



Friday, October 3, 1924.

WIRELESS WEEKLY



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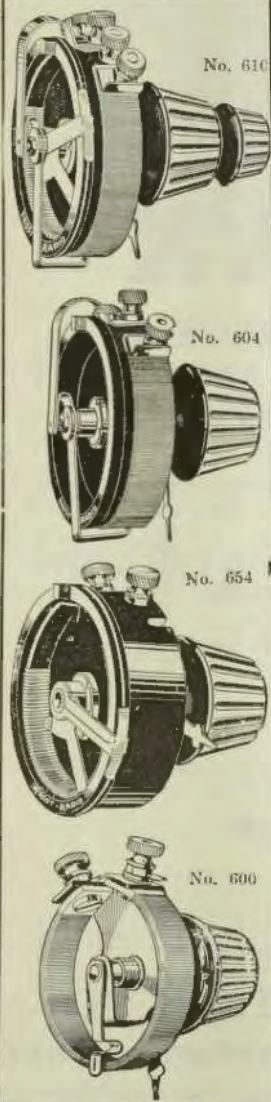
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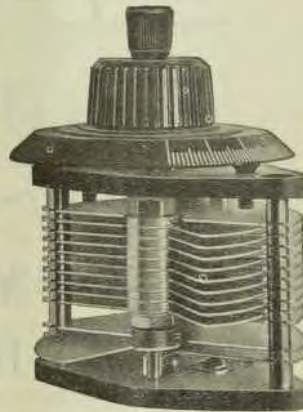
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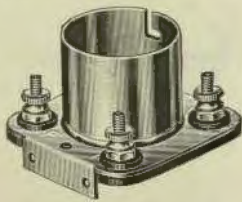
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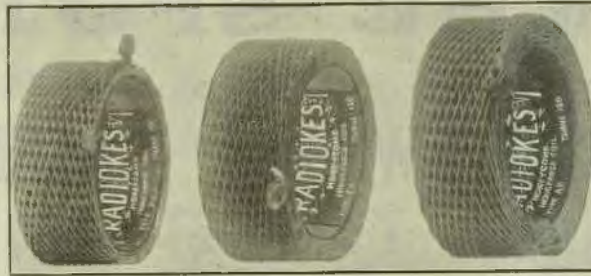
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Official Organ of the New South Wales Division of the Wireless Institute of Australia, with which is incorporated the Affiliated Radio Societies and the Australian Radio Relay League.

VOL. 4. No. 25.

FRIDAY, OCT. 3, 1924.

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

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## EDITORIAL

### WHY DO THEY DO IT?

A CORRESPONDENT has raised a question that, although it has been ventilated before, will easily stand digging up again.

Quite a number of transmitters, after establishing communication with some particular station, immediately drop their call signs and do not use them again throughout the entire conversation; in fact, in a number of cases they omit to send their call signs even when signing off. It is very disappointing to hang on to a two-way conversation for an hour or so, and then fail to get any indication as to the location of those sending. No doubt many a good D.X. record has been missed purely for the above reason.

It is extremely handy for the purpose of checking up to know just who is on the air, and it is certainly a good suggestion that transmitters carrying on long conversations slip in a call sign now and then so that others can make a note in the log and tune in somebody else. It is rather a bump to imagine one is listening to a couple of Californians, only to find later that they are Victorians; but still, far better to know the worst than never to know at all. Another sensible move would be to punch the call sign three or four times when signing off for the night. Much confusion would be avoided if, when using 'phone, transmitters adopted the idea presented recently in these columns by 2JT. For instance, 2DS could easily be confused with 2BF, whereas if it were sent as 2 Don Esses there could be no possibility of an error.

### DEALERS, PLEASE NOTE.

A number of communications have reached us from country readers complaining that they have had poor service from various dealers advertising in this journal, and requesting us to endeavour to find a remedy. One correspondent states that his letters were ignored; another that his order took six months to execute and that no explanation was offered him. Others, again, mention that, owing to insufficient packing, goods were damaged in transit, and when complaint was made no satisfaction could be obtained.

Now, the remedy is obviously not in our hands, but with the dealers. Service is that priceless asset in business which has the effect of binding customers by the strongest ties to one particular business house, and which ensures good support when times are bad. The country represents a field for selling that has scarcely been touched, and it is to those dealers who genuinely try to give service to country clients now that the bulk of the trade will go to when the wireless boom shifts from the city to the country.

### LONG DISTANCE

Under the heading of "Long Distance" a daily paper gives just over two inches of space to the wonderful achievement of Frank Bell (N.Z., 4AA) in establishing two way conversation with a Californian amateur. Another paper affords it just one inch of space.

It seems remarkable that what really constitutes one of the greatest records ever put up in wireless communication—a better record than the Australian speech reception from a high power station in Great Britain—should pass almost unheeded. If Bell had run 100 yards in an umpteenth of a second under the record, his reward would have been a full page. However, some are born to blush unseen, etc.

The power used by 4AA is about 120 watts, and he is the first Australasian to establish contact with the United States. Congratulations, Bell! We are now waiting for an Australian to beat this record.

### LET US GLOOM!

"Mind you, this fad will wear off, and the public will become sick and tired of the very name of wireless. Six months hence, there won't be a receiver sold in Sydney. In San Francisco there are now only two radio stores, where there were once scores," and so on and so forth. Those were the utterances of the Sales Manager of an electrical firm to us the other day; at which we wept bitterly and went our way.

Here is the actual position in America to-day. The Bureau of Statistics estimates that the sales

Watch the Colored Paper!



of wireless apparatus in the United States for 1924 will reach the biggest figures yet. Next year is considered to have even greater possibilities. The number of broadcasting stations has reached such proportions that it has become necessary for certain stations to share a wave length. In Los Angeles, there is now established what is known as "Radio Row," which compares in importance with the automobile and furniture rows. On Radio Row are located nine huge radio corporations, and a big building has just been erected to accommodate Western Radio Incorporated, a large Californian concern. From the same informative American journal from which we obtained the foregoing figures we find that in Los Angeles alone in the month of May, 1924, five new wireless businesses were opened up. It certainly looks as though wireless is dead over there.

To those pessimists and ill-informed people who make rash statements about slumps and other unpleasant things we can only repeat those words uttered by young George Washington when his dad accused him of maltreating the old apple tree:—"Where do you get that stuff?"

#### THE FIRST ONE.

Amateur Operator's Certificate of Proficiency in Radio Telegraphy has been awarded to Mr. H. K. R. Thomas, 59 Harbour St., Mosman. His call sign is 2HT. Congratulations, Mr. Thomas, on being the first.

#### WIRELESS WEEKLY TRANSMITTING TESTS FINAL ARRANGEMENTS

So that an opportunity may be afforded to everybody to take part in these tests, it has been decided to hold them from Monday, October 13th, to Sunday, October 19th inclusive. Unfortunately, Mr. Norman Hurl, 2BC, has been forced to withdraw as he is removing to new premises, but following transmitters will take part: 2CM, Chas. Maclurean, Strathfield, 132 metres; 2JM, R. C. Marsden, Edgecliffe, 237 metres; 2DS, J. Davis, Vaucluse, 124 metres; 2GR, J. S. Marks, Rose Bay, 245 metres; 2YI, Phil. Nolan, Woollahra, 210 metres; 2BB, E. B. Crocker, Marrickville, 230 metres; 2DK, R. P. Whitburn, Leichhardt, 230 metres; 2CS, L. T. Swain, Hamilton, Newcastle, 230 metres; 2BF, L. E. Forsythe, Northbridge, 240 metres.

Transmission will be in the following order, ten minutes being occupied by each station.

The Colored Paper in this issue tells a story that will interest you!

2CM, 10 p.m. to 10.10 p.m. 2JM, 10.10 p.m. to 10.20 p.m. 2DS, 10.20 to 10.30 p.m. 2GR, 10.30 to 10.40 p.m. 2YI 10.40, to 10.50 p.m. 2BB 10.50 to 11 p.m. 2DK, 11 to 11.10 p.m. 2CS, 11.10 to 11.20 p.m. 2BF, 11.20 to 11.30 p.m.

At 10 p.m. sharp (all times are Sydney time) 2CM will call "CQ. W.W. Test" on C.W. for 2½ minutes. Then signals on I.C.W. for 2½ minutes, followed by 5 minutes of music or speech, signing off on C.W. or I.C.W. 2JM will follow immediately, as above, and so on. To avoid possible confusion with other stations, each transmitter before closing, will announce the call sign of the station to follow.

For the convenience of listeners, we have had forms printed which will enable them to keep an accurate record of strength of signals, atmospheric peculiarities, etc. A form will be sent to any amateur upon request. Any listener is welcome to join in, so if you have not already written us, don't fail to do so right away for a form.

#### DIRECTION FINDING AND THE HOWLING VALVE.

The possibilities of tracing the source of howling valves by means of direction finders has been the centre of interest of the Mosman Radio Research and Experimental Laboratories for some time past, and although many difficulties have been encountered during that time, the continual perseverance and co-operation of the laboratories has been justly rewarded.

Last Sunday at 6.30 p.m. the first D. F. patrol started out with apparatus mounted on a car, and for five hours' observations were taken of many of the known stations in the district and altogether the evening's work proved a huge success.

The laboratories intend to leave no stone unturned to rid at least one district of the infernal bug bear, the howling valve, and this body holds it the duty of all persons possessing a regenerative receiver, and who are not quite familiar with the correct tuning of same, to approach the laboratories, where any help in this direction will be given without any obligation whatever.

To this particular person, be he a broadcast subscriber or a junior experimenter, every assistance is offered. But to the other fellow who is neither a subscriber nor a genuine experimenter—

(Continued on Page 15, Col. 1.)



HEADQUARTERS  
Room 24 2<sup>nd</sup> Floor  
82 Pitt St.  
SYDNEY NSW



Phil Renshaw Hon. Sec.  
Box 3120 G.P.O. Sydney  
Phone B 2235  
Art Perrett Publicity Officer

As reported in these columns last week, a good deal of interest was raised at the last meeting of the N.S.W. Division of the Wireless Institute, over the question of closing down amateur stations during broadcasting hours. A reference to last week's notes will indicate the necessity for some action such as this being voluntarily taken by the experimenter if he does not wish the authorities to be forced to take some step which may prove more hampering and unwelcome. In accordance with the resolution passed by the meeting, the letter appended at the end of these notes has been forwarded to all transmitters in N.S.W., together with the attached slip and although at the time of writing these were posted barely three days ago, already 24 signed slips have been returned to Headquarters in every case signifying a willingness to co-operate in this movement.

Speaking of co-operation, it is encouraging to note the readiness with which experimenters generally will co-operate and make an effort to advance the cause of wireless in this country. Those who do not fall in line with this or any other movement which may be originated for the ultimate benefit of amateurs should carefully consider their position as by standing aloof they are not only retarding the progress of the cause generally, but they are cutting themselves off from their fellow-experimenters and sooner or later they will find that they have been left out of some important move simply due to their own lack of co-operation in past times. The old fable of the man whose sons were always quarrelling and who one day called them around him asking them to break a bundle of faggots could well be taken to heart by experimenters. Each of the sons attempted the task but gave it up as hopeless and the old man then cut the string and taking each faggot separately, he broke it with ease, thus illustrating that while they were quarrelling each one could be easily disposed of, but by presenting a united front it was impossible to cause them any harm.

#### Radio Relay League.

The meeting of transmitters called for Tuesday, 23rd September was held at Institute Headquarters, and it was decided to restrict membership at any rate for the time being, to a few enthusiastic members. The programme decided upon is rapidly being pushed ahead and it is expected that matters will be in full swing in a short time.

#### Notes.

Mr. Phil. Renshaw, Hon. Secretary of the N. S. W. Division of the Wireless Institute, is now on a visit to Queensland, having left Sydney on Saturday, 27th September. He expects to be away for about three weeks. While he is in the Northern State, Mr. Renshaw will devote considerable time to the amateur wireless movement, and it is expected that this visit will be fruitful of much good both to local and Interstate interests.

Mr. J. Malone, Chief Manager for Telegraphs and Wireless, was in Sydney during the last weekend. Before leaving for Queensland on Saturday, Mr. Renshaw had an interview with him with regard to the matter of experimental licences. As a result of this interview, it is quite clear that Mr. Malone is quite in sympathy with the experimental movement, and we can rely on his ready co-operation in any reasonable proposition that may be put before him.

2CX reports that he heard Z4AG calling U.S.A. the other evening and signals were received Q.S.A. 2CX will soon be settling down to real hard work as much of his preliminary arrangements have now been completed. He would appreciate reports from any experimenters receiving his transmission.

2GM is now in the country, but expects to return in a few days. No doubt we shall hear him over the radio phone again at an early date.

2BF mentions the fact that he was heard in New Zealand one night last week, but the reply indicated that Station 2BL had been heard transmitting. 2BF should be more careful of his Morse signals as this has apparently caused no slight mis-

Look for Colville Moore on the Colored Paper !



understanding of late.

Readers will be pleased to note that 2JM's resurrection has been accomplished. Congratulations should be forwarded to him over the ether. We trust that he will enjoy much health and prosperity.

A. H. PERRETT,  
Publicity Officer.

**THE LEICHHARDT AND DISTRICT RADIO SOCIETY.**

On Tuesday, September 23rd, members of the Leichhardt and District Radio Society held their 99th general meeting at the club-room, 176 Johnston St., Annandale.

The attendance was all that could be desired, and as it had become necessary to postpone the delivery of the lecture on "Telephones," until the following meeting, it was decided to conduct a "Questions and Answers" evening instead. The idea met with general approval, and the number of questions asked and replied to were many and varied. Such varied subjects as wave length, induction, interference, wave traps, and range were all dealt with, and all present spent a very enjoyable evening!

Next Tuesday's meeting will be a very busy one for members, it being the second annual general meeting, and as such important matters as the reading of the annual report, and the election of office-bearers for the ensuing twelve months are to be dealt with, a very good attendance of members is anticipated. It is expected that the annual report will reveal a very successful year of activity, and as increased membership will mean greater activity and an even more successful period ahead, local enthusiasts who have not yet joined up with the Society would be well advised to help along the good work by becoming members.

Inquiries should be addressed to the Hon. Secretary, Mr. W. J. Zech, 145 Booth St., Annandale.

(Continued from Page 13.)

well all he need do is to get a license and be very careful when tuning his apparatus.

To the broadcast subscriber is made an earnest and respectful appeal to exercise every care in tuning his apparatus at all times, especially after 10 p.m. on wave lengths below 300 meters, as all the traffic in progress at that time is amateur experimental test work carried out by men who are spending the greater part of their time in scientific research. The D.F. patrol, under the approving eye of the Department, will police the district very frequently in the future.



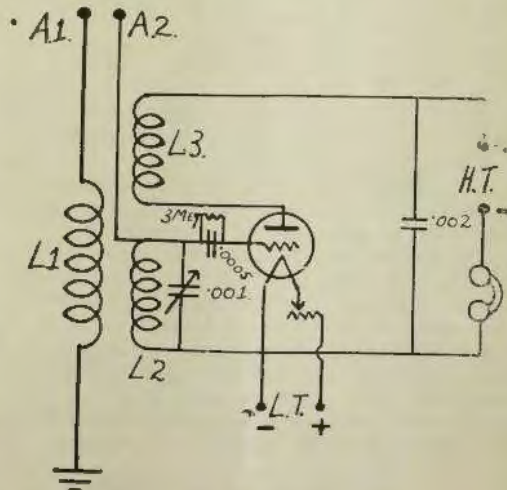
Garfield Street,  
Wentworthville,  
16/9/24.

The Editor,

Dear Sir,

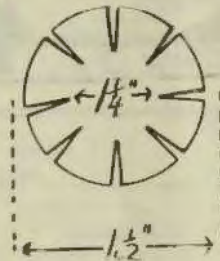
With regard to my' reception of K.G.O., on August 30th, as published in "Wireless Weekly"—I have had many enquiries as to my circuit, etc., from readers of this paper. If you have the valuable space to publish this letter, I would be much obliged.

My set consists of a three coil regenerative circuit L.1, L.2., and L.3. It will be noted from diagram that I have two aerial terminals A.1., and A.2., A.2. being connected directly to L.2. This permits the use of two coils only, if desired, although the use of 3 is better for D.X., and in many other ways, as it does not cause so much interference with other listeners. I am using Spider Webb coils on this set, which I find very efficient. The





primary, L.1., consists of 60 turns of 36 gauge cotton covered wire; the secondary, L.2, consists of 84 turns of 28 gauge, and L.3, 38 turns of 24 gauge. With these three coils I reach a range of from 250



metres to 1200 metres wave length, although smaller coils wound with heavier gauge wire will serve better for the short wave lengths. Coils similar to the short wave receiver, as published in "Wireless Weekly", August 22nd should be used. I have a Radiotron Valve Model U.V.201-A, with a 35 ohm Rheostat. The panel is wired with 1/16 in gauge tinned copper wire. You will note I have reversed the position with phones and B. battery to the usual way; I consider it better as the H.T. reaches the anode of the valve without passing through the phones. My aerial is similar to that of the efficient short wave receiver, as published in "Wireless Weekly", August 15th. The three Spider Webb Coils are mounted similar to the ordinary honeycomb mounting.

I remain,  
Yours etc.,  
HAROLD E. ORMEROD.

12 Gordon Street,  
Paddington.

Dear Sir,

In a current issue of W.W., page seventeen, the sending of Morse is advocated instead of phone. Now what about the cat whisker brigade who cannot read Morse? The broadcasting companies are giving good services, but their programmes are apt to lull, this no doubt being due to the apathy of the P.M.G. in not enforcing the licensing regulations, thus giving the broadcasting people more revenue so that they could vary their programmes more. The amateurs offer a good advertisement; personally we always wait until 2BL closes down to see if 2Y1 is sending out any music.

The Colored Paper in this issue tells a story that will interest you!

I hope you will publish this letter so that amateurs can see that they are not wasting their time sending music, and I take this opportunity of congratulating them on their good work. On with the dance, Mr. Nolan.

Yours etc.,  
MAX CARLTON.

Mr. H. Rigby Gregory, Abbotsford Point, forwards a letter received by him from H. L. Hobler, Box 38, G.P.O., Rockhampton, Q., and, as he was not transmitting on the date referred to, he requests that the party concerned communicate with our Queensland friend.

Box 38, G.P.O., Rockhampton,  
Queensland, 5th Sept., 1924.

Dear Mr. Gregory,—

Further to my letter of a few weeks past. I suppose you have been wondering when you will hear that I have heard you. Well, I got some telephony at 7.40 p.m. on 2/9/24, and think I heard you call. Here is what I heard, and I hope you will confirm by letter if it is correct:—

"Hello (repeatedly). This is...here...3, 4, 5, 6, 7, 8, 9, 10, 11. This is 2ED here." "Hello" was said very often, and after this speech a little Morse was sent.

If this did not come from your station, I would be pleased to know if you could tell me who sent it. I have also heard the following N.S.W. transmitters, but don't know their addresses, so if you know them would you please send me their QRA—2QG, 2KO, 2SR, 2YR, and 2ME. This last joker kept sending "Doggett de 2ME V," and I heard him from 6 p.m. on 2/9/24.

Trusting you will confirm this report if correct, and awaiting an early reply.

Yours faithfully,  
H. L. HOBLER.

P.S.—Was using three valves on you, no audio being used.

REPLIES TO CORRESPONDENTS. . . .

Glebe Point: We much appreciate your courtesy in forwarding your suggestions. It is always difficult to know what is wanted, but your letter gets down to brass tacks and gives us ideas which will be put into effect right away. Thank you!

"Old Hand," Townsville: As you say procrastination is the thief of time, but we don't think

(Continued on Page 35, Col. 2.)



Friday, October 3, 1924.

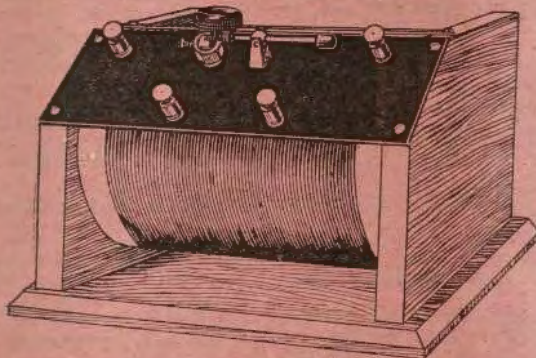
WIRELESS WEEKLY

# This Week's Specials

Read the Red Pages in this issue; they will save you both time, trouble and money. You can buy with a perfect assurance in knowing that all goods supplied by the House of COLVILLE-MOORE will be the best quality possible.



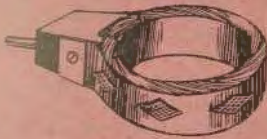
AI Quality Condenser.  
 43 Plate, .001 ..... 15/-  
 25 " .0005 ..... 12/-  
 11 " .0005 ..... 11/-



Single Slide Crystal Set of Col-Mo Design, £1/7/6.  
 The Panel may be purchased separately complete for 5/-.



Condenser Dial. 2/-.



Honeycomb Coils.

Coils.	Mtd.	Unmtd.
19	5/3	2/6
25	5/3	2/6
35	5/3	2/6
40	5/3	2/6
50	5/6	2/9
75	5/9	3/-
100	5/9	3/-
135	6/3	3/4
150	6/6	3/4
200	6/6	3/8
225	6/6	3/9
250	6/6	3/9



Slide Complete, 1/6.



Catwhisker Holder, 1/3.



Bushed Switch, 1/6.



Crystal Cup, 6d.

Make a point of getting all your supplies from

**COLVILLE MOORE**

WIRELESS SUPPLIES LIMITED

10 ROWE STREET

NEXT HOTEL AUSTRALIA

SYDNEY



Keep this Price List by you for Reference. It's the  
**COLVILLE MOORE PARTS LIST**

**AERIAL WIRE.**—3/20, 2/-; 1/16, 2/-; 7/20, 6/6; 7/22, enamel, 7/6 per 100 ft. Heavily insulated, 5/22, 3d.; 1/18, 2d. per yard.

**INSULATORS.**—White, reel, 3d. Strain, egg type, 5d. Brown, loop, 8d. Elctrose, 1/-. Ebonite, 2/6 each. Lead-in insulators, porcelain, 9d. Ebonite, 6in., 1/6; 9in., 2/-. Marconi, 6in., 6/6 each.

**ACCUMULATORS.**—Dry or charged. Exide, 2 volt, 40 amp., £1/1/-. 2 volt, 60A., £1/6/-. 2 volt, 80, £1/13/-. 2 volt, 100, £2. 4 volt, 40, £2/2/-. 4 volt, 60, £2/12/-. 2 volt, 80, £3/6/-. 2 volt, 100, £4. 6 volt, 40, £3/3/-. 6 volt, 60, £3/18/-. 6 volt, 80, £4/10/-. 6 volt, 100, £6. **U, X, L** same price as above supplied with carrying plates up to 8/- extra.

**AERIAL SWITCHES.**—S.P. D/T., porcelain base, 2/6. M.P., Ebonite base, 4/8. D.P. D.T., porcelain base, 4/6. Ebonite base, 6/8.

**BATTERY SWITCHES.**—Cullerhammer, 4/8; Marco, 5/-. Frost, 4/-.  
**BATTERY CHARGES.**—Tungar, 2 amp. charging rate, £6/10/-; 5 amp., £9.

**B. BATTERY CLIPS.**—6d. each. Accumulator Clips, 1/-.  
**BATTERIES.**—Ever Ready, 31 volt, 8 taps, 9/6; 42 volt, 12/6. 4.5 volt, flashlight cells, 15/- doz.; 1.5, 3/-. 4.5 dry cell valves, for dry cell valves, 12/6 each. Hellison 45 volt tapt, 13/6; 60 volt taps, 21/-. Ever Ready (American), 22 volt, 18/-; 45 volt, 30/-.  
**BRADLEY STATS.**—13/9. Bradley Leak, 13/9. Bradley ometers, 13/9.

**BUZZERS.**—Watch type, 5/-. Square, 6/- each. Transmitting, high tone, 15/-.  
**BAKELITE SHEET.**—1/8th, 10/6; 3/16th, 16/-; 1/4, 24/- per sq. ft.; small quantities, 1d., 1 1/2d., and 2d. per square in.

**BINDING POSTS.**—N.P., 4d., 5d., and 6d. each. Bakelite top, 5d., 6d. each. Engraved, set of 8, 4/6.  
**BEZELS.**—Or Peep Screens. Unilted, 1/2in., 10d. each. Marco, moulded, 1/2in. and 1 1/2in., 1/3 ea.; black finish, 1/6.

**CONDENSERS, FIXED.**—Col-Mo .00025 Grid Condenser, 1/6. .001 Phone Condenser, 1/6; .002, 1/9. Dublier, .001, .0025, .0005, 2/9; .001, .002, 3/-; .004, .005, 4/-; .006, 4/8. Type 610 moulded, .001, .002,

.0025, 4/8; .003, .004, .005, 6/2. Type 600, .0025, with clips, 4/6. Muter .00025 Grid Condenser, with clip for leak, 3/- each.

**CONDENSERS, VARIABLE.**—Col-Mo, complete with knob and dial, .0003, 11-plate, 12/-; .0005, 23-plate, 14/-; .001, 43-plate, 17/-.

**MASTER VERNIER CONDENSERS.**—With cal. dial, Vernier knob, 11-plate, 36/-; 23-plate, 39/6; 43-plate, £2/3/6. Without Vernier and cal. dial, 25-plate, 25/-; 43-plate, 30/-. Dublier Varioden, .0004, 15/6; .0006, 15/6; .001, 20/-. Polas, .001, .0005, 22/6. Gillilan, 43-plate Ver., £2/9/-; 23-plate Vernier.

**CONDENSER SUNDRIES.**—Mov. and Fixed Plate, 1/9 per doz. Mov. Washers, 10d. per doz. Fixed Washers, 6d. per doz. Ebonite End Plates, 1/9 pair.

**MUTER CONDENSERS.**—.00025 Grid Condenser, with clips for leak, 3/- each.

**CRYSTALS.**—N.H.M. Galena, tested and guaranteed, 2/- and 1/- each. Q.S.A., 1/8 and 1/- Zincite, Borate Combination, 2/6 pair. Molybdenite, 1/9. Copper Pyrites, 1/6.

**CRYSTAL DETECTORS.**—Glass enclosed, 5/6. Featherby, multi-point enclosed, 9/6. Mounted Ball joint type, with 2 terminals, N.P., 6/6; Brass, 4/-; Unmounted on card, 2/9.

**CRYSTAL CUPS.**—Col-Mo, round table type, 6d. Hexagon, 8d. Panel Mounting, 1/-.  
**CONTACT STUDS.**—N.P. 1/2in. and 1/4 shank, with nut, 1/- per doz. Stops, 1d. each.

**CHOKE COILS.**—Meyers, intervalve, 22/6. Transmuting, 2, 4, or 6 Henry, 37/6; 8, 10, or 12 Henry, 50/-; 20 Henry, £3/10/- to £4/10/-.

**DOUBLE SLIDE TUNERS.**—Col-Mo, 27/6; Featherby, 45/-.

**DIALS, CALIBRATE.**—For Rheostats, Signal, 2in., 1/6; Master, 2in., 4/-. Potentiometers, Master, 2in., 4/-; for Condensers, 3in., 2/- and 2/6. Master, Bakelite, 3in., 4/6. Remler, Bakelite, 3in., 4/6.

**EBONITE SHEET.**—1/8th, 8/6; 3/16th, 11/-; 1/4, 14/- per sq. in. Ebonite Tube, 3 1/2in. and 4in. outside diameter, 10/6 per sq. ft.

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## Push Pull Method of Audio Frequency Amplification

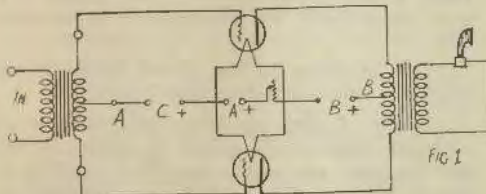
By W. A. STEWART

MANY and varied are the new circuits that are continually being evolved as far as radio frequency and detector circuits are concerned, but very little is done with audio frequency amplifiers. Many people seem to think that two valves and two transformers give all that can be got. For average purposes these are quite satisfactory, but when unlimited volume, of exceptional quality is required the limitations of an amplifier of this kind are quickly realised. A third stage of audio is often attempted, but without special transformers, distortion is particularly noticeable and parasitic noises are manifest.

Resistance couplings can certainly be used, but unless the right resistance and battery voltages are obtained, the amplifier is liable to be noisy.

These amplifiers require more valves and more B. battery, and usually three valves are required to give the results of two ordinarily.

Until the advent of what is known as "Push Pull" circuits, and the necessary transformers, unlimited volume was out of the scope of the average experimenter.

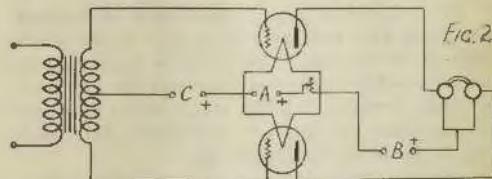


The push pull method of amplifying has certainly solved the problem of clear, distortionless, audio amplification, and I can certainly recommend the method to anyone who wants really good loud speaker operation, and plenty of volume. It is not very much good putting one of these amplifiers on to a poor receiver, as the amplifier amplifies faithfully and any distortion in the detector circuit will be reproduced, much worse in the loud speaker.

The ordinary push pull circuit is shown in Fig. 1, and as will be seen, it utilises two transformers having a centre tap and two valves in parallel.

With regard to the various components, about ninety to one hundred and fifty volts can be used with about twenty per cent. C battery or grid biasing battery. Use the same sort of valves on both sides of the amplifier; UV-201A's are O.K., but of course any power can be used.

The transformers themselves have to be specially constructed so that the centre tap is exactly in the centre of the winding. I have found that the "All American" make of push pull transformers give extremely good results, and they can be recommended.



The theory of this method of amplification is that the impulse is applied to grids of the 2 valves exactly 180 degrees out of phase; that is one tube is in operation for one half of the cycle and the other tube for the other half. This method balances out or neutralises any distortion which usually crops up in the usual type of amplifier.

Another way in which it may be explained is this. Owing to the irregular electron emission of the filament of the valve, the B battery voltage is fluctuating, and while one tube tends to increase the current, the other tube tends to decrease it; when the correct adjustment of B and C battery voltages has been obtained the valves balance each other and the output is fed into a special output transformer and transferred to the loud speaker or phones.

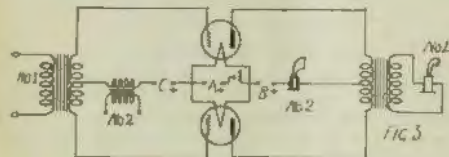
For best results the push pull amplifier should be built into a special cabinet or unit, and separate B batteries used.

Watch the Colored Paper !



Numerous experiments can be tried with an amplifier of this kind, and in Fig. 2 an amplifier is shown in which only one transformer is used, and two single phones on the one headband, connected to the output. The phones act as a sort of auto transformer.

The amplifier will not give surprising results off a detector alone, as it will amplify the high notes too much. However, it is really a power amplifier, and if a stage of straight audio amplification is used before it, it will act wonderfully. If greater amplification is desired, two stages of audio can be used, but in this case it is desirable to use transformers having a ratio of not more than three to one.



No matter how well a transformer is designed it will not give even amplification over the whole range of frequencies. The average types usually amplify the high notes too much and the low notes too little, therefore the less transformers used, the less distortion will result. For this reason Circuit Fig. 2 should be very desirable.

The circuit shown in Fig. 1 is a standard Push Pull Circuit and gives results that have to be heard to be appreciated. It is possible in my opinion to bring in as much DX on a circuit using noiseless audio amplification as it is on a circuit using radio frequency amplification.

The push pull method seems about the best, as it is far quieter in operation than the average audio frequency amplifier, and I really believe that three stages of noiseless audio frequency amplification will give equally as good results as two stages of tuned radio frequency amplification, and furthermore no more controls are added to the set.

I have heard a push pull circuit working and I was really surprised at the results. Local stations were coming in without any aerial or earth, and with the amplifier working all out with 150 volts on the plate it was impossible to hear yourself speak near the speaker, and the music and

speech from a local amateur station were clearly audible 200 yards down the street. This was done on a "low loss" receiver having one stage of audio and a stage of push pull.

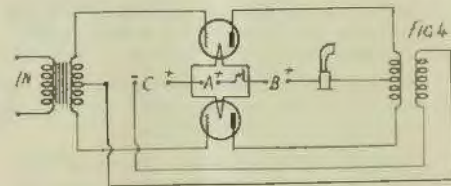
The music was not only loud, but free from distortion and all announcements were easily understandable.

Let us refer again to circuit No. 1. If the values of the C and B batteries are properly adjusted, no current will flow in the lead marked A.

The secondary of an amplifying transformer could be connected in this lead without in any way interfering with the action of the push pull.

It also follows that the current flowing in the lead marked B would be constant, so that in here we could connect a loud speaker, without affecting the amplifier.

If we connected the input of transformer No. 1 to a receiver tuned to Broadcasters (2BL), the music would be heard in loud speaker No. 1, and



if we connect the transformer No. 2 to a receiver tuned to Farmers (2FC) their music would be heard in loud speaker No. 2. This system is all right theoretically, but practically it is not workable.

This is shown in Fig. 3 and should provide scope for some interesting experiments.

In Fig. 4, after the tubes have acted in the push-pull fashion, the energy is again fed back and the tubes are used in parallel to amplify the signals again. This method gives splendid results, and when the correct values of C and B battery voltages are obtained it is very stable.

The transformers must be well built and the tap must be in the dead centre to give the best results.

In conclusion I would like to say that if more circuits using amplification of this type are used less of the so called poorness in loud speaker operation will be heard, and better, clearer music will result.

SEE PAGES 2 and 3 FOR FROST LINES.



## NEW ZEALAND TRANSMITTERS

HERE is a full list, right up to date, of amateur and broadcasting stations in New Zealand. Except where otherwise stated, the times mentioned are New Zealand time, one hour and a half ahead of Sydney, Melbourne, and Brisbane time.

- 1 A.A.—C. N. Edwards, 42 Pollen Street, Grey Lynn, Auckland, N.Z. 160, 170, 180 metres. Transmits 6 p.m. to 7 p.m., 9 p.m. to 12 p.m.
- 1 A.B.—Penny, No. 11 Peary Road, Mt. Eden, Auckland, N.Z. 140 to 180. Transmits C.W. to I.C.W., 6 p.m. to 7; Tuesdays, Thursdays, and Saturdays, 6—12 p.m.
- 1 A.C.—L. S. Spackman, 10 Ardmore Road, Ponsonby, Auckland. 155, 165, 175 metres. Transmits C.W., buzzer, modn., telephony, any and all times.
- 1 A.H.—Hartle and Gray, Hall Commerce, High Street, Auckland, N.Z. 155, 165, 175 metres. Transmits C.W., I.C.W., 'phone, Monday, Wednesday, Saturday, 8—10.45.
- 1 A.I.—Charles Sievier Goodwill, Hamilton. 140 metres. (No particulars.)
- 1 A.K.—Claxton, William Harry, Parawai Road, Thames. 140 metres. Transmits C.W. and T.C.W., 8 to 10.30 p.m.
- 1 A.M.—Hamilton Amateur Radio Club, Hamilton. 155, 165, 175. (No particulars.)
- 1 A.O.—Russell Garland White, 125 Grafton Road Auckland, N.Z. 130 to 190 metres (now using 140 metres). Transmits C.W., I.C.W., and 'phone, 6 p.m. to 7 p.m. week days, and 6 p.m. to 1 a.m. Saturday, Sunday, and Monday nights.
- 1 A.Q.—Aymer Alexander Sommerville, Thames. 140 metres. (No particulars.)
- 1 A.R.—Frank Beesley Hobbs, 44 Le Arota Street, Claudelands, Hamilton, N.Z. 140 metres. Transmits C.W., I.C.W., telephony, most evenings between 6 p.m. and 10.30 p.m.
- 1 A.S.—Ralph Eric Grainger, 88 Clarence Street, Ponsonby, Auckland, N.Z. 130 metres. Transmits C.W., I.C.W., tonetrain, telephony. C.W., I.C.W. (chopper), fone (Heising modulation), 1800 to 1900 and 2220-2300 N.Z.M.T. and 1900-2200 irregularly.
- 1 A.U.—Rolf Ernest Lempriere Aubin, Auckland. 140 metres. (No particulars.)
- 1 A.V.—Rolf Ernest Lempriere Aubin, "The Oaks," Parnell, Auckland, N.Z. 140 metres. Transmits C.W., I.C.W., tonie train, telephony. Have not started transmission yet, but hope to do so within a month or so.
- 1 A.W.—Robert Maxted, Queen Street, Thames, N.Z. 180 metres. Transmits C.W., I.C.W., tonie train, telephony, 6 p.m. to 12 p.m. Only at Xmas vacation, i.e., December 1—March 1. Present address, Canterbury College, Christchurch.
- 1 A.Z.—James Reginald Therson, 17 Te Aroha Street, Claudelands, Hamilton. 140 metres. Transmits C.W., telephony, 6 p.m. to 7 p.m., 9 p.m. to 11.30 p.m.
- 1 F.C.—Robert Fred Douglas Burrell, Auckland. 160, 170, 180. (No particulars.)
- 1 F.F.—Vincent John Williams, 45 Valley Road, Mt. Eden, Auckland. 140 metres. Transmits C.W., I.C.W., and 'phone.
- 1 F.H.—James Steel, Auckland. 140 metres. (No particulars.)
- 1 F.I.—Herbert W. Batty, 22 York Street, Parnell, Auckland. 140 metres. Transmits C.W., I.C.W., and 'phone, 6.30 p.m. to 11 p.m.
- 1 F.J.—George Henry Choules, Waiuku. 140 metres. (No particulars.)
- 1 Y.A.—Auckland Radio Service Ltd., Scots' Hall, Symonds Street, Auckland. 330 metres. 500 watts input to set. Tuesday, Wednesday, Thursday, and Friday evenings, 8 p.m. to 10 p.m. (Broadcasting station.)
- 1 Y.B.—Mr. C. H. Pearson, La Gloria Gramophones Ltd., 157 Karangahape Road, Auckland. 330 metres. Transmits Saturday, 7.30 p.m. to 10 p.m. Sunday connected up with the following churches, from which is broadcasted the entire church service: Church of Christ, West Street, Auckland, first Sunday in the month; the second Sunday in the month, Beresford Congregational Church; the third Sunday in the month, from Auckland Baptist Tabernacle; fourth Sunday in the month, Salvation Army. (Free broadcaster.)

FROST LINES ARE SHOWN ON PAGES 2 and 3



- 2 A.B.—Dan Wilkinson, Motueka, N.Z. 125 to 150 metres. Transmits C.W. and telephony, 9 p.m. to 11.30 p.m.
- 2 A.C.—Ivan Henry O'Meara, 209 Harris Street, Gisborne. 130 to 190 metres. Transmits C.W. and telephony, 6.30 to 12 (Greenwich time).
- 2 A.C.—Percy Ronald Stevens, Gisborne. 5 watts, 140 metres. (No particulars.)
- 2 A.E.—Robert James, Gisborne. 140 metres.
- 2 A.F.—William John Sinclair, c/o W. Sinclair and Co., electrical engineers, P.O. Box 227, Gisborne. 150 to 200 metres (about 175 metres usually). Transmits I.C.W., telephony, music, etc. No special nights; two or three nights every week.
- 2 A.H.—Wanganui Amateur Radio Club, Gordon S. Bissett, hon. sec., P.O. Box 423, Wanganui, N.Z. Station: Y.M.C.A. Buildings. 165 to 175 metres. Transmits broadcasting Tuesdays and Saturdays, 220 metres.
- 2 A.I.—Walter Leslie Harrison, 47 Austin Street, Wellington, N.Z. 60-140 metres. Transmits C.W., I.C.W., tonic train, telephony, 6.30 p.m. to 11 p.m.
- 2 A.J.—Henry Bransgrove, Broadway, Stratford. 140 metres. Transmits C.W., I.C.W., tonic train, telephony. At present only (telephony) music. Sunday evenings from 8 p.m. to 10 p.m., and sometimes on Thursday evenings from 8 to 10 p.m.
- 2 A.K.—Leslie Rawson, 99 Victoria Street, Hawera. 140 metres. Transmits C.W., I.C.W., tonic train, telephony. At intervals every night.
- 2 A.L.—A. C. Cooper, 3 Cecil Street, Ashfield. 325 metres. Transmits C.W., I.C.W., telephony, 10 p.m. to 12 midnight.
- 2 A.M.—Dr. William Fred Buist, Hawera. 180 metres. (No particulars.)
- 2 A.O.—Gordon Albert John Brunette, Club Hotel, Opunake. 100 metres. Transmits C.W. and telephony, from 8 till 12 p.m. on ordinary nights, and during daytime on holidays.
- 2 A.P.—Percy Charles Collier, 17 Taft Street, Brooklyn, Wellington. 140 metres. Transmits C.W., I.C.W., by chopper and tone, most any evening between 6.30 and 10.30 p.m.
- 2 A.Q.—Morton Wm. Coutts, Box 26, Taihape. 155, 165, 176 metres. Transmits C.W., I.C.W., telephony, 8 p.m. to 10.30 p.m.
- 2 A.R.—Thomas R. Clarkson, 304 Nelson Street, Hastings. 110 metres and 140 metres. Transmits normal transmission pure D.C., C.W., also 'phone and I.C.W., 6 p.m. to 7 p.m., and 8 p.m. to 10.30 p.m.
- 2 A.S.—Albert Edward Simpson, Wellington. 160 metres. (No particulars.)
- 2 A.U.—Ian J. Innes, Radio Road, Nelson. 160, 170, and 180 metres. Transmits C.W. and I.C.W. Not working at the present time, but hopes to be going in the near future.
- 2 A.W.—Cecil Roy Clarke, 60 Edinburgh Terrace, Wellington. 120 to 140 metres. Transmits C.W., I.C.W., tonic train, and telephony, 8 p.m. till 2 a.m.
- 2 B.C.—Eric William Beale, Hastings. 140 metres. (No particulars.)
- 2 B.F.—The Wilkins and Field Hardware Co. Ltd., Nelson. 160 metres. (No particulars.)
- 2 B.H.—Paul Bareham, 213 Nelson Street, Hastings. 140 metres. Transmits C.W., I.C.W., and 'phone, Saturday 8-12, week nights 6-7 o'clock and 8-9 o'clock.
- 2 B.I.—Harry Neville Shrimpton, Brookside, Nelson. 140 metres. Transmits C.W., I.C.W., every evening 6.30 to 7 p.m., Mondays, Tuesdays, Thursdays, Fridays 8.30 to 10 p.m., Wednesdays, Saturdays, Sundays 8 to 11 p.m.
- 2 B.J.—Allan Evans, Wellington. 140 metres. (No particulars.)
- 2 B.L.—Wellington College Radio Club, Wellington. 140 metres. (No particulars.)
- 2 B.O.—Ereel Mervyn Goffe, Gisborne. 140 metres. (No particulars.)
- 2 B.Q.—Edmund Dolbel Edmundson, Napier. 140 metres. (No particulars.)
- 2 B.R.—Kenneth Arundel Lambert, Wanganui. 140 metres. (No particulars.)
- 2 X.B.—Physics Dept., Victoria University College, Wellington. 60 to 140 and 395 metres. Transmits C.W., I.C.W., tonic train, telephony. No fixed times, but generally between 7 p.m. and 11 p.m.
- 2 Y.M.—Gisborne Radio Co., Gisborne.
- 3 A.A.—Reginald John Orbell, Christchurch. 175 metres. (No particulars.)
- 3 A.B.—Francis Vincent, Christchurch. 175 metres. (No particulars.)
- 3 A.C.—Radio Society of Christchurch, 158 Manchester Street, Christchurch. (No particulars available.)
- 3 A.D.—Blake, E. G. F., Blaketown, Greymouth. 140 to 180 metres. Transmits C.W., I.C.W., telephony, 8 p.m. to 11.30 p.m.
- 3 A.F.—Leonard Francis Ball, 90 Nursery Road, Linwood, Christchurch. 130 to 185 metres, also sometimes from 100 to 130. Transmits C.W., I.C.W., tonic train, telephony, nightly from



- 6.45 till 7 p.m., and 8 p.m. till 10 p.m.
- 3 A.H.—Honry B. Courtis, 69 Grey Road, Timaru. 140 metres. Transmits C.W., I.C.W., 10 p.m. till 11 p.m.
- 3 A.K.—Ernest Reynolds, Ashburton. 140 metres. (No particulars.)
- 3 A.L.—Wilfred Milne Dawson, 263 Wills Street, Ashburton. 140 metres. Transmits C.W. and I.C.W., telephony, 6 p.m. to 7 p.m. every night, 8 p.m. to 9.30 p.m. Tuesdays, Wednesdays, Fridays and Sundays.
- 3 A.M.—Bernard Tyndall Withers, Christchurch. 180 metres. (No particulars.)
- 3 A.Q.—James Ingram Smail, 188 Hereford Street and 263 High Street, Christchurch, N.Z. 230 metres. Transmits telephony, 8 to 10 each Wednesday, Saturday, and alternate Sunday evenings.
- 3 A.R.—David Wm. Buchanan, 74 Wills Street, Ashburton. 160, 170, and 180 metres. Transmits C.W. at present 8.30 till 10 p.m.
- 3 A.S.—Ian James McLean Paterson, Timaru. 140 metres. (No particulars.)
- 3 C.A.—H. W. Lavallin-Puxley, Farmleigh, Ealing. 140 metres. Transmits I.C.W. and telephony, 8 till 10 every night.
- 3 C.B.—Clyde Romer Hughes Taylor, 45 Weston Road, St. Albans, Christchurch. 170 metres. Transmits C.W., I.C.W., and telephony, usually after 10 p.m. on week days and 8—12 week-ends.
- 3 C.F.—Albert E. H. Simpson, 99 Amberley Road, Christchurch. 160, 170, 180. Transmits C.W., I.C.W., and telephony, 7 p.m. to midnight.
- 3 C.G.—Harold Phillip Vincent Brown, Christchurch. 140 metres. (No particulars.)
- 4 A.A.—Frank D. Bell, Palmerston South. 120 to 180 metres. Transmits I.C.W. or voice for local and C.W. for D.X. work, week nights 8—11 p.m., N.Z. time, and till all hours Saturday and Sunday nights. Usually calls C.Q. on 170 metres midnight Saturday.
- 4 A.B.—Otago Radio Association Incorp., P.O. Box 660, Dunedin. 180 metres (concession 300 metres). Transmits telephony and modulated key, Tuesday and Friday evenings 8 to 10 p.m., Sundays 2.30 to 4.30 p.m.
- 4 A.C.—Robert Edward Robinson, Dunedin. 175 metres. (No particulars.)
- 4 A.D.—Arthur Edward Jordan, 17 Biggar Street, Invercargill. 175 to 180 metres. Transmits C.W. and telephony, 6.30 p.m. to 11 p.m. every night.
- 4 A.G.—Ralph Slade, 15 Harbour Terrace, Dunedin. 140 metres. Transmits C.W. (A.C.), C.W., and sometimes fone and buzzer modulated, intermittently from 6 p.m. to midnight, and after if necessary.
- 4 A.H.—Ian Sinclair Macdonald, 45 Royal Terrace, Dunedin. 140 metres. Transmits C.W., I.C.W., and telephony, any time.
- 4 A.J.—Claude Norman Douglas McGregor, 131 Engleton Road, Mornington, Dunedin. 140 metres normally. Transmits mostly telephony, occasionally I.C.W., fairly regularly on Thursday evenings at 8 o'clock.
- 4 A.K.—William L. Shile, Post Office Box 519, Dunedin. 130 to 180 metres. Transmits C.W. and I.C.W., fone, dark to midnight.
- 4 A.L.—Arnold Henry McLeod Crubb, 53 Sligo Terrace, Roslyn, Dunedin. 155 metres. Transmits C.W. and 'phone.
- 4 A.M.—William McGill, Crockett, Palmerston. 140 metres (and lower). Transmits C.W., I.C.W., and fone, 6.30 p.m. until midnight, or later by arrangement; Saturday from 6.30 p.m. till Sunday 4 a.m.
- 4 A.O.—Thomas Edward Scott, Dunedin. 140 metres. (No particulars.)
- 4 A.P.—Invercargill Amateur Radio Club, Hallenstein's Buildings, Invercargill. 170 to 190 metres. Transmits C.W., I.C.W., and telephony.
- 4 A.R.—W. Grey Wilkinson, 21 Melrose Street, Roslyn. Transmits C.W. and telephony nightly N.Z. M.T.
- 4 X.O.—Professor Robert Jack (for University of Otago), Dunedin. 395 metres. (No particulars.)
- 4 Y.A.—British Electrical and Engineering Co., Dunedin. 370 metres. (No particulars.)
- 4 Y.O.—Radio Supply Co., Dunedin. 370 metres. (No particulars.)
- EXCHANGE 2 Phillips B 2 for D 2 Lamps.**  
**SALE, Manhattan Speaker, (second hand) 10 inch mouth £5/0/0. Wm. Henderson, Box 48 COLAC, Victoria.**
- D.X.**  
 Mr. J. Rowe, of Punchbowl, forwards his D.X. list from 31st August to 14th September. Results were on I. Myers valve:—2GQ, 2HM, 2RJ, 2CR, 3XF, 3BQ, 3OT, 3BD, 3BM, 3BG, 3XO, 3DB Morse 4 H. Morse, 5AN, 5DN, 5CT, 5BF. K.G.O. on 1st September.

Look for Colville Moore on the Colored Paper !



## AN EXCELLENT CRYSTAL RECEIVER

By "Insulator."

YOU will know that old song, which starts, "I'm Forever Blowing Bubbles," to be applicable to me, it should read, "I'm Forever Answering Letters." These letters—Oh, Glory—they seem to come nineteen to the dozen — sometimes I am snowed under and have to gradually wear the pile down by consistent application.

This is Sunday, and don't I know it; so do the neighbours, for "Querists" come from all directions to me on Sunday. The bus driver is making a permanent stopping place at my home; he tells me that some of his passengers just pass up their fares and mention my name as their destination.

However, my intention is to describe a "natty" little crystal receiver. I have just finished making it, and while writing, I am listening to an

auto-harpist from Farmers, and a boy soprano, both of which came in very well on this set.

The photographs will show you the completed article which is very simply made and well worth the effort. You will note the three terminals on the left side of the panel. These provide for series or parallel tuning of the condenser. I will tell you about this later. Here is what you need for this receiver:

1 piece of bakelite or ebonite, size 9in. x 6 in. x 1/8in.

1 77a 23 variable condenser (.0005).

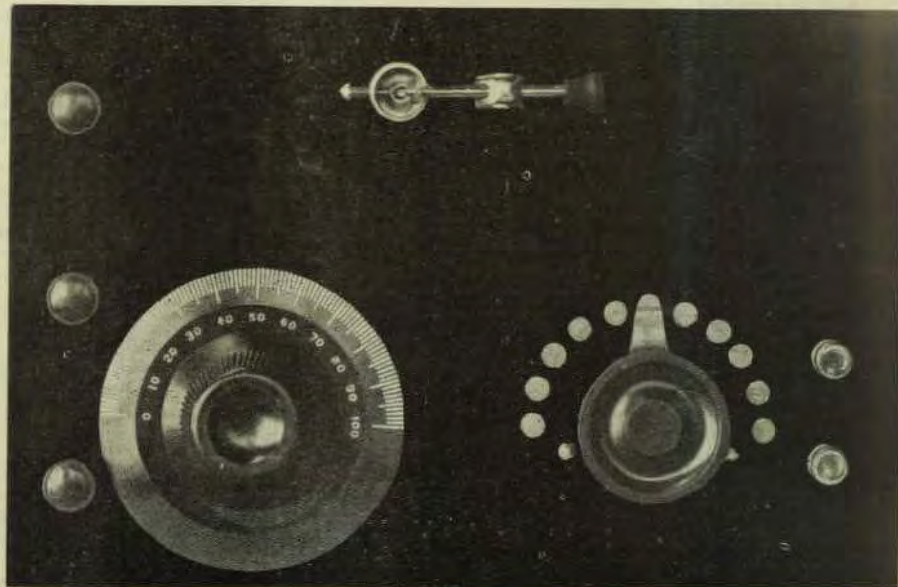
1 switch arm.

11 contact studs.

2 stops.

2 terminals.

3 binding posts.



Front View of Panel.



- 1 Grodan crystal detector and cup.
- 1 Grodan tube, 3 1/2 in. in diameter.
- 1 yard bell flex.
- 4 oz. No. 26 D.C.C. wire.
- 1 3 in. dial.

You will note I have again specified the 77a 23 variable condenser. This only requires a 3/8 in. hole for fixing to panel. Bakelite is preferable to ebonite, but even good dry 3 ply wood, well shellaced, will suffice for the panel.

Now this little set will fit nicely into a small cabinet. Personally, I haven't given any dimensions for this as most people prefer to design their own—when I say most people, I don't include myself in "most," as I am by no means a wood worker. I remember one time I started to make a medicine chest—that is as far as it got—started!

But back to our set. The first job to be done is to wind the former. Pierce 3 holes in the tube 1/4 an inch from the end and thread the 26 D.C.C. wire through and wind on 110 turns, taking the tapping on the outside of the coil at every tenth turn. Get that clearly now? Take a tapping at the 10th, 20th, 30th, 40th, 50th, 60th, 70th, 80th,

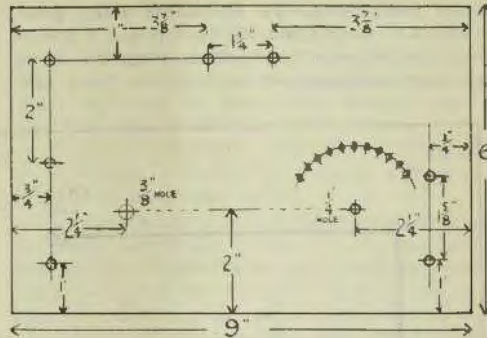
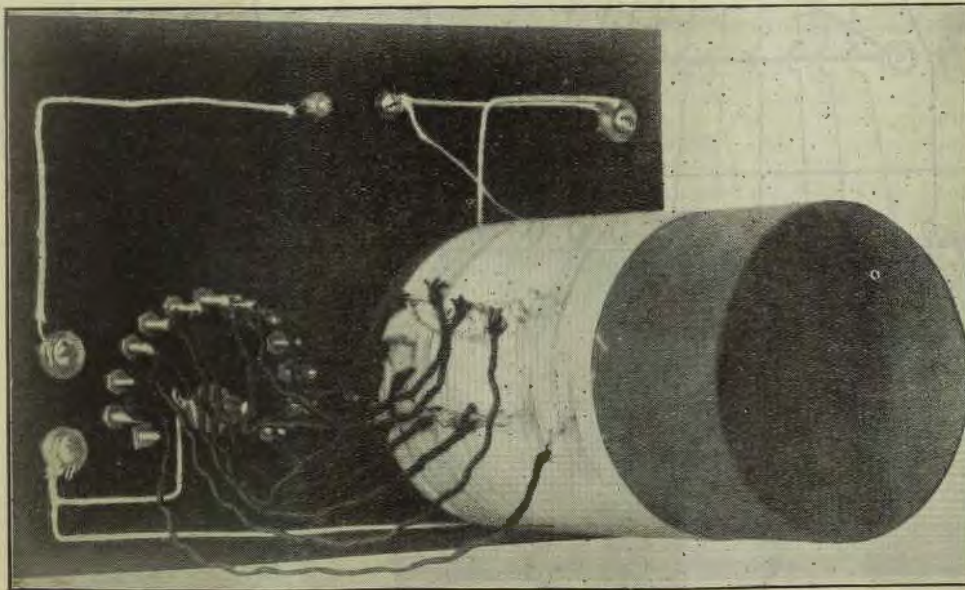


FIG. 4

90th, 100th, and the last turn, 11 taps in all (see Fig. 3). If this is wound tightly, you will not have any occasion to shellac it.

Trim up your bakelite, ebonite or wood — whichever you have for a panel, and polish it; if bakelite, or ebonite, with Brasso. Next mark



Back View of Panel

as for components, the dimensions being given in Fig. 4. Once again let me tell you I always space the centres of my contact studs  $3/8$  of an inch apart, and again let me point out that I can-

not give you the exact dimensions for the contact studs, on account of the varying radii of these articles. Still, I know you will manage O.K. Assemble your contact studs, switch, terminals, bind-

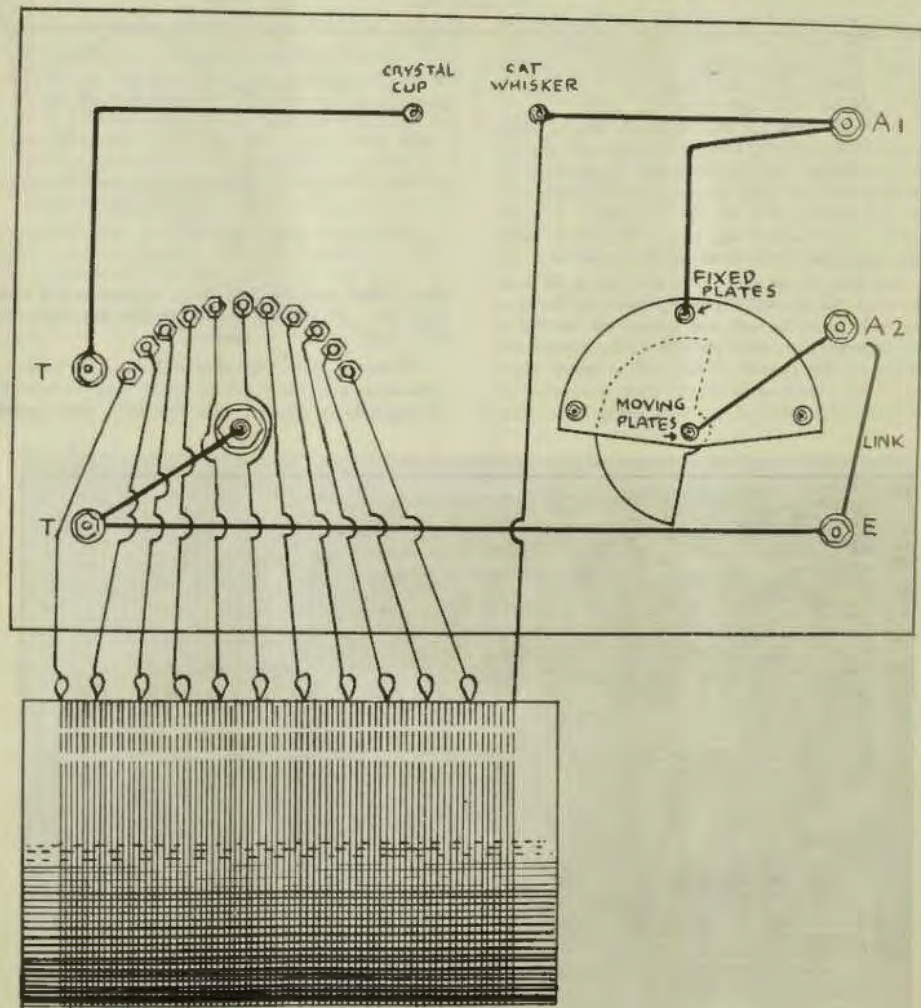


Fig. 3.

Watch the Colored Paper!



ing posts, crystal detector, and variable condenser. Binding posts, by the way, I call those terminals which have no hole, but which have a milled nut screwing down to a base. Ask for binding posts to distinguish from telephone terminals. On the set I made, I intended to have nickelled binding posts, and at the last minute on Saturday I purchased three, which were given me in a nice little envelope. This I opened on Sunday morning, only to find that one was odd. Hence the bakelite top terminals.

Most people I know, must be gifted like I am, in so far as making receivers on Sunday is concerned. I know I always find that I am short of a few nuts or washers, or screws, just when I need them most and just when every place is closed. Then the whole house is turned upside down in a hopeless search for something to suit. Nuisance, isn't it? (Mrs. Insulator will endorse this.) However, wire up the panel top telephone terminal to detector, crystal cup to top aerial terminal (A1), thence to fixed plates of variable condenser. Movable plates of variable condenser to middle aerial terminal (A2), earth terminal (E) to switch arm, and then on to the bottom telephone terminal. Leave the panel down for a few moments and scrape the insulation off the tappings. Cut the bell flex into 6 inch lengths and bare 1/4 of an inch off each end. While this is being done, put the soldering iron on to heat, and when hot, put a drop of solder on the end of each stud. This is known as tinning, and is easily done if you put a small piece of flux or a drop of Baker's Soldering Fluid on to the end of the stud and then tipping with the iron and leaving a small ball of solder on the end. Having done this, lay the bare end of the flex on the tinned stud, and touch again with the iron. This will solder the flex to the studs, and you can now solder each piece of flex to its respective tap. When soldering, keep your iron clean by dipping it into the soldering fluid occasionally. I can do the job more quickly than I can tell you since a friend showed me the way. The last connection is completed by connecting the beginning of the coil to crystal cup, or to A1. Place the former around the variable condenser, that is, condenser inside the tube and everything should be O.K. Oh! A .001 Wetless phone condenser connected across the telephone terminals is an improvement. Now look at your handiwork. The binding posts a bit loose, are they? Pack a condenser washer behind. Everything else al-

right? Good! Insert a piece of N.H.M. Galena in the cup and connect your phones to the telephone terminals, earth to E, and aerial to A2. This places the aerial tuning condenser in series, which is better for short wave lengths such as amateurs and Broadcasters (2BL).

To receive Farmers, link A2 to E, using a piece of bare wire for the purpose, and connect earth to E, and aerial to A1.

The condenser is now in parallel, which brings the wave length up. Tune in with the switch first and then gradually bring the condenser round until the signals are loudest. It won't take you long to understand the set, and you will be very pleased with the results achieved. "This station is now closing down, etc., etc. Goodnight everybody, go-a-dnight."

#### CAN YOU GIVE IT A NAME?

Mr. Barlow, of Armidale, N.S.W. (2GQ) hands us a query which we pass on to the gang in the hope that someone can tell us the Q.R.A. of the chirper. Here's what 2GQ says:

Has any experimenter heard the call signals (on approximately 120 metres) 9LCO and 12LCO? Listened to this station on Saturday and Sunday last between the hours of 1730 and 1945 and he gave the following consistently (in fact he repeated a lot of traffic in either the French or the Mexican language). "V's" and signs 9LCO and 12LCO and sent LPZBK. BK. He then repeated five times "punch ZWO and ZSS." He was on C.W. and although weak and faded a fair amount, his signals were QSA enough to read well. Probably he is a commercial station, but cannot locate him in any list I hold. Also, can you inform me the Q.R.A. of station 2XD? He was repeating the following for 2½ hours on Saturday evening last from 1715 to 1950. "ABC de 2XD."

(We have the latest lists, but neither 9LCO nor 12LCO are shown in the United States files. At a rough guess we should say they were stations of the United Fruit Co., which intercommunicate in the vicinity of Panama. Can anybody tell us?

(2XD is not shown in our N.S.W. or N.Z. list. He may be a very recent N.S.W. licensee. The only 2XD we have on record is the Ware Radio Co., New York City. We wouldn't like to say this was the bird 2GQ heard—still you never can tell, can you?)

**The Colored Paper in this issue tells a story that will interest you!**



## NOVEL DESIGNS IN CRYSTAL DETECTORS

BY W. A. STEWART.

**M**OST amateurs are well acquainted with the conventional "ball-socket" type of crystal detector, and a complete set of parts for constructing such an instrument may now be purchased so cheaply that it does not pay to make them. The main parts are illustrated in Fig. 1, and are too well known to be described. These can be purchased with all the necessary bolts, screws, etc., from firms whose announcements appear on the advertisement pages of this paper for a mere trifling sum.

The simple ball-socket permits the necessary movements for the desired selectivity of "points" without the use of any complicated mechanisms, and there is little doubt that this method is the most efficient and certainly the most popular in use today.

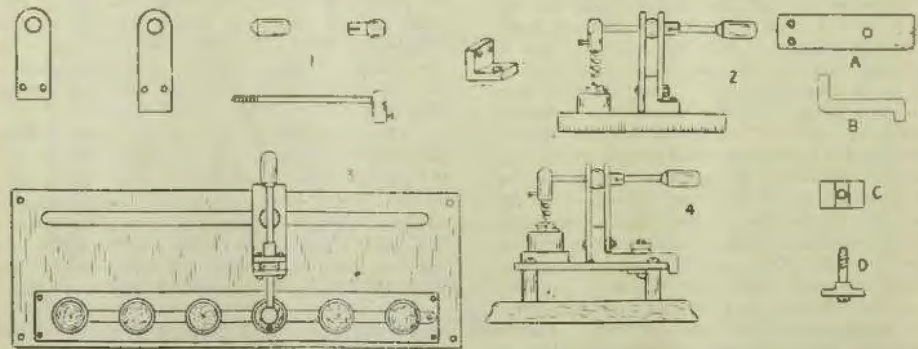
The usual method of assembling the parts is to mount them on a small ebonite base in the manner indicated in Fig. 2. Two terminals are sometimes included, one connected to the crystal cup and the other to the upright pillar. The instrument is then screwed down to the baseboard of the receiver or mounted on an ebonite panel, in which case no base or terminals will be required.

### EMERGENCY CRYSTALS.

Most crystals have a habit of losing their sensitivity at inopportune moments, and where only one crystal cup is provided it is then necessary to change the crystal. If the crystal has been mounted in the cup with Woods' metal, this operation takes a considerable amount of time and gives an equal amount of trouble. To prevent this happening, more than one crystal cup should be fitted to the detector.

The instrument shown in Fig. 3 not only indicates a clear break from the conventional model, Fig. 2, but is in every way more efficient, convenient, and reliable. Six crystal cups connected in series by five short strips of copper foil are mounted on a piece of 3/8 or 1/2 inch sheet ebonite about 7 in. long and 1 in. wide. A small tab of foil is left projecting from one of the cups, as shown, for connecting-up purposes. The holes for the crystal cup screws should be well recessed to take the screw-heads, and afterwards filled in with melted paraffin-wax.

From a sheet of 1/16 in. brass cut out a piece about 8 in. long by 2 1/2 in. wide, and cut a slot 1/4 in. wide in the position shown. Mount the ebonite with the linked-up crystal cups on the opposite side of



SEE PAGES 2 and 3 FOR FROST LINES.



the plate by means of a small screw or bolt in each corner, and make quite sure that there is no electrical connection between any of the crystal cup screw-heads and brass plates.

If ebonite cannot be obtained thick enough to allow the counter-sinks to be sufficiently deep, another slot should be cut in the plate, or six holes drilled directly under each screw-head, and at least three times larger than the diameters of screw-heads. This is most important, since the crystal cups must be perfectly insulated from the plate, which is electrically connected to the detector pillar and catwhisker.

All the usual parts are utilised in constructing the remainder of the detector with the exception of the small brass angle-piece. A piece of brass of about the same thickness and width as this, and about 2 in. long, is drilled as shown at A, and bent at right angles at the dotted lines to the shape indicated at B.

The large hole should be drilled to allow the shank of an ordinary terminal to slide freely in same, the two smaller holes being provided for the bolts as in the original angle-piece. A small piece of 1/8 in. brass is drilled through the centre and filed to an inverted "T" shape. (See C. and D.) The projecting portion should be made to slide freely and truly in the slot, and the terminal shank should be soldered in the hole. The general arrangement of the detector will be easily understood by referring to Figs. 3 and 4.

It will be seen that by unscrewing the terminal nut, the "Z" piece carrying the pillars, detector arm and catwhisker can be pushed along the plate to any one of the crystals. Thus, if a crystal should fail during an interesting transmission, it will be comforting for the operator to know that there are five other chances.

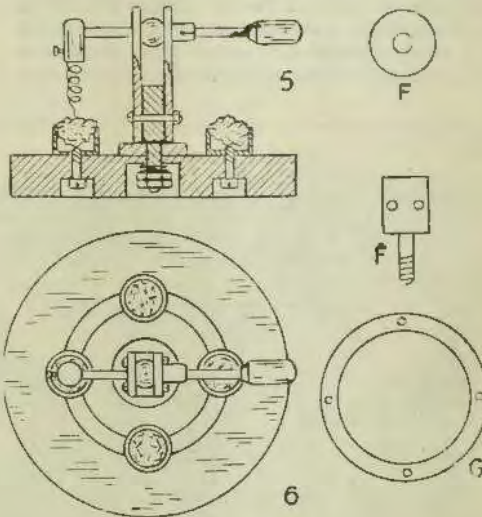
The instrument may be attached to any suitable base by four fairly long wood screws and four short lengths of brass tubing as shown in the end view, Fig. 4. The other connection may be taken from any part of the brass plate.

**ANOTHER "MULTI-CRYSTAL" DETECTOR.**

The detector shown in Figs. 5 and 6 may have four or more crystal cups, but instead of being arranged in a straight line they are in circular

formation, equidistantly separated on a disc of ebonite and connected to each other by the copper foil washer G. A round ebonite plate as used for an end plate on a variable condenser will be found quite suitable. The detector arm is made to revolve by dispensing with the usual angle-piece and substituting a flat piece of brass shaped as shown at F, having the lower portion rounded and threaded. The arm and supports are bolted to this in the usual way.

A hole slightly larger than the diameter of the rounded portion is drilled through the centre of the ebonite disc and recessed on the under side to



accommodate a spring washer and two lock nuts. (See Fig. 5.) A thick brass washer, E, is placed between the pillar and the ebonite disc to prevent the edges of the pillar cutting into the ebonite, and to permit an easy swivelling movement.

Connections are made from one of the crystal cups or copper-foil washer, and from a piece of flex soldered to one of the supports.

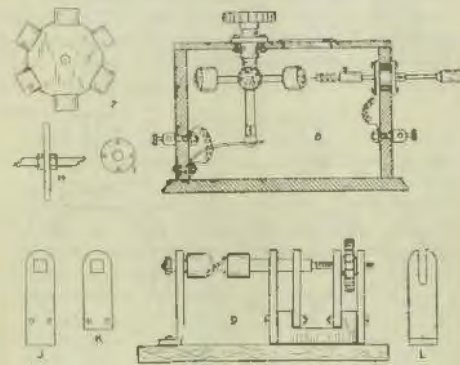
A novel detector having six crystal cups enclosed in a small cabinet is indicated in Fig. 8. This detector has the additional advantage of being absolutely dustproof.

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



**AN ENCLOSED DUSTPROOF CRYSTAL HOLDER.**

By means of a hacksaw a small groove is cut across the diameter of the base of each crystal cup, the cups then being fitted and soldered round the edge of a brass disc about 2 in. in diameter, as shown in Fig. 7. A hole is drilled through the centre of the disc to accommodate a brass spindle, which is clamped firmly to the disc by two nuts. (See H.) An ebonite panel at the top of the cabinet is fitted with a fairly long brass bush, which forms the main bearing for spindle. A short length of brass tubing is placed between the bottom of the bush and the top side of disc, allowing only sufficient play for the spindle to revolve freely. A fall-socket is soldered to the bottom end of the spindle to make a moving contact in a hole drilled in a strip of fairly stiff spring brass attached at the other end to the inside of cabinet. A hole



about 1½ in. in diameter is cut in the ebonite panel in the position shown, and over this is glued a round piece of glass for inspection purposes. An old watch-glass will answer admirably.

In the place of the usual stamped supports each side of the ball joint, two small metal discs, I, are used. A hole large enough to allow the usual movement of the ball joint should be drilled through one side of the cabinet in a direct horizontal line with the centre of the crystal cups, and the ball-socket fitted as shown with one disc inside and the other outside the cabinet.

Two terminals may be included, one connected to the spring brass arm, and the other to one of the discs of the ball-socket or the detector arm. An

ebonite knob is fitted to the top of the spindle, and, if desired, a scale and pointer can be added, the scale being marked "Silicon," "Hertzite," "Permanite," and so on, to indicate the different specimens being used.

The success of any crystal detector will depend upon the robustness of design. Every part must be perfectly rigid so that the slightest vibration will not affect the working of the instrument. Unfortunately, this important feature is often overlooked.

**PERIKON—ANOTHER IMPORTANT POINT.**

The success of the Perikon detector depends, first, upon obtaining a perfect parallel movement between the two crystals, and, secondly, upon rigidity of design. The usual arrangement is to mount the movable crystal cup on a spring brass arm. No doubt this method is cheapest from the manufacturer's point of view, but it is not efficient. The arm is essentially fixed at one end; therefore, there must be a movement on an opposite axis to the desired parallel movement, which results in the two crystals grating together, to accomplish their ultimate ruin. This is the direct cause of so many Perikon detectors failing to give satisfactory results. We know that dust is the natural enemy of the crystal; it is the dust created by the rubbing of one crystal against the other that is the root of the trouble.

In the method to be described a perfect parallel movement is obtained by employing a square arm arranged to slide horizontally through two square holes in the supports: A small spindle as used for the moving plates of a variable condenser is quite suitable for this purpose. The squared portion should be filed perfectly smooth and true, and made a perfect sliding fit in the holes in supports J and K. Another pair of supports of exactly the same dimensions as J and K are provided with round holes at the top slightly larger than the diameter of the threaded portion of spindle.

A small ebonite disc is bushed with brass and drilled and tapped to engage the thread on the spindle. The movable cup is attached in any suitable manner to the extreme end of the squared portion of spindle. The method of assembling the instrument is clearly indicated in Fig. 9, a piece of "channel" brass or a built-up equivalent forming the foundation for supports. The support carrying the fixed crystal cup should be slotted, as shown at L, to permit selective adjustments. The cup is fitted with a terminal before mounting the crystal. The most usual arrangement of the crystals is a

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point of copper pyrites pressing against a flat surface of a piece of zincite.

These designs are entirely novel, and demonstrate the great improvements that may yet be effected with regard to crystal sets. Certainly, there are one or two commercial sets fitted with more than one crystal, but in most cases two crystals are the limit which manufacturers at present have reached.

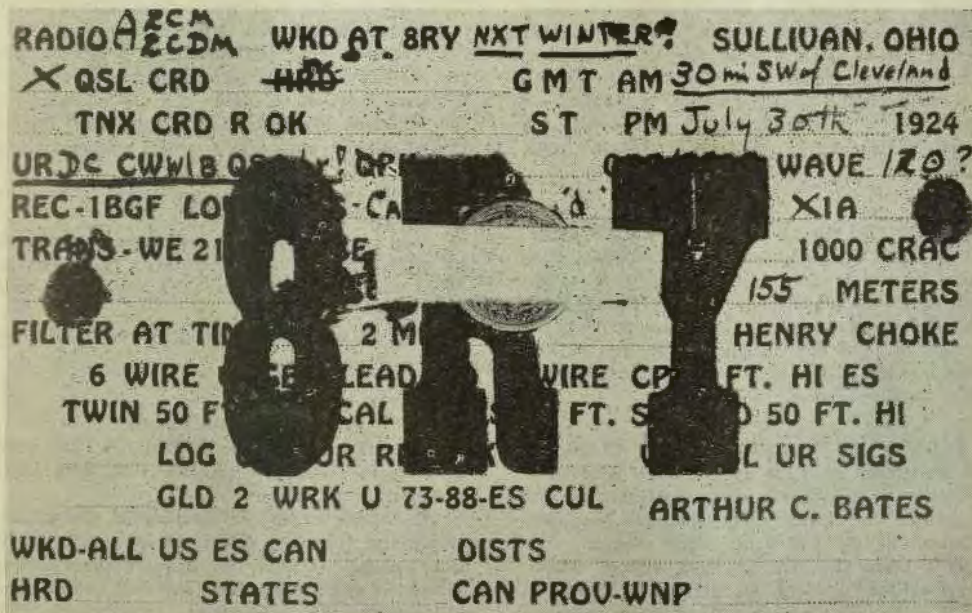
Even these sets are not entirely satisfactory, and there is no doubt that the amateur who approaches experimental work in connection with crystals in the right manner, stands to benefit considerably by the improved results that he will obtain and, above all, the greater reliability of his instrument.

Everyone who possesses a crystal set has at one time or another experienced the annoyance caused by the failing of a crystal at a critical mo-

ment. In many instances a crystal does not contain a large number of sensitive spots, and therefore much time is wasted before the correct adjustment is found again.

With the instrument described above, this disadvantage is not present, for with six or more crystals practically ready for use, one would certainly be found with a large number of sensitive contacts and the necessary re-adjustments be made with speed and ease.

All that is required to construct these novel instruments is patience. The outlay is really so small that any keen amateur who wishes to make his set efficient and attractive, will not grudge it in the least. Those lucky enough to possess a "scrap box" will, no doubt, be able to construct most of the instruments from the odd material they have, which can be made to look very neat.



The photograph shows a Card received by 2CM from 8RY, Ohio, U.S.A. Note the coin gummed in the middle. On the back is written, "This will help out your bill for postage stamps o.m. You can spend it on your next trip up to the States. Hi?"

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#### WOOLLOOWIN RADIO CLUB.

The above club held their fortnightly meeting on the 8th inst. The President, Mr. H. Kington, was in the chair, and there was a fair attendance of members. One new member was elected, and several names were mentioned as likely members. After business was disposed of, Mr. Grant, one of the members, gave a lecture on the growth of wireless from the very first experiments till the present day, illustrating his remarks by blackboard diagrams. Mr. Grant had gone to great trouble to prepare his lecture, and it was much appreciated by those present. This is the first of a series of lectures by the members which will lead up to the complicated circuits by degrees. An appeal is again made for other clubs to correspond with the club, the address being c/o H. Jear, Lisson Grove, Woolloowin.

#### ROZELLE TRAMWAY DEPOT RADIO CLUB.

This Club commenced action on Monday, September 8th, with 100 members, and it is anticipated that it will develop into the largest club in the Metropolitan area. Splendid support is being received, and the class of instruction is well attended. Mr. Morrison is instructor, and the organiser is Mr. Ford.

#### SYDNEY HIGH SCHOOL RADIO CLUB.

On September 11th, the Sydney High School Radio Club gave a lecture and demonstration to the members of the wireless club which has been lately formed at the Cleveland Street School. The members from the Sydney High School Radio Club, the Vice-President, Secretary and Treasurer, arrived at the time appointed, and were welcomed by quite a large gathering.

Mr. Pont (Treasurer) delivered a lecture on the crystal, showing how it detects, and contrasted it with the way rectification is accomplished by the

valve. He then went on to explain what is meant by the characteristic curve of a valve.

On 16th, the Sydney High School Radio Club held a general meeting at which were present a large number of the members.

At the meeting the club's new set was discussed, which is now almost completed, and the best methods of arranging those components which were as yet not mounted. Other business was also discussed, and it was mentioned that the club might be able to obtain a permit for some of the members to look over some transmitting station such as Farmers or Pennant Hills. It is probable that in the near future this will be done.

The meeting closed at 12.30.

#### CONCORD AMATEUR RADIO CLUB.

The usual weekly business meeting of the Concord Amateur Radio Club was held at the club-rooms, Wallace Street, Concord, on Thursday, 18th September, at 8 p.m.

The meeting was well attended, and several important matters were dealt with.

These included the election of a new member, the reading and reception of minutes of second and third meetings of delegates of clubs affiliated with the Wireless Institute of Australia, and finalisation of the club photographs, which will be published soon.

After business had been finished, transmitting was carried out.

Any persons hearing these tests are requested to notify the honorary secretary, W. H. Barker, "Euripides," Wallace Street, Concord, who would be glad of these reports.

Transmissions are carried out every Thursday from 9.30—11 p.m.

#### WAVERLEY RADIO CLUB.

Waverley Radio Club held its half-yearly meeting on Tuesday, September 16th, with Mr. E. Bowman in the chair.

The delegate to the meeting of the affiliated clubs, Mr. Burrows, submitted his report of the last meeting. Mr. A. W. Stewart then moved—"That the club's delegate at the next council meeting propose that all amateur transmitters voluntarily agree to close down between the hours of 8 and 10 p.m., unless under exceptional circumstances." Mr. Stewart supported his motion with the opinion that such a restriction was bound to

FROST LINES ARE SHOWN ON PAGES 2 and 3.OST LINES.



come, and it was better that it should be done voluntarily. The motion was seconded by Mr. G. Thomson, and carried.

Arrangements were then made to proceed with the construction of the club's aerial and receiver.

The half-yearly elections were then held. Mr. Graham proposed Mr. Perry as president, the motion being seconded. Mr. Howell proposed Mr. A. Burrows; this was also seconded. Mr. Burrows then signified his intention of declining in favour of Mr. Perry. The meeting was then notified, however, that Mr. Perry did not wish to stand for president. The elections finally resulted as follows, all being elected unopposed with the exception of the committee:—President, Mr. A. Burrows; vice-presidents, Messrs. E. Bowman and J. Muller; secretary, Mr. R. Howell; treasurer, Mr. J. Simpson; publicity officer, Mr. A. Burrows; auditors, Messrs. W. Howell and W. Anderson. Messrs. Stewart, Thomson, Howell, and Anderson were nominated as committeemen, Messrs. Stewart and Thomson finally being elected.

The competition for the best and most efficient crystal set was won by Mr. J. Millar, whose set cost 7/6. Mr. A. Burrows (cost 15/-) ran second, and Mr. W. Stewart third, his set costing £2/10/-.

#### ESPERANTO—RADIO

We have received from Mr. A. H. Epton, Hon. Secretary Internacio Radio-Asocio, a copy of a circular describing the foundation of a world wide Esperanto-Radio Association. As a matter of experimental interest, we are publishing a copy of the circular, and those desiring to link up with this organisation are invited to write to Mr. Epton, at 17 Chatsworth Rd., London, E.5.

#### Internacia Radio-Asocio.

President: Dr. Pierre Corret (8AE), Comite Intersocietaire de T.S.F., 97 Rue Royale, Versailles, France.

Honorary Secretary: Harry A. Epton, F.B.E. A., 17 Chatsworth Road, London, E.5.

#### OBJECTS.

1. To facilitate relations between radio users in all parts of the world, by means of the international language Esperanto.
2. To furnish technical assistance and information of an international character by means of Esperanto to those interested in radio, whether Esperantists or non-Esperantists.
3. To elaborate the Esperanto radio dictionary.

4. To publish an "Internacia Radio - Revuo," which, inter alia, by means of Esperanto summaries of original articles from various languages, will place at the disposal of its readers technical documents hitherto obtainable and understandable only with considerable difficulty.

5. To deal with any other matters which may be deemed to come within the scope of an international radio association of this character.

#### MEMBERSHIP.

Membership is open to any person, Esperantists or not, who is interested in radio in an amateur or professional capacity, and who is in favour of the adoption of Esperanto as the International Radio Language.

#### SUBSCRIPTION.

The annual subscription in Great Britain is 1/-; in other countries an amount equal to 1 Swiss franc; payable to the Hon. Secretary, at the above address.

Mr. F. W. Larkins, of Amalgamated Wireless (A/sia) Limited, has returned from Melbourne, where he has been supervising the Company's display at the All-Australian Manufacturers' Exhibition, and also at the Victorian Royal Agricultural Show.

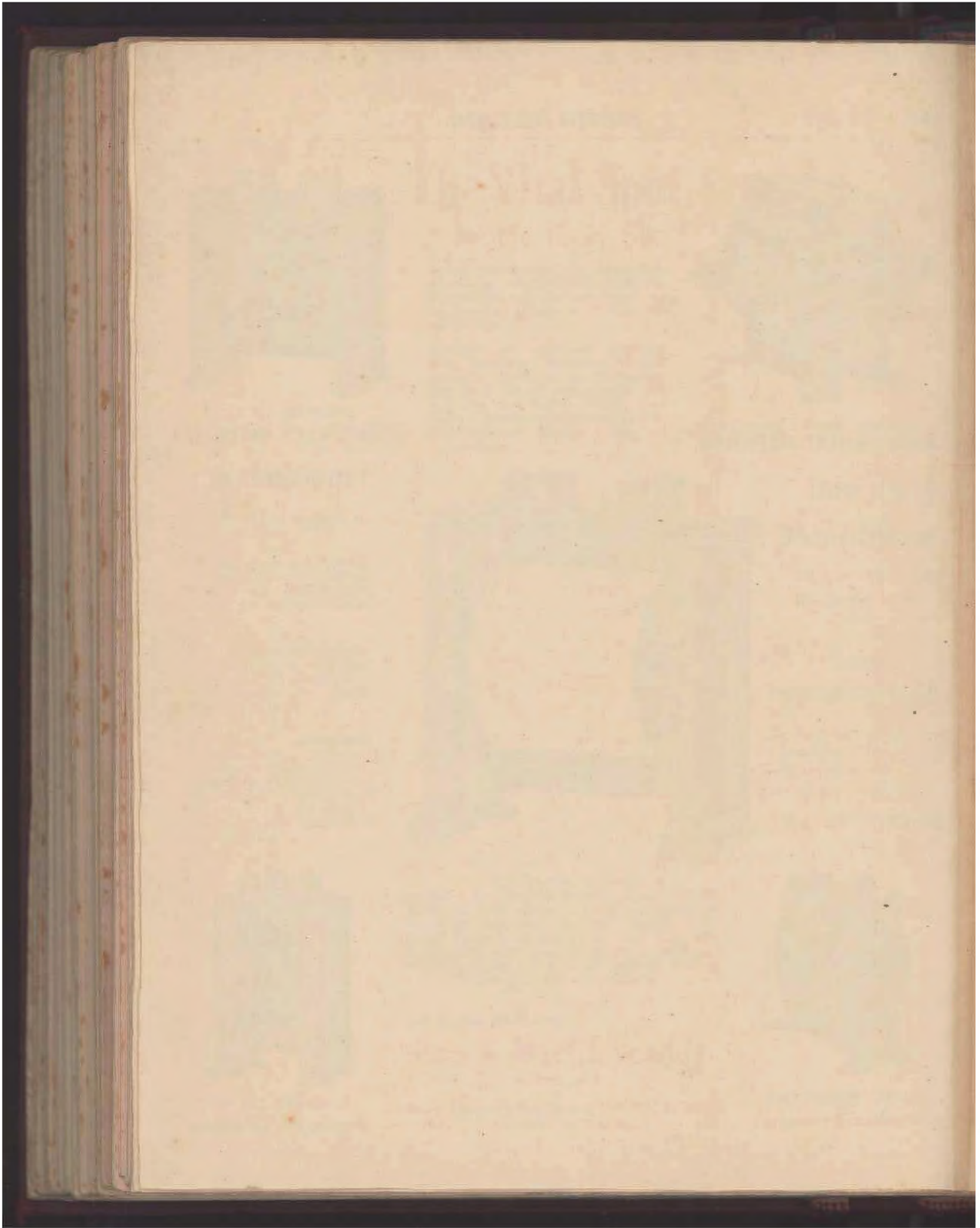
He says the Manufacturers' Exhibition was one of the finest displays of Australian manufactures that has yet been put on in Australia. Many of the working exhibits are somewhat of a revelation to visitors, and as the exhibition will be open for the next two months, there can be little doubt that it should prove most successful in demonstrating Australian manufacturing progress.

Even the Holy Land has succumbed to radio. The installation of radio apparatus in Palestine was given official sanction by a government ordinance issued June 3, permitting all inhabitants to instal radio sending or receiving instruments. The British Government is planning to instal a powerful broadcasting station on the Mount of Olives, the report said.

When storage battery clips become green, soak them in a hot solution of bicarbonate of soda and water. Afterwards wash them in clean water and set them aside to dry. When they are dry, rub them over with a light film of vaseline. Do the same to the lugs on the storage battery.

SEE PAGES 2 and 3 FOR FROST LINES.







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250 Miles Guaranteed Reception on Loud Speaker.

1 Bakelite Panel, 18 x 6 1/2 x 9/16	4 11 2
1 .001 Variable Condenser, with Vernier	1 10 0
2 30 ohm Rheostats	0 10 6
1 Battery Switch	0 3 0
4 N.P. Terminals	0 2 8
1 45-Pin Panel Plug	0 2 0
1 Extension Handle	0 1 0
1 .00225 Condenser and Grid Leak	0 9 0
2 Valve Holders	0 12 0
2 Jefferson "Star" Transformers	2 8 0
1 Single Circuit Jack	1 10 0
Maple Cabinet	28 1 0

**ACCESSORIES**

4 Manned I.C. Cells, 180 to 2000 meters	1 71 0
4 UV-201A Valves	4 10 0
1 6V-40 amp. Accumulator	1 3 0
1 45-pin B. Receptor	1 5 0
Loud Speaker and Head Phones, as detailed, see price list	20 15 0

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UV-200	
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It is our intention that every article in this list shall be truthfully described. Therefore, whenever you buy from us to be satisfactory to you in every detail. You take no risk whatever in sending us your order, for unless you are completely satisfied with the goods and your selling, you may send back everything you buy from us and we will promptly return your money and all transportation charges you have paid.

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300 Miles Guaranteed Reception on Loud Speaker.

1 18 x 9 x 17/16in. Bakelite	48 3 0
1 .001 Variable Condenser, with Vernier	1 10 0
1 .00225 Variable Condenser with Vernier	1 7 0
2 45-Pin Panel Plugs	0 4 0
1 45-Pin Panel Plug	0 3 0
1 45 Extension Handle	0 1 10
2 30 ohm Rheostats	0 10 0
1 Battery Switch	0 3 0
4 N.P. Terminals	0 2 8
4 V.T. Holders	0 10 0
2 Jefferson "Star" Transformers	2 8 0
1 .00225 Fixed Condenser	0 10 0
1 Frustrum Variable Leak	0 8 0
Panel Wires, Solder, etc.	0 2 0
1 Maple Cabinet	2 5 0
1 Single Circuit Jack	0 4 0

**ACCESSORIES**

4 Manned H.C. Cells, 180 to 2000 meters	22 6 0
4 UV-201A Valves	5 0 0
1 6 volt 40 amp. Accumulator	2 3 0
5 45-volt "D" Batteries	1 3 0
Head Phones and Loud Speaker, as selected, see Price List	20 15 0



**SOME DX LIST.**

**CAN YOU BEAT IT?**

The list printed below shows the stations logged by U. Preston Smith (2 Z.Z.), Cremorne, Sydney. When we consider that a lot of these stations were logged on detector only, and that never more than two valves were used, this list is one of the best we have seen for a long time. A V24 is used as a detector, and an Edison A.R. as audio amplifier. Mr. Smith says that 6 C.G.W. can be heard practically any night calling C.Q.

**N.S.W.**—2G.Q, 2HM, 2CR, 2CH, 2LJ, 2BM, 2SO, Vic.—3AM, 3AP, 3BD, 3BG, 3BH, 3BL, 3BM, 3BP, 3BQ, 3BY, 3DB, 3DD, 3HD, 3JP, 3JU, 3LS, 3QW, 3SW, 3XP, 3TM, 3EP, 3JH, 3HL, 3OT, 3RY, 3ZR, 3UX, 3BC, 3BU, 3BV, 3FH, 3EF, 3AR, 3BT.  
**Queensland.**—4AU, 4CK, 4EG, 4DO, 4GE, 4AN, 4CM, 4AK.

**S.A.**—5AC, 5AD, 5DA, 5AE, 5AI, 5AH, 5BQ, 5BD, 5DO, 5BF, 5BG, 5AV.

**W.A.**—6AG.

**Tasmania.**—7AA, 7AB, 7BN, 7BK, 7AL, 7BC.

**N.Z.**—1AA, 1AX, 1AM, 1AH, 1AG, 2AC, 2AP, 2AI, 2AW, 2AO, 2XA, 2AQ, 2LZ, 2AF, 2AE, 2AR, 2AA, 3AD, 3AF, 3AB, 4AA, 4AD, 4AG, 4AY, 4ET, 4AH, 4AO, 4AM, 4AT, 4AR, 4AW, 4AK.

**U.S.A.**—1VHT, 1VC, INCO (?), 1OR, 2RD, 2FT, 4AOV, 4MI, 4CAY, 5AW, 6KA, 6CKR, 6KKR, 6RI, 6CKP, 6AV, 6AOV, 6AOS, 6GV, 6AVV, 6COP, 6AAV, 6KT, 6VY, 6CDE, 6CGW, 7GD, 8BAK, 8GZ, 8CM, 8CF, 8ZT, 8MC, 8YA, 8LRE, 8JTB, 8HNT, 8AVR, 8BN, 4ACT, 9BG, 1ACK, 7GA, 9BTE, 1GX, 6BV, 1AR, 8AAU, 6AVT, 6BV, 6AAO, 4ACT, 5TAD, 3AAN.

**D. X.**

R. W. Woodhouse, West Maitland, using mainly detector only, has pulled in the stations mentioned below. Two sets are used on his station; one consists of 1 stage of H.F. transformer coupled Det. and 2 L.F., and the other is the well known P1 single valve. K.G.O. has been heard on the P1, and on 2 valves, 4EG (Queensland) was received on a 6ft. indoor aerial during daylight.

**N.S.W.:** 2HM, 2UW, 2SO, 2CM, 2RD, 2YM, 2YD, 2AC, 2ZG, 2CS, 2YQ, 2YI, 2GR, 2EP, 2XA, 2LO, 2ZN, 2YU, 2ZX, 2BK, 2CR, 2GW, 2ZL, 2ZZ, 2BZ, 2RY, 2KC, 2CI, 2EG, 2BF, 2BB.

**Victoria:** 3BM, 3BY, 3ZL, 3ZZ, 3YU, 3BU, 3BE, 3BA, 3UM, 3LN, 3RY, 3XO, 3YM, 3AN.

**Queensland:** 4EG, 4AN, 4CM, 4CK, 4KN.

**South Australia:** 5CQ, 5BQ, 5AD, 5BC, 5BE, 5FB, 5UL, 5AD, 5AC, 5CS.

**New Zealand:** 1YD, 2AQ, 1YB, 4AA, 4YD.

**America:** KGO.

The following have been received on the loop:  
**N.S.W.:** 2ZN, 2FP, 2YI, 2RY, 2GR.  
**Victoria:** 3XO.

An old friend, in the person of Mr. H. L. Hobler, Rockhampton, Q., in sending us his list, writes as follows:

The results obtained were in exactly two months work and practically every station was heard on 3 valves, no audio. Confirmations have been received from practically every station heard and most of them have been heard and copied often.

Herewith is the report for two months:

**MORSE.**

**Queensland:** 4CK, 4AN, 4EG, 4GE, 4CM.

**N.S.W.:** 2HM, 2CM, 2CR, 2YI, 2DS, 2GQ, 2QG, 2YG, 2BK, 2GR, 2RJ, 2YB, 2LJ, 2AY, 2BF, 2GY, 2LO, 2ZZ, 2KO, 2YR, 2YA, 2BB, 2ME.

**Victoria:** 3BM, 3LM, 3OT, 3XF, 3BD.

**South Australia:** 5AD, 5BF, 5LO, 5WJ, 5AF.

**New Zealand:** 4AP, 4AD.

**U.S.A.:** 4NAI.

**PHONE.**

**Queensland:** 4EG, 4CM.

**N.S.W.:** 2BL, 2FC, 2HM, 2CM, 2CR, 2YI, 2DS, 2GQ, 2QG, 2CS, 2GR, 2RJ, 2AY, 2HF, 2SR, 2YA, 2RA, 2ME, Riverina Wireless Supplies.

**Victoria:** 3EF, 3OT, 3XF, 3AR.

**South Australia:** 5CF.

**New Zealand:** 1YA (3ft. from phones on 5 valves, 2000 miles).

**U.S.A.:** KGO (2in. from phones on 1 valve, 6000 miles).

2BL and 2FC can be heard any night on one valve, 2BL faint in daylight on one tube, distance 800 miles. Using 2 valves, 2BL is audible 15 feet from loud speaker, and with 3 valves he is audible at 30 feet.

KGO has been heard 22 times, including 13 on one valve only. This station was heard a few times when using 1 k.w. It is easy to tune now and is generally there as soon as I light up. The last three receptions of this station have been very good and audible two inches from the phones using one valve, without exaggeration. The greatest time KGO has been heard was for one hour and fifty minutes, during which period he was held continuously for 36 minutes, the only interruption being VIS on a harmonic. Eight witnesses can be produced, including a J.P., to verify the reception of KGO. Using one phone and one valve speech and music are easily readable.



A 5 watt transmitter is shortly to be constructed and with this I hope to do some testing. Having no electricity here has been the chief drawback, but now it is available, I soon hope to have the transmitter under way. Until it is installed in the house I intend to use dry cells.

H. R. K. Thomas (2HT), Mosman, sends a handy little list. He uses mostly one tube, sometimes two, a small aerial and Murdoch's phones.

Victoria: 3BQ, 3BH, 3BD fone, 3LM, 3BM, 3XO 3BP, 3JH, 3SW, 3AM, 3TM, 3JP, 3XF, 3OM, 3OT, 3CB, 3QW.

Queensland: 4EG.

South Australia: 5AC, 5AD, 5DO.

New Zealand: 2AC, 1AX, 1AO, 2AP, 2AW, 2AE, 3JH, 3OT, 4AW, 4AK, 4AA, 4AG, 2AR.

N.S.W.: 2HM fone, 2GQ fone.

Tasmania: 7AH.

#### WIRELESS IN NEW ZEALAND

Wireless in New Zealand is still in embryo and its birth can only be brought about by the development of efficient high powered modern stations broadcasting attractive programmes.

This was the opinion expressed by Mr. John Harrington (Managing Director of Harrington's, Ltd., Australia and New Zealand), who returned to Sydney from the Dominion by the S.S. "Makura" on Saturday last.

The Radio Traders in New Zealand have, however, not been losing any time since the radio boom became so apparent in Australia. They have got together in an Association and by their combination of ideas and efforts have at last formulated a scheme for broadcasting and listening in regulations, which it is expected will receive Government approval some time this month. Under this scheme the broadcasting will be carried on at four stations: Wellington, Auckland, Dunedin, and Christchurch—the wave lengths varying from between 300-400 metres.

At present, the radio traders at Wellington and Auckland are broadcasting on low power from stations 2YK and 1YA respectively, the items being mainly pianola and gramophone. When this new scheme for broadcasting is established in New Zealand it is expected that at all four stations the transmitting power will be 500 watts.

New Zealand is largely indebted to a number of enthusiastic experimenters who are co-operating with the radio traders to bring matters to a speedy settlement, and Mr. Harrington expresses hope

that the time must be surely near at hand when the people of the Dominion will be enjoying the privileges of efficient broadcasting such as supplied in New South Wales by stations 2FC and 2BL.

#### N.S.W. TRANSMITTERS.

Please add to list published last week:

- 2 A.J.—Walter Short, Campbell Street, Kirribilli. 200 metres. Transmits C.W. and I.C.W. telephony, 7 p.m. to 12 p.m.
- 2 A.R.—William Henry Hudson, 1 Terrace Road, Dulwich Hill. 210 metres. Transmits C.W., tonic train, telephony, 8—12 p.m.
- 2 A.S.—Haydn Errol Grigg, 327 Military Road, Mosman. 200 metres. Transmits C.W., I.C.W., tonic train, telephony, irregular hours.
- 2 G.R.—J. S. Marks, Ritz Flats, Rose Bay, Sydney. 245 metres. Transmits C.W., I.C.W., tonic train, and telephony, 7 to 7.30 p.m., and from 10 p.m. onwards.
- 2 J.T.—Chas. F. A. Luckman, "Moutana," 14 Queen Street, Croydon. 195 metres. Transmits C.W. and tonic train, 7 p.m. to 9 p.m.
- 2 Z.X.—Norman Peter Olsen, "Normanhurst," Macquarie Street, Waratah, N.S.W. 240 metres. Transmits telephony. 7.30 to 9 p.m. daily.
- 2 Z.Z.—C. Preston-Smith, 83 Cabramatta Rd., Cremorne. 217 metres. Transmits C.W. 7 p.m. to 12 p.m. daily.

On a farm in South Georgia is posted this sign: "Trespasser's will be persecuted to the full extent of 2 mean mongral dogs which ain't never been ovarly soshibil with strangers and 1 dubbel barelt shot-gun which ain't loaded with no sofy pillers. Dam if I ain't tired of this hel raisin on my proputy."—Everybody's.

Little Rosie: "Mother, tell me a fairy story."  
Mother (glancing at the clock): "Wait till father comes home, my dear, and he'll tell us both one."

(Continued from Page 16)

any good purpose could be achieved by raking things up again. In any case, we are watching developments closely, and if there's a kick coming, we'll put on our gardening boots. Yes, we know the Queensland Coast well, and as you truly observe, atmospherics up there in summer are unmentionable.



## CLUBS AND THEIR MANAGEMENT

SOCIAL AMENITIES AND THE AFFILIATION.

No. III.

By A. BURROWS.

THE social side to club activities should never be neglected. On the other hand, it is generally fatal to overdo it. And in radio club work the designation "social work" is capable of a wide interpretation. It may only mean an evening free from the restraints and formalities of a properly conducted meeting, or it may consist of an elaborate function during which the word "wireless" will be taboo. Both have their purpose, and both, if persisted in too frequently, can mean the rise and fall of almost any organisation.

It will be easily seen that a limited amount of social work is necessary to attract those to whom wireless is not the beginning and end of everything. Every club has a certain strata of "social members" who may be worth-while adjuncts to the club, yet who would scarcely know a microhenry if they saw one. These can hardly be called "beginners" because they may never progress further. Yet there they are, and no club can afford to disregard them. And they may eventually get the "bug" properly. This, apart from the pleasure of such affairs afforded to every member, will illustrate the value of the social touch to a club.

Then, of course, there is the other aspect to the question. An over-abundance of these affairs will attract some utterly disinterested in wireless, and once this section gains anything like a majority radio and most things connected with it, it will go by the board. The crux of the matter, if a club decides to go in for this sort of thing at all, lies in striking the happy medium; and once it is found that the social functions are gaining an undue place in the club's doings, and officers and serious members appear unable to check them, it is far better to eliminate them completely. Social affairs are not absolutely necessary in a wireless club, but wireless certainly is.

It is impossible to lay down arbitrary rules in connection with this matter. Whether the social element should be something entirely apart from the wireless side, or should be as before suggested, simply a loosening of the regular formalities, is entirely a matter for individual opinion. But I would say, by all means, get away from the regular routine occasionally, and forget wireless sometimes—but not too often. How often is also

a matter for separate consideration; once a month is perhaps rather too often, but anything above that may mean the difference between a live club and a dead one.

### Value of Affiliation Movement.

A discussion on club work would scarcely be complete without some reference to the value of the affiliation with the N.S.W. division of the Wireless Institute of Australia. The Wireless Institute, of course, is run upon entirely different lines from the smaller and more localised clubs, and is another proposition, so far as the remarks in these articles are concerned. The affiliation, however, has in some cases a direct bearing upon the conditions which have been dealt with in the matter of the smaller clubs.

The clubs must not expect too much from the affiliation. Indeed, very little tangible evidence of it will be forthcoming for some time. Intended primarily as a means of bringing the experimenters into something approaching a united front, I do not think the Wireless Institute ever intended the affiliation to be more than an invisible binding together of experimenters in the State. Definite and visible results were never at any time promised.

So far, then, as the actual life of the club is concerned, this amalgamation will make very little difference. If, as is hoped, the Delegates' Council can arrange the interchange of lecturers and speakers, with perhaps the organisation of debates, then a very big slice of the responsibility of providing items for the meetings will be taken off the executive's shoulders. It must not be expected, however, that these arrangements, when they do materialise, will cover every meeting, or even every alternate meeting. The main part of keeping things going will still be in the hands of the club executives.

The importance of every club becoming a member of the Affiliated Societies cannot be over-emphasised. Not many expect, of course, in these enlightened days, that there will be any great need for concerted action amongst the experimenters; the authorities, so far as the amateur experimenters are concerned, have lately shown themselves amenable to reason, and while at one time there appeared

(Continued on page 38)



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(Continued from Page 36)

to be a very real need for the marshalling of amateur forces, that time has evidently gone. Still, it may have these signs on the experimenters' part which caused the alteration in the authorities' outlook—on the principle that "preparedness for war prevents war." On this account alone, every club should consider becoming affiliated.

There is, however, another aspect which bears more directly upon the life of the club. This is the fact that a club's affiliation will mean an added interest to the members; it gives the club an undoubted place in affairs, a certain standing, which will be found of definite value in holding and gaining members. With it are connected practically all the foremost amateurs, and most of the transmitters. Members will feel that they are taking a decided part in amateur radio doings, and nothing could be of more value than this knowledge in a club.

In conclusion, as well as making the meetings a pleasure and an instruction, it should be the officers' duty to keep the fact well to the front that a club is of real experimental value to anyone, whether he be a transmitter, average experimenter, or a broadcast-listener. A club is, after all, a business, or should be regarded as such, and must give a fair return for its charges. Few are willing to devote an evening a week to anything unless they get their time and money's worth, a fact which very often seems to escape some club officials. On the other hand, of course, members must realise that with the payment of their dues their obligation by no means ends, and that they owe as big a duty to the club as it does to them. With the energy and whipping-up, however, of a good executive which combines resourcefulness with "pushfulness," it will seldom be found that the members fail to come up to scratch.

#### CRYTAL DETECTORS AND THEIR ACTION.

By H. F. WHITWORTH, B.Sc.

This Lecture was Delivered before the 97th General Meeting of the Leichhardt and District Radio Society on September 9th.

THE function of a crystal detector is to convert the incoming high frequency impulses received by the aerial of a receiver, into impulses capable of operating the diaphragms of the

telephones, and thus producing audible sounds which approximate those produced by the transmitter. The impulses in the aerial circuit consist of a major wave at audible frequency, impressed upon a radio frequency alternating current in such a way as to change or modulate its amplitude. In performing its function, the detector merely cuts off half of the incoming wave. The remaining current in the detector circuit then consists of unidirectional puffs which still take place at radio frequency but which have a cumulative effect upon the telephone diaphragms and cause audible sounds. The type of detector which is most popular at present, consists of a crystal of galena, iron pyrites, or silicon, held in some form of cup and connected to the telephones and a catswhisker of fine wire connected to one side of the tuning coil. In selecting a wire for a catswhisker care should be taken to select one that will not scratch the surface of the crystal, otherwise the efficiency is impaired, since a new "sensitive spot" has to be found when this occurs.

Galena is sold under many different trade names, such as Q.S.A., "Magnetite," and "Million Point." Some of these consists of natural galena and some of synthetic or treated galena. Galena seems to be the most sensitive crystal for the catswhisker type of detector, but pyrites is usually preferable on account of its greater hardness and stability.

Another type of detector is known as the "Perikon" in which two crystals, usually one zincite and one of bornite, are used; adjustment is carried out by altering the pressure between them.

Probably the most stable of all the crystal detectors is the carborundum detector. This consists of a crystal of carborundum and a contact, which is tightly pressed against the crystal by means of a spring. When using this type of detector a battery and potentiometer are required, as the potential difference between the crystal and spring needs careful adjustment in order to obtain the best results.

It is rather difficult to give a good explanation of the action of the crystal detector. One rather ingenious theory makes use of what is called the Peltier effect. In a thermo-electric junction (i.e., the junction between two different conductors) there is a liberation of heat when current flows in one direction and an absorption of heat when the current flows in the opposite direc-

(Continued on Page 42)

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

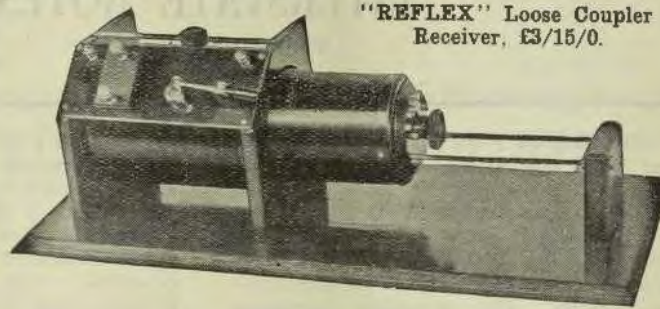


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PEERLESS, 2000 ohm . . . . .	32/6
TRIMM, 2000 ohm . . . . .	32/6
TRIMM, 3000 ohm . . . . .	45/-
RED SEAL—the Aristocrat of all Head- phones . . . . .	50/-



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## INTERSTATE NOTES

WESTERN AUSTRALIA.

A MUCH travelled young man is Harold Rowland Wells, chief announcer of the Westralian Farmers' Wireless Section. He is the grandson of the celebrated Benjamin Wells, the renowned flautist, who probably played before English Royalty more than any other Anglo musician, one of his flutes now being held sacred in the Kensington Museum, London. This particular instrument, made entirely by the said grandpa himself, has played in concerted numbers and obligatos at concerts at which the stars of bygone years scintillated. Patti, Jennie Lind, Sims Reeve, Santley, etc., and to him was awarded the delicate duty of supervising the final tuning of the orchestral instruments used at the big Covent Garden operas and concerts. Young Wells came to Australia on the advice of his dad, the latter having been a ship's medical officer often at Fremantle and Albany. He has done all sorts of jobs before assuming the directing of the wireless concerts, etc. At 16 he took out on English tour and personally directed a small costume comedy company; then on arriving in W.A. his first job was on a Kalamunda orchard. Next he navvied on the Green Hills railway line, varying it with wheat lumping at Quarrading, and clearing and burning off at Bruce Rock. Two months with a mean cockie was enough for Harold Rowland Wells, and he returned to Perth to pick up his present job. Wherefore, when the city, suburban, hinterland and outback listeners-in hear a clear-cut voice with a slight English twang in it, they mustn't imagine its owner as having come out per saloon de luxe, clothed in cotton wool and wrapped in Park Lane pyjamas. The same voice has frequently told Strawberry to bail up, Dobbin to gee-whoa, a railway navvy to do it if possible, and a cocky to wake the fowls himself.

The opera which was broadcasted from 2FC was received practically throughout the whole of Western Australia by amateurs using comparatively simple receiving apparatus. The greater majority originated from country users of the Mulgaphone receiver made up by the Westralian Farmers Ltd. The greatest bug-bear of our country districts is static, it being practically continuous the year round, more particularly, of course dur-

ing the summer months. The open country dweller most certainly has great privileges to erect a fine aerial but it is a case of a standard size aerial or static. Mr. S. Chambers, a description of whose set has been given, entertained a party of friends to the broadcasted opera, every word being clearly audible. Read what a farmer, who listened on 3 valves, writes to me: "I am now able to get Sydney very strong; last Wednesday and Thursday night I received the opera from Sydney. Wednesday night I had trouble with static; Thursday night 2FC came through very clear. The audience clamouring for the artists after the play came through with a roar and the speeches given by two of the company were exceptionally clear. I am able to pick up 2BL clearer now, but the wave length (350) is too near 600 metres and I get much interference from V.I.P. and other spark stations." The above is from Mr. Clinch, Greenough, W.A. Another extract from a letter, commenting on some of the recitals from 2FC reads: "The classical stuff from Sydney last week was particularly good, the singing of Miss Hadley and Signor Martini being extremely clear; the concert from 2FC last night was also very nice. A flute solo by Mr. Albert Howard was in my opinion about the best instrumental item, and of the songs, "Down in the Forest" and "The Bride's Song." I like 2FC's idea of repeating the names of the artists immediately before they commence." I hope that the management of 2FC will feel flattered at these comments coming, as it is, from the other side of Australia.

Our first radio and electrical exhibition will be held at the Perth Town Hall, from September 22nd to 27th. Radio concerts are to be given nightly.

In this time of economy, it is only natural that the amateur should confine part of his activities towards decreasing the high cost of receiving. It is very well known that the bright type of wireless valve is very greedy in respect to the consumption of current, in fact, some of them show a consumption of nearly one ampere. This is quite a decent amount of current that has to be supplied somewhere, and practically the only useful

(Continued on page 42)

**The Colored Paper in this issue tells a story that will interest you!**

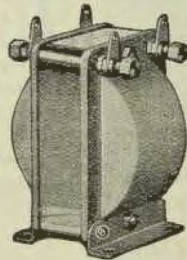


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(Continued from Page 40)

supplier is the accumulator. Now these are expensive and are a source of worry, always wanting recharging just when they are most needed. Mr. T. J. Jewel, an enthusiastic Subiaco amateur, is an experimenter who has had great success, using A.C. for the valve filaments. Not that the use of stepped down A.C. is new to wireless; far from it, but something else is, and which previously has made a transformation useless, owing to the A.C. frequency. Numerous circuits were tried out, and experimented with, but there was no total elimination of the A.C. periodicity, consequently amateurs and others never gave it much consideration. Not so Mr. Jewell, who tried numerous circuits, and worked with different types of transformers and has succeeded in not only getting results equal to those when the accumulator was used, but in addition has entirely succeeded in suppressing the A.C. 40 cycle hum.

Mr. Jewell has confined himself solely to employing the crystal to perform the rectification purposes. He uses one valve in his work, has tried many circuits but cannot attain the same success when using a valve as a detector, and valve LF amplifiers. This is quite important, and it should offer a wide field for experimental work, because if it works perfectly on the high frequency side, why should it not be equally as efficient on low frequency? The transformer used is rather a large size, being about 30 watt.

The problem of the oscillating valve set is becoming extremely acute in this State. It is almost impossible to listen-in in the city area without having the programme from 6WF interfered with.

The Affiliated Radio Societies at their recent meeting discussed this all-important topic, and it was decided that something must be done to put a stop to these ether fiends. It is not settled as yet exactly what steps will be taken. Possibly the adoption of the Radio Society of Great Britain's idea of an equipped motor van touring the streets would prove effective. These radiating sets are particularly annoying to the experimenter when he wishes to try for Eastern States' broadcasting.

6AB, Mr. Cecil, of Kalgoolie, is our only experimental transmitter at the present moment, his telephony being received in Perth just now by a Claremont amateur, who uses about 2-3 valves. This is very good work, as it must be remembered that Kalgoolie is 400 miles from the city. The two aforementioned gentlemen have arranged tests

and some interesting work is being carried out. Mr. Cecil uses one 5 watt transmitting tube in his set and the apparatus is simplicity itself, the circuit used being a type commonly used in aircraft. He has lately altered his antenna to the popular cage type, and those who hear him have noticed his wave length has jumped considerably, somewhere in the region of 300-400 metres.

One of our large emporiums (Boans, Ltd.) has lately extended its radio department to luxurious apartments on an upper floor. Considerable comment is being cast on the entering of large firms into the radio world by the local dealers. The former, being mere dabblers can retail the goods at a remarkably low figure and consequently the tide of purchasers promptly turns to the cheaper goods. What then, is the solution? I notice that the Melbourne correspondent of Wireless Weekly has something to say on this question, and I can endorse his remarks.

The janitor's little boy, very black, was named "Midnight" by his white neighbours. He didn't mind them calling him that, but one day when one of his own race exclaimed, "Hullo, Midnight!" he retorted indignantly, "Shet up, you'se jes about quarter to twelve yo'self."

(Continued from Page 38)

tion. This implies a higher resistance to the passage of the current in one direction than the other and therefore a rectification of an alternating current. In this case the junction of the current and catswhisker is the thermo electric junction and rectification is obtained by the varying resistance of the point of contact. This theory will explain the reception of signals when the catswhisker is resting on the crystal cup and not on the crystal, but will not explain why crystals are more sensitive in some spots than others.

Another theory is based on the fact that most of the crystals used for detecting belong to the cubic system. The upholders of this theory contend that the rectification is an actual function of the crystal itself and not of the thermo electric junction of the catswhisker and crystal.

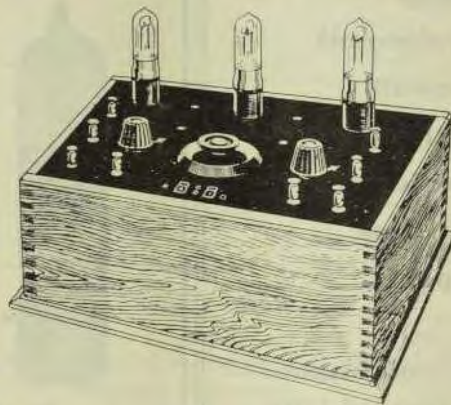
The former theory seems the more reasonable one, but until more research work has been done on crystals in finding out the relationship between sensitive spots and crystal axes it will be largely a matter of conjecture to explain the working of the crystal detector.

SEE PAGES 2 and 3 FOR FROST LINES.



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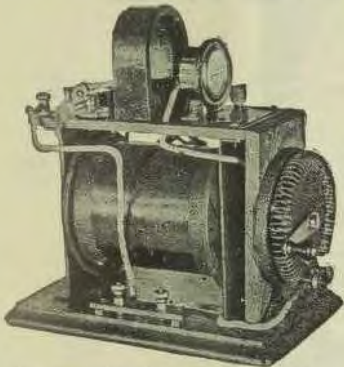
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**ENAMELLED COVERED.**—18, 3/6; 20, 3/6; 22, 4/6; 24, 4/6; 26, 4/6; 28, 5/6; 30, 6/6; 34, 8/6; 38, 13/6; 40, 20/6; 44, 40/6 per lb.

**SINGLE COTTON COVERED.**—14, 3/6; 16, 3/6; 18, 3/9; 20, 4/6; 22, 4/3; 24, 4/6; 26, 6/6; 28, 7/6; 30, 7/6; 32, 11/6; 34, 13/6; 36, 17/6 per lb.

**DOUBLE COTTON COVERED.**—14, 4/6; 16, 4/3; 18, 4/4; 20, 4/6; 22, 5/6; 24, 6/6; 26, 8/6; 28, 9/6; 30, 10/6; 32, 12/6; 34, 16/6; 36, 20/6 per lb.

**SINGLE SILK COVERED.**—20, 6/6; 22, 7/6; 24, 8/6; 26, 9/6; 28, 10/6; 30, 12/6; 36, 17/6 per lb.

**DOUBLE SILK COVERED.**—20, 9/6; 22, 10/6; 24, 11/6; 26, 12/6; 28, 14/6; 30, 16/6; 36, 22/6; 40, 30/6; 44, 80/6 per lb.

**EUREKA, BARE.**—22, 24, 26, 1/6 per oz. For small quantities, 3d. extra for winding.

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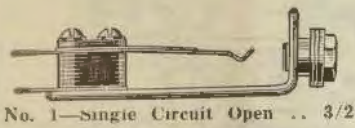
**COLVILLE MOORE**

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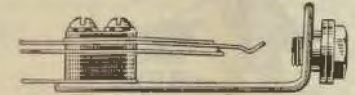
10 ROWE STREET NEXT HOTEL AUSTRALIA SYDNEY



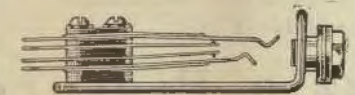
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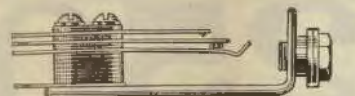
No. 1—Single Circuit Open .. 3/2



No. 2—Single Circuit Closed .. 3/6



No. 3—Double Circuit Closed 4/5

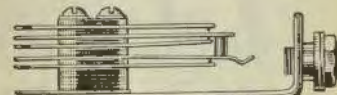


No. 4—Single Filament Control, 4/9

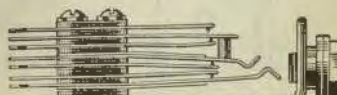


No. 4a—Second Audio Jack .. 5/4  
 (For Neutrodyne Receivers)

**T**HIS Jack is an improvement on any other Jack on the market. It is made entirely of non-ferrous metals — therefore no magnetic influences. The bracket is made of specially prepared brass strip with rounded edge, bent against the grain, insuring extreme strength and good appearance. Nipples, washers, screws, all made of brass, highly nicked and polished. All blades are made of high-grade German silver of spring temper, having tension springs where needed. The contact tips are made of pure silver, the best substitute for platinum. The ends of the blades are made with the crowfoot offset, allowing easy access for all wires; they are tinned and charged with a Non-Corrosive soldering flux, thereby preventing acid corrosion and consequent short circuits. They are of standard dimension and fit any standard plug, and can be mounted on any panel.



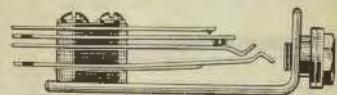
No. 5—Double Filament Control, 5/-



No. 6—Detector Jack . . . . . 6/-  
 (For Neutrodyne Receivers)



No. 7—Loop Antenna Jack .. 4/5



No. 8—First Audio Jack . . . 5/8  
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This brilliant book has been specially compiled and is awarded to commemorate this grand Competition. It is a book of thrills, of fun and fancy—160 pages of interest, amusement and adventure, beautifully printed and bound with an art cover. Remember, every competitor in Class "A" and "B" will receive a copy of "NARROW ESCAPES," free of charge.

Of course you would like to win £250. Here's your opportunity. Make a list of the things in the above puzzle picture beginning with the letter "S." There's Saddle, Stamp, Screw-driver, Shirt, Stockwhip, etc. It's a great game for your spare time! Over £600 will positively be paid in cash to the thirty persons who submit the nearest correct answers, so send in your list of "S" words as soon as possible.

If your list is awarded First Prize in Class A, you'll win £250. If you enter for Class B and win First Prize you will be paid £100. Under Class C (no subscription payment) you would win £10 for First Prize. The correct list by which judging will be done will be made up only of the correct words in the list received, thus you are insured honest and impartial treatment. **WISHING WILL NOT WIN**—so start now. Surprise yourself and friends by winning £250. Then you can travel, pay a deposit on a new home, buy beautiful things, or establish your own business—the possibilities are great. Two Four Valve "Radiovox" Wireless Sets are also offered as prizes.

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See opposite page.



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3rd	£40	£15	£1
4th	£15	£5	7/6
5th	£5	£2	2/6
Five additional prizes, each of	£2/10/-	£1	1/-

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Make up your list of "S" words and send it with your payment for subscription to "THE TRIAD," if you are competing in Class "A" or "B." No subscription payment is necessary for Class "C." Remit payment by Postal Note, Money Order, Crossed Cheque, or Bank Note. It is advisable to send entry and remittance in the same envelope and by registered post. Add exchange to cheques: 6d. N.S.W.; 1/- other States. Payment from N.Z. should be made by Post Office Money Order only.

### FOLLOW THESE EASY RULES

(1) Anyone, excepting employees of "THE TRIAD" MAGAZINE, LTD., or their relatives, may take part in this fascinating puzzle game. Competitors may send in any number of entries and may enter in any or all classes so long as the conditions of subscription to "THE TRIAD" are fulfilled. Enlarged copy of picture will be sent on receipt of stamped addressed envelope.

(2) Name only those objects visible in the picture beginning with letter "S." The idea is to have as many correct words as possible, and the method of awarding the prizes will be to deduct the number of incorrect or omitted words from those which are correct. Whichever list receives the most points will be awarded first prize, and so on down the list of 30 prizes, all of which will be awarded. **IN CASE OF TIES FOR ANY PRIZE OFFERED, THE FULL AMOUNT OF EACH PRIZE TIED FOR WILL BE AWARDED TO EACH TYING CONTESTANT.**

(3) Contestants in each class compete only against those in the class which they enter. The correct list, by which judging will be done, will be made up from the lists sent in by contestants, and not from a "master" list or an artist's list. Correct list, list winning £250 prize, and names and addresses of all prize-winners, will be published in the January issue of "THE TRIAD."

(4) Use only English words. An object may be named only once, but any part or parts of objects may also be named. Either the singular or plural of a word may be used, but not both. Words of same spelling but different meaning or synonymous words will count once only. Compound (words made up of two complete English words) and hyphenated words are acceptable, but obsolete or foreign words will not be permissible. Any dictionary may be used, but Webster's International Dictionary will be the final authority.

(5) Number your words in the order that you find them—1, 2, 3, 4, etc. Write on one side of paper only, and place your full name and address at the top of the sheet. Answers and subscription payments must be enclosed in the same envelope.

Post your answers to the Puzzle Editor.

**THE TRIAD Ltd.,** Desk 35, 160 Castlereagh St., Sydney

# EXTRA!

## Two (2) 'Radiovox' Four Valve Wireless Sets To Be Won!

To the gentleman, sending in the nearest correct list of "S" words, an Extra Prize of a Four (4) Valve "Radiovox" Wireless Set will be added to whichever prize he wins if he enters in Class "A" or Class "B."

This set (valued at over £75) has a range of over 8,000 miles. It will be supplied to our order by United Distributors, Ltd., complete with beautifully finished cabinet, valves, loud speaker, batteries and aerials. Delivered with full instructions and all charges prepaid.

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The function of the Cabinet in a Receiving Set is two-fold. First, to combine all units into a slightly whole, housing the Batteries, Loud Speakers, etc., out of sight, and away from dust and harm, and secondly, and most important of all, to refine the acoustic properties, delivering voice and music in perfect volume and purity.

Decide now to win one of these "Radiovox" Sets and also win a substantial cash prize. This is YOUR opportunity. Don't miss it.

(6) All answers mailed and postmarked November 18th, 1924, will be accepted. CONTESTANTS UNDER CLASS "A" OR "B" MAY QUALIFY BY MAILING SOLUTIONS UP TO MIDNIGHT, NOVEMBER 26th, 1924. All entries received will be carefully considered.

(7) The judges will be the Very Rev. Dean Talbot, Sir Frederick Waley and the Hon. W. A. Holman, K.C. The judges are in no way connected with "THE TRIAD," and all competitors agree to abide by the conditions of the Competition and to accept the decisions of the judges on any matters as absolutely final and conclusive.





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24 gauge, in 1/2 lb. reels . . . . .	2/2
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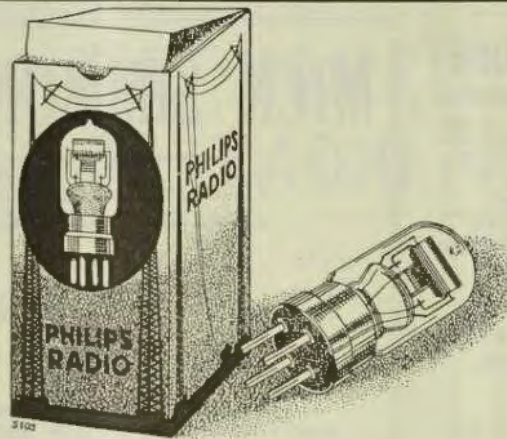
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Anode Voltage . . .	30/75 V	25/30 V	30/75 V	25/30 V	30/75 V	60/100 V	2/10 V	2/10 V
Filament Current . .	0,15 A	0,5 A	0,5 A	0,5 A	0,5 A	0,7 A	0,15 A	0,5 A
Filament Voltage . .	1,6/1,8 V	3,5 V	3,5 V	3,5 V	3,5 V	4 V	1,6/1,8 V	3,5 V
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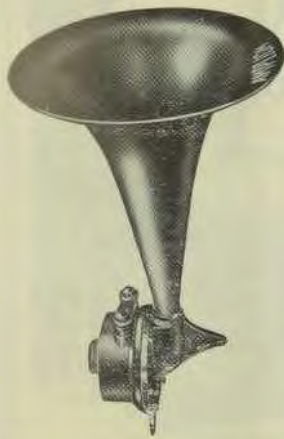
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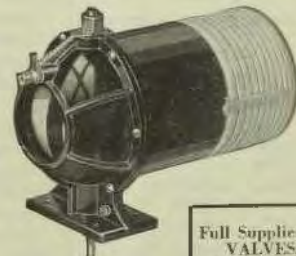
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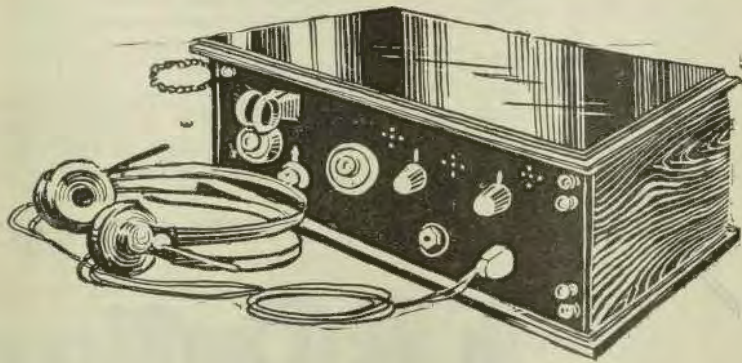
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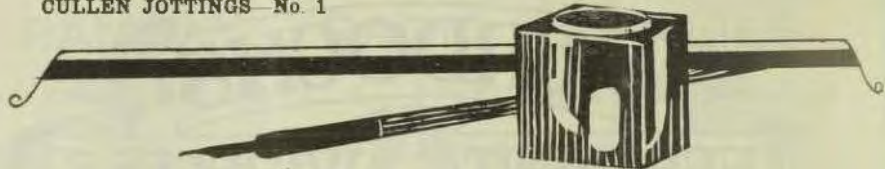
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Friday, October 3, 1924.

WIRELESS WEEKLY

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