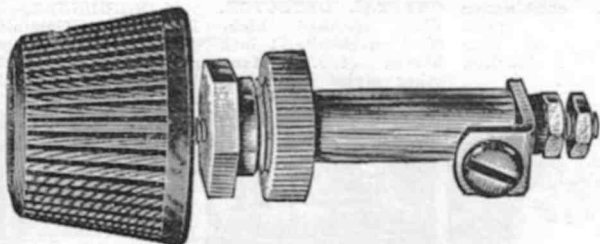
Old Man Ohm says it's easy if you know how to vary the resistance smoothly and continuously in your radio set.

Old Man Ohm knows all about resistance. He's the fellow who goes around measuring it.

The Marshall-stat is a great favourite of his, because it varies resistance, not step by step, but smoothly and uninterruptedly from zero to maximum. On the Marshall-stat, Old Man Ohm can get any resistance he wants with absolute precision.

So can you. And if you control the tubes in your receiving set with Marshall-stats you will hear new stations and clear up those which you hear only occasionally and then indistinctly.

The Marshall-stat is the ideal rheostat for radio work. It is compact in size (see full size cut takes up very little room, and can be fitted anywhere.



Marshall-stat

Exact Size.

Its resistance discs are made of specially-treated material which is the result of years of experimental and research work by radio and electrical engineers. They are absolutely uniform throughout, and are so constructed and proportioned that breakage is impossible.

For smoothness of adjustment, there is nothing like the Marshall-stat. Take Old Man Ohm's word for it.

WHY OLD MAN OHM LIKES THE MARSHALL-STAT—

It requires only one hole in panel. Can be inserted in hole from which old rheostat is removed.

Vernier all the way—but only one adjustment to make.

Can be used with any tube or combination of tubes.

Working parts entirely enclosed in nickel-plated chamber.

Knob can be replaced with knob of your set.

Get it in the green, orange, and black box.

PACIFIC ELECTRIC CO. LTD.

87 CLARENCE STREET, SYDNEY

Phone B 5891

Sole Australian Distributors

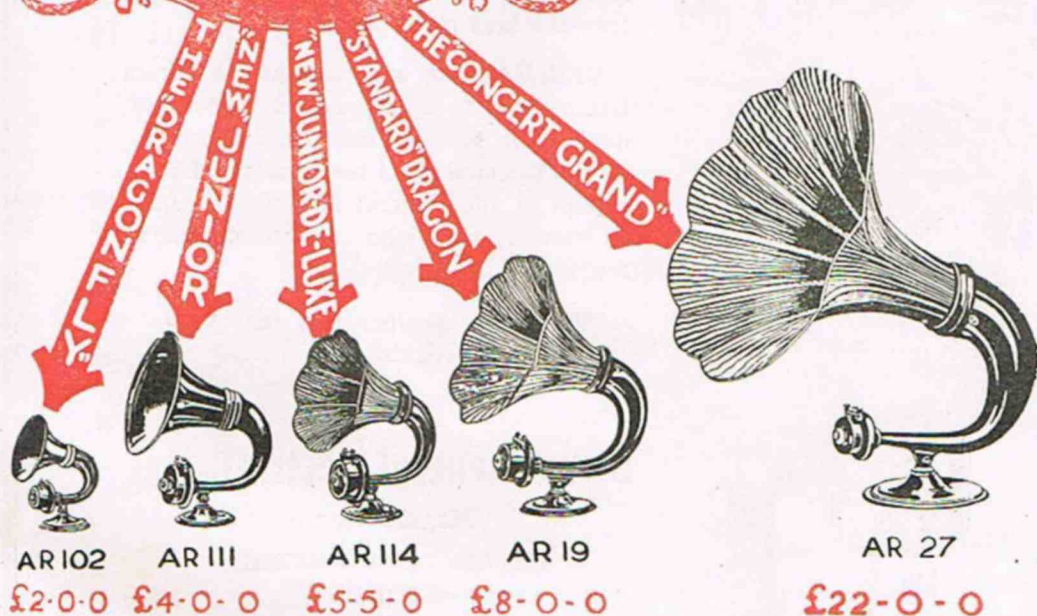
AMPLION

CHARACTERISTICS.

- Sensitivity** . . . or response to weak signals is a feature of all models of the Amplion. Other equally outstanding qualities are:—
- Volume of Sound** . . . which is the loudest possible consistent with
- Clarity** . . . or articulation of the spoken word and purity of reproduction.
- Stability** . . . meaning freedom from "chatter" and the necessity for frequent re-adjustment.
- Tone** . . . corresponding with the original transmission. In other words "Full and Natural."
- Appearance** . . . Although not an essential in a purely technical sense, is certainly desirable as far as "In the Home" reception is concerned, and here the Amplion has merit in the possession of artistic design and fine finish.



Little wonder that the "Amplion" has become a household word in Wireless and synonymous with "BETTER RADIO REPRODUCTION."



AT ALL RADIO DEALERS.

DEMONSTRATIONS
DAILY AT OUR
SHOWROOMS

Amalgamated  Wireless
(Australasia) Ltd.

Showrooms:
97 Clarence St. Sydney.
Collins St., Melbourne.



Type DE 3.

CHARACTERISTICS:

Filament Voltage, 2.4-3.
 Filament Current, 0.06 amps.
 Anode Voltage, 20-80.
 Impedance, 20,000 ohms.
 Amplification Factor, 6.



TYPE D. E. 5.

CHARACTERISTICS:

Filament Volts, 5. Filament
 Current, 0.25 amps. Anode
 Volts, 30-150. Impedance,
 7,000 ohms. Amplification
 Factor, 7.

Gecovalve

Efficiency and Long Life

GECOVAlVE Dependability is not a superficial quality—you discover it as time passes; later on you take it for granted. And still your GECOVAlVE is operating with maximum efficiency.

This lasting dependability is the natural outcome of GECOVAlVE manufacturing methods—skilled British workmanship, modern plant, and the use of only the best materials.

GECOVAlVES are made at the Osram Lamp Works, England, the largest of its kind in the Empire. Their manufacture is directed from the Research Laboratories of the General Electric Co. Ltd., by valve experts who are also experts in the design of wireless sets.

There's a specific type for every requirement.

British General Electric Co. Ltd.

"Magnet House,"

154 CLARENCE STREET,
 SYDNEY;

And at Melbourne, Perth, Adelaide,
 Newcastle.

AT ALL WIRELESS DEALERS