

WIRELESS WEEKLY

Registered at the G.P.O. as a newspaper.

Transmitted by post at a newspaper rate.

Vol. 12, No. 11

FRIDAY, 10th JANUARY, 1935.



Pure Music

That's what you want; and if you use a Philco Rechargeable Accumulator "B" Battery you must get the best results. Nearly all those crackling, spitting noises originate in your dry "B" Battery, and you often think the interference is due to Static. Power from a Philco "B" Battery costs about 4d. per Kilowatt hour, while from a dry "B" Battery it costs as much as £3 for the same amount.



Call or Write us for interesting data:

NEW SYSTEM TELEPHONES PTY., LTD.

280 Castlereagh Street
Sydney

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Melbourne.

PHILCO
DYNAMIC RADIO
BATTERIES

FEATURE:

A Single Valve
for a
Frame Aerial

YOU'VE NEVER HEARD PERFECT MUSIC BY WIRELESS

Unless you have

THE WONDERFUL TRUE BLUE TUBES



Non-microphonic and Vastly Superior to Ordinary Valves. Better and cheaper in the long run. The only non-microphonic Valve in the world. Saves in battery charging, and has 2 or 3 times longer average life. Don't blame static for microphonic valve noises.

Get a TRUE BLUE today and hear the difference.

"Cheap" Valves make a good Set sound like a bad Gramophone. "Cheap" Valves draw big current, and are expensive on batteries. "Cheap" Valves have about one-third the life of TRUE BLUE TUBES. So "cheap" Valves are dear. Improve your Set with TRUE BLUE TUBES. They are cheaper in the long run and better all along. True Blues are obtainable at Anthony Hordern's, Farmer's, Murdoch's, Cullen's, Radio House, Colville-Moore, Sandel 2UW, Levinson's, Mick Simmons', Sydney; P. A. Morris, Norris & Skelly, O. J. Nilson, and Leviathan, Melbourne; and

PARSONS & WHITTEMORE
LIMITED
30 MARKET ST., SYDNEY

Mail orders by V.P. Post. (Pay the Postman.)

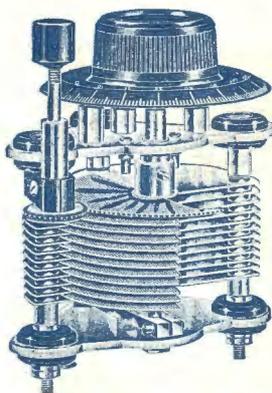
Every Day, in Every Way, Radio Sets are getting Better and Better

That Set you got in 1924, or early this year, is not up to to-day's standard, but there is no need to scrap it. Improve it with the latest parts. Do it gradually. This week True Blue Valves, next week Low Loss Condensers and so on. Here are the latest 1925 Radio Productions:

HEATH CONDENSERS

BUILT LIKE A WATCH.

AT LAST—A NON-DIELECTRIC STRICTLY LOW-LOSS CONDENSER.



THE BEST BY TEST.

In designing a receiver to bear the magic name of

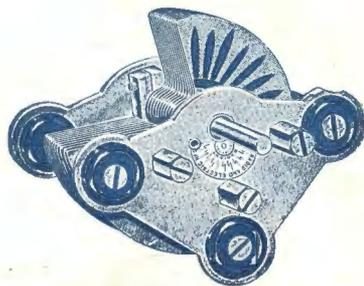
MARCONI.

The Marconi Co., of Canada, after exhaustive tests, adopted the new HEATH Condenser. Shipments of these Condensers have just arrived.

Prices, with micrometer, geared vernier, .001 39/8, .0005 34/-. .0025 31/-.

Without geared vernier 7/- less.

Remember, a Condenser with a geared vernier plate is more selective than one without. Improve your Set with Heath Non-dielectric Condensers. Heaths are obtainable at Farmer's, David Jones', Radio House, Swain's, Colville-Moore, Wiles, and Parsons & Whittemore Limited, 30 Market St. Sydney.



HEATH'S NEW SHOCK-PROOF SOCKETS. Even the screws have shock absorbers. Standard base, 4/9.

HEATH'S RADIANT DIALS are of genuine Bakelite, and have deep concaved grooves affording the easy natural grip necessary for fine adjustment. 3 inch, 4/-; 4 inch 5/-.

DYMAC'S NEW SILENT RHEOSTATS: 6, 10, 20, 30 ohms, 6/-; Potentiometer, 7/3. Enquire about our Loud Speakers, Phones, and Battery Chargers.

PARSONS & WHITTEMORE LTD.
30 MARKET STREET, SYDNEY

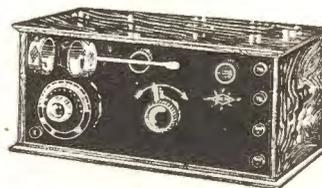
Mail Orders sent by V.P. Post. (Pay the Postman.)

COL-MO LITTLE GIANT SETS

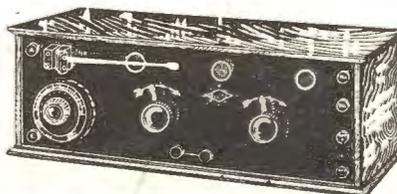
The Little Giant Sets are sold complete with all accessories, including aerial wire. The three valve Little Giant is complete with all accessories and Atlas Loud Speaker.

- One Valve Set £7/10/0
- Two Valve Set £12/10/0
- Three Valve Set £20/0/0

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



Col-Mo Ready to Wire Sets



GENUINE RADIO SETS THAT WILL WORK.

Our Ready-to-Wire Sets are complete with wiring diagrams. No previous experience necessary to wire a COL-MO Ready-to-Wire Set.

WIRING TAKES TIME, AND TIME IS MONEY.

DO THE JOB YOURSELF AND SAVE MONEY.

ONE-VALVE SET: Complete with Cabinet, £2/15/0.

TWO-VALVE SET: Complete with Cabinet, £4/10/0.

THREE-VALVE SET: Complete with Cabinet, £6/5/0.

SALE OF GENUINE PARTS

Clearing off a number of lines at cost. Call and inspect.

COLVILLE-MOORE
Wireless Supplies Limited

10 Rowe Street (opp. Hotel Australia) Sydney

Two Colours --- BLACK and MAHOGANITE

Nothing Else is as good as "RADION"



Radion is manufactured especially for radio work and far exceeds any other material in the four main characteristics required:

1. Low angle phase difference
2. Low dielectric constant
3. High resistivity
4. Low absorption of moisture.

Radion is beautiful in appearance. It is easily worked by skilled and unskilled alike without danger of chipping or cracking. In price, Radion is far more economical than any inferior substitute material.

Sets built with Radion panels and parts (dials, sockets, knobs, insulators, etc.) cannot help but give better results—the great supremacy of Radion insures much better reception with far less distortion than can be obtained from any other material.

Do not be satisfied with cheap makeshifts, always look for the name **Radion** stamped on every panel and part—it is your guarantee of the genuine.

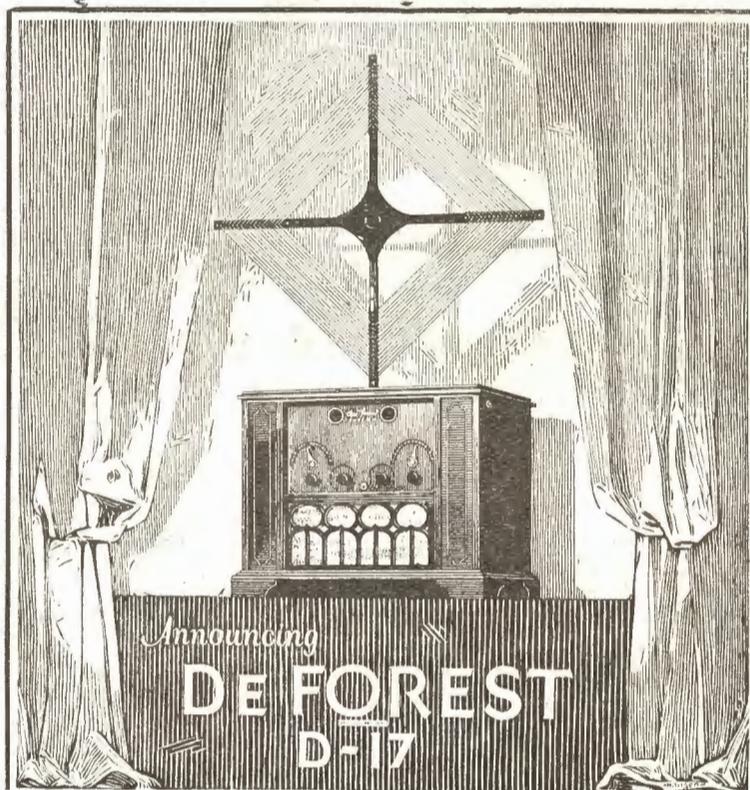
International Radio Co., Ltd.

200 Castlereagh St.
Sydney, N.S.W.

91-92 Courtenay Pl.
Wellington, N. Z.

For sale by all dealers in any size panels YOU want

His
Daddy's
Choice



His
Daddy's
Choice

THE LATEST IN RADIO

De Forest leads the field in 1925 with its new D-17. This new instrument has the great features that have made De Forest Radiophones famous alike with experts and the unskilled—plus refinements that simplify its operation, give increased selectivity, sensitivity and distance range.

Note these points:

1. A clear, natural tone common only to De Forest instruments—a tone so rich and pure that the living performer seems to be present.
2. No aerial—no ground wire.
3. Simplicity of operation—detector tube in place of crystal gives immediate results, eliminates all detector adjustments.
4. Disturbing squeals have been eliminated.

5. The D-17 can easily be moved from room to room on a tea waggon or carried by hand.
6. A handsome instrument that is a handsome piece of furniture.
7. Lee De Forest, the greatest name in radio, made present-day radio possible.

The D-17 has built-in loud speaker, tubes, loop, and space for "A" and "B" batteries.

Write us direct for further information and name of nearest De Forest dealer.

Price of D-17, Complete, £68/10/0.

International Radio Co. Ltd.
200 Castlereagh St., Sydney, N.S.W.

And at 91-93 Courtenay Place, Wellington, N.Z.

RADIOPHONE IS A DE FOREST INVENTION

Full Capacity.
Uniform rate
of Discharge.
Separate Cradling
of + and - plates.
Strong Wood Crates.



Just a Little Better in every way

Battery Bill says:—

I've seen a good many batteries that are advertised for radio work, and I've asked a good many leading amateurs what they consider the most important points in a good radio battery. I've checked up their replies with the features of

CLYDE - UNITED RADIO BATTERIES,

and I find them just a little better in every respect than any others I know.

Capacity—full or more than full rated ampere-hours capacity.

Voltage sustained throughout whole time of discharge.

Plates extra heavy, for long life, and the positive and negative plates cradled separately to prevent any internal current leakage.

Crates Clyde-United Batteries are enclosed in strong wood crates, for protection and ease in carrying.

PRICES AND CAPACITIES.

All Batteries are enclosed in strong Crate with handles. Also Single Cells, without Crate. All rechargeable from household electricity supply by using the Balkite rectifier.

S 5—6 volt, 44 amp. hrs.	£4 0 0	C 9—6 volt, 120 amp. hrs.	£6 6 0
S 7—6 volt, 66 amp. hrs.	£4 15 0	C 11—6 volt, 150 amp. hrs.	£7 7 0
S 9—6 volt, 88 amp. hrs.	£5 5 0	C 13—6 volt, 180 amp. hrs.	£8 8 0

Ask your Dealer for "Clyde-United" "Wet "B" Batteries and Clyde-United Chemical Rectifier for recharging Wet "B" Batteries .

Price, £1

United Distributors Limited

72 CLARENCE STREET,

SYDNEY.

Queen Street, Perth.

(Wholesale Only)

EDWARD STREET, BRISBANE.

592 BOURKE STREET,

MELBOURNE.

Cr. Jervois Quay & Harris Street, Wellington.

Use Clyde Storage Batteries for Radio, Motor Car and Home.

Ask for Clyde-United "B" Wet Batteries.

Tested Apparatus

"N.S.W. Wireless News"

IN STOCK:



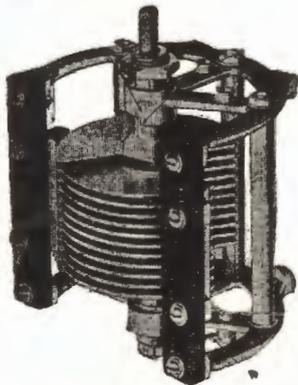
ACME Transformers & Condensers



FLEWELLING Low Loss Condensers and Sockets



HILCO Fixed (1000 lb. Pressure Built) Condensers



HILCO CONDENSERS
Caps. up to .002 3/-
Caps. up to .006 5/-



ACME A.2
ACME A.2 TRANSFORMER 35/-
ACME VERNIER CONDENSERS 48/6
ACME ALL RATIO TRANSFORMER 50/-

The reputation of the famous Acme A.2 for volume without distortion scarcely needs comment.

If you believe in different ratio audio transformers, here's one which will allow you the choice of fifteen different ratios. We believe the 4.25 to 1 ratio of the A.2 is correct for all stages, but all radio engineers do not agree.

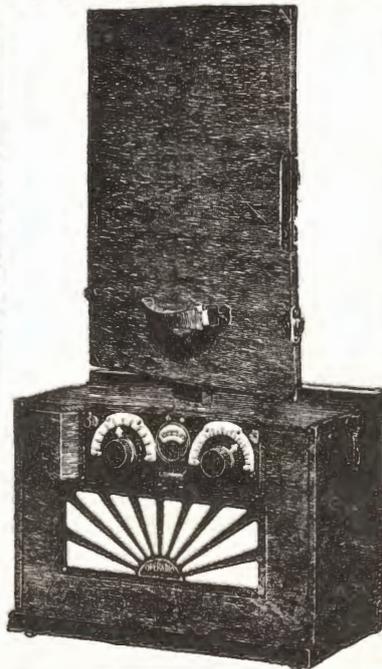
Also in Stock:

BLACK BEAUTY SPEAKERS
WALNART PRODUCTS
U.S.L. RHEOSTATS AND
POTENTIOMETERS

The Set is entirely self-contained. No aerial, ground, or outside wires or connections of any kind are required. A patented wave-bridge in the cover replaces the "loop" used on some sets. The Loud Speaker, Six Tubes, exceptionally large supply of Dry Cell Batteries and all parts are fitted into the compact and beautiful cabinet.

In brief, you will find in this new Operadio the realization of all you have hoped for in a radio set—performance that is consistent and reliably efficient, pleasing appearance, and the convenience of radio always available WHEREVER you want it and WHENEVER you want it.

OPERADIO



FLEWELLING CONDENSER

The Flewelling Condenser is one of the first really deserving the name "Low-Loss." This Condenser has features that are being widely copied, but usually some of the most important points are neglected.

The Flewelling Condenser is as close to a laboratory instrument as it is possible to get in commercial production. Quality in a radio set must first be in the apparatus before it can appear in the results obtainable.

23 Plate 32/6
11 Plate 30/-

Also in Stock:
RATHBURN CONDENSERS
Q.F.C. CRYSTALS
MILLIMETER JACKS

First Shipment Landed
COME AND SEE

**SIX-TUBE
Portable Set
£68 10s.**
(COMPLETE)

No Aerial! No Earth!

Radio Distributors

Cr. King & Clarence Sts., Broughton House Basement

P. H. Clark Ltd.

44 Carrington Street

Wireless Weekly

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Phones: Redfern 964 and 930.

MELBOURNE OFFICE: A.P.A. Building, 49 Elizabeth St.

Phone: Cent. 8955.

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

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.

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

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

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

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

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VOL. 6 No. 10

JULY 3, 1925

Editorial.

WHAT TO BUY.

The problem of what kind of goods to buy is really a very simple one, yet we are continually receiving letters asking our advice upon the relative merits of this or that make of condenser, or so and so's receiver. There are, of course, individual cases where it is necessary to stipulate some particular type of instrument, but in the main, 99 per cent. of the information desired is contained in the advertisement pages of this paper, and those readers who like to keep in touch with progress should certainly make a practise of studying the advertising announcements regularly, whether they are in need of new parts or not, because these pages contain a host of valuable information which cannot be ignored.

The most important point to remember when buying is this: A thing which is consistently advertised **MUST** be a good proposition, for very good reasons. The consistently advertised products are invariably backed up by recognised efficiency consistent with price, otherwise they could not long survive the handicap of public disapproval, which is inevitable with cheap and shoddy apparatus.

us. No dealer can afford to go on advertising a thing which will not live up to its reputation when put to practical test, any more than the cheap jack merchant in any other walk of life can stand up against the competition of genuine, though perhaps higher priced articles. It must be remembered that, behind the standard wireless goods advertised at the present time are the best scientific and engineering brains, and we have only to check up a mental list of the stuff which disappeared off the market to realise that what is sold to-day has either survived and made good through its very efficiency or, by virtue of entirely new and improved features, has made a popular appeal. In both cases, these goods are advertised because they are worth it, and because universal experience has shown that they will function exactly as they are represented.

A GENUINE EXPERIMENT.

WHAT is a genuine experiment? The question has been propounded so often, has been labelled with so many varying explanations, that it has become almost on a par with the problem of perpetual motion.

The answer to the question has been demonstrated practically by A-2JT. On Friday night, June 12th, he transmitted approximately 650 miles, using a loop aerial and a power of 7 watts. On 87 metres, radiation was 110 ma. Some going!

The test was carried out with A-70M (R. D. O'May, Bellerive, Tas.) and was all the more creditable because it was not pre-arranged. At 10.15 p.m., 70M called CQ on 80 metres and received an answer from 2JT. Signals were readable, but fading was bad, but this was easily explained when 2JT informed him he was transmitting on a loop aerial which was situated inside the room. Two way contact was maintained until 11.10 p.m., signals being readable at all times except when the direction of the loop was altered, causing the signals to fade out. 70M used a low loss capacity reactance circuit with one stage of audio while 2JT had his Reinartz (one audio) attached to a small loop.

Experiments such as this are more than interesting—they display a genuine desire to get off the beaten track and do something original. As such they certainly constitute genuine experiments and open up new territory for the persevering amateur to explore. Prior to this, very little experimenting with loops for transmission have been carried out in Australia, and the initiative of 2JT in thus conducting a lone hand is to be highly commended. Experimenters of this type are an acquisition to the amateur ranks and work such as this has a distinct value.

Congratulations o.m.!

The AMPLION RANGE

AMPLION

THE WORLD'S STANDARD LOUD SPEAKER

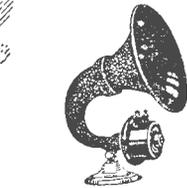
The remarkable clarity and delightfully natural tone of the world-famous "Amplion" Loud Speaker, when associated with a suitable receiving-set, renders wireless reproduction comparable with the original performance

Exclusive "Amplion" features are the wooden horn ensuring a rich and mellow tone, the rubber-insulated sound conduit making the speaker non-resonant, and the floating diaphragm giving pure tonal value

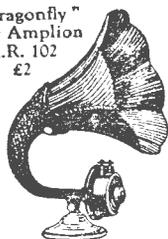
For artistic design, fine finish and efficiency, the "Amplion" is unapproached.

The World's Standard **AMPLION** Wireless Loud Speaker

For Better Radio Reproduction



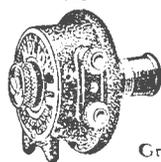
"Dragonfly" Baby Amplion A.R. 102 £2



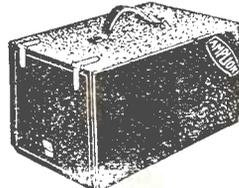
"New" Junior De Luxe A.R. 114 £5-5-0



"Concert" Dragon Model A.R. 13 £15



Gramophone Adaptor "Standard" Model A.R. 67 £3-5-0



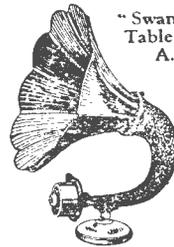
Portable complete with Collapsible Stand for use both in and out of doors A.R. 61 £9-10-0



"New" Junior A.R. 111 £4



"Swan-Neck" Table Model A.R. 15 £9



Standard "Dragon" Model A.R. 19 £8



Gramophone Adaptor "Concert" Model A.R. 35 £4

Amalgamated Wireless (A/sia) Limited.
97 Clarence Street, Sydney.
"Collins House," Collins St., Melbourne

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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

W.L. Carter, Hon. Sec.
Box 3120 G.P.O. Sydney
Phone B2235
A.H. Perrett Publicity Officer.

New Zealand Tests.

The results of the New Zealand tests have not yet been finalised as the report of the reception in New Zealand has not yet come to hand. It is hoped, however, that these will be available at an early date.

There is one striking feature with regard to the results of these tests, and that is the variation of reports of the reception of stations at different places at the same time. While it is quite possible that static conditions may vary in different parts, there should be no room for variation such as will be noted, as note rough, note good, etc. This would seem to indicate that the various receivers do not all have their sets in proper adjustment. Some may have just been on the point of oscillation and owners of receiving stations should look well into this matter, and it would be interesting to log reception from a given station and compare the results.

For this purpose it has been suggested that the Standard Wavelength Transmissions from station 2CX be taken as a convenient transmission and logs should be forwarded to the Institute reporting reception of these transmissions each Tuesday from 10 to 10.30 p.m. Particular note will be taken of any adjustments made during these tests and the times they were made. Announcements will also be made of the time as given by the clock at station 2CX so that there may be no difference in the times recorded for any given change of results. This should prove a most interesting test, and if it is carried out for, say three or four weeks, should yield very valuable results. Experimenters are therefore asked to listen carefully to these transmissions and to send in their reports weekly so that the whole of the data may be carefully tabulated and if necessary an interim report may be published during the progress of the test.

The N.Z. tests have also opened up fresh grounds for research and is proposed to organise a test extending over a period of one month investigating the variation of static and weather condi-

tions in different parts of the State. It is proposed that experimental stations throughout the country should listen in at a given time every night at stated intervals and record their observations of static conditions. This, together with observations of local weather conditions will be forwarded to the Institute Headquarters, and it will there be co-ordinated, and, if necessary, the assistance of the meteorological department will be obtained so that definite results may be forthcoming. This, besides being of experimental value to experimenters themselves, is of great potential value to the State and if it is found that the results justify any extension of these tests it is felt that the State Meteorological Department will probably be only too glad to co-operate with the Institute, and to obtain the Institute's co-operation in the matter of weather forecasts.

Mr. H. A. Stowe, has in the past been frequently communicated with for information as to what the weather will be 24 hours hence and his forecasts, gathered from his observations of static conditions have proved remarkably accurate.

As a preliminary to these tests it is necessary that all experimenters who are willing to co-operate in this way, should send in their name to the Honorary Secretary, Box 3120, G.P.O., Sydney, stating what nights and times would be most convenient for them to listen in regularly, and how many periods they are prepared to undertake that their observations shall include.

Let us get off the beaten track of DX hunting and combine together to do a little research work in this way. It will be well worth while and be a national aspect.

QRM.

The Northern Suburb village is still ringing with the exploits of the Big Man in Radio. We offer our congratulations to 2DE.

It is doubtful whether 2WL will ever get on the ether, he is now in possession of a car, which will be brought home with the band playing at an early date. It is anticipated that this will take

so much of his time that radio will be quite a secondary matter.

L. S. Lane has now secured a shore job. This is very welcome news to Institute members.

Membership in the Institute is still growing apace, but there is room yet for many more.

2CX is suffering from a painful malady. Fortunately it only affects his left hand, so that his Morse is still perfect. We trust, however, that he will soon recover.

A. H. PERRETT.
Publicity Officer.

Round the Clubs

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

THE CROYDON RADIO CLUB.*

The usual weekly meeting of the above Club was held at the Club rooms, "Rockleigh," Lang Street, Croydon, on Saturday, June 20th, 1925. The President, Mr. C. W. Slade, opened the meeting at 7.30 p.m. The usual routine business was dealt with, and some visitors from the Concord Club welcomed. There was no "high voltage" laid on on this occasion, so they had to be content with "dull emitter" refreshments. During a general discussion on "low loss" and "square law" condensers, one of our visitors explained how the term "square law" was arrived at. Mr. Pickering gave a lecture on "Measuring Instruments" and detailed the working of Galvanometers, voltmeter ammeters, watt-hour meters, A.C. and D.C., and also frequency meters.

Details were arranged for a competition amongst the members, the prize being donated by Mr. N. Pope Nr. The present year has been marked by the number of donations we have had, for prizes for competitions. All enquiries and communications should be addressed to the Honorary Secretary, A. N. Fitch, Rhos, Hay Street, Croydon.

THE LEICHHARDT AND DISTRICT RADIO SOCIETY.*

On Tuesday, June 23rd, members of the Leichhardt and District Radio Society held their 133rd general meeting at the Club-room, 176 Johnston Street, Annandale.

Owing to the inclement weather conditions prevailing at the time, and on account of a number of members being more or less indisposed, the attendance was not up to its usual standard. It was, therefore, deemed advisable to abandon the pro-

posed "Sale and Exchange," and substitute in its place a discussion under the heading "Ways and Means of bettering the Society." Although the attendance was not as good as usual, there were sufficient members present to permit of a very interesting and useful debate being indulged in, and when the time came for the chairman to declare the meeting closed, it was generally agreed that it had been an evening well spent. The matter will be further dealt with at the 33rd monthly business meeting to be held next Tuesday night, when it is expected that an active Publicity Committee will be formed for the purpose of bringing under the notice of the public of the district the good work which is being carried out by the Society in the interests of experimental wireless, and for the good of the science generally. Applications for membership will also be dealt with at the business meeting, and prospective and intending members are invited to address inquiries regarding the activities of the Society to the Hon. Secretary, Mr. W. J. Zech, 145 Booth Street, Annandale.

MARRICKVILLE AND DISTRICT RADIO CLUB.*

The above club's usual weekly meeting was held at Marrickville School of Arts on the night of Monday, June 22nd. Despite the fact that the weather was decidedly bad, there was an excellent attendance of members, who were pleased to again see the cheery face of the President (Mr. W. L. Hamilton), who had been unable to attend the previous meeting on account of illness.

Proceedings opened with a talk on transformers, which was attentively listened to, members relating their experiences with some of the well-known makes. A portable set, kindly lent by E. R. Cullen, was then brought into commission and used for the purpose of trying out a further series of valves of different makes to those tested on the previous meeting night. During the progress of the test, particulars were taken and the valves classified in their order, points being given for signal strength, clearness of tone, and absence of microphonic noises. Great interest was evinced in the De Forest DV3, which, in the opinion of those present, more than held its own with the others tried out. This form of demonstration seems to meet with general approval, and much interesting knowledge was derived therefrom.

Members are looking forward to the visit to Leichhardt and District Club on the night of Tuesday, June 30, in response to the kind invitation of the members of that club.

Radio enthusiasts are always welcome to our

With "Philco" your set will go.

meetings, which are held every Monday night. The club's Secretary, Mr. A. W. Hemming, of 23 Central Avenue, Marrickville, will be pleased to hear from those desirous of becoming members.

THE STRATHFIELD RADIO CLUB.

The usual weekly meeting of this club was held at the club rooms, corner Albert Road and Duke Street, Strathfield, on Monday evening, 22nd inst., and the programme arranged, which proved highly instructive, was carried out without a hitch. We were pleased to have our President, Mr. A. F. Jacob, back again after an absence of some few weeks holidaying in the country. The attendance, considering the very wet weather, was excellent, and we were pleased to see present a few visitors from other clubs and a prospective member or two.

The programme consisted of the screening of four highly educational films, and was provided gratis by the Australian General Electric Company, who also supplied the operator, Mr. Buckley. The manner in which the films were screened reflected great credit on Mr. Buckley, and the entertainment was in every way excellent. The films shown were as follows: "The Wizardry of Wireless," "The World of Paper," "The Busy Body," and "A Trip through the G.E. Laboratories with T. A. Edison." The first film dealt with the evolution of various forms of communication from the days when smoke signals were employed to the present wonderful stage reached by wireless, including flag-wagging, helio, wire telegraphy, and telephony.

The Secretary of the club will be glad to hear from any other firms who would be willing to demonstrate or lecture to the members, as it is thought that this should not only be of educational value to the members, but would be of equally good advertising value to the trade. Quite recently a party of the members visited VIS, through the courtesy of Amalgamated Wireless Ltd., and were shown round by the officer in charge, who explained everything in a very interesting way to the visitors.

The club is in a position to consider further applications for membership, and letters on this matter addressed to the Hon. Secretary, 44 Bayard Street, Mortlake, will receive prompt attention. Visitors are always welcome, so anybody who is interested is extended a cordial invitation to come along.

WOOLOOWIN RADIO CLUB. BRISBANE.

This Club had another very satisfactory meeting at its Headquarters, on Thursday, 25th instant. There was the usual good roll up of members and one visitor was made welcome.

(Club Notes continued on page 14)

MURDOCH'S



Mullard Transmitting Valves

	Price	Less 10% ^o / _o	Red Spot Price
5 Watts ..	£1 10 0	"	£1 7 0
10 " ..	1 16 0	"	1 12 5
50 " ..	8 10 0	"	7 13 0
150 " ..	10 10 0	"	9 9 0

also

Bruno Low Loss Variable Condensers

The famous Bruno Low Loss Condensers as used by the leading experimenters in U.S.A. and Australia. 44 plate can be used as an .001, .00075, .0005, .00025, .0002, .00018, .000125 mf, or could be used to tune 2 stages of tuned anode radio frequency.

49/6 less 10%—44/7

22 plate can be used as an .0005, .00025, or .000125 or could be used to tune 2 stages of tuned anode radio frequency.

37/6 less 10%—33/9

Hosts of other Radio Bargains.

SALE ENDS JULY 18th.

When writing kindly mention "Wireless Weekly."



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3 VICTORIA ARCADE

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20% OFF

MARKED PRICES IN OUR WINDOWS

Low Loss Condensers.

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Soldering Sets.

Audio Transformers.

Sockets

4/- in the £ off

If we haven't got it in stock, just leave your order and we will get it

at 20% off

SMITH'S

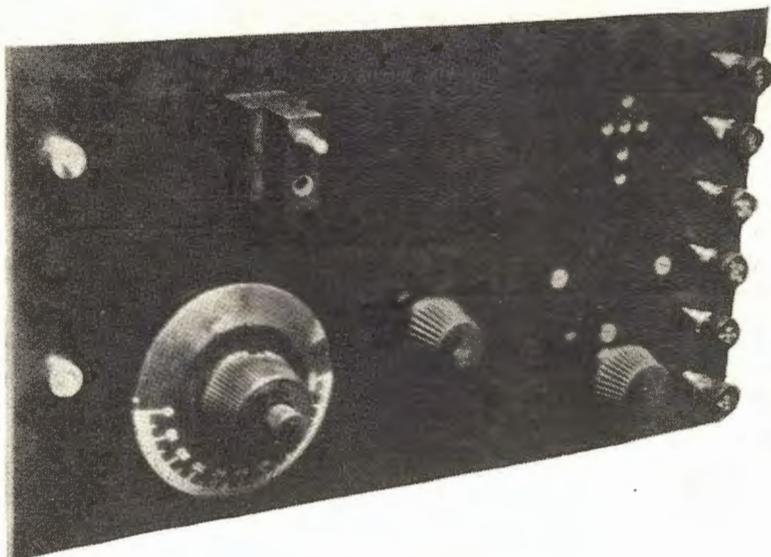
3 Victoria Arcade

Near King Street

Opp. Hotel Australia

A Single Valve for a Frame Aerial

By "INSULATOR."



Front Panel View

THE average wireless enthusiast in the course of his experimenting generally overlooks the value of a frame aerial for reception. This is caused mainly on account of the necessity of having a multivalve receiver before a frame or loop aerial is of any practical value. While this may be true enough, there are exceptions which prove the rule. The Armstrong Super-regenerative Receiver is one, but it is not at all popular for many reasons. One is the necessity of two large sized coils, generally a 1250 turn and a 1500 turn, and another reason lies in the fact that a very shrill whistle is always present during reception.

Strange to relate, I have very often met people who are just beginning wireless and have some hazy notion of building a crystal set to work off a frame, and seem somewhat disappointed and often doubt one's word when advised that this is impracticable. The frame somehow has a charm all its own, and I fell under its spell a week or so ago. I made myself one, then made a single valver to suit it, and quite pleased I was with the result. With the ear phones I heard 2BL, 2UE, 2FC, 2WW (I am learning Morse), and many other stations too numerous to mention.

First of all, as I have already told you, I made a frame, and this is what I used:—

- 1 piece of maple, 3 ft. x 1 in. x 1 in.
- 1 piece of maple, 4 ft. x 1 in. x 1 in.
- 1 3½-inch round woodblock (obtainable from any electrician).
- 1 loose coupler maple baseboard.

81 3/8 x 6 nickelled wood screws.

5 1 x 6 nickelled wood screws.

1 lb. of 20 d.c.c. wire.

5 inches 3/8 in. dowling timber.

And for the receiver itself I made use of the following:—

1 bakelite or radion panel, 12 x 7½ x 4 3/16.

1 .00025 variable condenser.

1 Bradleyleak.

1 Bradleystat.

1 .00025 grid condenser.

1 valve socket.

1 fixed panel plug.

8 terminals.

3 busbars.

1 Philips Tetrode valve.

My first concern was the frame. The sketches here will show you how this was made. I first of all marked out and cut the halved joints in the manner shown, and for the position marked out in the sketch. Being the first halved joint I ever made in timber, and as it fitted snugly, I felt justly proud of it. Before fitting it together I marked out the positions for the wood screws round which the wire had to be wound. So taking the shorter length and beginning half an inch from each end, using a bradawl I pierced twenty small holes each 1/4 inch apart on the face of the timber. I treated the longer one in a similar manner, but in this one I started the holes 12½ inches from the end.

Before shellacing, I drilled a 7/8 in. hole two inches deep down the centre of the longer half of

"What is a Double Seven?"

"The world's best value."

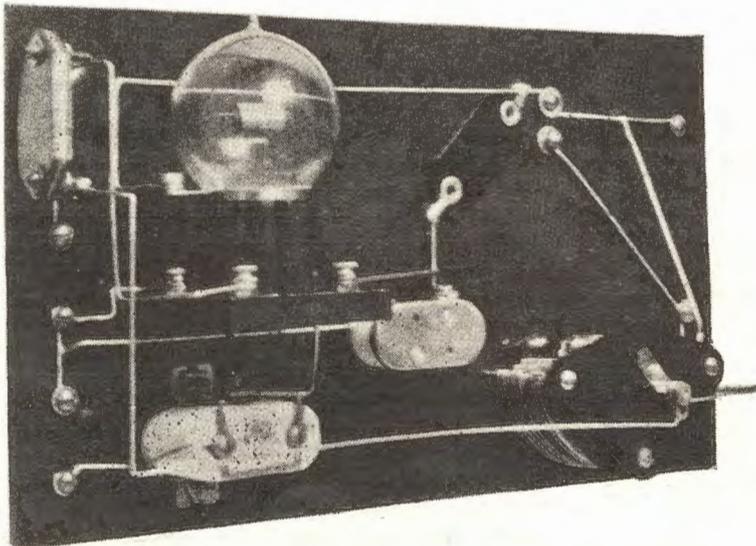
the arm. This was for the dowl, which I now plugged in, leaving two inches projecting. Three good coats of shellac added to the appearance, and the wood screws were driven in just far enough to leave about 1/16 in. to catch the wire. When I said twenty screws in each I was wrong really, as twenty-one were necessary on the bottom lead.

All this being done, I started to wind on the wire. I need not describe this process to you. Scrape the insulation off a small portion of the 4th, 7th, 12th, 16th, and 18th turn, near the top, and solder leads from these to the 1 in. wood screws, which should be screwed into the side of the bottom support—the 12 in. portion. This allows you to use any number of turns you may desire. Finish the frame by drilling a 3/8 in. hole in the centre of the 3 1/2 in. wood block. Screw the block down to the baseboard and erect the frame by inserting the dowl piece in the 3/8 in. hole in the block. A frame of this description is quite a handy thing to have.

Now build the set itself. The photographs and drawing will give you all the information regarding this. I don't think a panel layout is necessary, and the wiring diagram will assist you greatly in wiring. Let me impress upon you the necessity for a Bradleystat. An ordinary rheostat is useless, as will be understood later on. The Bradleyleak may be dispensed with, provided some other good make of gridleak is available, but personally I should like to see you use a Bradleyleak. It will be noticed in the photograph that I have employed a Philips Tetrode valve, which fits the standard American socket. Since the photograph was taken I've tried the English base Tetrode, both bright and dull emitter,

and no difference in reception was perceptible. The Tetrode Yankee socket was handy at home, so I used it. The condenser must necessarily NOT be more than 13 plates; in fact, 5 or 9 plates would be much better. A 23 or 43 plate condenser is useless. While I've been telling you all these things, I've no doubt you will have finished the job and are anxious to listen-in. Righto! Connect up your A battery according to the valve you have in use; the B battery will be happy with 9 to 16 1/2 volts. Say you start off with 9 volts, that is, two small torch batteries joined in series. Connect these to your set—to the B battery terminals, of course. Now the phones, and lastly the frame aerial. Say you try for 2BL for a start. Alright, use 16 turns of the frame, that is to say, connect the beginning of the frame to the top terminal of the set and the 16th turn to the bottom terminal. Slip the phone over your ears and SLOWLY turn the Bradleystat, gradually lighting up your valve. Keep on turning until you get a whistle in the phones; then a noise like a rain storm pelting on a tin roof. Leave your 'stat alone now and tune with the condenser, slowly too, mind you. As you turn the condenser the rushing noise will cease, the whistle will remain, and a number of carrier waves will be found. You can't mistake Broadcasters, so convert it by judicious use of your Bradleystat and reduce the whistle by turning the Bradleyleak. Finalise your tuning with your condenser; turn the frame until you point to the broadcasting station, and you'll agree with me that reception under these conditions is really wonderful.

Well, play about the Broadcasters for a while,



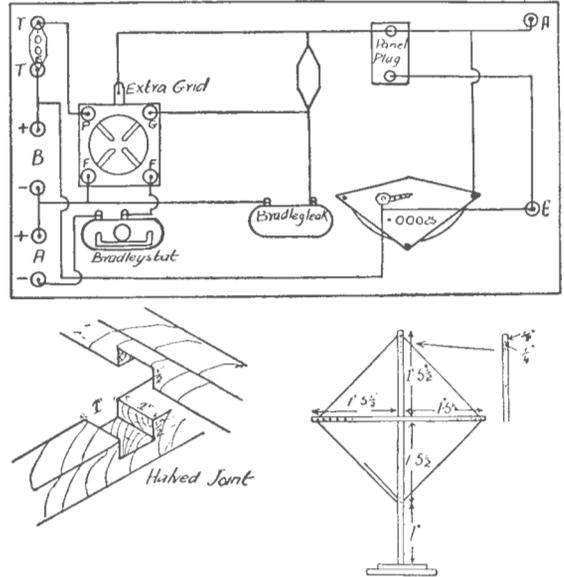
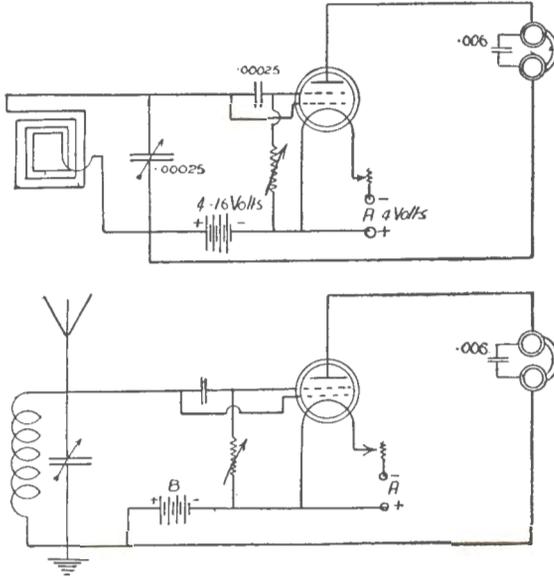
Showing lay out of the parts on back of panel

The "New System" 'phone is matched in tone.

then go for the other carrier waves you heard. I'll admit they are a bit difficult to convert at first, but persevere and you'll be surprised at what you get. The amateurs come in very well on 4 and 7 turns of the frame. 12 turns gave me 2WW's Morse practise, and as loud as any single valve receiver. I first got Farmer's without any aerial at all; simply plugged in a 200 turn honeycomb coil and tuned them in. Bit hard, of course, so I connected one end of the frame to the top terminal of the set and there was the hello man singing to the kiddies. It's really a wonderful little set. I've given a cir-

cuit here which can be used as well—that of connecting a short indoor aerial to the top terminal and the standard earth to the bottom terminal. By plugging in various sizes of coils you will get great results. It may be worth while to mention that when using the frame on wavelengths under 450 metres, no coil is necessary in the plug. Leave it vacant.

With this type of set I feel sure that reasonably good distant results will be obtained. Try it out for yourself!



(Club Notes continued from page 10)

Following on recent correspondence from the Ipswich Radio Society, it is expected that the members of the Wooloowin Club will visit that centre on Saturday, 4th proximo, for the purpose of making the acquaintance of the Ipswich enthusiasts.

A large amount of correspondence was dealt with. Matters in connection with the issue of a club badge are well in hand, and the Technical Committee announced that they hoped to put 4WN on the air in a fortnight's time.

A social evening to augment club funds has been approved for Thursday evening, 16th July, and Messrs. Jiear, Love and Anderson have been appointed a committee to further the arrangements.

During the evening Mr. J. P. Love gave an ex-

cellent discourse on "B Batteries." By dissecting several types of dry-cells the lecturer described their formation and functioning. He also dealt at length with the accumulator type of B battery, Dutho, Williard, and Edison types, and also touched on the several types of mechanical converters. After his remarks a keen discussion took place between members, and Mr. Love was accorded a hearty vote of thanks.

On Thursday, 9th July, six members of the Club, under the leadership of Messrs. Ryan and Beatson, will meet in debate.

Thursday, 2nd prox. will be an informal night for general wireless discussion.

Enquiries from friends and intending members are welcome and should be addressed to the Hon. Secretary, Mr. H. A. Jiear, Lsison Gorve, Wooloowin.

"New System"—the Trade House for all Wireless requirements..

De Forest Radiophones

De Forest, Type D17 Radiophones, have the very obvious advantage of being completely self-contained. They operate on a loop antenna no larger than a picture frame. No need for a "ground" connection or other wires inside or outside the house.

This means easy moveability from one place to another. It means that you can "tune in" and be listening to radio programs five minutes after the De Forest D-17 is delivered to you.

The use of the loop antenna gives a very helpful degree of "selectivity" which is so much desired. It is also very effective in minimising the annoyance of such atmospheric disturbances as static.

The artistic and graceful design of the cabinets which house the D-17 radio phones is such that you will be proud to own one. They are an adornment to any home.

The faithful reproduction of the human voice, and of musical programs is a thing that all who hear the De Forest D-17 Radiophone comment upon. The fidelity and purity of tone reproduction and colour is almost beyond belief. You'll also note that absence of metallic sounds, of roaring and grating noises.

You must operate the De Forest yourself to appreciate its many advantages. You'll marvel at the ease of "tuning in" desired stations. Its remarkable stability of operation and simplicity will appeal to you.

A further advantage in purchasing a De Forest, is the standing of the De Forest Radio Company. De Forest products are sponsored by Dr. Lee De Forest, the inventor of the three element vacuum tube which has made modern radio possible, and of other important radio inventions.

2UW (267 Metres)

A special program has been arranged from Station 2UW, on Sunday, July 5th. 2UW will broadcast from the King's Academy, Bondi Junction, after 8 p.m. every Tuesday night, and also odd items on Sunday nights.

"Perfection Detection"
"Ample Amplification"

G. & R. 77

"The World's Best Valve"



Filament Voltage
4/5

Filament
Current
.26 amps.

PRICE

17/6

Plate Voltage
30/100

Plate Current
1 milliamp
at 60 volts

PRICE

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Ask for the Double Seven

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NEW SYSTEM TELEPHONES PTY., LTD.

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"A BURGINPHONE FOR EVERY HOME"

is now made possible by the new models now being placed on the market.

Every purse is catered for, and as these "Burginphone" Wireless Receivers are the essence of efficiency, no excuse can be given for not having a wireless set.

NEW PRICES AS FROM 1st JULY.

"Junior Two" .. Complete,	£16 14 6
"Junior Three"	22 18 6
"Junior Four"	26 4 0
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Other models made to order. (Special arrangements for easy payments can be made.)

Full particulars readily supplied.

BURGIN ELECTRIC CO. LTD.

Wireless Manufacturers and Suppliers

340 Kent Street, Sydney

IMPROVED VOICES FOR GUARDIANS OF THE SEA

AS A result of the invention of a high-powered, low-voltage thoriated tungsten filament tube, The U.S. Coast Guard Cutters, Tampa and Modoc, put to sea recently equipped with the highest powered telephone and telegraph radio transmitters carried by any ship flying the American flag. Each ship has a 2KW telephone telegraph transmitter, and, if the regulations of the Coast guard Service permitted, they could easily be used as floating broadcasting stations greater in power than most licensed land stations.

The Tampa and Modoc left the Boston Navy yard detailed to patrol the ship lanes of the North Atlantic to protect shipping from the menace of icebergs. These floating radio stations, both with the same call letter, NIDK, are in reality, international, for the cost of the operation of the patrol is shared by the leading maritime powers of the world, as provided in the London agreement signed in January 20, 1914, at the International Conference on the Safety of Life at Sea. This conference was the outcome of the sinking of the Titanic with appalling loss of life after striking an iceberg on the night of April 14, 1912. As a result of this conference, the United States was asked to undertake the responsibility of the ice patrol in the North Atlantic.

The success of this service is vitally dependent upon adequate radio facilities and it was for the purpose of providing a dependable, long-range, high-powered transmitter that the Coast Guard headquarters commissioned the General Electric Company to develop a transmitter especially for this work.

Many unusual factors had to be considered in meeting the Coast Guard requirements. For, example, the set, although high in power had to be so compact that it would fit in a small radio room. Due to its compactness, the voltages generated were required to be kept down to a minimum and the panels to be all of the "dead front" type so that the operator would not be exposed to dangerous voltages if thrown against the set during a heavy sea. Factors of strength, reliability and simplicity of tuning had also to be considered. It was further necessary that the emitted wavelength or frequency must be absolutely independent of any variations due to the rolling and pitching of the ship. All these requirements were met in the equipments now aboard the Tampa and the Modoc.

The Coast Guard is keeping in the van of all new development which may benefit its work. Both the Tampa and Modoc are electric drive ships of the latest type and are equipped with every kind of measuring instrument needed for their important work.

satisfactory service. The construction is simplicity itself and is fully explained in the drawing. The length and other dimensions of the insulator may be modified to suit individual requirements, but remember that the longer it is made, the more efficient will the insulator be. The dimensions of the small porcelain insulators used were as follows, height, 3in.; diameter, 1 1/8in. and this seems to be an ideal size. The screws used were 3/16in. diameter and just fitted through the holes in the insulators. In use the aerial wire is attached to one of the reels and the halyard to the other. As a mechanical test these insulators were loaded and successfully supported a weight of 300 pounds and showed no ill effects. Discarded panels may be used to supply the bakelite strips thereby reducing the cost.

The edges of the strips should be filed smooth so as not to collect dust and after being in use for about 12 months it is advisable to remove the deteriorated surface by rubbing the strips with fine emery paper. If ebonite strips are used they will require treatment about every three months.

The insulation of the point where the aerial

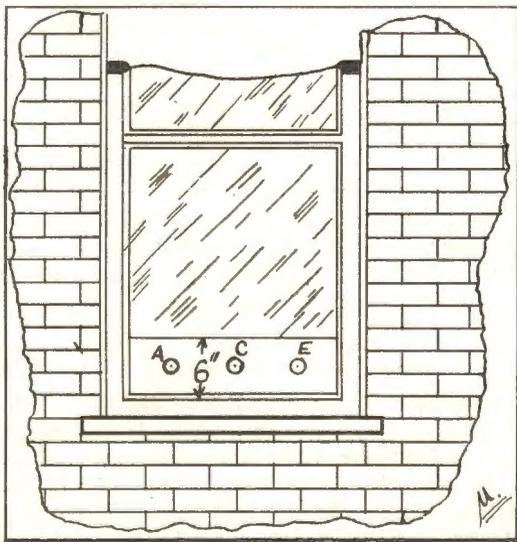


Figure 2.

Complete lead-in insulator installed, showing leads for aerial, counterpoise and earth. Nothing unsightly or inefficient about this.

wire is lead into the building is even more difficult and more frequently neglected.

Capacity losses are the most common in lead in insulators. These may be considered of negligible importance but such is not the case. For example, a capacity of .000050 mfd at a wavelength

of 600 metres offers a resistance of only 6400 ohms and a capacity of .000001 mfd at a wavelength of 200 metres offers a resistance of 10600 ohms.

Now the capacity to earth through the average lead in insulator is as a rule greatly in excess of

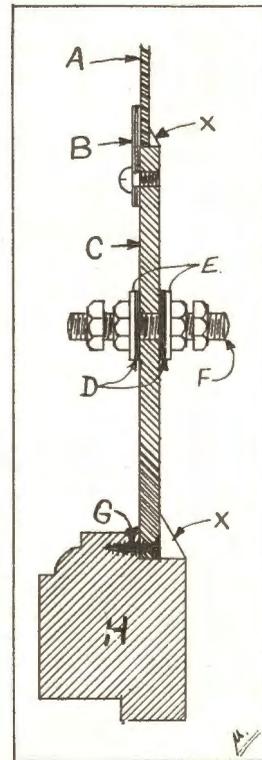


Figure 3.

Method of constructing lead-in insulator.

A—Window glass. B—Metal strip. C—Bakelite panel. D—Rubber washers. E—Brass washers. F—Lead-in bolt. G—Fixing screws. H—Section of window sash. X—Putty.

either of these values so that although for ordinary power currents, the insulation might be excellent its resistance for radio currents would be very low. Apart altogether from the difficulty of obtaining a really well designed lead in insulator, the amateur is frequently confronted with a prohibition against the drilling of holes through walls and window frames for the purpose of fitting it. The leading in scheme shown herewith is much more efficient than most available methods, is not unsightly and does not involve damaging any of the house fittings. Essentially it amounts to the substitution of a bakelite panel in place of portion of the original glass in a window. Figure 2 shows how the com-

“True music” minor speakers, thirty-six and six.

pleted insulator looks when installed. Three wires are lead through the panel and serve for aerial, counterpoise and earth. My window was just two feet wide and a panel of 3/16in. bakelite of this width and six inches high was used. The points where the wires are lead through were spaced eight inches apart. Figure 3 shows in detail how the insulator is fitted to the window frame. The first step is to remove all the original putty and the glass. If this is done carefully the glass need not be broken. Next cut out and square up a panel of the required that will just fit neatly in the groove of the window sash previously occupied by the putty and glass. Holding panel in position, mark its inner surface with a line round the edges showing how far the inner portion of the sash overlaps; now remove the panel and along the ends and bottom edge about midway between the marks just made and the edge of the panel, drill a few small holes for the small screws or nails (G) which are to secure the panel in place, then cut a strip of metal about 3/4in. wide and 1/16in. thick and just a shade shorter than the distance between the marks on the ends of the upper edge of the panel. This strip (B) must be secured to the inside surface of the upper edge of the panel in such a way that half its width overlaps the edge of the panel as shown in the drawing. Its ends must lie between the marks previously made otherwise it will prevent the panel lying flat in the grooves of the sash. Eighth inch brass screws and nuts are excellent for securing the strip. The panel may now be drilled for the leading in bolts. These may be of any convenient type, but the scheme shown, using threaded 3/4in. brass rods and nuts, is excellent and the rubber washers ensure a watertight joint. The completed panel may now be secured in position. The original window glass may now be cut down to fit the space above the panel, but unless a good glass cutter is available it will be found more satisfactory to purchase a new sheet of glass ready cut to the new dimensions. The window glass may now be puttied up in the usual way and at the same time the joints between the panel and the sash and the panel and the glass should be puttied. The strip of metal along the upper edge of the panel keeps the glass in position while being puttied and gives a neat appearance to an otherwise unsightly job.

Careful insulation will increase your DX range either transmitting or receiving and particularly on short waves and during wet weather while at the same time giving your station a ship shape appearance.

HAMIOGRAMS

(By "QTC.")

OF HAMS—BY A HAM—TO HAMS.

THE latest station of interest on the air is, of course, the American Pacific Fleet's amateur rigout, NRRL, operated by Schnell, who is traffic manager of the American Radio Relay League. Signals from this station, now in the vicinity of Hawaii, come in with a great kick here, especially on the 40 metre band. The power is in all probability about 1 k.w., so it is no wonder that his signals perk.

Does anybody know the QRA of WIZ? This call is used by a station working around 40 metres; obviously a commercial after the style of KEL and KET. He comes in here at all hours of the day and night, with much the same strength.

This 40 metre band bids fair to be the most popular hit on by the nomadic group of hams who are ever wandering lower and lower. They now measure their QRH with a foot rule. Say, o.m., do you remember the time when we hollered because the Government forced us down to two hundred metres?

CN9TC, the station of Major Raven Hart, Los Andes, Chile, was coming in well a week or so ago. He is easily the strongest ham in South America, and was one of the first after CB8 to tie up with Ivan H. O'Meara, Z2AC.

The Sixth Australian Radio District seems to have one solitary live ham. This is A-6AM, who comes in here like QRN in summer—very QSA f.b. o.m. What's the matter with the rest of you A-6's? Don't leave it to one lone station to put you on the radio map. Kick into it, and you'll soon be reported "QSA o.m." from east of Alice Springs.

Anybody noticed that A-2WS is putting out some fine fone from up Newcastle way? 2WS is one of the premier country stations of the second district, and his fone sure lives up to his previous reputation.

A-2RJ is another feller whose sigs perk some. What's the power this time, o.m.? 1 k.w.! hi!!

If it's a "New System" product it's good.

The Best Aerial for Transmitting

THE cage type of aerial is meeting with increasing popularity among the advanced experimenters. In view of the fact that the average Australian transmitter is limited to very small power, any increased efficiency that can possibly be obtained in any of the apparatus that he uses is of the utmost importance.

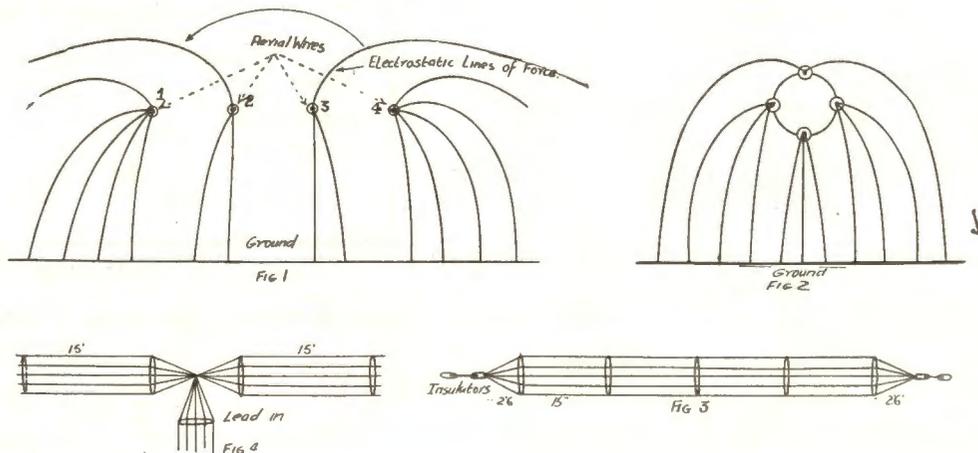
With the ordinary flat top type of aerial, the outside wires are worked at a higher efficiency than the inner ones, owing to the fact that they carry the most current. A glance at Fig. 1 will show you the comparison of the electro static fields around the different wires of a 4 wire flat top aerial. It will be noticed that wires 1 and 4 have more lines of force connecting them to the ground than the two inner wires 2 and 3.

In the cage type of aerial the wires are arranged in the form of a circle. See Fig. 3. In an aerial of this design the currents flowing in the wires are much more evenly distributed. This type of aerial also gets increased efficiency because of its tubular shape. It is a well known fact that the metallic tube is the most efficient conductor of high frequency currents.

Everyone admires a well-made aerial, so that a few notes on the construction of a cage type of

aerial will not be out of place. When the constructor has decided on the length of his aerial, the five wires should be cut and stretched out tightly between two posts. (If the wires are not stretched tight some of them will be longer than others between rings and look anything but pleasing.) The loops may be made of hard drawn copper wire, or children's wooden hoops may be used. The writer has had wooden hoops in use for over two years. They should be well painted with a good oil paint, after which a coat of aluminium paint may be put on them. Each loop should be marked off into five equal sections; a small nick cut into the wood and a piece of wire about 8in. long should be passed round the ring inside the nick. These small pieces of wire are for attaching the main aerial wires to the rings in such a way that the position of each wire will be exact when the cage is hoisted. Each ring or hoop should be 15 feet apart, the two ends being not more than 2ft. 6in. from the insulators.

The cage aerial can be used as an inverted L type or a T type. In the case of the inverted L type, the lead is taken from one of the ends of the cage. In the case of the T type it is advisable to place two rings either side of the lead in. See Fig. 4.



Mr. R. B. Hungerford, managing director of the Western Electric Company (Australia) Ltd., who left by the Melbourne Express on June 23rd to join the R.M.S. Orvieto at Melbourne, was the guest of the staff at a social evening in the Women Painters' rooms on Thursday last, when he was presented with a pair of binoculars. Mr. Hungerford intends to visit England and the United States.

Telephone B 5925

CHARLES D. MACLURCAN
Consulting Radio Engineer

Pratten Building,
26 Jamieson Street,
SYDNEY

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 384 PITT ST. (Near Goulburn Street.)
 23 PITT STREET, Near CIRCULAR QUAY.

Construct your own Broadcasting Receiving Set
 advice with each order, which are so clear that
 Send us your Radio problems. Our service is

AERIAL WIRE.

1/16 Navy, Non-Corrosive, 100ft.	2/6
3/20 Navy, Non-Corrosive, 100ft.	2/9
1/18 Bare Copper, 100ft.	2/-
1/16 Bare Copper, 100ft.	2/3
3/20 Bare Copper, 100ft.	2/6
9/20 Insulated Lead-in, per yd.	7d.
3/20 Insulated Lead-in, per yd.	4d.
1/16 Insulated Lead-in, per yd.	3d.
1/18 Insulated Lead-in, per yd.	2½d.

ACCUMULATORS, C.A.V.

English Manufacture, in Vulcanite Containers.

4 V. 40 Ampere Hour, each	40/-
4 V. 60 Ampere Hour, each	47/-
6 V. 40 Ampere Hour, each	60/-
6 V. 60 Ampere Hour, each	70/-
6 V. 80 Ampere Hour, each	84/-

BAKELITE.

(Cut to any size.)

1/8 in., per square inch	1d.
3/16 in., per square inch	1½d.

BOOKS.

All the latest publications on Crystal and Valve Set Construction.

BATTERIES.

Ever-Ready, type W.P., 40 volts	12/6
Ever-Ready, type X.P., 40 volts	21/-
Ever-Ready, W.P., 60 volts	18/-
Ever-Ready, No. 126, 4½ volts	2/9
1½ Volt Columbia Cells	3/-

CONDENSERS.

(Variable with Dial.)

	Plain.	Vernier.
Ormonde, .001	13/6	17/-
Ormonde, .0005	10/6	13/6
Ormonde, .0003	10/-	12/6
Ormonde, .0002	9/-	11/6
Warner, .001	—	25/-
Warner, .0005	—	20/-
Menominee, U.S.A., .001 plain, 15/-; .0005, 12/-		

CRYSTALS.

(Tested and Guaranteed.)

Galena, Iron Pyrites, Australite, each	1/-
Hertzite, Planatite, Tungstalite	1/6

CONDENSERS, FIXED.

Aerovox, .001, 7d.; .00025, 1/-.
Wetless, .001, .0005, .00025, 1/6.
Freshman, .001, 2/9; .00025, 2/6.
Micadons, .001, 3/-; .00025, 3/-.

All reliable makes and capacities stocked.

CONDENSERS, UNASSEMBLED.

Ormonde, .001, 9/6.

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EXPERIMENTAL JOTTINGS

(By F. C. SWINBURNE.)

MOST writers preface their productions with apologies and excuses for having written. In this respect I differ from them. During the years I have been connected with radio it has become more to me than a means to a living, more even than a delightful pastime, and yet it remains to me as both. I write of it almost as of a dear friend, and should these articles assist others in deriving pleasure from it, then I shall be well repaid.

Before dealing with technicalities, let me address a few remarks to experimenters and budding experimenters. There has been in the past, and still is, a great deal of controversy on the subject of what constitutes a scientific experimenter and what constitutes an experiment. It has become an embittered topic, and while no concrete definitions can be formulated, it will be generally agreed that the criterions on which judgment must be based are well defined.

To say that the experimenter is without value, and should be suppressed as a nuisance, is to wrong a valuable and enthusiastic army of workers. The experimenter's sphere of usefulness is almost unlimited. His task it is to apply the acid test of practice to the theories of the philosophers, and his also is the task of discovering new phenomena, which will in turn form the basis of still newer theories. Yet, judged by the strict standards of science and commerce, the results obtained by radio experimenters as a whole are disappointing. It is rarely, indeed, that one finds in the radio magazines or in the records of the Patents Office evidence of successful experimentation. No commercial corporation, however kindly disposed, could afford to support research engineers for a space of time equal to that expended by amateur experimenters, nor could it afford to capitalise them to the extent represented by the capital invested in amateur stations, without getting more concrete results. I make this statement as a bald fact, which can be readily proved despite the flood of indignation which I know it will raise.

The reason for this parity of results is not far

to seek. With few exceptions the men employed by large corporations on research work are trained scientists. To my mind this matter of scientific training is far greater in its effect than any advantages which might accrue to the professional research engineer through more elaborate equipment. The "hit or miss" experimenter, working in mental darkness, may justly be compared to a drunk searching for a keyhole. His success depends upon a lucky accident, and such accidents are rare. I am certain that the quality of the work done by experimenters and the amount of pleasure which they

can derive from radio will be greatly increased if they make some endeavour to master the basic rules and principles of science. By this I do not mean the collection of a vocabulary of half understood technical terms, nor do I mean that they should adopt the prevalent practice of mis-spelling all their communications. Such childish idiosyncrasies have no place in true science, which is governed by rigorous logic, truth, and exactitude.

Experimenters who attempt to train themselves for scientific investigation will find their path beset with many difficulties, but the object is a great one, worthy of almost any sacrifice, and offering magnificent rewards for conscientious work.

Much could be written of the objects of science and many examples could be given, showing the advantages of the scientific method, but this is hardly the place. In conclusion on this topic, let me offer a few words of advice to those anxious to progress towards a scientific training. It has been said that the basis of science is measurement, and in this one sentence is crystallised a great truth.

Hand in hand with measurement comes mathematics and the mathematical method of reasoning. Mathematics constitutes the chief stumbling block to the budding scientist, and that this subject should be regarded with fear and hatred, as is usually the case, is tragic. The more so as this attitude is founded on a misconception brought about by the

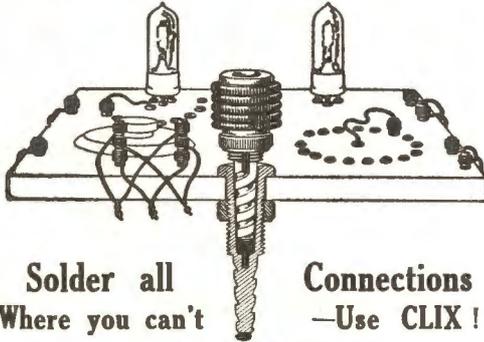
(Continued on Page 28.)

(Editor's Note.—Mr. Swinburne has been connected with wireless for many years, and has had long experience as a designer of technical electrical equipment, including transformers, etc. He was one of the two experimenters chosen by the Royal Astronomical Society to accompany their expedition to Stanthorpe, Q., in connection with the Solar Eclipse in 1923, and until recently conducted the Radio columns of "Smith's Weekly." In the series of articles, of which this is the first, readers may look forward to something out of the ordinary.

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Mr. Max. Howden.

After having been with Messrs. Corbett Derham & Co. to the great satisfaction of their town and country clients for some time, Mr. Max Howden recently responded to the urgent solicitations of friends who have induced him to set up business oscillations on his own account as a wireless engineer. In addition to this he is Technical Adviser to the Melbourne "Listener-in," and has just lately been appointed Traffic Manager (a la Mr. Mr. Schnell of the A.R.R.L.), to the Transmitters Section of the Victorian Wireless Institute. So that he is not likely to find time idle on his hands even when he does get up at 4 a.m., for a little chat with G2OD. In his capacity as Traffic Manager he anticipates plenty of strenuous work, and as he is to be responsible to the P.M.G. for the traffic over all amateur lines his position as an animated semaphore on the ether will not be a sinecure. If one of these foggy mornings you are engaged in illicit code manufacture, and trying to put one over N.R.R.L., and you hear a series of loud explosions and see signals like a speed cop waving furiously, then shiver in your shoes, for it will be 3BQ on your track.

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(Continued from Page 26.)

archaic methods of teaching it which have until recently been employed, and which insisted upon a meaningless juggling of figures and symbols while losing sight of the broad philosophic principles upon which it is based and of its practical application. Used as the scientist employs it, it becomes a veritable gift of the gods—almost, I might say, an extra sense. The secret of mastering it is the secret of its utility. It is the logical way in which rules and conclusions fit together. Forget this blind fear of the subject; find out what it is and what it means, then you can with confidence attack the purely mechanical processes which are necessary for its application. Scientists in the past have carefully studied thousands of natural phenomena, and from them deduced the rules which govern their occurrence. To obtain full advantage from this fact the experimenter should make a point of studying these rules rather than the isolated phenomenon, because in the rules is crystallised the basic cause and effect which governs all phenomena. In this way the mind is saved the necessity of remembering countless details which contribute little real knowledge, and is thus left free for constructive thinking.

One of the chief failings which the self-trained experimenter should guard against is obtaining a patchy or incomplete grasp of his subject. The various branches of science are so intermingled that it is impossible to have a full grasp of any one branch without having at least some knowledge of the related branches. Similarly even in a single branch it is dangerous to specialise until a certain amount of basic knowledge of all its sections has been obtained. Neglect of care in this respect will lead to a distorted view of the subject, and this in turn to incorrect conclusions, which are valueless.

In the practical side of experimental work accuracy and attention to detail should be the first rule, but more important than any rule that can be formulated is the mental attitude of the experimenter himself. In this connection it should be remembered that true experimenting, like true criticism, is always constructive. Approach your experiments in the guise of a student searching for the knowledge which they can give you, and not in the guise of one destined to "show the world." In this way you may hope for success, and unless you are a positive genius there is no other.

Thomas A. Edison, the world's most successful experimenter, advocated these very sentiments of hard work and patient endeavour when he said that his genius was due to "Ninety per cent. perspiration and ten per cent. inspiration." Above all, it

is essential to avoid hasty conclusions and prejudices. Facts should be carefully weighed and proved before acceptance. To those experimenters who boast their practicality as opposed to any theoretical knowledge, may I repeat the definition of a practical man, as given by Lord Beaconsfield: "The practical man is one who practices the errors of his forefathers." Surely a definition worthy of thought. In succeeding articles it is my intention to deal in detail with some of the more important phenomena encountered in radio, in the hope that the treatment will not only increase the general knowledge of the subject, but also produce new thoughts on old subjects.

Appreciations

THE Morse Code lessons from 2WW on Tuesdays, Thursdays, and Sundays are being regularly tuned-in by large numbers of enthusiasts, and letters are still reaching us from various places near and far by every mail. It is interesting to note that quite a few learners are from the ranks of the fair sex, several of whom have written us. In some cases whole families are listening and practising regularly. The letters printed below were selected at random from our "Morse Code Mail Bag":—

To the Editor,

Dear Sir,—In response to your request for reports upon reception of lessons in Morse Code from 2WW, I wish to inform you that at my address same are being received well on a P1 single valve set, except that at times the verbal instructions fade to be almost inaudible. This, however, often happens when receiving 2UW, although never with 2UE. As well as my wife, our little boy (who is under 8½ years) is also following the lessons and has memorised the alphabet perfectly, although last night's (Sunday) speeding up found us all weak in quickly recognising some of the letters. However, we do not think you are progressing too quickly and intend to persevere, as the interest is keen and the service rendered by "Wireless Weekly" is much appreciated.—Yours, etc.

C. S. EDDES.

4 Darley Street, Sans Souci.

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THURSDAY 2nd JULY.

Morning Session: 10.15—Weather Information, Commercial News, Cables, Domestic, Fashion and Garden Talks, Health Hints, Daily Menu. 11.15—Close down.

Midday Session: 12.30—Midday News, Market and Weather Reports, Sporting Information. 2—Close down.

Afternoon Session: 3—Afternoon News, Cables and Commercial Reports. Readings and Afternoon Concert, Sporting Information. 4.30—Close down.

Early Evening Session: 6.30—Children's Hour. 7.15—Late Market, Weather and Commercial News, Late Sporting Information. 7.30—Close down.

Night Session: 7.45—A Talk. 8—Broadcast from Beale's Concert Salon. Programme arranged by Mr. Frederick Newton, the conductor of the Sydney Madrigal Society; Choral, Vocal and Instrumental Numbers. 8.30—Mr. Harold Tollemache baritone. 8.38—Miss Elsie Peerless, soprano. 8.4—A Talk on "Wit and Humour of Famous Composers," by Mr. Arnold Mote, M.A.; Subject: Beethoven. Interval. 9.5—Mr. Harold Tollemache, baritone. 9.13—Mr. Harrison White, banjo solos. 9.26—Miss Elsie Peerless, soprano. 9.35—The First Instalment of a thrilling Mystery Serial Radio Play, "The White Rat," specially written for 2FC by Codrington Ball, and produced by Scott Alexander and his players. A prize of a Marconiphone receiving set will be given for the solution. The serial will run in six parts. 10.5—National Anthem. Close down.

FRIDAY, 3rd JULY.

Morning Session: 10.15—Weather Information, Commercial News, Cables, Domestic, Fashion and Garden Talks, Health Hints, Daily Menu. 11.15—Close down.

Midday Session: 12.30—Midday News, Market and Weather Reports, Sporting Information. 2—Close down.

Afternoon Session: 3—Afternoon News, Cables and Commercial Reports, Readings and Afternoon Concert, Sporting Information. 4.30—Close down.

Early Evening Session: 6.30—Children's Hour. 7.15—Late Market, Weather and Commer-

cial News, Late Sporting Information. 7.30—Close down.

Night Session: 7.45—Eric Pearce and his Astoria Band. 7.55—Chamber Trio. 8.5—Rayne and Powell, English Harmony Duo. 8.17—A Talk on Java. 8.32—Mr. Gladstone Bell, 'cello solos. 8.45—Rayne and Powell, English Harmony Duo. 9—Chamber Trio. 9.10—Interval. 9.12—Final performance of "The Lady of the Rose," Act 2. Musical numbers: Opening Chorus, Chorus Ladies and Gentlemen; Song: "With Me" Nellie Payne and Chorus; Duet: "A Woman's No," Gladys Moncrieff and Claude Fleming; Trio: "When Men Grow Older," Linda Foy, Blake Adams and Leslie Holland; Duet: "I Love You So," Gladys Moncrieff, Noel Leyland; Ensemble: Gladys Moncrieff, Noel Leyland, Claude Fleming and Chorus; Finale: "Mariana" Claude Fleming and Gladys Moncrieff. 10.20—National Anthem. Close down.

SATURDAY, 4th JULY.

Morning Session: 10.15—Weather Information, Commercial News, Cables, Domestic, Fashion and Garden Talks, Health Hints, Daily Menu. 11.15—Close down.

Mid-day Session: 12.30—Mid-day News, Market and Weather Reports, Sporting Information. 2—Close down.

Afternoon Session: 3.0—Afternoon News, Cables and Commercial Reports, Readings and Afternoon Concert, Sporting Information. 4.30—Close down.

Early Evening Session: 6.30—Children's Hour. 7.15—Late Market, Weather and Commercial News, Late Sporting Information. 7.30—Close down.

Night Session: American Day of Independence. 7.45—Mr. Walter Hunt, A lecture on "Shakespeare." 8.0—The Congress Band will play American Airs. 8.15—Miss Joyce Hadley, Soprano. 8.22—Mr. Charles Stephens, Tenor. 8.30—The Congress Band. 8.52—Miss Joyce Hadley, Soprano. 9.0—Wentworth Cafe Dance Orchestra. 9.10—Mr. H. S. Bowde, a Talk on America. 9.25—Mr. Charles Stephen, Tenor. 9.30—Wentworth Cafe Dance Orchestra. 9.40—Congress Band. 10.0—Wentworth Cafe Dance Orchestra. 10.30—National Anthem. Close down.

SUNDAY, 5th JULY.

Afternoon Session: 3—Broadcast from the Sydney Town Hall, Massed Band Concert. A performance of the 1812 Overture (Tschaikowsky) played by the Manly Military Band, the Fire Brigade Band,



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and the grand organ, in connection with the Rose Day appeal. 4.30—Close down.

Night Session: 7—Broadcast from the Lyceum Hall, Central Methodist Mission Service; preacher, the Rev. F. H. Raward. 8.30—From the studio, a programme of choral, vocal and instrumental items. 10—National Anthem. Close down.

MONDAY, 6th JULY.

Morning Session: 10.15—Weather Information, Commercial News, Cables, Domestic, Fashion and Garden Talks, Health Hints, Daily Menu. 11.15—Close down.

Midday Session: 12.30—Midday News, Market and Weather Reports, Sporting Information. 2—Close down.

Afternoon Session: 3—Afternoon News, Cables and Commercial Reports, Readings and Afternoon Concert, Sporting Information. 4.30—Close down.

Early Evening Session: 6.30—Children's Hour. 7.15—Late Market, Weather and Commercial News, Late Sporting Information. 7.30—Close down.

Night Session: 7.45—How to Listen to an Orchestra, by Mr. John Travis, Conductor of the Orpheus Orchestra Society. 8—Chamber Trio. 8.10—Mr. Harold Tollemache, baritone. 8.18—Mr. E. P. Kerry, cornet solos. 8.25—Miss Jean Grant, soprano. 8.30—Mr. Lionel Lawson, violinist. 8.38—Miss Mary Bourke, contralto. 8.43—A Photography Talk by Mr. Van de Velde on "Midwinter Hints to Amateurs." 8.57—Interval. 9—Chamber Trio. 9.10—Mr. A. L. Champion, tenor solos. 9.15—First broadcast performance of the Musical Sketch, "Flora's Holiday," by H. Lane Wilson. Soloists: Jean Grant (soprano), Mary Bourke (contralto), A. L. Champion (tenor), A. G. Ellis (baritone). 9.40—Mr. E. P. Kerry, cornet solos. 9.48—Mr. Harold Tollemache, baritone. 9.56—Mr. Walter Hunt and Eva Warhurst, a play. 10.30—National Anthem. Close down.

TUESDAY, 7th JULY.

Morning Session: 10.15—Weather Information, Commercial News, Cables, Domestic, Fashion and Garden Talks, Health Hints, Daily Menu. 11.15—Close down.

Midday Session: 12.30—Midday News, Market and Weather Reports, Sporting Information. 2—Close down.

Afternoon Session: 3—Afternoon News, Cables and Commercial Reports, Readings and Afternoon Concert, Sporting Information. 4.30—Close down.

Early Evening Session: 6.30—Children's Hour. 7.15—Late Market, Weather and Commercial News, Late Sporting Information. 7.30—Close down.

Night Session: 7.45—A talk by the Wireless Institute of N.S.W. 8—Haymarket Theatre Orchestra in selected items. 8.15—Mr. Ernest Archer, tenor. 8.23—Captain J. H. Watson, Research Secretary of the N.S.W. Historical Society, will talk of Port Jackson. 8.35—Reno's Marimba Novelty Quartette, direct from the Tivoli Theatres. 8.50—Miss Elsie Peerless, soprano. 8.58—Duet, Miss Elsie Peerless (soprano and Mr. Ernest Archer (tenor). 9.3—Interval. 9.5—Haymarket Theatre, vocal act. 9.20—Mr. Ernest Archer, tenor. 9.24—Miss Elsie Peerless, soprano. 9.28—Reno's Marimba Novelty Quartette. 9.45—Haymarket Theatre, fox trots. 10—Duet, Miss Elsie Peerless (soprano) and Mr. Ernest Archer (tenor). 10.5—Wentworth Cafe dance music. 10.45—National Anthem. Close down.

WEDNESDAY, 8th JULY.

Morning Session: 10.15—Weather Information, Commercial News, Cables, Domestic, Fashion and Garden Talks, Health Hints, Daily Menu. 11.15—Close down.

Midday Session: 12.30—Midday News, Market and Weather Reports, Sporting Information. 2—Close down.

Afternoon Session: 3—Afternoon News, Cables and Commercial Reports, Readings and Afternoon Concert, Sporting Information. 4.30—Close down.

Early Evening Session: 6.30—Children's Hour. 7.15—Late Market, Weather and Commercial News, Late Sporting Information. 7.30—Close down.

Night Session: 8 Orchestral Music. 8.30—Mr. Charles Stephens, tenor. 8.37—Miss Joyce Hadley, soprano. 8.44—Mr. S. H. Bowden will commence a series of talk on "Rome, the Eternal City." 8.58—Mr. Lindley Evans, pianist. 9.12—Broadcast from Beale's Concert Salon, the Repertory Theatre Society will present several Australian sketches. 10—Miss Joyce Hadley, soprano. 10.5—Mr. Charles Stephens, tenor. 10.10—Duet, Mr. Charles Stephens (tenor) and Miss Joyce Hadley (soprano). 10.15—National Anthem. Close down.

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THURSDAY, 2nd JULY.

Early Morning Session: 8—News Items. 9—Close down.

Morning Session: 11—Social Notes. 11.15—Music from the Studio. 12—Weather and Commercial Reports; Music from the Studio. 2—Close down.

Afternoon Session: 3—G.P.O. Clock Chimes. Music from the Studio. 4.30—Serial Story. 5—Close down.

Early Evening Session: 6—Pavilion Dinner Orchestra, under Direction of Mr. Cec. Morrison. 6.30—Nursery Rhymes and Bedtime Stories. 7—Radio Billie. 7.30—Union Football Talk by Mr. C. L. Brown, Chairman of the Country Committee. 7.45—Pitt, Son and Badgery Market and Stock Reports.

Evening Session: 8 — Mr. Julian Fisher (Tenor); Miss Jennie McLaughlan (Mezzo Soprano); A Lecture on Music by Mr. Ronald Foster; Miss Sara Collins (Elocutionist); A Drama by Norman Campbell & Co. 11—National Anthem.

FRIDAY, 3rd JUNE.

Early Morning Session: 8—News Items. 9—Close down.

Morning Session: 11—Social Notes. 11.15—

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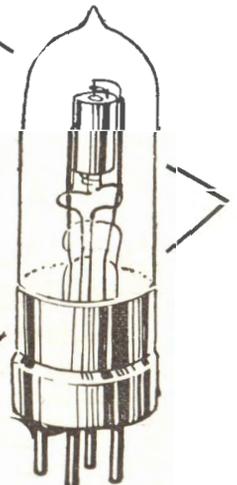
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Music from the Studio. 11.30—Chat on "Modern Psychology." 12—Weather and Commercial Reports; Music from the Studio. 2—Close down.

Afternoon Session: 3—G.P.O. Clock Chimes; Music from the Studio. 4.30—Serial Story. 5—Close down.

Early Evening Session: 6—Pavilion Dinner Orchestra, under Direction of Mr. Cec. Morrison. 6.30—Nursery Rhymes and Bedtime Stories. 7—Mrs. Mary W. Liddell, A Talk for Girls. 7.45—Pitt, Son, and Badgery Market and Stock Reports.

Evening Session: 8—Miss Mary Neal (Mezzo Soprano); The Aha Duo (Steel Guitars and Ukulele); The Famous Four (Male Quartet); Mr. Morgan will talk on Motoring; Mr. J. M. Prentice, O.C.B., C.de.G., will talk on "Book Reviews." 11—National Anthem.

SATURDAY, 4th JULY.

Early Morning Session: 8—News Items. 9—Close down.

Morning Session: 11—Social Notes. 11.15—Music from the Studio. 11.30—Chat on "Health and Domestic Topics." 12—Weather and Commercial Reports; Music from the Studio. 1—Close down.

Afternoon Session: 2—G.P.O. Clock Chimes; Music from the Studio. Special Sporting News. 5.30—Close down.

Early Evening Session: 6—Pavilion Dinner Orchestra, under Direction of Mr. Cec. Morrison. 6.30—Nursery Rhymes and Bedtime Stories.

Evening Session: Recital and "Aida" from The King's Hall.

SUNDAY, 5th JULY.

11—Service, Broadcast from Chalmers Street Presbyterian Church. 3.30—Organ Recital from Palmer Street Presbyterian Church, City. 6—Nursery Rhymes and Bedtime Stories. 7.15—Lecture by Mr. J. M. Prentice, Broadcast from The King's Hall. 8.45—From the Studio: The Premier Trombone Quartet (Messrs. W. Fellows, E. J. Daly, H. Larsen and B. W. Caten).

MONDAY, 6th JULY.

Early Morning Session: 8—News Items. 9—Close down.

Morning Session: 11—Social Notes. 11.15—Music from the Studio. 11.30—Chat on "A Course in English Literature." 12—Weather and Commercial Reports; Music from the Studio. 2—Close down.

Afternoon Session: 3—G.P.O. Clock Chimes; Music from the Studio. 4.30—Serial Story. 5—Close down.

Early Evening Session: 6—Pavilion Dinner Orchestra, under Direction of Mr. Cec. Morrison. 6.30—Nursery Rhymes and Bedtime Stories. 7.45—Pitt, Son, and Badgery Market and Stock Reports.

Evening Session: 8—Miss Pat Reid; Conservatorium Ladies' String Quartet; Mr. Charles Lewis (Humorous Entertainer); A Debate by Members of the Y.M.C.A. 11—National Anthem.

TUESDAY, 7th JULY.

Early Morning Session: 8—News Items. 9—Close down.

Morning Session: 11—Social Notes. 11.15—Music from the Studio. 11.30—Chat on "The World of Art." 12—Weather and Commercial Reports; Music from the Studio. 2—Close down.

Afternoon Session: 3—G.P.O. Clock Chimes; Music from the Studio. 4.30—Serial Story. 5—Close down.

Early Evening Session: 6—Pavilion Dinner Orchestra, under Direction of Mr. Cec. Morrison. 6.30—Nursery Rhymes and Bedtime Stories. 7.30—A Talk on Football by a Member of the Australian Rules Association. 7.45—Pitt, Son, and Badgery Market and Stock Reports.

Evening Session: 8—Classical Concert from the Studio.

WEDNESDAY, 8th JULY.

Early Morning Session: 8—News Items. 9—Close down.

Morning Session: 11—Social Notes. 11.15—Music from the Studio. 11.30—Chat on "The Musical Outlook." 12—Weather and Commercial Reports; Music from the Studio. 2—Close down.

Afternoon Session: 3—G.P.O. Clock Chimes; Music from the Studio. 4.30—Serial Story. 5—Close down.

Early Evening Session: 6—Pavilion Dinner Orchestra, under Direction of Mr. Cec. Morrison. 6.30—Nursery Rhymes and Bedtime Stories. 7.30—Mr. H. W. Turner, Vice President of the Baseball Association will Lecture. 7.45—Pitt, Son, and Badgery Market and Stock Reports.

Evening Session: 8—Mr. Bryson Taylor (Tenor); Miss Irene Darragh (Mezzo Contralto); Mr. Burning will talk on "The Wine Industry"; Mr. H. Unite-Cross, Ph.D., will talk on the Psychology of Fate. 11—National Anthem.

3LO

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THURSDAY, 2nd JULY

Morning Session (11 a.m. to 2 p.m.): 11—Time Signal. Express Train Information. 12 noon—Time Signal. "Argus" and "Herald" News Services. Reuter's and the Australian Press Association Cable News. 12.15—Community Singing under the auspices of the Community Singers and Concert Goers' Association, transmitted from the Assembly Hall. 1.45—"Herald" and "Argus" News Services. Stock Exchange Information; Weather Forecast; River Reports. 2—Close down. During the session the following programme will be played by the Buckley and Nunn Studio Orchestra. Overture, "Seraglio" (Mozart); Fox Trot, "Woop Woop" (O'Hagan); Violin Solo: Miss Bessie Gaunson, "Rondino" (Beethoven); Selection, "Popular Songs" (Dorothy Forster); Waltz: "Millionon" (Strauss); Suite, "Suite Fantastique" (Foulds); Cello Solo, Miss Tasma Tiernan, "Chant Indou" (Korsakoff); March, "The Scout March" (Von Blom); Orchestra, Joannette" (Salcedo); Selection, "Tom Jones" (Gorman).

Afternoon Session (3 to 5.15): 3—Time Signal. 5—"Herald" and "Argus" News Services. 5.15—Close down. A programme of orchestral music, played by the Paramount Theatre Orchestra, will be transmitted throughout the afternoon.

Evening Session (6 to 7.15): 6—Children's Hour. "Billy Bunny" Stories by little "Miss Kook-aburra": 2nd Instalment of "Mrs. Wiggs of the

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Cabbage Patch", and a talk about the story of Little Tod. Mr. Sydney Dickens will give the children mouth-organ lessons. 6.45—"Herald" and "Argus" News Services. Reuter's and the Australian Press Association Cable News. Market Reports: Wheat, Grain, Produce, Fruit, Vegetable, Fish, Dairy Supplies; Newmarket Sales; Stock Exchange Information; Weather Synopsis. 7.15—Close down.

Night Session (7.15 to 11.15): "Our Dance Night": Speakers: Miss N. M. Shaw, Mr. E. C. Rigby. Pianiste, Miss Elspeth Duncan; Artists: Miss Jessie Irwin, Winner "Herald" Radio Voice Contest; Mr. Sydney Dickens, mouth-organ selections; Mr. Jack O'Hagan, baritone; Mr. E. Ogier, baritone; Miss Daisy Ely, mezzo soprano; Miss Hilda Thirling, contralto; Mr. Walter Pearl, male alto; Mr. Allen Fitzallen and Miss Louise Moorehead. Bert Ralton and his Savoy Havana Band from Carlyon's, St. Kilda. 7.15—Miss N. M. Shaw, in her talks on famous cities. 7.45—Mr. E. C. Rigby, under the auspices of the Town Planning Campaign: "The Metropolitan Town Planning Commission and its Work." 8—Miss Elspeth Duncan, "Polonaise" (Gale). 8.5—Miss Daisy Ely, "Fair Spring is Returning," "The Little Silver Ring." 8.12—Mr. Walter Pearl, "Garden of your Heart," "Morning." 8.19—Miss Hilda Thirling, "Abide With Me," "I Dream of a Garden of Sunshine." 8.26—Mr. Allen Fitzallen and Miss Louise Moorehead in a one-act play, "Ella's Apology," Dick Harvey, Mr. Allen Fitzallen; Ella Harvey, Miss L. Moorehead. 8.44—Miss Daisy Ely, "Caro mio bon," "Chanson de Florian." 8.51—Mr. Walter Pearl, "Dawn," "Little Old Garden." 9—Bert Ralton and his Savoy Havana Band, transmitted from Carlyon's, St. Kilda. During the intervals at Carlyon's, the following order of programme will be observed: Miss Hilda Thirling, "Salaam," "Sanctuary"; Mr. Jack O'Hagan, "Sammy's Come to Town," "Paddy Maloney"; Miss Jessie Irwin, "O Moon upon the Water," "When Love is Kind"; Mr. Sydney Dickens, "La Paloma," "Eileen Alanah"; Mr. E. Ogier, "Muleteer of Malaga," "Smuggler's Song." "Argus" and "Herald" News Services will be given at approximately 10 p.m. 11.15—God Save the King.

FRIDAY, 3rd JULY.

Morning Session (11 a.m. to 2 p.m.): 11—Time Signal. Express Train Information. 12 noon—Time Signal. 12.30—"Argus" and "Herald" News Services. Reuter's and the Australian Press Association Cables. 1—Time Signal. 1.45—"Herald" and "Argus" News Services. Stock Exchange Information. Weather Forecast. River Reports. 2—Close down. During the session the following programme will be played by the Buckley and Nunn Studio Orchestra: Overture: "Norma" (Bellini); Fox Trot: "Off and Gone" (Kahn); Trio: "Menuett" (Boccherino); Selection: "Lightning Switch" (Alford); Cello Solo: Miss Tasma Tiernan "Caprico" (Hamish MacCunn); Waltz: "Valse Infidele" (Mackeben); Orchestra: "A Musical Snuff Box" (Klemm); Selection: "Girl from Brazil" (Romberg); Pianoforte Solo: Miss Agnes Fortune, "Bosquet de Julie" (Bendel); Fox Trot, "Chili Bom Bom" (Friend and Donaldson).

Afternoon Session (3 to 5.15): 3—Time Signal. Dr. Durmont, B.B., D.Litt., "The Psychology of Emotion." 3.40—"Cinderella" in "General Home



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Topics." 4—"Au Fait" of Buckley and Nunn Ltd., in a "Fashion Talk." 5—"Herald" and "Argus" News Services. 5.15—Close down. During the afternoon a programme of orchestral music, played by the Paramount Theatre Orchestra, will be transmitted.

Evening Session (6 to 7.15): 6—Children's Hour: "Billy Bunny" Stories: "The Little Green Road to Fairyland," "Peggy and the Giant's Aunt," "The Derelict." 6.45—"Herald" and "Argus" News Services. Reuter's and the Australian Press Association Cable News. Market Reports: Wheat, Grain, Produce, Fruit, Vegetables, Fish, Dairy Supplies. Newmarket Sales. Stock Exchange Information. Weather Synopsis. 7.15—Close down.

Night Session (8 to 11 p.m.): "A Champion Night." Lecturers: Mr. Frank A. Russell, Mr. Leslie Brunning. Artists: Mr. Fred Haigh, baritone; Miss Gertrude Hood, contralto; Miss Jessie Irwin, winner of the recent "Herald" radio voice contest. Mr. Clement May, Dickensian and entertainer. Collingwood Citizens' Band (Commonwealth Champions, 1924-25); musical director, Mr. F. C. Johnston. 8—Collingwood Citizens' Band. March, "Bolts and Bars"; overture, "Tancredi"; fox trot, "Riley's Cowshed"; waltz, "Dreams on the Ocean." 8.30—Mr. Frank A. Russell, "Out of the Hurly-Burly." 8.45—Miss Jessie Irwin, "The Robin's Song" (White), "Meadow Sweet" (Brahe). 8.52—Mr. Fred Haigh, "Song of the Air Force," "From the Land of the Sky Blue Water." 8.59—Mr. Leslie Brunning, "Deciduous Fruit Trees." 9.14—Collingwood Citizens' Band. March, "Sons of the Wild"; descriptive selection, "Military Church Parade"; trombone novelty, "Miss Trombone"; cornet and euphonium duet, "Excelsior," Messrs. Walters and Spencer. 9.45—Mr. Clement May, "An Arabian Night in Madison Square" (O. Henry); "When I was a Boy at School" (a song story); "Serooge," from "Christmas Carols," by special request. 10.5—Miss Gertrude Hood, "How Shines the Dew" (Rubinstein); "The First Primrose" (Grieg). 10.12—"Argus" News Service. 10.17—Miss Jessie Irwin, "A Heart That's Free" (Robyn); "Qui la Voce" (Bollini). 10.24—Mr. Fred Haigh, "I Pitch My Lonely Caravan," "Banjo Song." 10.30—Collingwood Citizens' Band. March, "Brilliant"; intermezzo, "Bells Across the Meadow"; cornet duet, "Ida and Dot," Messrs. Noney and Barrett; grand march from "Tannhauser." 11—"God Save the King."

SATURDAY, 4th JULY.

Morning Session (11 a.m. to 2 p.m.): 11—Time Signal, Express Train Information. 12—Time Signal. 12.30—"Argus" and "Herald" News Services. Reuter's and the Australian Press Association Cable News. 1—Time Signal. 1.45—"Herald" and "Argus" News Services. Stock Exchange Information. Weather Forecast. River Reports. 2—Close down. During the session the following programme will be played by the Buckley and Nunn Studio Orchestra:—Overture, "Tancredi" (Rossini); cornet solo, Mr. Walter Smith, "Serenade" (Gounod); fox trot, "Incense" (Consana); 'cello solo, Miss Tasma Tierman, "Serenade" (Bridge); suite, "Petite Suite de Concert" (Taylor); pianoforte solo, Miss Agnes Fortune, "Polonaise in G flat" (Chopin); selection,

"The Girl from Brazil" (Romberg); violin solo, Miss Bessie Gaumson, "Brindisi Valse" (Allard); fox trot, "What Do You Say, Boys?" (Cal de Voll); orchestra, "Humoreske" (Dvorak).

Afternoon Session (3 to 5 p.m.): 3—Time Signal. Orchestral Concert by the University Symphony Orchestra, transmitted from the Auditorium, Collins Street. 1, Overture, "Ruy Blas" (Mendelssohn); 2, suite, "Peer Gynt" (Grieg); 3, variations for 'cello and orchestra (Boelmann), (Cellist, Gwen Proekter); 4, "Bush Miniatures" (Henry Tate); 5, "Hungarian Dance No. 5" (Brahms). Sporting Results, Local, Country and Interstate, will be given during the afternoon as they come to hand, and at half-hourly intervals. Final scores of League and Association Football Matches will be given at 5.30 p.m.

Evening Session (6 to 7.15 p.m.): 6—Children's Hour. "Billy Bunny" stories. "Mother Goose" will take you on her Magic Carpet to India, and tell the story of the "Good Elephant and the Ungrateful Man," "How the Robin got his Red Breast," and "Heroes Who Guard the Lights." 6.45—"Herald" and "Argus" News Services. Reuter's and the Australian Press Association Cable News. Market Reports: What, Grain, Produce, Fruit, Vegetable, Fish, Dairy Supplies. Newmarket Sales. Closing Stock Exchange Information. Weather Synopsis. 7.15—Close down.

Night Session (7.40 to 11 p.m.): 7.40—Dr. J. A. Leach, D.Sc., Birds of Australia, "Nightjars and Swifts." 8—Mr. James Hill, baritone (by special request), Australia's National Anthem, "Australia, Land of Ours" (Dudley Glass). 8.5—340th Chamber Concert of the Musical Society of Victoria, relayed from the Assembly Hall. 10—"Herald" and "Argus" News Services. 10.10—Miss Marie Lethbridge, soprano (by permission of J. C. Williamson Ltd.), "Cigarette Song" from the "Southern Maid," "The Cuckoo" (Lehmann). 10.17—Mr. Russell Callow, tenor (by permission of J. C. Williamson Ltd.), "Lolita," "Dolorosen." 10.24—Buckley and Nunn Studio Orchestra, "Mireille" (Rossini). 10.30—Miss Gwen Russell, soprano (by permission of J. C. Williamson Ltd.), winner of the "Herald" Radio Voice Contest. "The Wood-pigeon" (Lehmann), "By the Blue River" (Clarke). 10.37—Mr. Russell Callow, tenor, "Immortality," "Dreams of Long Ago." 10.44—Miss Marie Lethbridge, "The Butterfly and the Rose," "A Little Birdie" (Puccini). 10.51—Miss Gwen Russell, "Lament of Isis" (Bantock), "Spring's a Lovable Lady." 11—"God Save the King."

SUNDAY, 5th JULY.

Morning Session (11 a.m. to 12.15 p.m.): 11—Service relayed from Wesley Church Central Mission. Conducted by Rev. S. J. Hoban. Doxology. Invocation. Hymn: "Lord of all being throned afar." Prayer. Hymn: "Thou whose Almighty Hand." Scriptural Reading. Anthem by the Choir. Notices and offerings. Hymn: "Blest are the humble souls that see." Sermon: Rev. S. J. Hoban. Hymn: "Jesu my truth, my Way." Benediction.

Afternoon Session (3 p.m. to 4.30 p.m.): 3—Service from Wesley Church Central Mission—Pleasant Sunday Afternoon; Chairman, Rev. S. J. Hoban. Orchestral Selection (Conducted by

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Mr. G. M. Williams). Hymn: "Hail Thou once despised Jesus." Prayer: Rev. S. J. Hoban. Hymn: "O for a heart to Praise My God." Solo: "Stars of the East" (Tannhauser) Mr. Arnold Ashworth. Orchestral Selection. Solo: "Take up Thy Cross" Mr. Arnold Ashworth. Announcements and collection. Orchestral Selection. Address: "The Australia of To-morrow," Dr. J. W. Springthorpe. National Anthem. Benediction. Orchestral Selection.

Evening Session (6 p.m. to 6.45 p.m.): 6—Children's Hour. "Billy Bunny" Stories. "A British Empire Story." 6.45—Close down.

Night Session: 7—Service from the Collins Street Baptist Church. Preacher, Rev. W. D. Jackson, B.A. Invocation. Lord's Prayer. Hymn No. 281: "My God is any hour so sweet." Scripture: from Amos, Chapter 4. Solo: Mr. Ernest Sage. Scripture: St. Luke, Chapter 23, verses 25 to 38. Hymn No. 113: "When I survey the wondrous Cross." Notices. Organ Interlude. Offertory and Offertory prayer. Anthem: Collins Street Choir, under the direction of Madame Ella Kingston. Prayer. Hymn No. 742: "Tell me not in Mournful numbers." Sermon: "Two Kinds of Women," Rev. W. D. Jackson, B.A. Hymn No. 398: "Take my life and let it be." Benediction and Vesper. Miss Winifred Lloyd, Mus.Bac. will preside at the organ.

Brass band and Song Recital. Lecturer: Mr. J. Howlett Ross. Artistes: Mr. Harry Wotton (by permission of J. C. Williamson Ltd.); Accompanist: Miss Siegenberg; Allan's Studio Band (Musical Director: Mr. T. B. Davison). 8.30—Allans Studio Band; March: "The Unconquered" (Daly); Reverie: "Daffodils"; Fox trot: "Marcheta" (By special request); Cornet Solo: "In the Cathedral" (Channett), Mr. J. Doherty; Intermezzo: "Tola" (Johnson). 9—Mr. Harry Wotton, "Song Offering" (Ronald); "Three quadrains from Omar Khayyam" (Rogers). 9.7—Mr. J. Howlett Ross, series of talks on great Australians: "Lord Forrest." 9.22—Mr. Harry Wotton, "Vecchia zimarra senti" from "Lo Boheme" (Puccini); "Elgerie" (Massenet). 9.29—Allans Studio Band; Patrol: "With Kilt and Sporrán" (Sutton); Hymn: "It is well" (Caros); Two Step: "In rag town" (Brown); Waltz: "Pal that I loved, stole the girl that I loved"; March: "B.B. & C.F." (By special request) (Hume). 10—"Argus" News Service. God Save the King.

MONDAY, 6th JULY.

Morning Session (11 a.m. to 2 p.m.): 11—Time Signal; Express Train information. 12 noon—Time Signal. 12.30—"Argus" and "Herald" News Services; Reuters and the Australian Press Association Cable News. 1—Time Signal; Mr. Marcus Burke, under the auspices of the Develop Australia League, will speak on "Australian Micawbers." 1.45—"Herald" and "Argus" News Services; Weather forecast; River reports. 2—Close down. During the Session the following programme will be played by the Buckley and Nunn Studio Orchestra. Overture: "The Black Monk" (Schlepegrell); March: "The Fox Trail" (Zamonik); Cornet Solo: Mr. Walton Smith, "Still as the Night" (Bohm); Orchestra: "Boloro Brilliant" (Leybach); Suite: "A day in May" (Friml); Violin Solo: Miss Bessie Gaunson, "Cavatina" (Raff); Selection: "Robin Hood" (Weigand); Fox Trot: It's a bird'

(Kaufman); Selection: "Moszkowskiana" (Moszkowski); Orchestra: "La Traviata" (Verdi).

Afternoon Session (3 to 5): 3—Time Signal. 3.40—Matron Moreland, "Infant Welfare." 5—"Herald" and "Argus" News Services. 5.15—Close down. During the afternoon a programme of orchestral music will be given by the Strand Theatre Orchestra.

Evening Session (6 to 7.15 p.m.): 6—Children's Hour. "Billy Bunny" Stories: "The Little Green road to Fairyland." "Betty and the giant's aunt." "A Midsummer Night's Dream" from Lamb's "Tales of Shakespeare." 6.45—"Herald" and "Argus" News Services. Reuters and Australian Press Association Cable News. Market Reports; Wheat, Grain, Produce, Fruit, Vegetable, Fish, Dairy Supplies. Newmarket sales. Stock Exchange information. Weather Synopsis. 7.15—Close down.

Night Session:

7.15—"Radiette"—Women's work and play." 7.30—"Gargoyle"—"Building a motor car and caring for it." 7.45—Mr. G. M. Wallace, Education Department, "Some adventures of Don Quixote." 8—Buckley and Nunn Studio Orchestra: Ballet Music from "Faust" (Gounod). 8.15—Melbourne Music Club's recital relayed from the Assembly Hall in the Presence of Fritz Kreisler. 9.45—"Argus" and "Herald" News Services. 9.50—Miss Marie Lethbridge, Soprano, by permission of J. C. Williamson Ltd.: "Boats of Mine" (Miller); "To You" (Rodenbach). 9.57—Mr. Rupert Swallow, tenor, by permission of J. C. Williamson, Ltd.; "Poet's Song" from "La Boheme" (Puccini); "From the land of the sky blue"

(Programme Continued on Page 42.)

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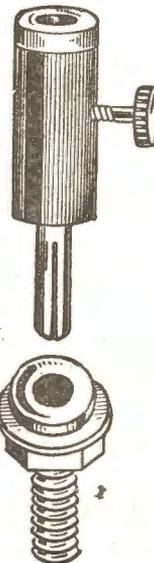
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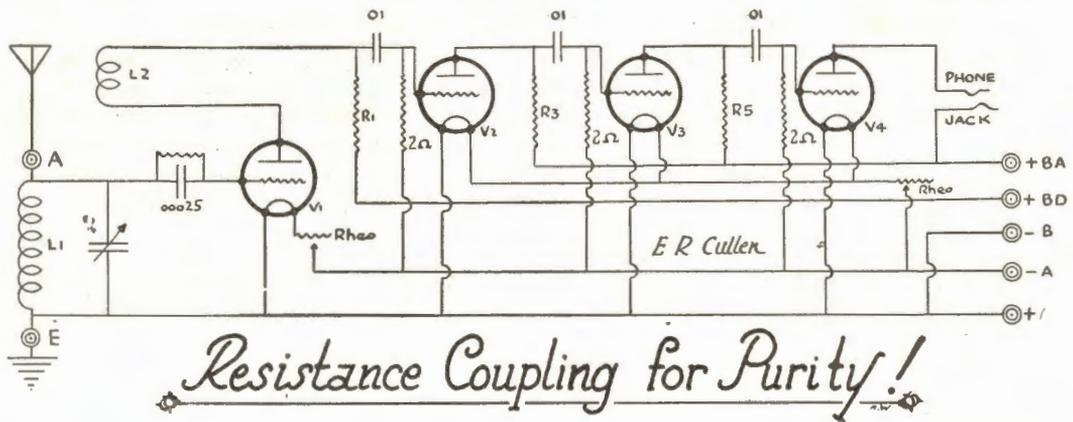
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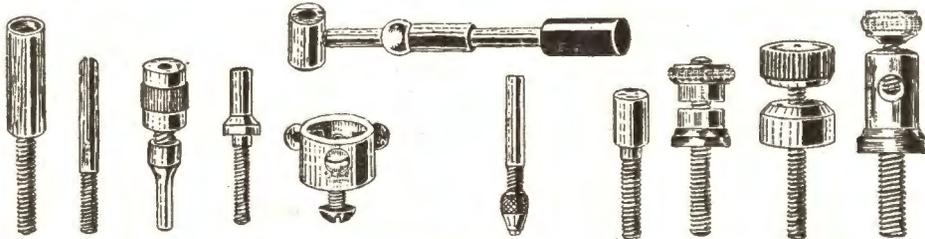
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(Programme Continued from Page 39.)

water" (Cadman). 10.4—Buckley and Nunn Studio Orchestra; Overture: "Passepied" (Delibes). 10.10—Miss Gwen Russell, Winner of the "Herald" Radio Voice Contest, "Ye Banks and Braes," "Charlie is my darlin." 10.17—Mr. Russell Callow (Tenor) by permission of J. C. Williamson Ltd.; "What the red haired bo'sun said" "I did not know." 10.24—Orchestra: "Anvil Chorus" (Verdi); "Quartet" (Verdi); "Sextet" (Verdi). 10.32—Miss Marie Lethbridge: "The Three Cavaliers" (Schindler); "Down in the Forest" (Ronald). 10.39—Mr. Rupert Swallow: "La Donne e Mobile" from "Rigoletto"; "Now sleeps the crimson petal" (Cadman). 10.46—Miss Gwen Russell: "Prince Charming" (Lehmann); "I know a lovely garden" (Cadman). 10.53—Mr. Russell Callow: "A dream"; "Selected." 11—God Save the King.

TUESDAY, 7th JULY.

Morning Session (11 a.m. to 2 p.m.): 11—Time signal. Express Train information. 12 noon—Time Signal. 12.30—"Argus" and "Herald" News Services. Reuters and Australian Press Association Cables. 1—Time Signal. 1.45—"Herald" and "Argus" news services. Stock Exchange information. Weather forecast. River Reports. 2—Close down. During the Session the following programme of music will be given by the Buckley and Nunn Studio Orchestra. Overture: "Titus" (Mozart); Fox trot: "In the garden of To-morrow" (Grant); Waltz: "Moonlight Memories" (Rose); Cello Solo: Miss Tasma Tiernan, "Lullaby" (Scott); Suite: "La Source" (Delibes); Cornet Solo: Mr. Walter Smith, "Ich Wiene" (Mozart); Selection: "The Arcadians" (Monkton); Fox trot: "Clover Club" (Arndt); Viola Solo: Miss Dorothy Roxburgh, "Minette" (Milandro); Orchestra: "Rigoletto" (Verdi).

Afternoon Session (3 to 5.15 p.m.): 3—Time Signal. 3.40—"Au Fait" of Buckley and Nunn Ltd., will describe latest modes in a "Fashion Talk." 4.50—Miss Flora Pell, Supervisor of Domestic Arts, Education Department in a cookery chat. 5—"Herald" and "Argus" news services. 5.15—Close down. During the afternoon the musical programme will be given by the "Strand" Theatre Orchestra.

Evening Session: (6 to 7.15 p.m.): 6—Children's Hour. "Billy Bunny" Stories by little "Miss Kookaburra" "Janet, Jessie and the Golliwog" and another instalment of "Mrs. Wiggs of the Cabbage Patch." 6.45—"Herald" and "Argus" News Services. Reuters and Australian Press Association Cables. Market Reports—Wheat, Grain, Produce, Fruit, Vegetable and Fish. Dairy Supplies. Newmarket sales. Closing Stock Exchange information. Weather Synopsis. 7.15—Close down.

Night Session (7.45 to 11 p.m.): 7.45—University Extension Lecture. 8—Salvation Army Headquarters Staff Band and Party. 9—Dr. Loftus Hills, D.Sc., "Popular Science." 9.15—Salvation Army Headquarters Staff band and Party. 10—"Argus" and "Herald" news service; "Table Talk" social news. 10.5—Mr. Rupert Swallow (Tenor) by permission of J. C. Williamson Ltd.; "Spirito Gentile"; "At Dawning" (Cadman). 10.12—Miss Gwen Russell, winner of the "Herald" Radio Voice Contest; "The Sun whose Rays" (Mikado); "De-

parted" (Grieg). 10.19—Buckley and Nunn Studio Orchestra; Overture: "Tancredi" (Rossini); Waltz: "Sunset on the St. Lawrence" ((Heller)). 10.34—Mr. Rupert Swallow: "I'll Sing Three Songs of Araby"; "Mattinata" (Tosti). 10.41—Miss Gwen Russell: "My Dear Soul" (Sanderson); "Yo San" (Finden). 10.48—Orchestra: I'll see you in my dreams." 11—God Save the King.

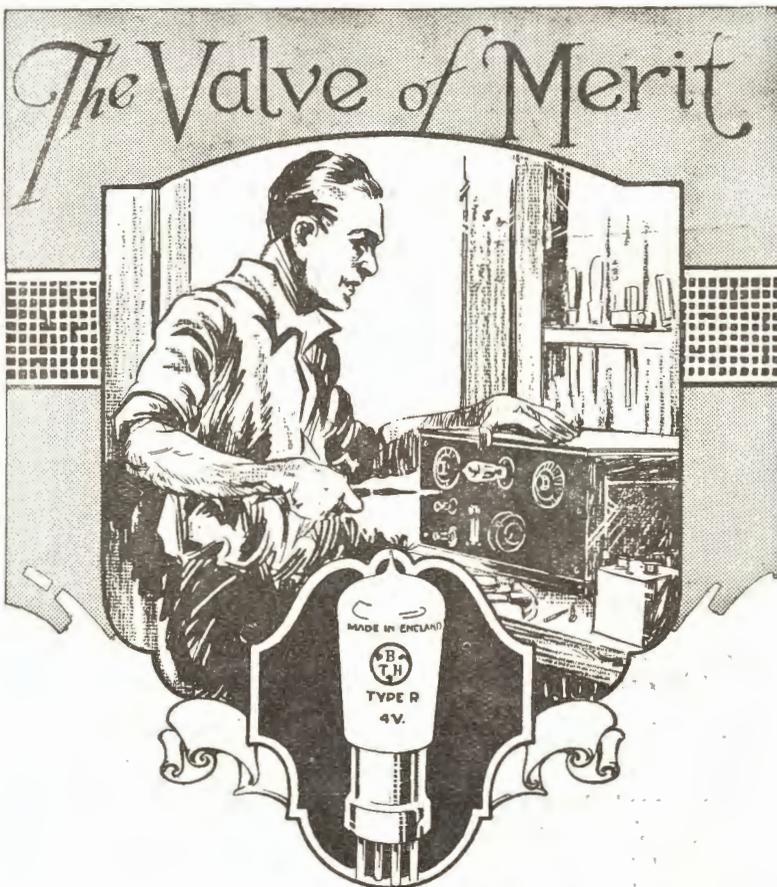
WEDNESDAY, 8th JULY.

Morning Session (11 a.m. to 2 p.m.): 11—Time Signal. Express train information. 12 noon—Time Signal. 12.30—"Herald" and "Argus" news services. Reuters and Australian Press Association Cables. 1—Time Signal. 1.45—"Herald" and "Argus" news services. Weather forecast. River Reports. Stock Exchange information 2—Close down. During the Session the following programme of music will be given by the Buckley and Nunn Studio Orchestra. Overture: "Zampa" (Herald); Foxtrot: "The Fox Trail" (Zamocnick); Suite: "The pipes of Pan" (Logan); Trio: "Trio Op171" (Gurlitt); Pianoforte Solo: Miss Agnes Fortune, "Soaring" (Schubert); Valse: "Kisses" (Zamocnick); Selection: "In a Persian Garden" (Lohmann); Violin Solo: Miss Bessie Gaunson, "Andante from ionlin concerto" (Mendelssohn); Selection "Carmon" (Bizot).

Afternoon Session (3 p.m. to 5.30 p.m.) 3—Time Signal. 4.30—Sister Peck, of the Victorian Baby Health Centres Association; "Mothercraft." 4.45—Evensong Service from St. Paul's Cathedral. 5.30—"Herald" and "Argus" news services. 5.45—Close down. During the afternoon the musical programme will be given by the "Strand" Theatre Orchestra.

Evening Session (6 p.m. to 7.15 p.m.): 6—Children's Hour. "Billy Bunny" Stories. "The Little Green road to Fairyland." "Betty and the Giant's Aunt." "A Midsummer Night's Dream" from Lamb's "Tales from Shakespeare." 6.45—"Herald" and "Argus" news services. Reuters and Australian Press Association Cables. Market Reports—Wheat, Grain, Produce, Fruit, Vegetable and Fish. Closing Stock Exchange information. Dairy Supplies. Newmarket sales. Weather Synopsis. 7.15—Close down.

Night Session: 7.45—Mr. H. R. Croll, Education Department, in an authentic talk: "Middle Distance Running." 8—Allan's Studio Band (Musical Director, Mr. T. Davison). 8.45—Mr. A. W. Clarke, Winner of the 3LO Humorist prize in the "Herald" Radio Voice Contest: "Story of Two Cats"; "Can't be too careful." 8.52—Miss Jessie Irwin, Winner of the "Herald" Radio Voice Contest: "Una Voce poco Fa" (Rossini); "When Love is Kind." 8.59—Captain C. H. Peters, "Books, Wise and Otherwise." 9.15—Miss Marie Lethbridge, (by permission of J. C. Williamson Ltd.); "Lass with the delicate air" (Arne); "Farewell" from "Maid of the Mountains." 9.22—Mr. Russell Callow, (by permission of J. C. Williamson Ltd.): "Oh Flower of all the World"; "Vale." 9.29—Mr. A. W. Clarke: "The way to kiss a girl"; "The 11/69 express." 9.36—Miss Jessie Irwin: "Pierrot"; "Love's Echo." 9.43—Allan's Studio Band. 10.30—"Argus" and "Herald" news services. "Table Talk" Social Notes. 10.37—Miss Marie Lethbridge, "Comin' Thru the Rye"; "Waters of Minnetonka." 10.44—Mr. Russell Callow, "Vesti la Giubba"; "Nita Gitana." 11—God Save the King.



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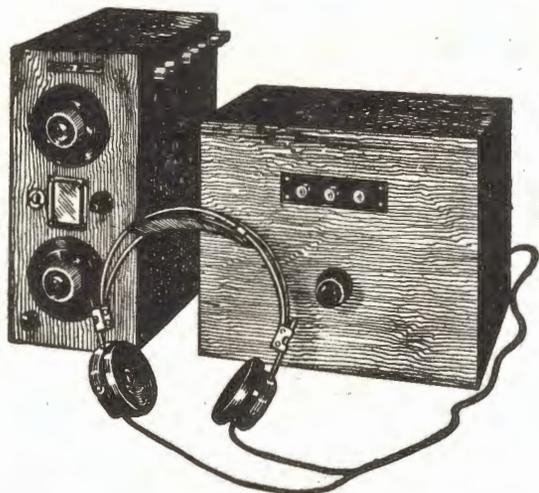
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KEW AND HAWTHORN RADIO CLUB (Victoria)

A meeting of the above club was held in the band Room, Brougham Street, Kew, on Wednesday, 24th June. A letter from the W.I.A. received too late for consideration at the last meeting, was dealt with, and the contents were received with the utmost disapproval by members. The delegates for the next council meeting were given explicit instructions to act on various matters, and also to try and straighten out the sad tangle of affairs of the W.I.A. that has been existing for so long. We hope after the next council meeting the administration of the Victorian Division will be placed on a sound basis which will be satisfactory to all clubs. It must be understood that the antagonism shown between BCL's and the other radio fraternity is being kept out of this club.

A flashlight photo of members' sets and the cup which the club won, was taken.

We wish to notify any persons interested in radio that they are particularly welcome at our meetings; the next is July 14th, at 8 p.m.

The publicity officers would gladly give further particulars. H. W. B. Bowers and A. McLean, Publicity Officers, "Welton Dale," 153 Derby St., Kew, Victoria.

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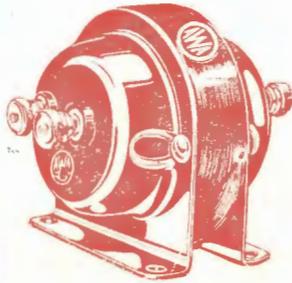
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