

# WIRELESS WEEKLY

Registered at the G.P.O., Sydney, for

transmission by post as a newspaper.

VOL. 5. No. 13.

FRIDAY, JANUARY 23, 1925.



## *Have You Seen the New Philco Radio Batteries*

Rechargeable "A" and "B" Batteries

So small and compact you can handle them with ease.  
So dry and clean you can instal them in your Drawing Room.  
So large a range that they suit every purse.

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SOLE DISTRIBUTORS FOR AUSTRALIA.

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See the Display of PHILCO BATTERIES at  
WIRELESS SUPPLIES LTD.

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Sydney

REIN. ALL WAYER  
REPRINT.

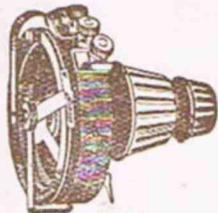
Basket Coils  
and  
How to  
Make  
Them

# FROST-RADIO



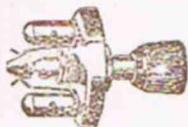
FROST

FONES



**FROST-RADIO.**

Tube Control Unit.. 17/6



**FROST-RADIO.**

Push-Pull Battery Switch,  
4/.



**FROST-RADIO.**

Plug and Jack.

## FROST FONES

No. 161, 2000 ohm, 32/6  
No. 171, 3000 ohm, 37/6  
Aluminium Type.

No. 172, 3200 ohm, 45/-  
Genuine Moulded Bakelite  
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On this page are illustrated but a few of the items in this well-known line.

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**FROST-RADIO**

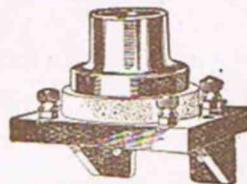
**FROST-RADIO.**

No. 616-619, Shock Absorber for UV199 and UV201, 3in. core .. 24/6



**FROST-RADIO.**

No. 602, Metal Frame Rheostat, 35 ohm .. 5/6



**FROST-RADIO**

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Bakelite Sockets.

Sponge rubber cushion, non-microphonic. Standard base or C-299 UV199 type, Panel or Table Mounting .. 6/3

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THE ONLY REAL LONG DISTANCE SET  
MAY BE HAD FOR THE ASKING

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ALL THE MOD-  
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Samples of which  
may be seen on

DISPLAY IN OUR  
WINDOWS  
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SEE THE  
LOW LOSS 3-COIL SET  
ALL WAVE REINARTZ  
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THE FAMOUS PI.  
THE NEUTRODYNE

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"The Rolls-Royce of Radio"  
The VOLMAX V.

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THE VOLMAX V.

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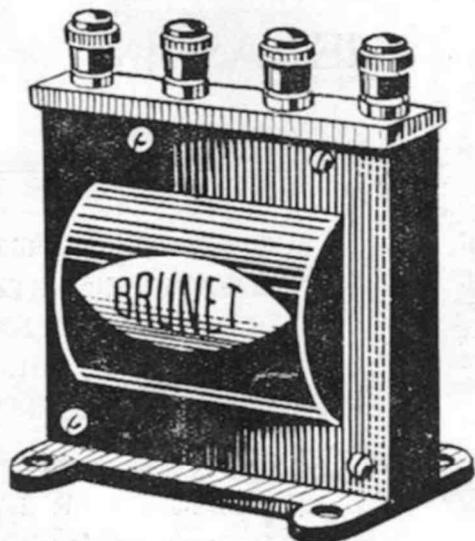
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## TRANSFORMERS

(RATIO—5 to 1)



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Brunet Transformers are a product of proven merits—brought by rigid tests to a high standard of construction and working perfection.

PRICE

21/-

Brunet Transformers are SHIELDED—giving protection from external stray currents. Amplification without distortion is thus assured. They are fitted with low loss coils and terminals are complete with ebonite knobs.

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You can enjoy the most entertaining of broadcast programs—hear all the items plainly and pleasingly,—when your set is well made and all parts are reliable. In no small measure does your result hinge on the quality of the condensers, but if "Ormond" English Variable Condensers have pride of place in your equipment, then you're set for the best results possible.

Join the happy throng of carefree radio enthusiasts—the whole world over—who are daily proving "Ormond" the best Condensers and the greatest value for the money. We guarantee satisfaction. Instal "Ormond" to-day.

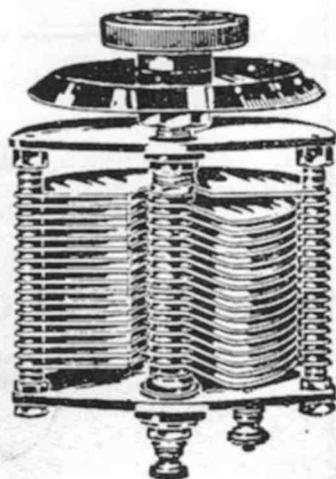
Without Vernier.

.0002	9/6
.0003	10/6
.0005	11/6
.00075	13/6
.001	14/-

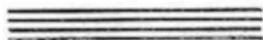
With Vernier.

.00025	13/-
.0003	14/-
.0005	16/-
.001	18/6
Duo Anode (Twin)	25/-

All Complete with Knob and Dial.



You Can Purchase "ORMOND" Condensers from all Dealers



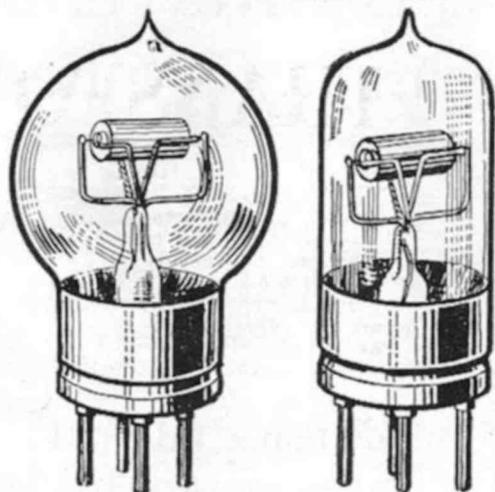
## CORBETT, DERHAM & CO. PTY.

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# New Dutch Valves

## TUNAWAVE HONEYCOMB COIL

Each  
Type  
**12/6**



These coils, neat in appearance, are obtainable in sizes to suit any Wave Length.

25 Turns .. . . .	Price 2/-
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150 Turns .. . . .	Price 3/3
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Honeycomb Coil Mounts, 1/6 each.	

Designed for Highest Efficiency  
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These New Dutch Valves are obtainable everywhere—either detector or amplifier type—at 12/6 each. This value is amazing, because these valves are considerably below the price of competitive lines, yet are more than equal in results and service.

Highly developed, they ensure quality of reception, ample volume and all other characteristics that are necessary in good radio valves. Obtainable everywhere.

Price . . . . . 12/6 each.

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(English Make)

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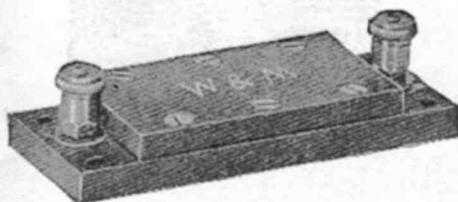
ALLEN - - - 3/6

.5 to 5 megohms glycerine type



## English Fixed Condensers

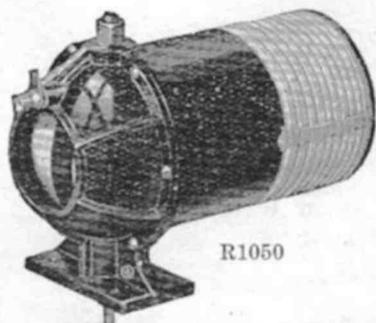
- EFFICIENT
- RELIABLE
- ECONOMICAL



W. & M., .0002, .0003, .0005, .001, .002 . . . . .	1/9 each
W. & M., .0003, complete with grid leak . . . . .	3/6 each
"Justso," .0002, .0003, .0005, .002, .001 . . . . .	1/3 each

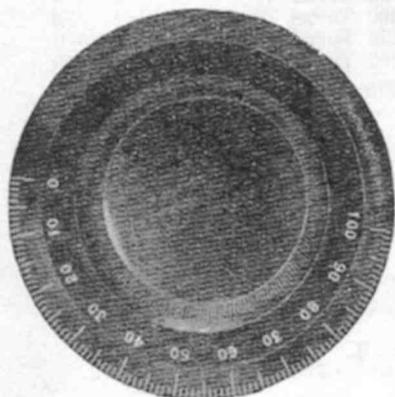
LTD. 39 Dixon Street, Haymarket, SYDNEY

MANAGING AGENTS FOR N.S.W.: CHAS. R. GABB & CO.



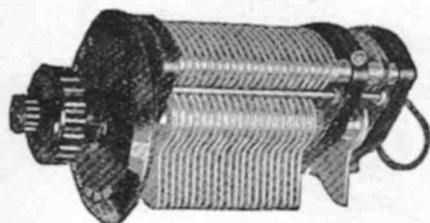
R1050

VARIO COUPLER



R 200

4 inch Tapered Dial



R 725

43 Plate Vernier Condenser



R 800

Vernier Rheostat.

## Only "Quality" Radio Sets Give Permanent Satisfactory Results ..

When purchasing your Radio Set be certain it is constructed of

## Gilfillan Radio Parts

Used by the foremost Radio Set Manufacturers in America and Australia.

## The Famous IMPERIA RADIO SETS are constructed entirely of GILFILLAN RADIO PARTS

A Complete Range of Parts for Any Circuit.

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R 650 B—Wavelengths 200—1100 metres

R 1050—Radio Frequency Type

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Here is Your Chance! Buy a "Scientific Headset" 25/- and secure £10-10-0 worth of the best radio goods for your new set

We are offering the following prizes in return for your giving us twelve distinct features of

"THE WORLD'S GREATEST HEADSET VALUE."

1st Prize: An Open Order on any firm, value £10/10/-, for any goods distributed by us.

2nd Prize: An Open Order on any firm, value £5/5/- for any goods distributed by us.

3rd Prize: An Open Order on any firm, value £2/2/-, for any goods distributed by us.

CONDITIONS:

1. Each entry to be accompanied by the picture of the Tower in the large circle on the front of each container.
2. Each entry must specify 12 reasons why, in your opinion "Tower's" is the world's greatest headset value.
3. Any competitor may send in any number of entries provided each is accompanied by a large picture of the Tower.
4. Your full name and address, including State, must be written on the upper right hand corner of the page.
5. Entries must reach us not later than Saturday, 28th February, 1925, and results will be announced in March 11th issues of "The Wireless Weekly" and "The Boys' Wireless News."
6. Entries must be addressed "Competition," Box 914, G.P.O., Sydney.
7. The decision of the Managing Director of P. H. Clark Limited shall be final.
8. All entries shall become the property of P. H. Clark Limited and the whole or any portion of any entry may be used for advertising purposes if desired.

SEE THEM AT YOUR DEALERS ————— DO IT NOW!  
List of Dealers stocking these Headsets will be published in next issue.



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QUEENSLAND: Colin Campbell, "City" Buildings, Edward St., Brisbane.

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Last Sunday Night a Sydney experimenter got THIRTEEN AMERICAN STATIONS using as detector the

# True Blue Valve

and proves that its Bakelite Base does end capacity losses.

FOR CLEARNESS True Blues stand alone, and put an end to the expression "Like a Bad Gramophone."

Better tone and no Microphonic Noises and Distortion.

Experts are enthusiastic about "TRUE BLUE" VALVE.

Buy a "TRUE BLUE" to-day and see the difference for a little extra. If your dealer cannot supply, write us mentioning his name.

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# Argentite Crystals

Known the  
World around  
as



the most  
Sensitive  
Known

SOLD WITH AN ABSOLUTE GUARANTEE BY THE BEST  
RADIO DEALERS

Australian Distributors:—

**WELBY RADIO CO., 13 Royal Arcade, Sydney**

# Brandes

*The Name to Know in Radio.*



*Result of  
16 years'  
experience*

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If you have any difficulty write for name and address of nearest Brandes dealer to:

**Amalgamated Wireless**

(Australasia) Ltd.

"Wireless House,"

97 Clarence Street, Sydney

"Collins House,"

Collins Street, Melbourne

Sole Agents for Australia and  
New Zealand

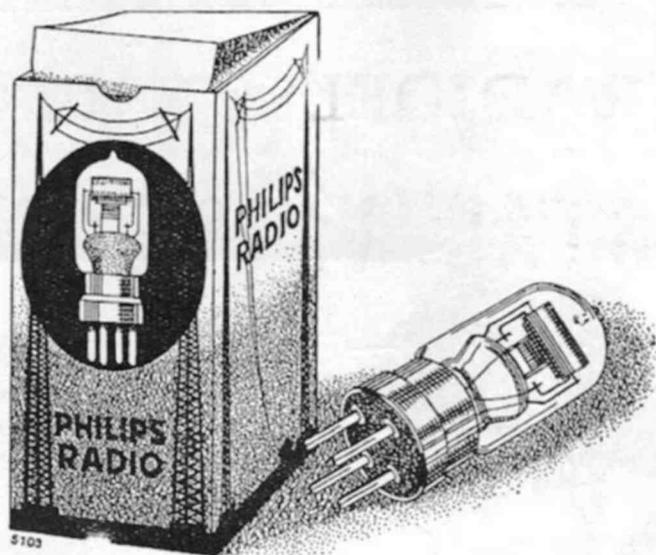
Trade  
Enquiries  
Invited

Are you sure that you can invite her to listen. Can you depend on your headphones to give you clear and unsullied reproduction? You want her to appreciate the efficiency of your set, and it's on these occasions that the ordinary headphones choose to be perverse and a rueful but patient smile is your reward. Get Brandes "**Matched Tone**" headphones and be proud of them—their consistent purity and richness of tone will never fail you. Finished appearance, strong construction and designed for long and comfortable wear, a guarantee enabling you to return them within ten days if you are not satisfied adds to their desirability. Ask your Dealer for Brandes.

# *Matched Tone*

TRADE MARK

## Radio Headphones



You do value results, then —

# USE PHILIPS VALVES

"A TYPE FOR EVERY NEED"

## TECHNICAL DATA

TYPE	TRIODES.						TETRODES	
	B II Dull- emitter hard	D I soft	D II hard	D IV soft	D V hard	E hard	B VI Dull- emitter Double- grid valve	D VI Double- grid valve
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	3,5 V	3,5 V	4 V	1,6/1,8 V	3,5 V
Cap .. ..	A	A	A	C	C	A	A	A
	ENGLISH		CAP	AMERICAN		CAP	ENGLISH	CAP

Wholesale Distributors —

# WARBURTON FRANKI LTD.

307-11 KENT STREET, SYDNEY.

SOLD BY ALL RADIO DEALERS.

# RADIOELECTRIC CRYSTAL VALVE SETS

FOR

**EFFICIENT LOUD SPEAKER RECEPTION.**

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Perfectly designed and manufactured, these sets are compact, strong, easy to adjust and operate, and will give excellent results at all times.

COMPRISING—

Panel Mounted Crystal Receiver, Tapped in Tens and Units, with Adjustable Crystal Detector.

2 Valve Panel Mounted Amplifier with Jefferson Transformers. V.T. Sockets for Dry Cell Valves, and Filament Control.

**£ 6 - 0 - 0**

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SINGLE-VALVE AMPLIFIERS **£ 2 10 0**

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# RADIOELECTRIC

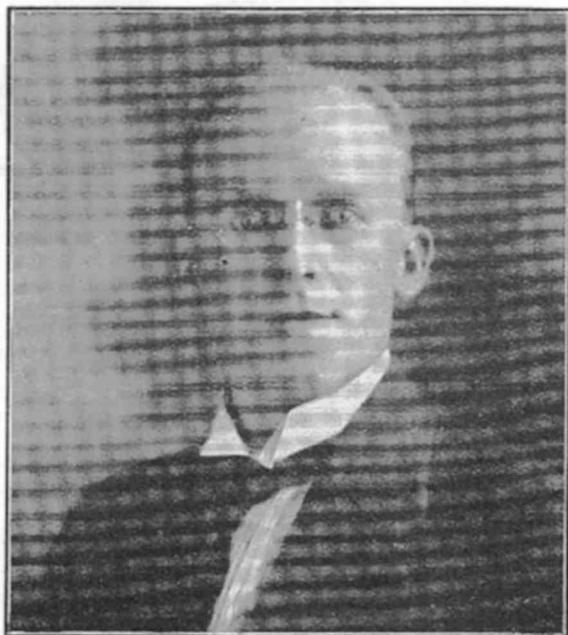
Wireless  
Suppliers

10 MARTIN PLACE  
(right opp. G.P.O.)  
SYDNEY

Wireless  
Engineers

Tel. B 2666

*Large*  
**STOCKS**  
**REMLER**  
**GOODS**  
**!**



**ASK THIS MAN'S ADVICE**

**M**R. HAMILTON, of our Service Department, is too well known in amateur and professional circles to need introduction.

Bring him your problem, ask his advice. A fund of practical experience and knowledge is thus at your service.

If you contemplate the construction of a set, why not make a point of seeing him before you commit yourself to purchase of parts.

**E. R. CULLEN**

LATE A.I.F.

**RADIO & ELECTRICAL STORE**  
**96 BATHURST STREET**

Tel. City 86 & 25 96

"You have my word for it"





Phones, Redfern 964 and 930.

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.

FRIDAY, JAN. 23, 1925.

VOL. 6. No. 13.

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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," 12/16 Regent Street, Sydney, N.S.W.

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RATES**

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

**QUESTIONS and  
ANSWERS DEPT.**

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

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

All accounts should be made payable to Publicity Press Ltd., 12/16 Regent St., Sydney.

Agents in Great Britain: The Colonial Technical Press Ltd., Dudley House, Southampton Street, Strand, W.C. 2.

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# EDITORIAL

## The License Fee

THE prosecuting of unlicensed broadcast listeners some weeks ago resulted in some hundreds of aërials disappearing from the public view and thus a very large number of potential supporters of broadcasting went out of the game, perhaps permanently. The warning issued by the P.M.G. and the repeated appeals in the press for poachers to play the game had no effect, but directly the authorities showed that they meant business and as soon as the pocket nerve of a few people was jabbed by an unfeeling magistrate there was a wild rush. The direction of that rush unfortunately was not towards the license counter at the G.P.O. but to get the back yard aerial down before the postman appeared along the street next morning. If the effect of the prosecutions had been to urge the undetected offenders into obtaining licenses, they would have certainly been worth while, but as the sole result was to drive a lot of people out of the radio circle, it is questionable whether it would not have been more sensible and better for everybody concerned if they had been postponed until next winter. In any case since a list of unlicensed listeners was available, perhaps the broadcasters could have achieved something more practicable if they had secured a copy of the list and made a direct appeal by mail. Yes, of course it would have entailed a lot of work but better to get a direct subscription from only 10 per cent of them than to frighten the whole lot out altogether. This certainly does not advocate the tolerating of an army of unlicensed listeners but it assuredly emphasises that the matter was approached from the wrong angle and that the adoption of sensible methods would have resulted in a very definite gain for the broadcasters and would have assured a great number retaining an active interest in broadcasting. Most things in life hinge chiefly upon one important point—finance, and it is because of this that quite a crowd of people hold off broadcasting, much as it may interest them. Now a man investing in a valve set automatically includes the 35/- license fee in the amount he is prepared to pay for his receiver.

Usually he can afford it and in any case, when compared to his expenditure on the set itself, it doesn't loom very high. Assuming the price of the set to be £25, then the ratio would appear something like this—£25 + £1/15/- = £26/15/-, not a great deal of difference. But, let us take the case of the crystal set purchaser, whose set complete with telephones cost, say £3. The ratio would then appear after this style—£3 + THIRTY FIVE SHILLINGS = £4/15/-,—a vast comparative increase upon the original £3. After all, the broadcasting itself is the same whether a crystal set with a pair of cheap phones is used for its reception, or a multi valve set with a loud speaker and whether the actual use to which the listeners-in put their receivers is similar or not, it is perhaps quite fair that all should pay an equal fee.

The 35/- which covers one year isn't a great deal when it is spread over a period of 365 days, representing as it does only a little over one penny for some hours entertainment daily, but to the person with a shallow pocket a lump sum of 35/- is more than a shadow, it is a mountain. Now it is reasonable to suppose that most of those who dismantled their aërials to escape prosecution were operating crystal sets which, to them did not warrant a further expenditure of 35/-. But the point is that a lot of those people would to-day have possessed valve receivers had they been allowed to stay in the game. And what must be considered now is that, having been scared off, how can they be brought back again and how numbers of citizens who can't afford that extra 35/- on top of the cost of a crystal receiver, can be helped along to the enjoyment of broadcasting. The remedy obviously is to make it easier for people to pay, and we must remember in considering this, that the crystal enthusiast ultimately passes on to the study of valve price lists and that in the interests of broadcasting itself and of the Industry in general, every effort should be made to encourage prospective listeners-in. Therefore, without questioning the amount of the annual fee itself, wouldn't it be worth considering to make the payment quarterly at 8/9? It certainly would be easier to pay.

## Wireless in the Mercantile Marine.

SINCE the first timely rescue brought about by wireless at sea, March 3rd, 1899, when life boats rescued the personnel of the s.s. "R. F. Matthews" on the Goodwin Sands, it has been responsible for the saving of millions of pounds worth of property. Thousands of people alive today would have been dead years ago through drowning, but are alive and directly owe their lives to wireless afloat.

Some of the most important rescues may be recalled:—

- s.s. "Republic"—1761 saved.
- s.s. "City of Racine"—200 saved.
- s.s. "Santa Clara"—95 saved.
- s.s. "Olympic"—123 saved.
- s.s. "Delhi"—235 saved.
- s.s. "Titanic"—703 saved.
- s.s. "State of California"—103 saved.
- s.s. "Volturno"—531 saved.
- s.s. "Empress of Ireland"—452 saved.
- s.s. "Santa Anna"—600 saved.

And so one can go on through the formidable list; yet notwithstanding this splendid record of humanitarianism, shipowners all over the world since the war, have been trying to get the standard of safety at present laid down by wireless laws, watered down and cheapened.

Side by side with this great record of life saving to its credit, thousands of lives have been lost that need not have been lost had the wireless regulations been stricter than at present. The only reason they have not been stricter is that because the cost of wireless lowers the shipowners' profits, they have from time to time thrown the whole of their weight against any betterment of the standard, and their latest move has been to approach the League of Nations to have the present standard lowered.

The Radio-Telegraphists' Institute of Australasia which keeps in touch with the international position of wireless afloat all over the world, upon being informed of the latest move on the part of the shipowners, immediately placed itself in communication with all sea-farers' organisations in Australia, with the result that speaking for these organisations, a memorial has been presented to the International Labor Bureau, Geneva, and a copy of it will be found in another portion of this issue.

The article is from the capable pen of the General Secretary, Captain S. Toombs.

The seafaring community should be grateful to Captain Toombs for the great work he has performed in Australia in connection with wireless, and which puts Australia in the position to-day, as stated in the article, of having the most efficient mercantile wireless system in the world.

## Below the Broadcast Bands

RADIO A 2JT.

STATION 2JT is owned and operated by Mr. C. Luckman, of Croydon, who has been interested in radio transmission for some years past. Many types of transmitters have been tried, but the present one seems about the best so far. The present transmitter uses a Hartley circuit and an "Airway" motor generator set supplies the plate voltage. Rectified, and unrectified A.C. have also been employed, but there is no doubt as to the efficiency of the generator.

The aerial at present employed is a six wire cage 80ft. long and 40ft. high, this is used in conjunction with a twin wire counterpoise, and the usual earth connection.

Provision has been made to transmit C.W., I.C.W. and phone, the phone being particularly well modulated. Grid modulation is used and is giving excellent results.

The station has been reported QSAvy, from many distant points, and stations in all States, and N.Z. have been successfully worked. American amateurs have also been clearly heard on the receiver which is the conventional low loss and one step, which is so extremely popular at present.

A feature about this station is the fact that all gear that can be constructed at home has been done so, even transformers of quite good design and appearance being constructed by the operator.

More changes are to be made, however, by Mr. Luckman, and it should not be long before we hear vastly improved transmissions from this station.

### Key Clicks.

On Sunday last station 2BK carried out extensive short wave daylight tests with 3BD of Victoria.

The transmissions lasted nearly all day, and the wavelength was well below 100 metres. A peculiarity that was noticed was the fact that while the signals were deafening before mid-day, towards 1 p.m., the strength began to fall off, and although by no means weak the strength was by no means

(Continued on page 15, column 1.)

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

# Wireless Institute of Australia

N.S.W. Div. Inc.

Incorporating the Affiliated Societies and The Australian Radio Relay League



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

## Monthly General Meeting.

The monthly general meeting of the N.S.W. Division of the Wireless Institute of Australia was held at the Royal Society's Hall, 5 Elizabeth Street, Sydney, on Thursday, January 15. Mr. R. C. Marsden of 2JM fame occupied the rostrum (not in pink tights and fluffies) and lectured very ably on the "Practical Operation of Transmitters." He gave details of transmitters that he had constructed laying particular stress upon the power supply, particularly the high tension supply. His power transformer has been constructed with considerable care and his rectifier and choke have been laid out after very careful thought, and the excellence of the results that he has obtained amply demonstrates the value of a little care in this matter. He gave many valuable hints concerning various parts of the circuit showing that many apparently unimportant points had a very far reaching effect upon the successful operations of the transmitter. His details of the construction and preparation of electrolytic rectifiers was practical and of intense interest, and the information thus obtained should prove extremely helpful to those who were present.

A number of questions were asked and answered which is sufficient evidence of the appreciation that members felt towards 2JM, and it is greatly to be deplored that so many allowed themselves to be discouraged by the inclement weather and refrained from attending the meeting. It would be interesting to know how many would not hesitate to go out in the severest storm to adjust their aerial, but who would nevertheless be absolutely prevented by a shower of rain from attending the meeting. When such important and interesting lectures as that presented by 2JM are presented before a comparatively few members, it does not say much for the patriotic spirit, of the others, who, by failing to show evidence of co-operation in this respect are only depriving themselves of one of the greatest benefits which can accrue from membership of the Institute.

## Next Monthly General Meeting.

The next monthly General Meeting of this Division of the Institute will take place on Thurs-

day, February 19, when Mr. P. L. Sewell will take for his subject "Rectifiers." Considering that these play such an important part in both the operation of transmitters and the charging of batteries, it is hoped that many will avail themselves of this opportunity to obtain a little practical information first hand.

## New Members.

At the last Monthly General Meeting of the N.S.W. Division of the Institute, the following members were unanimously elected:

W. E. Wilson, "Denwood," Archbold Road, Roseville, 2JI.

H. A. Leverrier, 7 Morton Street, Bay Road.

It is also interesting to note that applications are still pouring into this office, and it is scarcely necessary to emphasise that this point is due to the growing recognition which is accorded to the N. S.W. Division of the Wireless Institute of Australia, as the premier wireless organisation of the Commonwealth. The course which has been adopted to further the interests of the experimenter and of wireless in every branch, and the far sightedness of both past and present councillors is now reaping the harvest in this growing recognition.

We have repeatedly pointed out that 1925 is going to be a record year for wireless. In broadcasting much will be done, but it is in the amateur and scientific circles of the field, that most progress will be made, and it behoves all members of the Institute to make a very careful selection in their office bearers at the elections which will take place shortly.

Although much has been accomplished in the past, much more will have to be performed in the future, and energetic, self-sacrificing, enthusiastic radio men are required to further the interests of this science in the Wireless Institute.

## QRM.

2CX was in the chair at 2JM's lecture. At the close of the meeting he introduced to members a relative stranger in the person of 2FA. It was certainly a pleasure to see his genial face there again.

2GM complains that he has not been mentioned in these notes for two weeks. Can anybody offer a reason why?

On a recent Friday night, 2GC experienced difficulty in reading certain signals. No doubt static was very patchy that night.

2CX will be getting famous if he is not careful. Recently there was a gathering at this station of pseudo scientists, and alleged experts. What they did there is not related.

2LO journeyed all the way from Narrabeen and went without his dinner in order to hear 2JM's lecture. This is the right spirit and every member should strive to emulate it.

Black rumours are current concerning the stability of Insulator's new mast. Come out into the limelight Insulator and tell us the truth.

2CX has developed a new stunt. Instead of blowing valves he is becoming expert at blowing condensers. This is as is should be however, anything for a change to do a little original research.

A. H. PERRETT.

Publicity Officer.

(Continued from page 13)

what it was. Both stations noticed this, so that it could hardly be caused by local conditions. Towards the evening, however, the strength became normal again.

2BK has also been very successful in getting across the pond to U.S.A., on his new short wave transmitter, the working wave of which was 85 metres.

2FP is still coming in as loud as usual, and in fact, it seems as if the modulation has improved considerably.

2XY has also been improving somewhat, and has considerably increased his strength lately.

2BF is as consistent as usual, and continues to radiate quite excellent transmissions.

2EC has also been heard lately, although not quite as loud as could be expected the transmissions are pretty right, and perfection only comes with experience.

2BV has considerably improved lately and has lost quite a lot of the somewhat noisy background hum. It should not be very long before this station is one of the loudest and most consistent stations on the air.

FOR SALE.—Loose Coupler, perfect reception, guaranteed. Price 30/-. Apply 22 Challis Avenue, Dulwich Hill.

## SUPER AIR HOGS.

(To the Editor)

Sir,—For the last few weeks and during broadcasting hours, I have had my receptions entirely spoilt by a frightful noise emanating from a nearby amateur station, the transmitter of which sounds not unlike a demented chaff cutter suffering from an excess of wattage. Directly this foundry starts work the waves nearly damp out the broadcasting stations. The effect is very novel and interesting, something after the following: "He—ain't — no — body's darl — ing . . . But — you can—t keep — a damned . . . fool down."

On switching off, this contraption emits an unearthly drawn-out wail, such as one would expect from a lost soul on entering Hades (the transmitter's ultimate destination). Wave traps and other devices are useless. An axe seems the only remedy. To sum up the whole thing, reception of broadcasting is impossible where I reside. During a visit to a well-known publicity man's residence at Vaucluse I found the nuisance interfering there. On New Year's Eve, after an hour's agony I called up Mr. P. Nolan, who positively assured me he had not been transmitting since 7.30 p.m. It was then 9 p.m. Can anyone oblige me with the source, since evidently 2YI is not to blame? Whoever the offender, he is using an honourable and blameless citizen's call sign. I am wondering why the individual concerned does not protest. The genuine experimenter with a maximum of 10 watts and who observes the broadcasting hours deserves every encouragement, but the other pests are a bar to the progress of radio, and deserve prompt elimination. I have a profound respect for the self complacency (some call it hide) of an individual who maltreats the atmosphere at the expense of an ultimate storm of protest which they well know must eventually ensue. I have heard transmitters weeping about the misjudged energy of an adjacent humble Joey, but what of the self-same blatant noise-emitter whose transmissions spoil the reception of those patrons of broadcasting who may reside within a three mile radius of the offending amateur? If the genuine experimenters do not by mutual co-operation compel G hunting pests to play the game, they look like losing the benefits they now enjoy. Applicants for licenses would be well advised to ensure they are beyond the pale of these key-thumping half-fee specialists, before parting with their thirty pieces of silver, otherwise they may wish they had judiciously bargained with a S.A. man for his second-hand tambourine in their quest for harmony.

Yours etc.,

295 Edgecliff Rd., Woollahra.

COLEY.

## With Our Readers



(To the Editor.)

Sir,—I was very interested in your Editorial published in your last issue concerning low power transmitters and in my opinion you have ventilated a matter that is of far greater importance than is apparent on the surface. Quite aside from the use of wireless as a means of affording communication between outlying farms, the failure of the immigration policy and the trend of the countrymen to the city seems to me to represent good sound reasons why the Government should devote more attention to ways and means of rendering farm life less intolerable at the present time, and less to frantic endeavours to induce ignorant Britishers to come out and bury themselves in the heart of the bush and absolutely out of touch with fellow beings. There is no argument but that a wireless telephone set in cases of isolation would be a blessing especially in times of sickness. We read a lot of highbrow stuff concerning the development of wireless in Australia and about the uplifting of mankind through the medium of wireless, but in this great outback of ours, where there are a thousand and one ways in which wireless could be made of real service to farmers, apparently nothing has been done. Perhaps the reason is not far to seek. A friend of mine in the country wrote to a city firm asking for particulars and prices concerning wireless telephone sets but was informed that they could only be obtained on the hire system and at a figure which was absolutely ridiculous. Fancy a man acquiring a motor car on a system which would compel him to pay a high rental for years. Why is it that a wireless telephone set is valued at such a high figure compared to such things as motor cars and farm machinery? Now sir, the case quoted above illustrates that these methods do not tend to popularise wireless with the country people and in my opinion the reports concerning the development of wireless in Australia are as nothing compared to the fact that so far as the back blocks are concerned, development has been to date practically nil. Here is a golden opportunity for a politician to come out and create a little self glory and incidentally to do a real service for dwellers in the country.—Yours for outback wireless.

L. C. WARDLE.

Newcastle, Sunday.

## LIGHTNING ARRESTERS

(To the Editor)

Sir,—In response to "Ion's" latest outpouring of unbelief in lightning arresters, I must once more endeavour to keep him to the main issue. His first assertion that a "decent tuning coil" is sufficient protection against lightning was shown by me to be wrong. When he asked why arresters were not fitted to electric light wires I had the pleasure of informing him that they were, and at frequent intervals. His last effusion amounts to personal abuse, which is not argument. I am not concerned in the least when "Ion" says that as I am an electrical supply engineer I must necessarily be ignorant of lightning effects on an aerial, but I can assure him that I have records made at first hand that at least gives one food for thought. Direct discharges from the clouds are those which give us most concern and I will instance one for consideration. A line of poles, each 50 yards apart ran down a hilly road, and a galvanised iron wire was stretched along the top of them and earthed at every third pole (by a wire attached to the open wire running down the pole to earth) as lightning protection. One of the unearthed poles were seen to receive a flash from the clouds and was splintered from top to bottom, resembling nothing so much as a bunch of celery. (I have a photograph of this pole.) The mains' engineer in considering this damage naturally decided to earth every pole in future. What would "Ion" do? Say it was superstition? Because an aerial is only about 60 feet in length, "Ion" thinks it does not require protection. What is the opinion of other wireless men? By the way, if "Ion" has the courage of his convictions, why use a *nome de plume*?

Yours etc.,

H. E. TAPLIN.

Sydney, 15/1/25.

(To the Editor)

Sir,—I have seen in your valuable paper claims that 2HM etc., have been heard in Sydney on a crystal receiver. If I cared to do so I could also lay claim to having heard 2HM on a simple crystal receiver, because I really have heard his phone and morse using a piece of "Argentite" as a detector, and a spider web coil and .001 variable condenser in series. But—at the same time a regenerative 1 valve was receiving 2HM in the same house, with an aerial fixed to the same pole as my aerial. So you can draw your own conclusions! Very probably your other correspondents' feats were due to a powerful set nearby. I have heard of a radio bug

receiving KGO's program on crystal only, but it was found that next door he was being received on a five valver. I have conducted several experiments with a valve receiver and a crystal receiver working on adjacent aeriols, and have come to the conclusion that interference between the two is greater than between two valve sets. The person operating the crystal set will always get stronger signals provided his set is tuned to the same wave as the valve set, while the valve set nearby always loses signal strength slightly. A crystal set nearby will affect the signal strength of the valve set much more than another valve set will; in fact it seems to have a damping effect upon it. I have always got stronger signals on the crystal set when the valve set was tuned to my wave, and I could by returning the crystal slightly, set the valve into oscillation, the resultant howl being heard in both receivers. Below I am giving you a list of stations received by men on both a crystal set and a one valve set.

#### Crystal Set.

VIS, VKQ, VIH, VIB, 2BL, 2FC, 2AR, 2AY, 2BB, 2BF, 2BV, 2CI, 2CL, 2CM, 2CX, 2DH, 2DK, 2DN, 2FA, 2GR, 2HP, 2IJ, 2ME, 2MU, 2OI, 2RA, 2WN, 2XA, 2YO, 2YI, 2ZG, 2ZN, 2ZZ. (2HM by reradiation.) 27 amateurs, 25 phone—on crystal only.

#### One Valve—3 Coil—Not Low Loss—Outdoor Aerial.

2AJ, 2AY, 2BB, 2BC, 2BF, 2BK, 2BM, 2CJ, 2CL, 2CM, 2GR, 2CX, 2DE, 2DH, 2DK, 2DN, 2DS, 2FF, 2GQ, 2GR, 2HF, 2IJ, 2HM, 2JM, 2KC, 2ME, 2OI, 2RA, 2RJ, 2UW, 2VM, 2XA, 2YG, 2YI, 2ZN, 3XX, on phone.—2DZ, 4AN, 4AU on C.W. only. 39 amateurs, 36 phone—on one valve only.

#### One Valve—on Indoor Aerial.

2AY, 2BC, 2BF, 2BK, 2BM, 2BV, 2DE, 2GR, 2HF, 2JM, 2JS, 2ME, 2OI, 2OT, 2RA, 2SP, 2UW, 2XA, 2YG, 2YI, 2ZN on phone. 2KC on c.w.—22 amateurs—21 phone, on one valve and indoor aerial.

The above makes a total of 50 N.S.W. amateurs on both crystal and valve, in about 12 months, also 1 Victorian and two Queenslanders. I know that the above is by no means out of the ordinary, but I know you like to hear from your readers, so I thought I would send my list along. I am building a low loss receiver of my own design, and when I have it working you will no doubt hear from me again. Can you or any of your readers tell me the name and address of 2OT (N.S.W.)? Also is 2JS still at Orange or is he back in Sydney, because he was easier to get on the one valve and indoor aerial than I would expect from a station at Orange?

Yours faithfully,

ARTHUR A. WOOD.

Exp. 5467.

10 Murray Street Bronte.

## GOOD RESULTS.

A correspondent, Mr. P. J. Browne, of Randwick, who has just arrived from America, states that, using a Flex-o-dyne receiver, he has copied the following stations at loud speaker strength, without using aerial or earth: 2BL, 2BE, 2ZN, 2JM, 2YI, 2UW, 2FP, 2YM, 2RA, 2OT. Melbourne broadcaster's, has, he states, also been heard under similar conditions, and using aerial and earth, KGO KPO and KFI may be heard nine feet away from the loud speaker. Seems to us pretty good going.

## SMART WORK BY RADIO ENGINEER.

Usually allowed three months to erect such a transmitting plant, Mr. P. D. Thomas, the station engineer at the Capetown broadcasting station, erected a plant as powerful as the London transmitting station in five weeks. It was necessary to open up 40 feet of a Capetown street to provide a suitable earth for the plant. The opening night of this station was listened-in to by 45,000 people approximately—from Rhodesia, Portuguese East Africa, South-West Africa, and the four provinces of the Union of South Africa, but 2LO (London's broadcasting station), though intently listening, did not hear. Lt.-Col. H. B. T. Childs, of the Marconi Co., is joint director of the South African Wireless Telegraph Co. Capetown hotels and cafes and big department stores have added to the amenities of their places by the installation of receiving sets. Profiting by Johannesburg's experience, Capetown dealers in wireless equipment altogether got in £50,000 worth of stock. Johannesburg stocks ran out and there was a raid on the telephone booths! At Capetown the station director is Mr. A. N. Dickson, the studio manager Mr. C. C. H. King, late of the B.B.C., England.

## THE DUKE AND DUCHESS OF YORK.

### Special Wireless Equipment on the "Mulbera."

The P. and O. liner "Mulbera," which the Duke and Duchess of York will join at Marseilles on December 5th for their voyage to East Africa, has been equipped with special wireless apparatus by the Marconi Marine Communication Company, Limited.

In addition to a long range Marconi valve transmitter and special long range receiver, the ship carries a Marconi marine broadcast receiver, which will enable the broadcast programmes to be received throughout the voyage.

## THE RANGE OF A CRYSTAL RECEIVER

By "Brasso"

MUCH has been said and argued in the columns of "Wireless Weekly" on this subject which is one to which, of necessity for some years I devoted a considerable amount of time and thought—and latterly from choice, because I have always held the opinion that sooner or later the crystal will again come into its own. As a receiver of broadcast telephony, a crystal receiver is ideal because its properties render it able to reproduce musical notes exceptionally clearly. There are, of course, very good technical reasons for this, but it is natural to assume that the average broadcast listener doesn't worry his head over technicalities, so perhaps they are better left out. The statement concerning the purity of crystal reception cannot of course be misconstrued as an argument against the use of valves because the crystal has limitations which confine it to short distances whereas of course, by virtue of its amplifying properties, the valve is necessary where greater distance is desired; or where sufficient volume is required to operate a loud speaker, a number of valves are used.

In the old days at sea, before valves became common, phenomenal distances were covered in crystal reception. Two thousand miles at night was quite a common achievement on 600 metres and at times, distances up to 3400 miles were actually worked. Now, it is well known that only a very tiny portion of energy radiated by the transmitting station actually reaches the receiver, so, to present as comprehensive a surface as possible to these feeble impulses, the aerials on ships were shoved as high up in the air as possible and it was generally found that ships with the highest aerials achieved the best result. There were, of course, other essentials necessary for long distance reception and they were decent tuners, sensitive phones and crystals. The ordinary loose coupler with tapped secondary and primary proved quite efficient, but if anything, the variocoupler, with the primary tapped in tens and units was slightly better. A word here about the materials used by home builders of crystal sets would perhaps not be out of place. It is always better and cheaper in the long run to go a few pence further and buy decent materials. Cardboard formers are absolutely inefficient because they absorb moisture which pulls down the efficiency of the set. Some compositions are fairly good, but as a rule it pays to use Bakel-

ite tubes or a decent brand of Ebonite. After winding the coils it is a very good plan to boil the finished job in ordinary paraffin wax, thus covering them with an insulation which is impervious to moisture. Shellac is not recommended, although it is commonly used.

Upon the sensitivity of crystals, whole volumes could be written, but after years of experience I can think of nothing better than the old-fashioned galena in its original form. The cats-whisker is important and by experiment I found that a single strand taken from copper flex very suitable. Twisted in the form of a spiral, one end was soldered to a stiff piece of wire which in turn was attached to the terminal—the other end of the spiral rested lightly upon the surface of the crystal, the lighter the better, because a heavy contact breaks the crystal surface, thus ruining the sensitive spot. This form of crystal detector, while extremely sensitive, has its disadvantages because a heavy burst of static is liable to "blow" the point, and again, a jar of the table slips the catswhisker off the point. For ordinary broadcast reception where one is disinclined to keep adjusting the crystal there are forms of detectors on the market which maintain rigid contact and are fairly sensitive. Otherwise a very good form is a zincite-bornite combination, that is, the two crystals are grasped in a holder, the bornite making contact with the zincite, the most sensitive point being found after a little experiment. No catswhisker is required in this case, a lead from the Bornite being taken to one side of the telephones and from the zincite to one end of the secondary or rotor. Experimenting with different brands of crystals is most interesting, but I think that the galena arrangement as previously outlined will be found more than satisfactory. The brand of telephones is also most important in a crystal receiver and in distance reception their degree of sensitivity is a very large contributing factor. The stock equipment at sea some time ago was Murdoch's but, although rulggedy constructed they were not particularly sensitive. The difference in actual signal strength between Murdoch's and Brown's adjustable was positively amazing, the latter being particularly good on weak signals. In fact, on actual test, Brown's proved superior with crystal than Murdoch's on a single valve nonregenerative circuit

There are, of course, many types of telephones on the market to-day, some good, some indifferent, and some decidedly inferior, but where prices range about the same it would be a good plan to ask the dealer to demonstrate the various types with a crystal and buzzer so that one may determine the most sensitive. With these, however, as with the other components, the best is cheapest in the long run, this, however, not inferring that the best is the most expensive. As a general rule, telephones which are nationally advertised are usually backed up by consistently good performance, because an inferior article cannot long survive.

To summarise the foregoing remarks therefore, and endeavour to compute the range of receivers, let us take first of all aerials. A contraction which is simply slung up haphazard will never give good results. The results may seem quite good to the owner, but a vast difference will be noticed after erecting a really efficient one. Therefore, get it up as high as possible and as long as possible up to 100 feet between poles—if you can only get 30 feet, never mind, get it up high, and bear this in mind; twin wires must be at least ten feet apart to show any benefit with a crystal receiver. If you can't get this distance, don't worry about it, but stick to a single wire. Twin wires spaced 12 feet apart and about 80 to 100 feet long represents a pretty good aerial and the only result attained by putting in three or four wires will be to present a much more comprehensive and attractive landing place for atmospherics, without building up any appreciable increase in signal strength. Now, with regard to your lead-in, here is a golden rule and I pass this little secret along without any prejudice whatever—take it from wherever suits you best, but keep it well clear of other obstructions. Don't just bring it in by jamming the window down on it, but use a proper lead-in tube, AND SOLDER ALL CONNECTIONS. Your earth is also important. It must be as short as possible and where it is joined to the waterpipe, either soldered or fastened securely with an earth clip.

Crystals come next, and the remarks already penned will cover this subject O.K. Telephones have also been commented upon sufficiently. Now to the ticklish question as to the range of a crystal receiver provided the specifications above are adhered to. The range will vary with the peculiar atmospheric conditions affecting certain localities—for instance there are so called blind spots and dead spots where no signal will penetrate. These spots have never been charted in Australia, but provided the experimental transmitters could be induced to take on this job, it could be fairly easily

done, and would certainly prove a boon to wireless users in general. Assuming, however, that the conditions are normal, then the range will depend more than anything else upon the power of the transmitter at the other end. Let us assume that you can read the code and that you are listening in on 600 metres where exist ship and shore stations, and also that you are located somewhere adjacent to Sydney. Reckoning signal strength as from 1 (just audible) to 10 (very loud) then this is how signals should come in: VIS, Pennant Hills (3KW) 12, VIM, Melbourne (2-3 KW) 4, VIA, Adelaide (2-3 KW) 3, VIB, Brisbane (2-3 KW) 4, VIT, Townsville (1½ KW) 3, ViP, Perth (2-3 KW) 2, VLA, Awanui (5 KW) 5, VLD, Auckland, and VLW, Wellington (2½ K.W.) 3, VIH, Hobart (2-3 K.W.) 3. Ships within 100 miles' radius of Sydney, 8 down to 6, over that to 500 miles, 6 down to 3, and over that about 2. This doesn't take into account screening and fading effects peculiar to certain portions of the coast.

#### Broadcasting.

2BL and 2FC. Despite the recently published reports of crystal reception at some hundreds of miles, and the all round effective range of an efficient crystal receiver is no more than 50 miles. The distances of 300 miles, etc., may be regarded more or less as freaks.

#### Amateurs.

Let us clamp down the lid tightly at ten miles as a maximum general all round range. Some transmitters are more efficient than others and their transmissions get further, but we are dealing with averages. The ranges mentioned above all refer to night. Now the above statements may be by some regarded as conservative, by others as a little stretched—but they are actually records of results received on a crystal receiver, and only what others who pay attention to details may expect. If you don't know the code, more's the pity, because you are missing one of the most interesting phases of listening in. Code learning is, of course, entirely a matter of practise, but once learnt it opens up a tremendous field for exploration by the owner of a crystal receiver. A final word on a little trouble which seem to affect quite a lot of people—the inability to tune 2FC from 2BL or vice versa, on a crystal set. This trouble can be cured, as was shown effectively by Mr. H. A. Stowe, in his article in *Wireless Weekly* some time ago. The use of variable condensers in the aerial and secondary circuits of a crystal receiver, is always advisable where selectivity is desired.

## WINDING AND MOUNTING BASKET COILS

By W. R. HARDY.

WITH many amateurs basket coils seem to be a sadly neglected form of inductance, but if properly wound, tied and mounted, they will, within their limits of range, be found preferable to any other form of coil. Their virtues are many. They can be easily and quickly constructed at a very low cost, previous experience or special skill in coil winding being quite unnecessary. Moreover, they can be made quite rigid and self-supporting and can be simply and inexpensively mounted, yet still possess a very attractive appearance. As these coils have a very low internal capacity and offer a little resistance, their efficiency is very high, especially on the shorter wavelengths. A modified form which has been given much publicity in these columns by Mr. Stewart, is used almost exclusively in "low loss" work. Now! Having told you of their good points, allow me to point out a slight disadvantage. Unfortunately the range of these coils cannot be extended much beyond a wavelength of 1500 metres, for in order to secure compactness it is then necessary to use wire of a very small gauge and the resistance of the coil is thus increased considerably. A circuit possessing high resistance will not tune sharply so we must aim at keeping the resistance as low as possible.

It will therefore be found convenient to construct a series of basket coils to cover all wavelengths up to about 1500 metres, and then to continue the range by means of honeycomb or lattice coils. I am going to set out directions and data for the construction of this series of coils but I want particularly to bring to notice the methods of tying and mounting as it is the difficulties of securing rigidity and a convenient method of mounting that have prevented these coils from taking their rightful place in the estimation of the amateur. It is usual to make the mistake of impregnating them with shellac, paraffin wax, or some special "dope." A lesser evil is to wind them on impregnated cardboard or ebonite formers, but either of these methods introduces serious dielectric losses and considerably reduces the efficiency of the coil. For the winding we will require a small former or hub of some fairly close grained wood such as beech and shaped as shown in Fig. 2 and 3. This should be about 2 or 2 1/8 inches in diameter. Mine was obtained from a city dealer at a cost of eighteen pence, and is now used for winding honeycomb

and lattice as well as basket coils. Now! Let us get to work on the hub. Cut a strip of paper the exact width of its circumferential face and just long enough for the ends to meet when passed

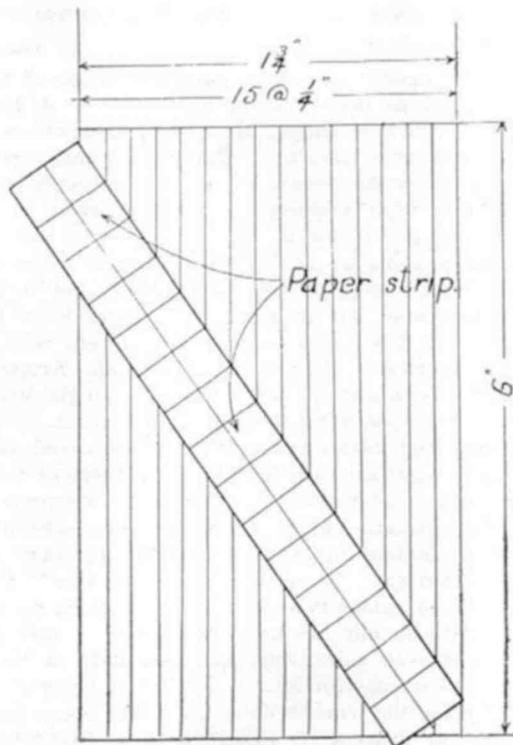


Fig. 1.

around it. Draw a line lengthwise along the centre of the paper and divide it into 15 equal divisions by the method shown in Fig. 1. That is, on a sheet of paper set out two approximately parallel lines 3 and 3/4 inches long and separated by a distance of about 6 inches. Divide these lines into 15 equal divisions by marking off each quarter inch and join the corresponding points of division as shown. Place the paper strip over the series of parallel lines so that the two extremities of one side fall on the two outer lines. From the points where the lines cut the edge of the strip, draw lines across it, perpendicular to its edge. These lines will then divide the centre line of the paper into 15 equal divisions. Take some gum or paste

and gum the strip of paper round the surface of the hub. Allow it to dry and then secure a brace and a 17/64 or 1/4 inch drill and proceed to drill holes about  $\frac{1}{8}$  inch deep at each of the division points. A vice would be welcomed at this stage, but the holes can be drilled quite easily by holding the hub in the left hand and placing the head of the brace over the region of the solar-plexus. Care should be taken to see that the holes are drilled radially, that is, the line of direction of the drill should pass through the centre of the hub. When you have completed the drilling, use sandpaper to remove the paper and any rough edges that may have been formed.

After all that, we will go out and take a little

reviver (fresh air only). Put on your hat, wander round to the family butcher's and ask him to sell you 10 or 12 wooden skewers. If he is a good chap like ours, he will give them to you and say, "Oh! We'll charge them up to the New Year," or something like that. Skewers in hand, hasten home and having placed a couple of the stoutest aside for future use, proceed to cut the others into 3-inch lengths. These are then placed spoke fashion in the holes in the hub. If a 1/4 inch drill has been used they may need paring slightly in order to make them fit.

Our former completed, we can now try our hand at winding a coil. First, turn to the table given at the end of this article, and find the gauge

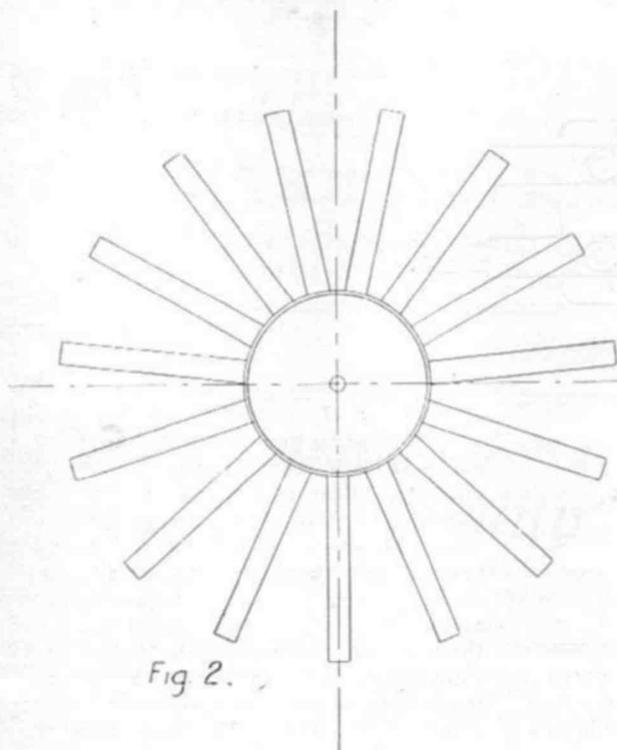


Fig 2.

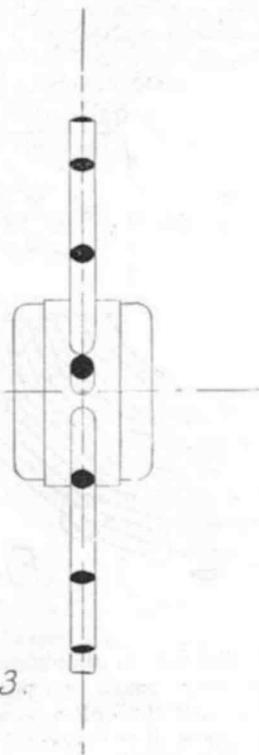


Fig 3.

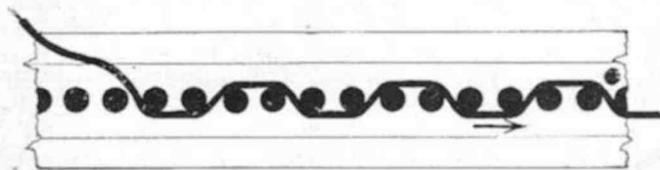


Fig. 4.

of wire specified for the coil you intend winding. This table has been compiled so that your coils when completed will be of such a size as to give the maximum efficiency consistent with rigidity. The weight of wire required has been determined by weighing the finished coils and the depth of the winding is given in the column under "X". As it is sometimes difficult to secure No. 16 D.C.C. wire, figures are also given for the use of No. 18 in the two smaller coils. We commence to wind the wire double basket fashion as shown in Fig. 4., leaving sufficient free end for attaching to the mounting

quantity of green twine, or better still, dye several feet of twine or stout linen thread by passing it through a brush or wad of cotton charged with green ink. When this is quite dry take the coil (with the pegs still in position) and proceed to lace the twine through it as follows: Between each peg there will be seen two holes leading down through the windings, one on either side of the line of pegs. Lace the twine through all the holes lying on one side of the line of pegs, and then with a second piece proceed to treat the other side in a similar manner. Commence by passing the twine down

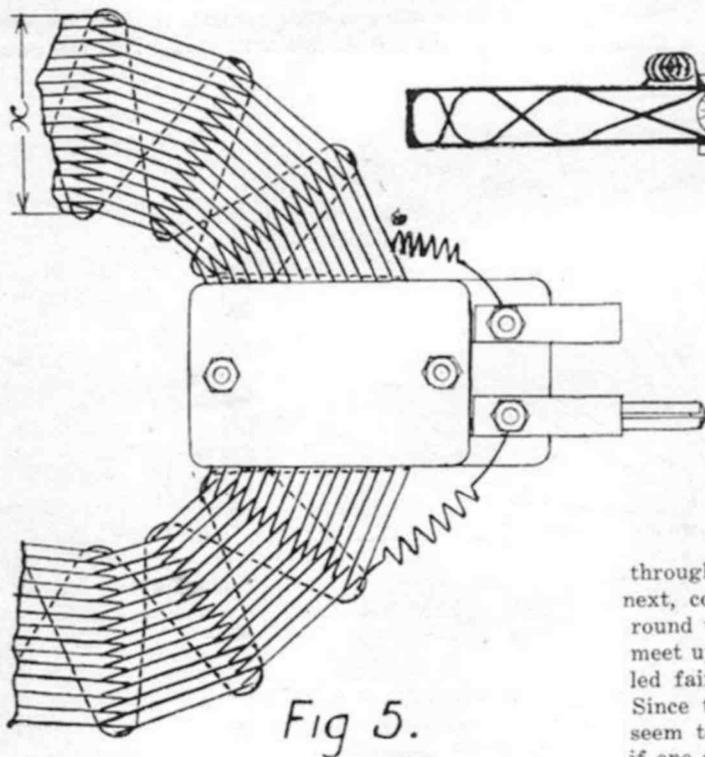


Fig 5.

plug. The wire is simply passed through between any two pegs, round two pegs and through, round two pegs and through again and the process continued thus until the required number of turns have been wound on. Simple! Isn't it? The number of turns can be easily counted at any stage by counting the number of wires on both sides of a peg. When the winding is completed the pegs are pulled out so that they are just clear of the hub which is now gently pushed out of the coil. The pegs are then pushed back so that they project slightly on the inside of the windings. Now for the trying. If properly carried out this will add considerably to the appearance of the coil. Secure a

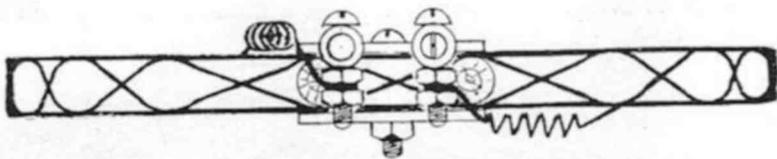


Fig. 6

through one of these holes and then up through the next, continuing thus until you have passed twice round the coil, when the two ends will be found to meet up and can be tied. Of course it must be pulled fairly tightly after passing through each hole. Since the advent of the bob and shingle, hairpins seem to have become as scarce as sovereigns, but if one could be "stalked" it would prove very handy as a bodkin. Treat the second side of the coil in the same way and remove the pegs. It will now be found to be quite rigid and the green twine will make quite a pleasing pattern with the white covering of the wire. On account of their limited range it is desirable that these coils should be interchangeable with honeycomb or lattice coils using the standard "plug in" system of mounting. This can be done quite easily by using coil adapters such as are supplied on certain makes of spider-web coil formers. These are now readily obtainable and if properly used they make a very efficient and convenient form of mounting. The components required are shown unassembled in Fig. 7, and include the coil adapter (one plug and one

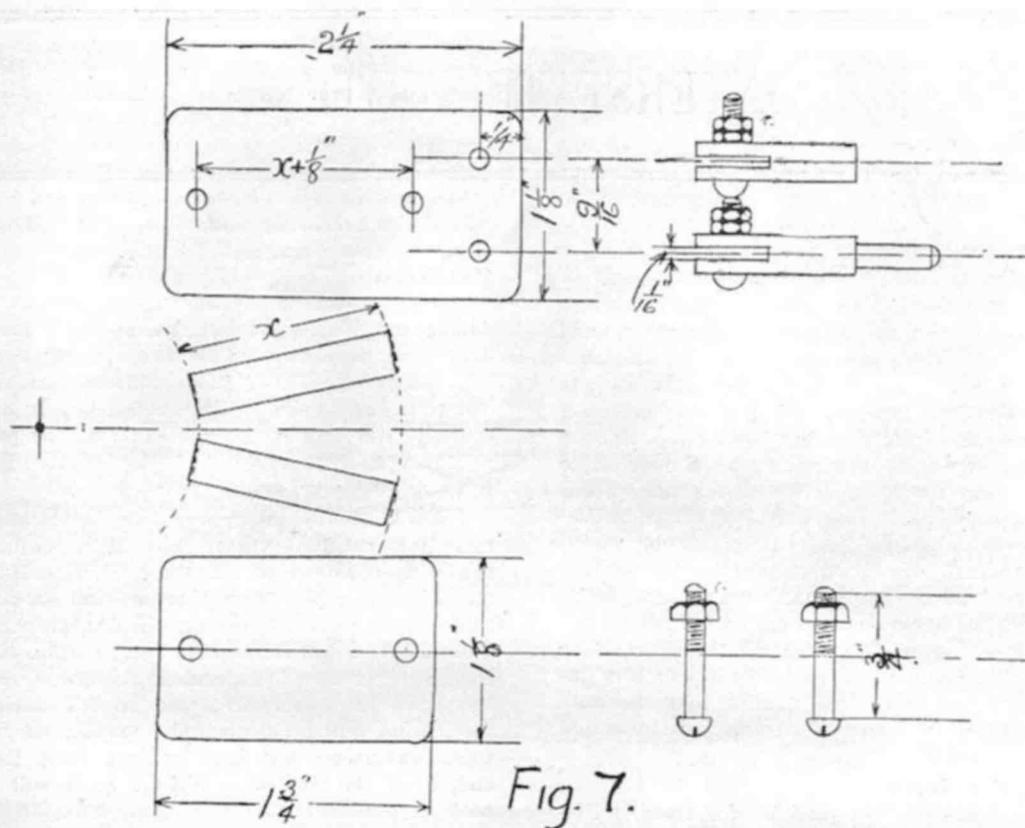


Fig. 7.

socket with screws and nuts to fit), two pieces of 1/16th inch sheet bakelite, two pieces of wooden skewer and two 3/4 inch x 1/8 inch screws with nuts. All necessary dimensions are given and the method of assembly can be easily gathered from Figs. 5 and 6. It will perhaps be evident that the representation of the coil is merely diagrammatic. The pieces of skewer are inserted in the peg holes of the coil to prevent it from collapsing when the bakelite strips are screwed in position against its sides. Contact studs can be substituted for the screws and ebonite can be used in place of bakelite, but the latter is recommended on account of its stiffness. A small hack saw or any moderately fine toothed saw will cut the bakelite or ebonite without difficulty and it can be easily drilled with an ordinary 1/8 inch engineer's drill. I have cut a number of these strips by means of a hack saw blade with a piece of cloth wrapped around one end to form a handle. The edges can be quickly trimmed and the corners rounded off with a file. It is not advisable to reduce the length of the longer bakelite strip for use with the smaller coils as these will not then centre properly with the larger ones when used together on the set. The

convention of joining the outside lead of the coil to the plug and the inside lead to the socket, as shown in Fig. 5 should be adopted.

The maximum range of the finished coil when used with the same condenser will be almost equal to that of the best honeycomb coil of an equal number of turns, but its minimum will be found to be considerably lower than the corresponding value for the commercial article. A quite definite improvement in sharpness of tuning will also be noticed and this alone should be ample repayment for the time spent in constructing such attractive and efficient apparatus.

Number of turns.	Gauge, S.W.G., D.C.C.	Weight of wire.	Depth, "X."
18	18	1 1/4 oz.	1/2 inch.
18	16	2 1/2 "	3/4 "
25	18	2 1/4 "	3/4 "
25	16	3 1/4 "	1 "
35	18	3 1/2 "	1-1/16 "
50	20	2 1/4 "	1-3/16 "
75	24	2 "	1-3/16 "
100	28	1 1/4 "	1-3/16 "
150	34	1 1/2 "	1-1/4 "

## INTERSTATE NOTES

### VICTORIA.

#### Recent Transmissions.

**T**HE holidays have produced a fine out crop of amateur transmissions and transgressions, to the accompaniment of joys innumerable, and some very distressing gramophone music. Mr. Spencer Nolan's reference to an opinion expressed in these notes (vide his recent letter) to the effect that gramophone music is the ideal for telephony testing, was very flattering, but, on the principle that lilies that fester smell far worse than weeds it is to be recognised that a bad gramophone selection is very bad indeed. It cannot be worse, however, than the raucous human voice hacked into splutters and tatters by a faulty microphone or by adjustments made *currente voce*. At the other end of the scale the transmission of the New Year peal of bells from St. Paul's by 3LO was very interesting and of such good quality that the published apologies on the score of unpreparedness and haste were hardly needed.

#### 3AR's Sunday Services.

Many congratulations to 3AR for steadily lifting itself higher out of the slough of despond in which up till recently it has been finding itself, until now it is doing very fine work indeed, especially on Sundays. Although only getting one third of the broadcast fee, this station has pioneered the way very admirably, and it deserves a great deal more than it gets, not only in pay but in praise. Of course one cannot consider seriously 3AR's day time transmissions which are horribly bad gramophone selections, but at night there is often good music and lecturing, and the Sunday services lately have left little to be desired. The transmissions of Mr. James' address from the Congregational Church do that eloquent and arresting speaker full justice and should bring pleasure to thousands of listeners-in.

#### Professor Meredith Atkinson.

3LO has undoubtedly scored a point in enlisting Meredith Atkinson for their Sunday evening talk on the news of the week. His enunciation leaves nothing to be desired. It is clear, loud, distinct, musical and fluent, and besides that, what he has to say is well worth hearing. His item alone is worth getting home at 9 p.m. to listen in for, and it seems a pity that the hundreds of good people who go to church on Sunday night are thereby de-

barred from hearing him unless they live near enough to home to get back in time.

#### 3LO Explains.

An unfortunate breakdown occurred at 8 p.m. during the Wesley Church transmission last Sunday, and the announcer very properly explained later on, during the studio concert, that it was due to a breakdown in the electric supply at Baybrook. But couldn't such breakdowns be provided against?

#### W.I.V.E.S. and Wavemeters.

Awakened by the recent visit of Messrs. Love and Hull to Sydney, the W.I.V.E.S. (which has before been shown to stand for Wireless Institute of Victorian Experimental Section, and not for anything more or less effeminate) has announced its intention to erect an experimental station in some lofty suburb where all sorts of DX and short-wave work will be attempted. Preliminary thereto, a wavemeter has been ordered from England, and, as is the way with W.I.V.E.S., it will be the best in Australia when it gets here. Why it should ever have been out of Australia does not seem to strike W.I.V.E.S., who, like other young men, think no good thing could possibly be made here and now. The awful example of Sydney Institute in securing a wavemeter from America might surely have been avoided, and indeed some W.I.V.E.S. champions claim that in securing a British instrument they have outdistanced Sydney in efficiency, but a plague on both your houses! Why not make it HERE? It is urged in reply that the calibration would not be possible in Australia, but goodness knows we have only to send to Sydney, if the worse comes to the worse, and get a locally made one calibrated there. Yet even that desperate course would not be necessary, since our own Melbourne University has all the facilities for calibrating even a much more delicate instrument than any of the W.I.V.E.S. will ever need. This continued ignorance of what we can do ourselves and running after other lands is a very poor foundation for an experimental station to start work on. It is funny to note that among other researches enumerated by the announcer for the Institute there is listed the trial of directional transmission in the nature of beam wireless. Soon the W.I.V.E.S. will be telling the world that Marconi has again

been stealing its thunder. Why don't they wander up into about 200,000 metres for a change and do something original as well as better?

#### Wireless and Wet Weather (Also Clothes-lines).

The question at present agitating the public conscience is whether the many aerials recently erected are having an adverse influence on the weather. Certainly the recent weather is preposterous and will take a lot of explaining away on Judgment Day, but why, pending the arrival of that interesting event, are aerials singled out for scapegoats? It should be obvious to any inspector of backyards that the universal habit of washing clothes and hanging them out to dry is the cause of so much wet weather. If you will only take notice, or consult a housewife, wet days are a regular sequence from washing day to washing day, and the eminent Eurasian professor, Pinchoff Saltovich, who has lately been collecting specimens of washing days in various suburbs, has conclusively demonstrated a connection between the weather and the washing. When the wind is from the north on any given Monday the moisture-laden clothes on the line give up their aqueous content to the supernatant atmosphere surges, and these pass on towards the Pole, where dense clouds are formed by congelation of all this suburban moisture. On the return journey these clouds are emptied of their contents according to a periodic law approximately at the place of their origin, so that the rain that falls next week can be definitely identified by an ingenious process as the very same water that was in the tub in that same backyard the Monday before last. Professor Saltovich conclusively proves that there is a definite electronic affinity between the particles of water thus carried and the metallic irons of the clothes-line on which the washing is rung. Owing to the flapping of the clothes, eddy currents are set up around the wire clothes-line, and these induce surges of equal frequency in the vapor as it is carried off by the polarised wind, and so everything is set in train for the return. The eminent Professor has successfully removed wet blankets and other articles of washing to his own backyard and demonstrated that the rainfall and windfall have thus been increased in his own vicinity. As his visits were necessarily hurried owing to reasons of State, the Professor was unable to collect more than a few specimens from the most accessible clothes-line, but he has now quite a useful range, with which he proposes to return to his own country with a view to increasing the rainfall there. He is taking also a considerable quantity of clothes-line that has acquired the necessary radio-activity through generations of washing days. It is understood that the Melbourne Radio

Police placed their services at his disposal during the experiments, but as his tests were carried out with the utmost secrecy they are not at liberty to divulge any further particulars. It is understood however, that the researches of the eminent Pinchoff will result in the washing in several suburbs being in future done at huge central laundries, and an elaborate system of insurance has been built up to protect them against damage from waterspouts. This should ensure a recrudescence of seasonable weather in parts sufficiently remote from these laundries. When last heard of, the eminent Professor was in seclusion, working out the details of his scheme. A good judge has summed it all up in one sentence—six months without the option. It is understood that the Prime Minister is being approached with a view to creating a bureau for further research, to be presided over by Professor Saltovich, and the Federal Treasurer has set aside an amount on the estimates for next year to be devoted to combating the ravages made in the weather by those who carry out washing without a license.

#### DX Telephony.

In notes on the amateur waveband, reference is made to hearing Sydney and Adelaide, and perhaps Perth, telephony in Victoria. Some people do not really appreciate what this means. In England, anyone who, living under the shadow of 2LO near London, can also hear Manchester, and even Birmingham, not to mention Glasgow, preens his feathers and emits a long ecstatic crow, although these are high-powered stations, and the ether of England has been dominated by wireless waves till it should now be fairly docile. But even Glasgow is hardly as far from London as Sydney and Adelaide are from Melbourne, yet even a beginner in wireless likes to be assured by his Melbourne dealer that he will be able to get Farmer's, Sydney, on his one-valve set. He will, too, if it is well-made and he learns how to handle it. He will also undoubtedly get 2FC on his loud speaker, and even Perth at good headset strength if he has a WELL-MADE three-valve and LEARNS HOW TO HANDLE IT. But to get such capital results he must attend to the conditions in capitals, and must not take all he reads in English magazines as gospel. Of course, to a great extent conditions for long-distance telephony in Australia are still very favorable. There are not so many transmitters and not so many listeners-in, and not by any means so many houses to interrupt reception as there are in England. On the other hand, we have fewer stations to experiment with, and constant experiment is the soul of good reception. Eiffel Tower is merely a few wavelengths from London,

and yet there are men that boast of having heard FL in London! Perth is over 1600 miles from Melbourne, and although a good deal of that distance is over the sea, still 1600 miles measured from London would seem an incredible distance to the insular Londoner. Compare these distances by air-line:

London to—	Melbourne to—
Manchester .. 160 miles	Sydney... .. 450 miles
Birmingham .. 100 "	Adelaide .. 400 "
Glasgow .. .. 340 "	Brisbane .. 840 "
Cardiff... .. 130 "	Perth .. .. 1620 "
Paris .. .. 200 "	Hobart. . . . 340 "

### "Good Morning, Dearie!"

The ancient Spartans made their slaves drunk in order to give their children ocular demonstration of the foolishness of intemperance, and no doubt their children derived an unholy edification from the spectacle. Was it with similar Spartan intentions that Messrs. J. C. Williamson made use of 3LO to broadcast that awful example of the sons and daughters of Jazzabel with the above title? At least they were good enough not to inflict more than a portion of it on listeners-in, but an ear that could listen even to Morse unmoved would surely rebel at the Hell's Bells' Band. We were supposed to tune in to the thing, but no adjustment of filament or grid leak or B battery or reaction coil or any other operation of tuning could possibly get that blare and bellow into tune. Must we have such stuff broadcasted? The Philharmonic Society lately refused to make the "Messiah" available, although it ostensibly exists to educate the public in good music, and of course, 3LO is to some extent a "tied" house and cannot go to rival theatres or concert halls not controlled by J.C.W.—unless it soars sublime to such considerations or is made to remember that it is subsidised by the Australian Government to provide unbiased programmes for licensed listeners in. When it awakes to that fact, no doubt there will be less advertisement of any one firm's particular wares and we will be deprived to an appreciable extent of the "Argus," the "Herald," Buckley and Nunn, and J.C.W., but gain in other directions. Of course it takes all sorts of listeners-in to make a broadcasting world, but let us hope for the sanity of Australia that although the moon was nearly at the full when G.M.D. was broadcasted, yet no one outside of a lunatic asylum could possibly have endured more of it than 3LO in its mercy inflicted on us.

### The Cricket Results.

3AR staged an excellent idea in transmitting direct from Melbourne Cricket Ground their five minute commentaries on the test match, supplied by Edgar Mayne and retailed by Uncle Rad. It was

most entertaining to hear the crowd burst into cheers and to guess whether they denoted another hit or a batsman out or a bit of brilliant fielding. Many a cricketing household must have hung long over the set and followed lovingly the fight so lucidly set forth.

### Around the Amateurs' Wave Band.

Besides the pipings and rattlings of Morse supplied by such stalwarts as 3BQ and his band, and which gave us excellent practice during the holidays, it was also a pleasure to hear experimenters in telephony making full use of their leisure. One hesitates to put 3BU among the amateurs unless we accept that title as including masters as well as apprentices. He puts out excellent stuff with a vigor and certainly that 3LO might envy but hardly excel. He informed the world recently that he uses two microphones in parallel, and he certainly gets unparalleled results. Lately he has developed in his own person or by an assistant a most intriguing role of the R's and when once heard "Experrrrimental Station Thrrrr BU" will never be forgotten. A new telephonist is 3JG who is a friend of 3BU but is not on any list. His output is strong but subject to a curious fading and a wobblulation of the wavelength that makes him difficult to follow. Of course 3UZ is always worth hunting for, and his excellent transmissions make one year for an associated traders' station that would transmit every night. If it is permissible to class 3AR also among amateurs, since it possesses many of an amateur's engaging qualities and possibilities, it may be mentioned here that their permanent station is still in the air or in the clouds or whatever a thing can be said to be that isn't anywhere at present. The Sunshine location has been abandoned as too near 3LO. The present station has been putting out some work that is very creditable considering its disabilities, but the tuning required is exceedingly sharp. One well-known amateur comes in almost on top of 3AR at times and gives the effect of two people talking at once, which is likely to be considered bad form by polite listeners-in. 3GI has lately gone back to his old love and favored us with selections on his Edison Diamond Disc, but is not yet up to his old excellent form. Although not on the amateur wave-band, 2FC over here is regarded as good meat for amateur reception, and has lately come back to us with all his old-time vigor. It is possible to hear him faintly on one valve even during 3LO's sessions, at any rate at night. Adelaide is also making itself heard and on New Year's Eve after the bell-ringing was over some station unknown, but suspected to be in that direction was heard singing Auld Lang Syne and God Save the King at 20 to 1. Sign, please!

## SOUTH AUSTRALIA.

**D**URING the past few days B class broadcasting licenses have been issued to Mr. E. J. Hume (5DN) of Parkside, and to Messrs. James Marshall & Co., Ltd., of Rundle street, Adelaide. The latter will work on 275 metres with the call sign 5MC. It is probable that 5MC will be in operation by the end of January.

Station 5DN is too well known all over Australia by the quality of his transmissions, to need any further introduction. The transmissions from this station have always been consistent both in quality of production and in the selection of good programmes.

A particularly fine concert was broadcasted from Mr. Hume's station last Thursday evening. The programme was specially arranged by Mrs. Hume. Several Cello solos were played during the evening and these came through in beautiful style; a number of recitations by Mrs. Hume were also very fine, and songs and duets contributed by local artists were also received very clearly and with excellent volume. Quite a feature of the evening's transmission was the announcing which was done by Mrs. Hume whose voice was heard very clearly by all who listened to this enjoyable evenings entertainment.

With the loud speaker placed before the open window it is quite a treat to be able to sit on the lawn these hot summer evenings, and to listen to a first class concert of this description. There is a certain amount of elation apparent in Adelaide over the allotment of the two B class licenses, but there is also a feeling of disappointment that 5DN did not get the A class license. The A license has not yet been issued although many rumours are prevalent; all that can be got out of the authorities is the same old stereotyped answer—"We are considering it and you will know within the next few days."

We were promised a broadcasting station more than twelve months ago, and it seems as far off as ever. We are told that the trouble is finance. If that is the case why was not the license granted to a company who could have financed the scheme? Such a company applied for the A license. If the license is issued to a company which cannot raise the mean to establish and run the station, what will happen then? More delay and then start all over again. Meanwhile a lot of harm is being done not only to the trade but to radio itself by inferior transmissions and by unwarranted boasting by persons who cannot carry out their obligations. Another problem that is being discussed by the public is what is to be done with the money collected in this state for license fees, as according to the regulations the Postmaster General can dis-

pose of this money in any way he may see fit. We only hope that the P.M.G. will see fit to allot the money to those who deserve it.

Owners of BCL licenses are asking whether their licenses are to be post-dated from the time broadcasting starts here, as they are thoroughly dissatisfied with the treatment they have received, having had nothing for their money. Even those with multiple valve sets get little for their license fee, as the interstate broadcasting stations 2FC, 3LO, and 6WF on their high wave lengths are not often able to be heard clearly during the summer months owing to static. We have all heard that these wave lengths are to be brought down much lower, and we are anxiously awaiting for this to take place, as from what we have heard of these stations during tests on the lower waves, we are expecting some wonderful improvements.

## New Year's Eve Transmissions.

New Year's Eve was a good night for radio, being almost free from static and the midnight transmissions from 2FC, 3LO and 6WF were heard very clearly and a very good loud speaker strength by many enthusiasts who waited up to hear the New Year in, in the different parts of our island continent.

## 5CL Broadcasts Midnight Chimes.

A microphone had been set up on the balcony of the Adelaide Town Hall. From 10 o'clock onwards music played by Holden's Brass Band was broadcasted and at midnight the chiming of the Town Clock was heard by listeners in, together with the noise of the crowd in the street, the singing of Auld Lang Syne and the speech of Alderman Entwistle who spoke especially to the inmates of the Bedford Park and Myrtle Bank Soldiers Sanatoriums, wishing them all a happy and prosperous New Year.

## WESTERN AUSTRALIA

**O**N about December 30, at 3.30 o'clock a.m., Mr. R. Wilkes, of Craig & Co. Ltd., Perth "picked up" broadcast music from the new wireless station recently erected at Durban, South Africa.

Interviewed to-day, Mr. Wilkes said that he had proposed listening in from about 2 a.m., but the alarm refused duty and consequently he did not awake until about 2 a.m. At this time he commenced to tune in, and although he could hear a distant station there was too much interruption from Applecross. The actual messages from Applecross could be tuned out, but certain oscillations known among wireless experimenters as "mush" could not be. Mr. Wilkes dozed in his armchair alongside the wireless set until 3.30 a.m. when Applecross closed down on the Press messages it

was sending to shipping and he was able to tune in the station more distinctly and ascertain it was Durban. The set Mr. Wilkes was using was a three valve one employing one H.F.D. and L.F. the circuit being of the tuned anode design. For about fifteen minutes Mr. Wilkes listened in to the faint music, with the interpolation of an occasional spoken word. He then decided to introduce a fourth valve in the set in order to increase the volume but the extremely critical tuning was upset by the addition. A few minutes later he was able to pick up the "carrier wave" and heard up a few notes of music before the station closed down at 4 a.m. or 10 p.m. African time. Although the new Durban station is understood to be sending on a wavelength of 370 metres, Mr. Wilkes says the wave length yesterday was about 395 metres.

Referring to the interruption from Applecross, Mr. Wilkes said that although this wireless station invariably sends out its press messages on a wave length of 2,100 metres on this morning it adhered to a wavelength of 600 metres and the proximity of the station to his home at Cottesloe had caused difficulty in tuning. Mr. Wilkes who was using V24 valves for HF and D and a BTH power valve for the LF said it was useless an experimenter hoping to get results if using single circuit tuning. As Applecross was usually sending out Press messages between 3 and 3.45 a.m., he urged experimenters to commence listening in between 2 and 3 a.m. This experimenter made another attempt this morning to receive the Durban station and although he was able to detect the "carrier wave" he was unable to pick up music, no doubt because the atmospheric conditions were not as clear as on the preceding day.

Many persons saw 1925 in in the modern way —by radio. The West Australian broadcasting station 6WF provided musical fare until some minutes after 12 p.m. on New Year's Eve. During the early evening His Majesties Theatre was broadcasted. From 10 p.m. items from the studio were enjoyed and at approximately 11.30 Sir William Lathlain, a prominent Perth citizen, addressed listeners-in on behalf of the station, etc., he wished them the compliments of the season. At 12 p.m. a time gong from 6WF was given, and a large gathering sang "Auld Lang Syne." The noise of the city constituting rooster imitations (!) by the locomotives, hooting of motor cars, etc., etc., was perfectly and loudly broadcasted for several minutes. The National anthem concluded an enjoyable novel session. A cheery "Good-morning Everybody; 6WF is now closing down" completed the entertainment.



*Little Maisie Byrn, of "Stockton," Parramatta Road, West Ryde, who was awarded first prize for the most original costume at a ball recently at the Ryde Town Hall. Maisie represented 2FC, 2BL, and "Wireless Weekly."*

#### BROADCASTING STATION FOR QUEENSLAND.

It is announced by Amalgamated Wireless (A/sia) Limited that arrangements have been completed with the Queensland Government for the erection of a 5 k.w. "Class A" broadcasting station at Brisbane.

Work will be commenced at an early date, and it is anticipated that the station will be in operation for the coming winter. In many respects it will be a replica of the three broadcasting stations—2FC Sydney, 3LO Melbourne, and 6WF Perth—already constructed by the company. The whole of the transmitting apparatus will be manufactured at the radio-electric works of Amalgamated Wireless (A/sia) Limited, Sydney.

The Broadcasting Association at Capetown is considering a proposal from a big inland town in South Africa to co-operate with the Cape station by the erection of a relay station. This would be with a view to encouraging people in the far-flung distances of the South African veldt.

# DUAL RECEPTION

By Wireless Weekly.

**T**HERE is plenty of room for scientific research work with dual or double reception. Here in Sydney, we have two broadcast stations transmitting nightly for several hours, so why not start to night to endeavour to receive them both at once, at the same instant of time using only one aerial.

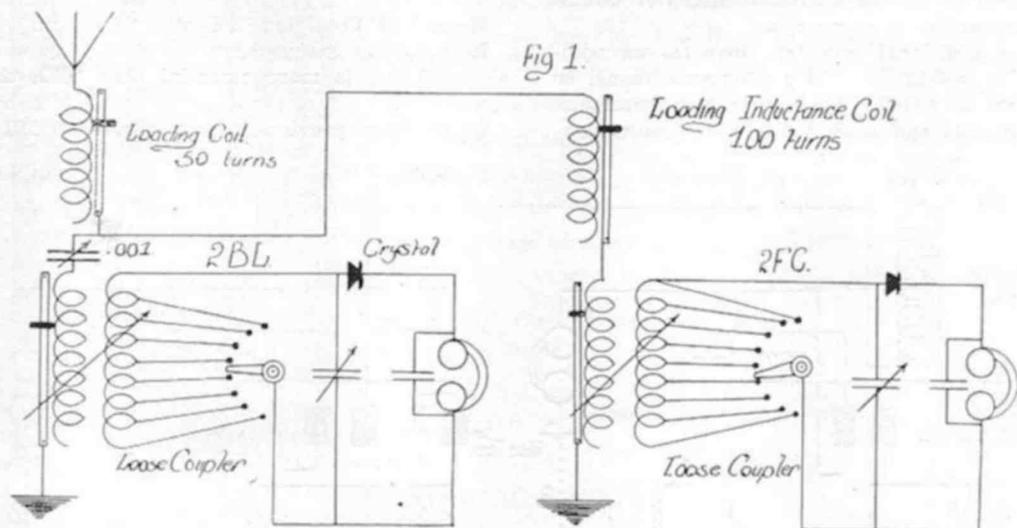
For the whole period of the war Admiral Beatty's Flagship H.M.S. "Lion" averaged a signal a minute, at times as many as six operators being employed on the watch at once listening on various wavelengths using only three different aerials. Think this over and we feel sure you will be convinced that it will repay you to experiment along these lines. In the early stages of the war quite ordinary receiving instruments were used for dual or double reception; later on however, all the larger ships were fitted with double silent cabinets, with seating accommodation for two operators with special types of receivers which enabled them both to read two signals on different wavelengths from one aerial at the same instant of time.

In all the diagrams (except one) shown in this

steer in carrying out their various experiments with dual reception. We need hardly add that we shall at all times be pleased to hear from readers concerning this or any other article appearing in W.W.

In order to avoid any confusion as to the circuits mentioned in this article a specific case is taken. It is assumed that 2BL's wave is being received on the one set and that 2FC's is being received on the second set and to be supposed for the time being, that it is more important to receive 2BL's wave than 2FC's Fig. 2 shows the vice versa method where it is more important to receive 2FC (without interference) than 2BL. These same methods of course can be applied to any other two waves which it may be desired to receive. Of these waves 2BL's will be received on the instruments which in this article are known as 2BL and the longer waves known as 2FC.

To receive these two waves together from the same aerial it is essential to add an extra circuit which we will term an acceptor circuit. The point at which this extra circuit should be connected de-

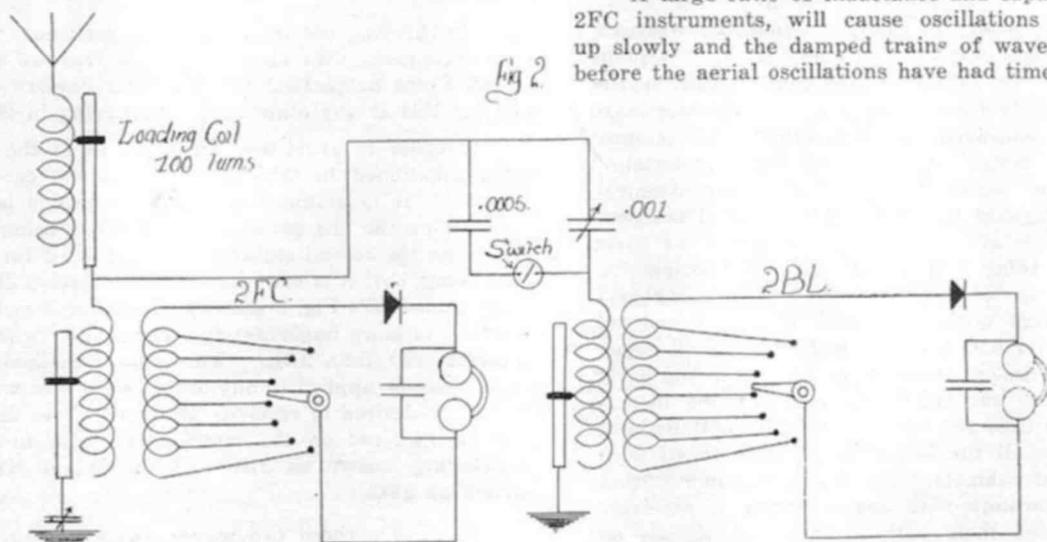


article, crystal means of rectification is shown because we wish to encourage the novice or beginner to experiment and not to be satisfied with merely listening in night after night to ordinary broadcasting programmes. Actual experiments carried out (no matter how small) with their ensuing results are infinitely more interesting than obtaining QSL cards; try it and see for yourself.

The following notes and diagrams will, we hope, guide our readers as to the course they should

pend upon which one wave you are most desirous of receiving the better. If it is connected to a point of the circuit where the voltage to earth is large, it will rob the acceptor of a considerable proportion of the 2BL wave. It therefore follows that if double reception on one aerial is to be used without interference with 2BL's wave, then 2FC's wave acceptor circuit must be connected to a point where the voltage to earth is small. See Fig. 1 for best receptor of 2BL.

With the above circuit arrangement it is possible to receive at the same time the two waves



with nearly the same strength of signals as when either of the two waves is being received alone. The reduction of strength of 2BL's wave is due up to the introduction of the additional acceptor circuit of 2FC and arises in two ways.

1. The additional acceptor involves an additional series resistance. This resistance should be kept as low as possible by having large size wire on loading coils and loose couplers (a point, how-

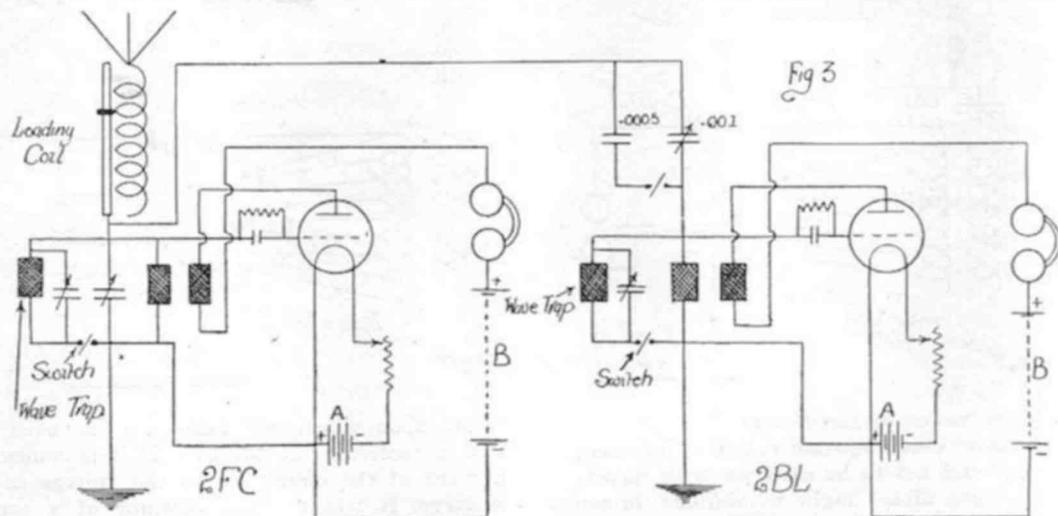
of the loading inductances, and the inductance in the additional acceptor.

A large ratio of inductance and capacity as in 2FC instruments, will cause oscillations to build up slowly and the damped train of waves is over before the aerial oscillations have had time to build

up. On the other hand, a small inductance and capacity as in 2BL enables the oscillations to build up quickly and more energy is absorbed from the wave train.

#### Method of Receiving 2FC with Minimum Reduction of Strength.

If this is more essential than 2BL, the long wave must be received on the set of instruments which have previously been receiving 2BL. The



ever, can be reached in the design of the coils, etc., where the increased size is not compensated for by the reduction of the resistance).

2. The introduction of an additional acceptor increases the effective ratio of the whole aerial circuit because the effective inductance is now the sum

connection now to the extra acceptor circuit should be taken off the aerial side of the additional acceptor as before. The short wave is now brought into resonance by means of the variable .001 condenser together with the .0005 fixed condenser which can be switched in and out of the circuit by

means of the single pole switch or a short-circuiting line. See Fig. 2.

With the circuit arrangement as in Fig. 2, the long wave signal are not weakened because the alternative path to earth is taken off at the point which is practically at earth potential, also the additional tuned circuit is very much out of resonance to the short wave, with the result that only a proportion of the short wave energy is wasted down his path. The short wave tuning will not affect the long wave adjustments. The long wave tuning will, however, affect slightly the short wave adjustments in the same manner as was explained previously. When using circuit diagram No. 2 you will find that the inductance of your additional acceptor (which is the primary of your 2BL circuit) has a greater effect on the short wave tuning than the capacity and it would be an advantage to use the variable condenser for very fine tuning. The slight weakening of the signals of both will be due to the same causes as before, when using diagram Fig. 1, viz., extra resistance, etc. Wave traps on both circuits will be found very valuable and for the more advanced experimenter we are showing Fig. 3.

Here the well known P1 circuit using H.C. coils is employed together with wave traps.

## Japanese Broadcasting

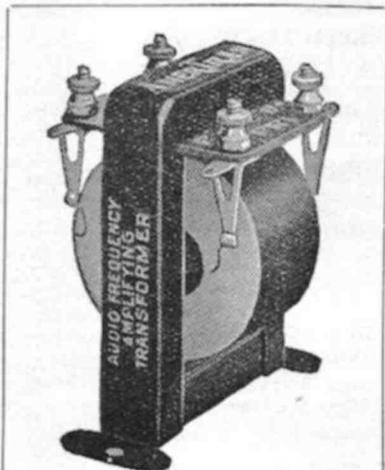
The Japanese Government have recently issued broadcasting regulations in which it is stated that persons wishing to start broadcasting services must make an application to the proper quarters, and also produce constructional details of the proposed station. An estimated profit and loss account of the working of the station is also required.

It is rather interesting to note how Western ideas have been taken as examples. The following are two extracts from the rules stating that the two kinds of stations permitted will be—

(1) High-powered long-distance stations, which must work on a wavelength of from 360 to 385 metres.

(2) Short-range stations, which must work on a wavelength of from 215 to 235 metres.

£40 will be the cost of the annual license fee for a high-power broadcasting station, £30 for short-range station, and 4/- for each receiving set belonging to listeners-in.



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only by using the best  
Transformer

"AMERTRAN"

Squeals and howls in audio-transformers are due to regeneration between the tubes and the amplifiers. To get rid of this trouble, very careful wiring is necessary. The grid and plate leads must be short and straight, and the other wires of the set must be grouped together. Insulated wires should be used, if possible. A proper "C" battery should be used in the grid circuit of each tube to match the first battery used in accordance with directions given with the transformer. Also, squeals may be avoided by placing a resistance of  $\frac{1}{2}$  megohm across the secondary of the last transformer. Capacity should not be placed across the secondary but may be placed across the primary. This capacity may be as high as .004 M.M.F.

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3in. N.P. with Unit, doz. . . . .	10d.
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Aerovox, .001, each 7d.; .00025, with Leak, 1/-; .006, each . . . . .	1/-
Freshman .001, 2/9; .00025 . . . . .	2/6
Micadons, 3/-; .00025 . . . . .	3/-

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Complete Stocks of all parts for home construction.

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Complete Parts: Brass 1/9 and 2/9; N.P., 2/6.  
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# TRANSFORMER LOSSES

WHICH EXPLAINS WHY SOME TRANSFORMERS ARE LESS EFFICIENT THAN OTHERS.

**T**RANSFORMERS are amongst the most important constituents of any wireless equipment. A good receiver (or transmitter, for that matter) can be spoiled by a bad transformer, and the radio worker who fails to study the practical difficulties of transformer construction is ignoring a very vital branch of his subject.

Readers of this article will be sufficiently conversant with the theory of the transformer to justify only the briefest reference to it here before proceeding to those practical considerations on which the efficiency of a transformer so much depends.

The principle of the transformer is based on the simple, elementary fact that if you move a conductor through a magnetic field a current of electricity will flow through the conductor. Or, instead of moving the conductor, you can produce the same effect by moving a magnet near the conductor. The important thing is that there must be relative motion between the conductor and the magnetic field.

Now, when an alternating electric current flows in a wire it produces an alternating magnetic field round that wire; that is to say, the magnetic field spreads outwards and collapses alternately, as the current rises to its maximum value and falls to zero alternately. There is thus a moving magnetic field round the wire. If a second conductor be placed in the neighbourhood of this magnetic field, therefore, there will be a current induced in it.

This induced current will also be an alternating current.

Thus any two conductors, placed close together, act as a transformer. If an alternating current be passed through one, it will give rise to an alternating current in the other.

Now, when an electric current passes through any material it has to overcome the resistance of that material. Some materials have a much higher electrical resistance than others. Air, for instance, has a far higher electric resistance than iron—to take two extreme “materials.” Similarly, when magnetic lines of force pass through any material they also have to overcome a certain amount of resistance.

Some substances have a much higher magnetic resistance than others. Air, again, has a much higher magnetic resistance than iron. Therefore, if

we were to use a transformer consisting of just two coils of wire, we should be compelling a large number of magnetic lines of force to pass through a high-resistance material, with the result that a good deal of energy would be lost, i.e., wasted in overcoming resistance, without doing any useful work. (In the case of very high frequency currents, this consideration does not arise.)

It must be remembered that the magnetic field surrounding a coil of wire in which a current flows is very much like the field of a bar magnet.

A transformer that consists of one coil wound over another, therefore, will be one in which the magnetic lines of force will have to traverse an air path through the core of the inner coil, and also through the air surrounding the outer coil.

Hence the use of “iron core” transformers. If the coils be wound on an iron core the resistance to the lines of force that pass through the core will be considerably reduced. Moreover, if the iron core be continued round the coils, as it were, so as to form a frame, a low-resistance path will be provided to all the lines of force. Or, to put it another way, instead of the path of the lines of force being partly composed of iron and partly of air, it will be a complete iron path. And since lines of force always take the path of least resistance, they will all crowd into this path, along which they will travel with a minimum loss of energy.

Transformers constructed on the latter principle are known as the “closed magnet circuit” type.

But the introduction of an iron core “cuts both ways,” as we say. It has its disadvantages as well as its advantages. Relative motion between a magnetic field and a conductor produces a current of electricity in the conductor. That, as we have seen, is the principle on which the transformer itself works. But we have to remember that when we introduce an iron core into a transformer, we are introducing a conductor, and the magnetic field will produce currents in this conductor as well as in the wire forming the transformer coils. Such currents are called “eddy currents,” and they represent so much wasted energy, of course.

In order to reduce this effect to a minimum, a process called “lamination” is employed. The core

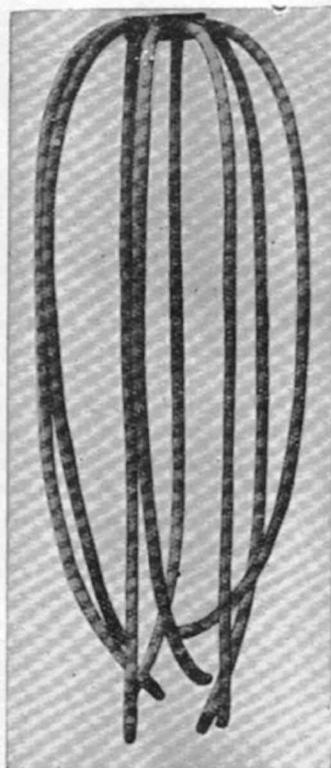
(Continued on Page 36)

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(The Editor, "Wireless Weekly.")

Dear Sir,—I have tried the Crystaudio attachment, manufactured by Cole and Cureton, and have found it satisfactory in every way. I purchased same through seeing the advertisement, and do not know either of the gentlemen in any way. All my friends who have heard it are very pleased. The tones are very mellow, absolutely no distortion. I will be pleased to recommend same to any who are interested.—Yours truly,

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293-295 Edgecliffe Road, Woollahra.

The "Crystaudio" can be supplied by: Radio House, 619 George Street; Wireless Supplies Ltd., 21 New Royal Arcade; Humphreys Ltd., 465 George Street; Keogh Radio Supply, 503 George Street; Slingsby and Coles, 482 Pitt Street (under Railway clock); Home Electric, King Street; J. Levenson, 244 Pitt Street; Elliot Bros., O'Connell Street, and Mick Simmons, Haymarket,

(Continued from page 34)

of the transformer, instead of being composed of solid metal, is made up of a number of thin strips of iron. Each strip is insulated from its neighbour by a sheet of paper or some other insulating material, and all are pressed together and fastened tightly in the form of a compact core (or frame).

As the eddy currents tend to flow at right angles to the direction in which the magnetic lines of force act, this arrangement offers considerable resistance to the passage of the eddy currents, whilst its effect on the lines of force is practically negligible. The conducting path offered to the eddy currents is only the thickness of the strips comprising the core, whereas the magnetic lines of force have the whole length of the core as their path.

Another source of loss in a transformer is that due to the effect known as "hysteresis." When a current flows in a conductor it produces a magnetic field round the latter, and when the current is switched off the magnetic field dies down again. These two effects do not take place simultaneously, however. It is found that the magnetic flux produced by a current never dies down to zero by the time the current has reached zero. This tendency of the magnetic flux to lag behind the current that produces it is termed "hysteresis."

This means that there is always a quantity of magnetic flux remaining in the iron core after the current has fallen to zero. This flux is called "residual magnetism." The residual magnetism, at the termination of a flow of current, will act in a certain direction, of course; and when the current is reversed the magnetic field that grows up with it will act in the opposite direction to the residual magnetism.

A certain amount of energy will, therefore, be wasted in overcoming the latter at every reversal of current. In each case, of course, the amount of energy wasted will be proportionate to the amount of residual magnetism in the core at the termination of each flow of current. This factor depends upon the quality of the material of which the core is made, and the practical problem is, therefore, to find an iron that will retain a minimum amount of magnetism.

In addition to the foregoing causes of energy-loss in a transformer there are the losses incurred in the passage of current through the primary and secondary windings. These depend upon the strength of the current involved, and are controlled by the length, thickness, and quality of the windings used.

—From "Broadcaster and Wireless Retailer," Eng.

## MAXIM ON AMATEUR WIRELESS.

**F**IVE years ago amateur radio telegraph operators were sending messages to all parts of the United States and Canada through the American Radio Relay League. There was no distance on the continent that they could not span. The idea of communicating with Europe was regarded as improbable. To-day hardly a week goes by but some amateur makes a record pointing the way to world-wide amateur communication by radio telegraphy.

Receipt of two messages within a day or two of each other, one from Australia and the second from New Zealand, brought from Hiram Percy Maxim, president of the A.R.R.L., the comment that the "big radio thrills are in the two-way telegraphic game." Both of these messages came all the way by amateur radio with the same reliability that they could be sent by cable and wire.

"This appears to be another of the startling things that amateur radio is developing," Mr. Maxim declared. "Imagine what would have been said of me only five years ago if I had predicted that in 1924 private citizens in their homes in New Zealand and Australia would be communicating back and forth with private citizens in the United States as well as in England and France!"

"The private citizens of the world have it in their power to communicate with one another without leaving their homes. Where is it leading to? May it not be toward broader political views, more international friendships, and better understanding? There is a thrill in receiving music broadcast from France, but I believe it is even more awe-inspiring to converse back and forth with an individual whom you have chanced to meet on the air."

## "BEAM" WIRELESS STATION.

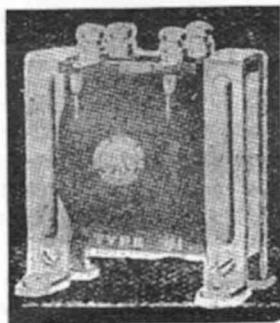
For three years there was much talk of a high power radio station for South Africa. "The Argus" evening newspaper at Capetown cabled the Marconi Co. in London to make an offer to the Union Government. Nine months later a high power station was put in hand, and Klipheuvell, near Capetown, was chosen as the site. When the foundations for 16 masts had been completed, a bombshell came in an announcement by Mr. H. E. Penrose, joint managing director of Marconi's South African Company, that investigation was taking place in London on the beam system for the station at Klipheuvell.

There followed the decision to substitute a beam station with a 25 kilowatts power for the original station with 750 kilowatts. The contractors, Messrs. Douglas and Munro, have sold by auction machinery, station's foundations.

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## RADIO TELEGRAPHY AT SEA

Memorial presented to the International Labor Bureau by Captain S. Toombs, Secretary Radio Telegraphists' Institute, Sydney.

WE regard the resolution adopted by the Subcommittee for Ports and Maritime Navigation set up by the Advisory Committee on Communication and Transit of the League of Nations as most unsatisfactory.

The resolution says, "in respect of radio telegraphic communications relating to safety at sea and the protection of shipping." It absolutely leaves out the words "of life" after the word "safety," and, in our opinion, safety of life is the primary consideration, and the protection or saving of shipping, whether of hull or cargo, is a secondary matter. And although they have left out this most important proviso, yet further on in their resolution the subcommittee decides "to take all measures in its power to promote the convening of the conference to revise the Radio Telegraphic Convention of 1912."

The Radio Telegraphic Convention of 1912 was convened for a totally different purpose than the International Conference on the Safety of Life at Sea of 1914.

The Radio Telegraphic Convention of 1912 was simply to revise the objects of the International Conference which sat in 1906, which may be summarised as "The Convention, the Additional Undertaking, the Final Protocol, and the Service Regulations," all of which were necessary to provide for smooth, uninterrupted communication, and to prevent chaos.

The International Convention on Safety of Life at Sea which assembled in 1914 made for a totally different purpose. Each country represented at that convention had before it its heavy lists of shipping casualties of a recurring character, and consequent heavy loss of life.

In reviewing the position at that time, it must be remembered that in 1906 the load line was raised on all British ships, as a result of which in the two following years there was an abnormal increase in wrecks and loss of life, especially to certain classes of ships, and this must be attributed to the lowered freeboard, which is the seamen's margin of safety.

This conference, from which representatives of the shipping trade were eliminated, and which consisted of administrators, experts, and jurists, came to the conclusion, after exhaustive enquiry, that radio telegraphy was a valuable aid in the preven-

tion of loss of life at sea, and it is to the work of that convention that the seafarers of to-day owe the protection that wireless telegraphy has given them, and not to the convention of 1912, to which the subcommittee refers.

Unfortunately the war broke out in 1914, and the work of the convention was interrupted, but the war had this result, that what the convention had found by exhaustive enquiry to be absolutely necessary to safeguard the lives of the seafarers, the shipowners immediately found was necessary to protect their property, and without the law of compulsory wireless behind it in Australia all ships were fitted with wireless.

During the same war we read of "Sparks the Hero," but now the war is over "Sparks the Hero," in common with the personnel of the Mercantile Marine of the Allies which rendered such conspicuous service to the shipowner and the nation, is conveniently forgotten, and if a few pounds per annum can be saved by the shipowner on wireless installation, let it be saved, even though seamen drown.

We in this country will accept no watering down of the safeguards provided at the convention of 1914; in fact, rather do we think that with the development that is taking place in wireless telegraphy, some greater measure of protection should be given us, and that both the primary set and the emergency set provided by the shipowner should be capable of covering much greater distances than is at present the minimum laid down by regulation.

Also, taking into consideration the lonely life of the seafarer, with its dull, monotonous, daily routine, there is no reason why broadcasting services could not be established, and some measure of recreation and amusement provided for the crew.

We regard with suspicion the fact that in the second session of the Commonwealth Parliament of 1923 a bill was introduced to amend our Navigation Act, and clause 3 of the bill, had it been successful in going through, would have annulled all requirements under the Convention for the Safety of Life at Sea, wireless included, and the suspicion before referred to is owing to the fact that the introduction of this measure followed close upon the Shipowners' International Conference in 1922.

(Continued on page 42)

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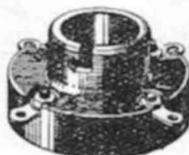
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A Brisbane experimenter, using one Weco valve, gets Sydney stations 2 B.L. and 2 F.C. with ease. Others using two Weco valves have heard K.G.O., Oakland, California, U.S.A., 4 Y.A., Dunedin, 5 A.B., Adelaide, and 6 W.F., Perth.

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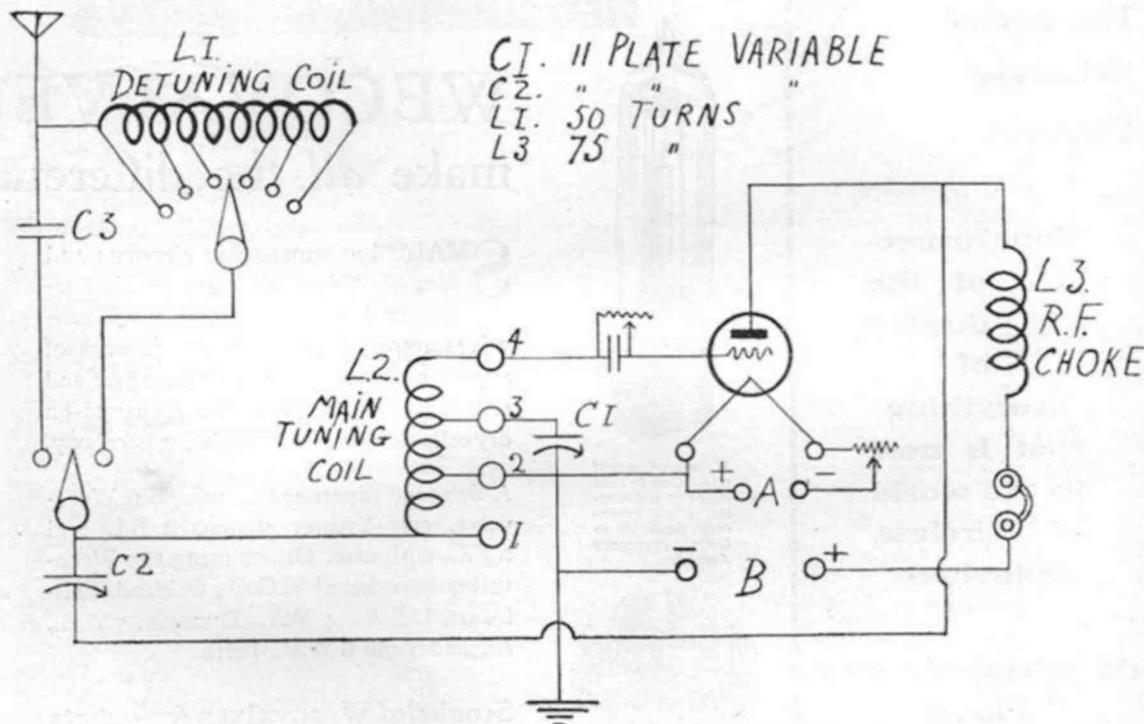
192-194 Castlereagh St., Sydney. Telephone: City 336, 355 and 356.  
And at 588 Bourke St., Melbourne. Telephone: Central 8336 and 8949

**WE**

# THE REINARTZ ALL WAVE TUNER

THE repeated requests we have had for information concerning the Reinartz Tuner, originally described in *Wireless Weekly*, impels us to print portion of the previous article. Some readers inform us that they have lost their original copies, others that they have only lately become interested in wireless, and so on. The publication of the list of American stations logged by Lawrence Deane in our issue of January 9th, and a letter from a correspondent who mentioned the splendid broadcasting results he had obtained, have aroused a great deal of interest. Mr. Deane mentioned that his set contains certain modifications of this circuit, but, without wishing to question that state-

ment, we would be interested to learn what modifications are possible, aside from slight differences in the coils. The following extracts from our other correspondent's letter, published in the issue dated January 9th, are interesting. He says: "I have one coil which covers from about 220 metres to 380 metres, and another from 1000 to 2000 metres. Using .0005 condensers I found that coils wound on a 2½ inch former were not large enough and that 3½ in. gave nearer results when using the formula of turns 1—3—1." However, with regard particularly to short waves, we ourselves found that a Reinartz constructed according to the instructions below gave wonderfully good results.



THE REINARTZ CIRCUIT.

Condensers C1 and C2 are 11 plate variable. C3 (fixed) is composed of two feet of ordinary lamp-flex, one wire of which is connected to the aerial and the other to the switch point. The other ends are left disconnected.

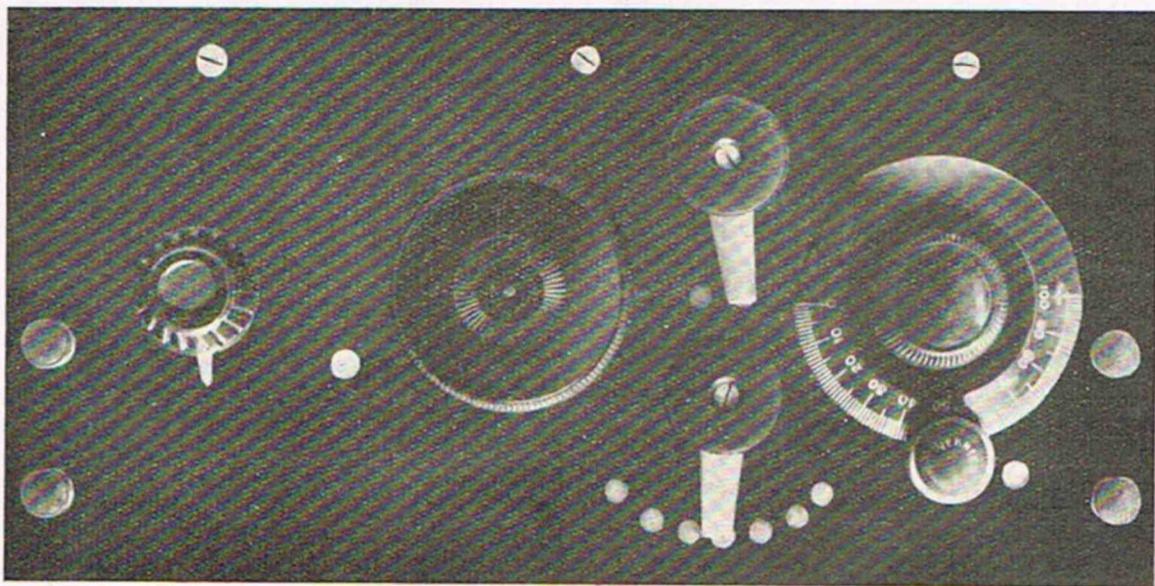
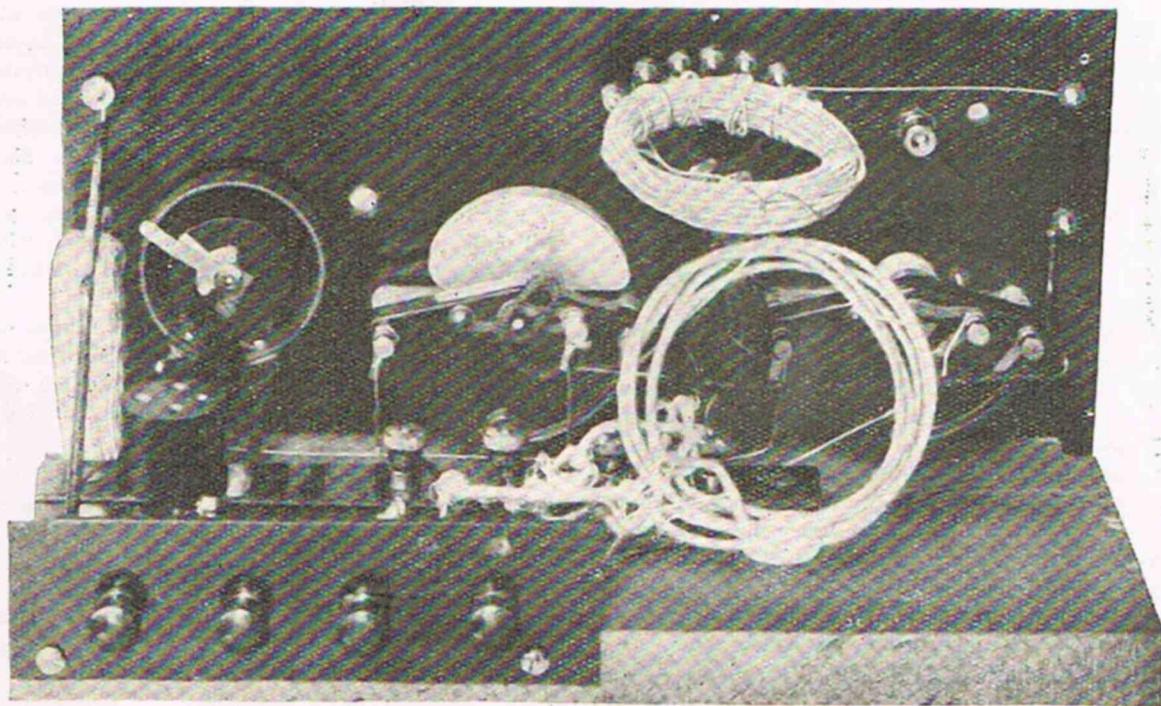
L1 consists of fifty turns of 24 D.C.C. wire wound in the following fashion:—Get an ordinary drinking glass of about 2½ in. diameter. Wind the wire on jumble fashion, slide the coil off and wind a few turns of thread round it. L1 is tapped every ten turns and the taps taken to a 6 point switch.

L2. Use the same drinking glass, and wind on No. 14 or No. 16 D.C.C. wire as follows:—Wind on five turns, take a tap; add fifteen turns, take another tap; five more turns, and another tap. Take the ends to four terminals mounted on a strip of bakelite.

L3 is wound as above and consists of 75 turns of 24 D.C.C., without tappings. This coil should be mounted at right angles to the other coils.

Audio frequency may be added to this circuit in the usual manner by hooking on to the phone terminals.

(NOTE.—We found that carefully-made coils wound in a single layer on the usual solenoid type of former gave no better results than those described above.—Editor.)



#### REINARTZ TUNER.

Top photograph shows front view of panel 12 in. x 6 in. Note the vernier control on the left-hand condenser. This gadget may be obtained from any wireless store, and is easily fitted to the panel. The large knob in the centre is another type of vernier control handle, but we doubt if it is obtainable. If not, fit a similar attachment as that shown on the other condenser.

Bottom photograph illustrates the mounting of parts.

(Continued from Page 38)

However, the bill failed, and we have reason to believe that the same tactics have failed in other countries, and now the shipowner comes to the League of Nations and asks the League of Nations to override the legislation of his own country.

We ask the shipowner, if wireless telegraphy is taken from the seafarer by the League of Nations, is the shipowner prepared to lower the load line of British ships, and give back to the British seamen their previous freeboard? We know they are not, and as any attempt to take away from the seafarers of Australasia the small margin of safety that they to-day enjoy, and which they have enjoyed for the past 10 years, would tend to provoke grave industrial consequences. Believing as we do in Australia, that our internal industrial conditions are not the concern of the rest of the world, but rather what we can by constitutional action compel, we submit with all due respect to the League of Nations that they take the provisions of the 1914 Safety of Life at Sea Convention as the minimum international requirement for the safeguarding of human lives.

In Australia we have the most efficient Mercantile Marine Wireless Service in the world.

It is conducted by certificated men only, and there is no case on record of a distress signal being missed or assistance asked for that has not been available, yet with this service in existence we have had two Royal Commissions on the foundering of vessels from unforeseen causes with heavy loss of life.

In other countries they have allowed inefficiency to creep into the Marine Wireless Service in the shape of "Watchers." There are abundant cases and ample proof of the inefficiency of this "Watcher system." Distress signals have not been heard time and time again that should have been heard. These inefficient men are employed by the shipowners on the score of cheapness, irrespective of efficiency. If the Australian shipowner in the interests of "safety and efficiency first" can afford to pay certificated wireless men throughout their service, so can his international competitors. Therefore, instead of the League of Nations taking from Australia what she already has, an efficient service, seeing that since 1921 the Australian shipowner has demonstrated and proved that he can successfully compete and without loss give to the Mercantile Marine personnel adequate wireless protection, then it is the bounden duty of the League of Nations, supposedly based upon the highest humanitarian ideals, to take the

standard set by Australia as the minimum of wireless safeguards at sea, and bring those nations who are lagging behind and placing profits before human life up to the standard of efficiency set by Australia.

If the League of Nations is to function and prosper, it can only do so by retaining the confidence of the people of its constituent nations. To lower standards of life, comfort, or safety in any industry is not, in our opinion, what it was created for, and will only bring it into disrepute; and once the ideal is sacrificed, that is the end of the League as a factor in international life.

In conclusion, we would say to the League, let your ideal be to improve that which has been entrusted to you; raise any standards you like that make for a better or a grander world, but lower nothing.

SAMUEL TOOMBS,

General Secretary,

Radio Telegraphists' Institute of Australasia.

#### STANDARDISATION IN THE STATES.

News from Washington goes to show that means to effect the manufacture of standard radio apparatus are being eagerly sought as the first step toward the unification of the industry in that country.

At present each manufacturer has his own measurements for apparatus that is in general use in as many forms as there are producers. Standardisation of such parts would, it is suggested, reduce cost and make replacements far more easy.

The advancement made in the motor car industry by the methods of standardisation of parts has been noted with interest, and many producers of radio apparatus have already signified their willingness to assist in achieving the same results in their industry.

It is only after certain important parts have been standardised, declared one manufacturer, that the radio industry will be in the position to produce apparatus on a large quantity basis; at present each manufacturer is virtually for himself. Condensers, variometers, rheostats, and many other parts used generally, if made on the same plan, could be manufactured in much larger quantities for assembly in the various receivers. Panels especially are suggested for standardisation as regards size and positions of holes. Such panels, already drilled, would be much cheaper than they are to-day, and would permit the radio enthusiast to dabble with new ideas and thus purchase more new parts. It is a matter of increased business, state most of the large producers, and should have close attention.

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 D.V.2 Filament 5 volts .25 amp.  
 Both Types Fit Standard American Socket.

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### TYPE A.R.

A splendid valve of the bright emitter type, specially recommended to the amateur. May be used either as a detector or amplifier (H.F. or L.F.), and operates on low plate voltage.

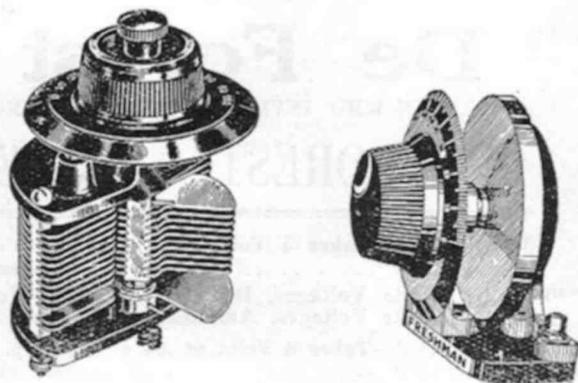
Filament Volts . . . . .	4
Filament Amps. . . . .	0.75
(General . . . . .)	30—80
Plate (Detector . . . . .)	30—40
Volts (H.F. . . . .)	40
Amplifier L.F. . . . .	80
Impedance in ohms. . . . .	36,000
Amplification Constant . . . . .	6.0
Emission Milliamps, Approx.	
Total . . . . .	6
Cap . . . . . 4 Pin Standard, Full Proof	
Price, 17/6 each.	

### TYPE A.R., .06.

Embodying the latest improvements in the dull emitter type. It works at a filament voltage of 2.5, and the current consumption is only of the order of .06 of an ampere (0.15 watts). Thus the valve may be operated off ordinary dry cells.

Filament Volts . . . . .	2.5—3
Filament Amps . . . . .	0.6
(General . . . . .)	20—100
Plate (Detector . . . . .)	20—30
Volts (H.F. . . . .)	30
(Amplifier L.F. . . . .)	50—100
Gird Bias Volts, Negative . . . . .	1—3
Impedance in ohms. . . . .	37,000
Amplification Constant . . . . .	10.5
Emission Milliamps, Approx.	
Total . . . . .	5
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### STRATHFIELD AND DISTRICT RADIO CLUB.

The ordinary weekly meeting of the above club was held at the clubrooms, corner Albert Road and Duke Street, South Strathfield, on Monday evening, 12th inst. Mr. A. F. Jacob presided, and there was a very good attendance of members. Our ranks were reinforced by the addition of another new member in the person of Mr. C. Simpson, of Eastwood, an experimenter in a small way of many years' standing. Gentlemen with the technical qualifications such as Mr. Simpson possesses are an acquisition to any club, and he was given a very cordial welcome by members. In a brief but modest reply to our welcome, Mr. Simpson left no doubt in the minds of those present regarding the keenness with which he will endeavour to advance the club's interests and, incidentally, his own knowledge of wireless subjects. The club is fortunate in the possession of several such members, and consequently our meetings are never characterised by dullness. After the usual discussion of practical points submitted by members—a regular and interesting feature of our meetings—the hon. secretary carried on with the second of a series of lectures on valve theory. The methods of plotting and the information to be obtained by a study of the characteristic curves of three electrode valves were briefly explained.

Next lecture will deal with the detecting and amplifying action of these valves, and at subsequent lectures their behaviour in various classes of transmitting and receiving circuits will be dealt with. The committee meet again on 21st inst. to arrange the programme of activities of the club for the next month, when it is hoped to introduce further interesting innovations with a view to stimulating the already healthy interest exhibited by members.

New members will be welcomed, and communications regarding membership addressed to the hon. secretary, Mr. K. Campbell, 44 Bayard Street, Mort lake, will receive prompt attention.

### THE GUILDFORD RADIO CLUB.

The Guildford Radio Club started off again this year with the addition of six new members to its list at the first meeting. The club meets every

Thursday evening, and has arranged a series of short lectures to be given during the first quarter. It may be stated that at least 20 of the club members take the "Wireless Weekly" regularly, and consider it the best wireless paper on the market. The club finished up last year in a very healthy state, and, while hoping for big things during 1925, the members extend to all fellow clubs and members very best wishes for 1925.

### WAVERLEY RADIO CLUB.

On 13th January, Waverley Club thrashed out, in a debate the question, "Are the present broadcasting services satisfactory to the public?" The answer, according to the judgment of the chairman, Mr. A. Burrows, was in the affirmative. Only one point, however, separated the teams, the victory therefore going to the affirmative side only by a narrow margin. It was significant too, that after the decision had been given, practically all the members of the winning side declared that they were speaking against their own convictions—unofficially, the meeting was almost unanimous that the services are not satisfactory. Mr. J. Miller led the winning team, and Mr. W. Stewart the leader of the opposing side.

Other business included matters dealing with the renewal of the club's license, and a notice of motion for the appointment of an assistant secretary and assistant treasurer.

### WOOLOOWIN RADIO CLUB (BRISBANE)

A meeting of the Wooloowin Radio Club was held at headquarters on Monday, 12th inst. The business of the meeting was a debate on "Bright Emitter versus Dull Emitter Valves." Three members upheld the claims of each type of valve. Studious care in preparation for the debate was evidenced by all speakers and the question was so well dealt with that the voting on the subject was even and it rested with the Chairman to exercise his casting vote which was given in favour of the bright emitter side of the argument.

This is the first of a series of debates set down on the club syllabus and the interest and attention evidenced augurs well for the future welfare of the club. The financial statement showed the club to be in a prosperous position. The club wishes to notify all wireless enthusiasts that Mr. A. Jackson, Jrn., will give a lecture, illustrated by lantern slides entitled, "Electricity and Magnetism for the Beginners in Wireless," at the Guild Hall, Wellington Street, Wooloowin, on Monday, 16th February. This lecture is open to all interested and there will be no charge for admission.

(Continued on Page 49)

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4000 ohm 'Phones (Mello) .. . . .	25/-	Ormond .0005 Plain Condenser .. . . .	11/6
Crystal Sets from .. . . .	20/-	Ormond .0003 Plain Condenser .. . . .	10/6
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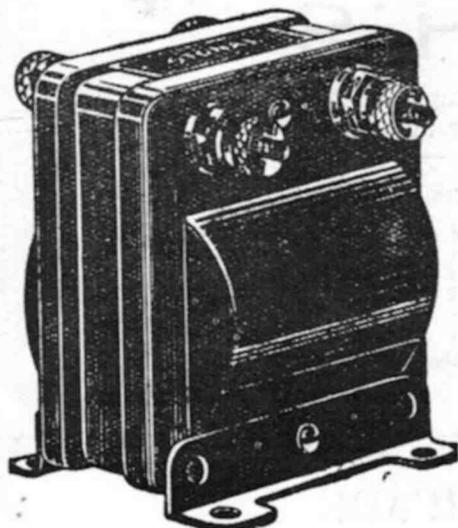
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(Continued from page 45)

### THE LEICHHARDT AND DISTRICT RADIO SOCIETY.

Keen interest was taken by members of the Leichhardt and District Radio Society in the important proceedings of the 114th general meeting, held at the club-room, 176 Johnston Street, Annandale, on Tuesday, January 13th.

It was the occasion of the judging of the short papers, written by members in connection with the competition organised recently, and members rolled up in good force to hear the decision of Mr. A. W. Watt, Editor of Wireless Weekly, and of Mr. W. Hamilton, better known as "Insulator," to readers of this magazine. Those two gentlemen had been appointed by the Society to act as joint judges, and at the conclusion of the meeting it was generally agreed that they had done their work well.

Mr. Hamilton, in his own breezy way, referred to the all-round excellence of the entries submitted, and assured members that he and Mr. Watt had had great difficulty in arriving at a decision as to which paper submitted was actually the best. However, it was decided, eventually, that a paper submitted by Mr. A. H. Dayman, under the heading, "The Theory of Broadcasting," should be awarded the prize, which took the form of a cheque for one guinea, donated by Wireless Weekly. Mr. Hamilton further announced that as a paper written by Mr. H. F. Whitworth on "Ohm's Law" was almost equal to that awarded first prize, he had decided to offer the writer a second prize of half a guinea, which was supplemented by a similar amount by Mr. Watt on behalf of Wireless Weekly.

After the result of the competition had been announced, and the prizes donated to their respective winners, members entered into a discussion with their visitors on experimental wireless matters in general and at the conclusion of the meeting all agreed that it was one of the most enjoyable and successful that the Society had ever had.

Syllabus No. 3 has now been drawn up by the officers of the Society, and a perusal of it as it appears below will convince the reader that members have a very busy half year ahead of them. Lecture No. 1 will be delivered at the next meeting to be held on Tuesday evening next, when Mr. R. C. Caldwell will chat to members on the Morse Code, and give examples of the procedure adopted in its use.

The Society still has ample room for new members, and persons interested in its activities are invited to communicate with the Hon. Secretary, Mr. W. J. Zech, 145 Booth Street, Annandale.

(Continued on Page 50)

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(Continued from page 49)

SYLLABUS, No. 3.

Ending June 30th, 1925.

- January 20th—Demonstration of Morse Code Procedure, Mr. R. C. Caldwell.
- February 3rd—28th Monthly Business Meeting.
- February 10th.—Aerials and Their Erection, Mr. E. J. Fox.
- February 17th—Club Debate.
- February 24th—Principles of Electricity and Magnetism, Mr. H. F. Whitworth.
- March 3rd—29th Monthly Business Meeting.
- March 10th—Short-Wave Circuits, Mr. S. P. Williams.
- March 17th—Sale and Exchange Evening.
- March 24th—Lecture by Mr. F. Thompson (selected).
- March 31st—Demonstrations by Sets of Members.
- April 7th—30th Monthly Business Meeting.
- April 14th—The Problem of Fading Signals, Mr. R. C. Caldwell.
- April 21st—Competition Night.
- April 28th—Batteries, by a visiting Lecturer.
- May 5th—31st Monthly Business Meeting.
- May 12th—Magnetic Rectifiers, Mr. J. R. Alexander.
- May 19th—Social Evening.
- May 26th—The Action of Crystals and Valves, Mr. H. F. Whitworth.

- June 2nd—32nd Monthly Business Meeting.
- June 9th—Lateral Communication During Wartime, Mr. F. W. Sommers.
- June 16th—Questions and Answers' Evening.
- June 23rd—Lecture by Mr. F. Lett (Selected).
- June 30th—Examination Evening.

## CLUB LECTURERS KINDLY NOTE.

Recently at Willesden, England, Thomas Francis Finucane, wireless lecturer, of Golders Green, was charge with obtaining wireless apparatus from a Kilburn firm by false pretences.

He stated in defence that his lectures were such a success that the adulation he received caused him to give way to drink, which weakened his moral fibre.

In spit of the fact that he had been convicted of a similar offence at Clerkenwell, the magistrate decided that the present case was a civil one, and discharged the accused.

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No. 500 Series Parallel Switches . . . . .	1/9	per card . . . . .	3/3
No. 400 Adjustable Lever Switch . . . . .	1/4	7 Special Mounted Indicating Binding	
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Contact Stops, doz. . . . .	10d.	Dials, 3in., 2/6; 3½in., 2/9; 4in. . . . .	3/6
Lettered Binding Posts, each . . . . .	5d.	No. 200 Switch Lever . . . . .	1/-

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Nature of Test: Physical properties and dielectric strength.

TEST.	MATERIAL.	
	"Ashcoy" Ebonite.	Bakelite.
Immersion in water for 48 hours—increase in weight . . . . .	.01 %	84%
Action of various agents:		
H2SO4 Sp. G. 1.2 . . . . .	No action.	No action.
Hot Transformer Oil . . . . .	No action.	No action.
Caustic Soda (10%) cold . . . . .	No action.	Liquid is discoloured and the surface roughened. The sample increased about 50% in thickness, but remained firm and could not be stripped or broken.
Dielectric strength, measured between $\frac{1}{2}$ inch diameter discs; thickness of samples .025 in. . . . .	30,000 volts.	29,000 volts.



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## SHORT CIRCUITS

An amateur in England who recently queried the legality of the P.M.G. license fee of 10/- on the ground that under the Act it could not be charged, had his case quashed by a barrister who showed that the fee was compulsory.

The officials of the Pittsburg radio casting station, KDKA, are kept well supplied with fruit from appreciative American radiophans who listen to that station. Peaches, water-melons, and other luxurious fruit continue to roll in from persons residing in States famous for this or that particular type of fruit.

If the idea caught on over here, one could easily picture Mr. Cochrane, of 2FC, staggering home laden with a load of cherries and Queensland pines, while the new car of Mr. Saunders, of 2BL, might well be utilised for the conveyance of Tasmanian apples and choice prickly pears.

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## Information Column

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

J.B. (Port Kembla) and others ask for further particulars concerning the low power transmitter described in *Wireless Weekly*, December 12th, stating approximate cost of parts.

Answer: Below is a list of parts required, together with the approximate cost.

One Marconi R Valve .. . . .	0 19 0
One Marconi R holder .. . . .	0 2 6
One piece of Bakelite 9in. x 6in. . . . .	0 6 8
One .0005 condenser .. . . .	1 3 6
Eight terminals .. . . .	0 5 0
One 6 ohm rheostat .. . . .	0 4 6
One key (good type) .. . . .	0 10 6
Former and wire .. . . .	0 5 0
One carbon granule microphone .. . . .	0 15 0
One A battery, 6 volts, 40 amps .. . . .	3 3 0
Three Ever-Ready B Batteries .. . . .	1 17 6
One single pole switch .. . . .	0 2 6

You must wind 70 turns of No. 24 D.C.C. wire on a former 2½in. in diameter. If a larger former is used, wind only 50 turns. The middle turn of the winding should be connected to negative A, the lower end of the former to the earth terminal and the upper end to the aerial terminal. The microphone is connected between the aerial and some portion of the upper part of the inductance above the tap which is connected to the negative A. You will have to experiment a little to determine which is the correct turn to which to attach this connection. Just bare the insulation a little to make a temporary connection and when you have ascertained the correct turn, solder the connection permanently. Every microphone varies in resistance and this is why we cannot tell you exactly what particular turn to place that connection on. When you wish to use C.W. or Morse, connect your Morse key between the negative A terminal and negative B terminal, the A representing the 6 volt accumulator and the B, the 150 volt dry battery.

J.R.R. (Noonbah, Holbrook), Q.

Question: What is the wavelength of a sending out station got to do with the length of aerial and

the coils of a receiving set? What length and height of aerial would you suggest as being most suitable for a five valve receiving set situated 300 miles from Sydney? Does the lead in on the aerial count as part of its length? At present I have two temporary aerials, one six feet from the ground and about 200 feet long and the other about 20 feet high and 120 feet long and can get fairly good results on either, from 2FC and 3LO. Would iron masts be as suitable as wooden masts and would it be necessary to insulate all the stay wires in addition to the aerial? Would an aerial 60 feet high at one end and 20 feet at the other, be as effective as one 50 feet high at each end? What is the reason why, when no alteration of the adjustments is made, at certain periods signals come in strongly and at others gradually die away until they are hardly audible?

Answer: Every aerial has its own natural wavelength made up of its own inductance and capacity and the average amateurs aerial has a natural wavelength of about 150 metres. As soon as a coil is placed in series with this aerial the wavelength to which the aerial best responds will have increased according to the number of turns of wire in the coil used. Your query concerning the best aerial for a five valve set is difficult to answer because you do not stipulate what type of set you propose to use. However, we strongly recommend the five valve tuned plate circuit which was published in *Wireless Weekly* on December 19. In this particular article, the sizes of the coils required for all the Australian broadcasting stations were shown. You will find the best aerial to use is one 100 feet in length, as high as possible, and pointing as nearly as practicable towards the broadcasting station you wish to receive. The lead in is included in this 100 feet. Iron masts are just as efficient as wooden ones but you should insulate all the top stay wires. The mean height of your 60 feet to 20 feet would be 40 feet so that two masts each 50 feet high would be best. The falling off of music strength which you mention is caused by fading and in the article which we referred to concerning the five valve set, there are also a number of particulars concerning this strange phenomenon. Please refer to your back files.

J.E. (Armidale.)

Question: I have a two valve set and wish to convert it into a four valve set. What I want is a really good four valve receiver for broadcast reception on any Australian station, with loud speaker strength from 2FC and possibly 3LO. Honeycomb

coils to be used only. I want a complete wiring diagram of this set including accurate winding of the jacks. The following are the articles I have on hand and I would be glad if you would supply me with a list of the other parts I will require:

- 1—44 plate Vernier variable condenser .001
- 1—22 plate Vernier variable condenser .0005.
- 2—Type 41 Jefferson Super Transformers Ratio 3.75 to 1.
- 1—Grid Leak 75,000 ohms.
- 1—Grid Condenser .00025 mfd.
- 4—Radiotron valves 201a.
- 4—Frost Shock Absorbers. Sockets for same.
- 3—Frost Jacks (one No. 135, two No. 136, fil., control.)
- 1—Push Pull B battery switch.
- 1—Frost tube control unit (Rheo. Pot.) Rheostat 35 ohms; Pot. 400 ohms.)
- 2—35 ohms vernier rheostats, Frosts.

A piece of bakelite 22 x 9.

Answer: The circuit which we recommend you is shown below and also a drawing showing the

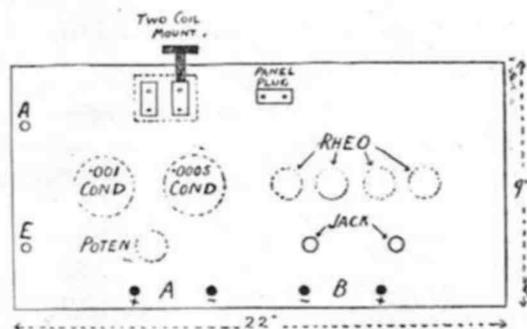
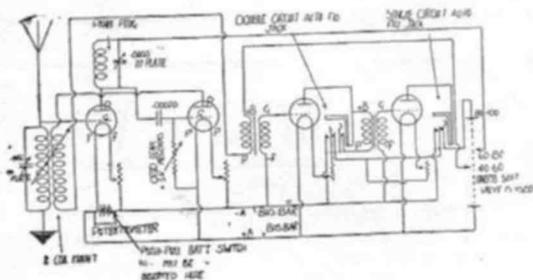
tically all cases, one stage of audio is required so that we are only showing jacks from the first audio onwards. You will need the following extra material for this set: One 2-coil mount, one panel plug, two 30-ohm rheostats, one Freshman variable grid leak without condenser. Valves, valve holders, grid leak and transformer should be mounted on a wooden baseboard secured to the bottom of the bakelite panel. The remaining gear should be mounted on the panel as per sketch.

C.H. (Concord.)

Question: Can you explain why I am not able to receive Broadcasters but only Farmers' service? My aerial is a single wire, 120 feet long with a lead in of 12 feet. My earth lead is 10 feet long and another lead runs 20 feet to an iron rod in a well. Using a tuned impedance circuit, primary 100 turns, honeycomb coil, I get Farmers, but I am not able to get Broadcasters on a 35 turn coil or on any other.

Answer: You should be able to get Broadcasters O.K. at Concord if your tuning is right. Perhaps you are using too large a coil in your primary and you would be wise to alter your aerial to 100 feet in length including your lead in to the set. Keep your earth wire as short as possible. If you don't wish to alter your aerial, place your primary condenser in series for 2BL and in shunt for 2FC by means of a series parallel switch. A number of readers lately have written us mentioning that they are unable to get Broadcasters but can get Farmers quite O.K. and in most cases we found that they have been using the slider method of tuning and that the handle of the slider has come into contact with the wood end in such a way that the slider was not making contact with either the end turn of the wire or beginning turn. In this case it is better to take a few turns off the primary so as to make sure that the slider is making contact with the first or the last turn before touching the wooden end. Your situation at Concord however may be screened as some parts of this district are very low. Farmers of course are on a larger power and this screened effect would not be so noticeable.

(Continued on page 58)



suggested layout of the panel. The circuit comprises one radio, detector with regeneration and two audio frequency amplifiers with automatic filament jacks between the first and second audio. In prac-

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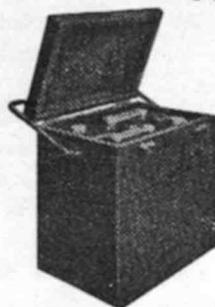
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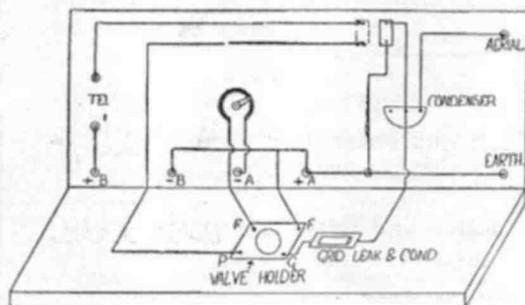
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parts: One .0005 variable condensed, De Forest DV3 valve (dry cell), One honeycomb 2-coil mount.

Answer: The circuit we recommend is the standard P1 circuit and the sketch below showing the suggested layout of the panel will be found useful.



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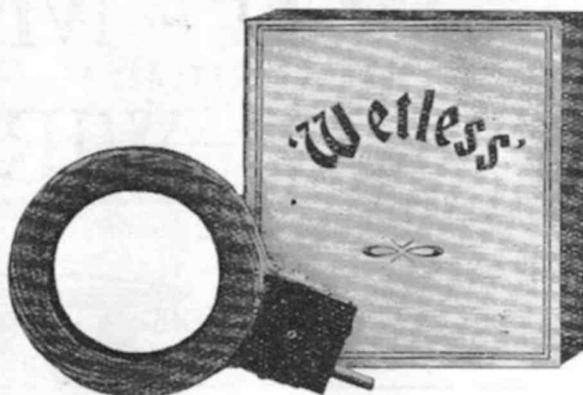
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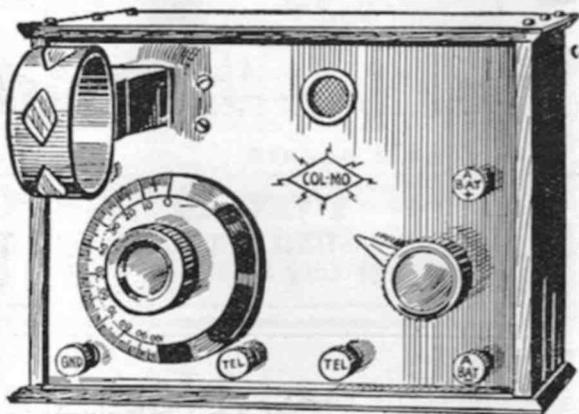
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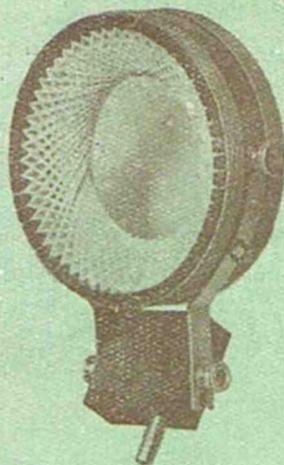
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150	820	2000
175	850	2400
200	980	2780
225	1010	3160
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