

ISSUED EVERY
SECOND WEDNESDAY

SIXPENCE

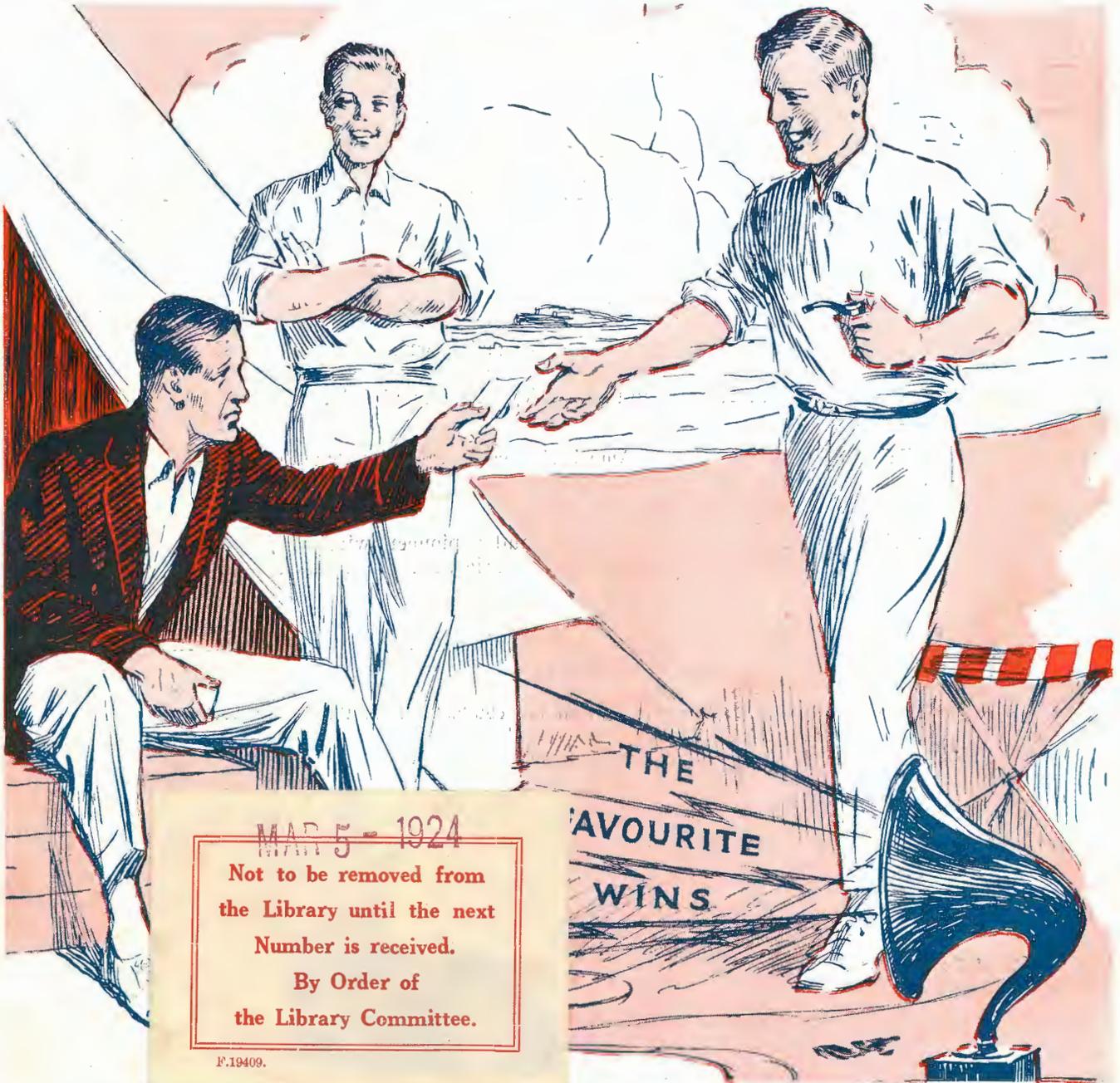
RADIO

IN AUSTRALIA
& NEW ZEALAND

VOL. I.

FEBRUARY 20, 1924

No. 24



MAR 5 - 1924
Not to be removed from
the Library until the next
Number is received.
By Order of
the Library Committee.

F.19409.

THE LOSER PAYS! RESULTS BY WIRELESS.

Registered at G.P.O., Sydney, for transmission by post as a newspaper.



IN AUSTRALIA AND NEW ZEALAND IS KEPT UP-TO-DATE BY

"WIRELESS PRESS" Publications

A variety of wireless books and magazines exceeding seventy in number, all written by world-wide experts for professionals, amateurs and beginners.

The Books range from the most simple book for the beginner to the most advanced book for the expert.

The Magazines are selected as the very best obtainable. They are:—

"RADIO"—Australia's Broadcasting Magazine, written in such a popular way that everybody, from the beginner to the most advanced experimenter, is catered for and can enjoy it. Fortnightly. Price, 6d. Annual Sub., 10/-.

"THE WIRELESS AGE"—America's foremost Radiophone Review, is the most popular American wireless magazine published. Monthly. Price, 2/- Annual Sub., 24/-.

"THE WIRELESS WORLD"—England's pioneer wireless journal. Liked by all experimenters. Weekly. Price, 6d. Annual Sub., 26/-.

"Wireless Press Publications" are the very best on the market. They are authoritative, reliable, and written so that you can understand them!

All "Wireless Press" Books and Magazines are obtainable from the leading booksellers throughout Australia and New Zealand, or direct from the publishers:—

THE WIRELESS PRESS

*Specialists in Wireless
Books and Magazines.*

97 Clarence Street, SYDNEY.

422 Little Collins Street,
MELBOURNE, VIC.

Australasia Chambers,
WELLINGTON, N.Z.

SEND FOR OUR FREE CATALOGUE.



OFFICIAL JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA.
[New South Wales, South Australia and Queensland Divisions.]

Managing Editor: S. E. TATHAM.

CONTENTS

Copyright Registered.

Volume I.	FEBRUARY 20, 1924	Number 24
		PAGE.
Radiatorial—		
Broadcasting Economics		579
Theatrical Entertainments Broadcasted		580
Highlights on Radio Broadcasting		582
Broadcasting and Listening-in		584
Book Review		585
Club Notes and News		586
Automatic Printing Telegraphy		587
Broadcasting Begins in Melbourne		588
Wireless Institute, N.S.W. Division		588
Miss Josie Melville Sings for Radio		589
The Celoron Panel		590
Obituary—The Late Mr. F. L. Moore		590
Queensland Notes		592
Australian Broadcasting Stations		592
Radio Doings in New Zealand		593
Technical Section—		
High Tension from Lamp Socket		594
Recent Wireless Patents		595
Report of Trans-Pacific Tests		596
Queries Answered		598
Movements of Wireless Officers		599

Published by

THE WIRELESS PRESS

422-24 Lt. Collins St.,
Melbourne.

97 CLARENCE ST.,
SYDNEY.

Australasia Chambers,
Wellington.

PRICE, 6d. per Copy.

Subscription Rate: 10/- per annum (26 issues) throughout Australia and New Zealand; Foreign Rate, 12/6 (26 issues).

Obtainable from all Booksellers and News Agents, also the N.S.W. Bookstall Co., Ltd.—all branches.

Wholesale Distributing Agents:

GORDON & GOTCH (AUSTRALASIA), LTD.,

Sydney, Melbourne, Adelaide, Brisbane, Launceston, Perth, Auckland, Wellington, Christchurch, and Dunedin, N.Z.

Great Britain:

The Wireless Press Ltd.
12-13 Henrietta St.,
London, W.C.2

Canada and U.S.A.:

The Wireless Press Inc.,
326 Broadway,
New York City.

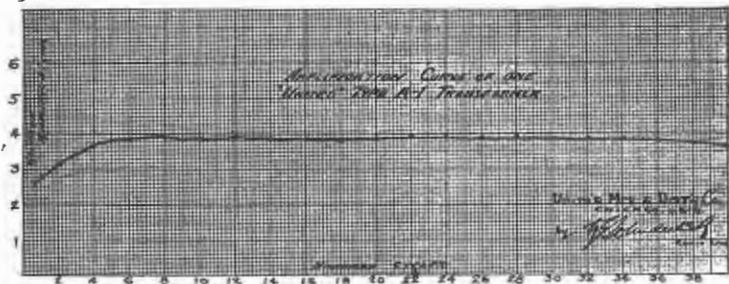
UNITED.....

UNITED
Type A-1 Ratio 5 to 1



Transformers

UNITED
Type A-2 Ratio 3½ to 1



Let Us Once and for All Times Settle This Question of Audio Amplification

Transformers, in order to give perfect audio amplification must have a characteristic curve as near to a straight line as possible.

United Audio Transformers have just such a curve as can be seen from the above chart.

A perfect audio transformer necessitates the best of core and winding design and construction.

In the United the best of core iron is used. A proper air gap is another reason for their perfect performance, and the winding construction and impedance further combine to make it the absolute best.

The winding ratio and shielding present other items necessary to a perfect transformer.

The Good United Transformers have solved both questions in an admirable manner.

Last, but really first, a perfect audio transformer must give perfect practical results.

Recently, United Audio transformers came out **FIRST** in tests conducted by the University of California—conclusive proof that United is supreme.

Ask your dealers to show you these transformers and other United efficient Radio parts. Variable Condenser, plain and vernier, Audio.

Try them and convince yourself. Results speak louder than advertisements.

Radiovox Receiving Sets

GOVERNMENT SEALED,

FOR BOTH FARMER'S AND BROADCASTERS' IN ONE SET.

WRITE FOR CATALOGUE.

United Distributing Co. Limited

Manufacturers of Radiovox Sets

Distributors of Remler, "United" and "Signal" Radio Parts (wholesale only)

28 CLARENCE STREET, SYDNEY and at 592 BOURKE STREET, MELBOURNE.



Broadcasting Economics

"RADIO" has a friend; as a matter of fact, it has quite a number of thousands of friends, but it is this particular friend, Brown; that we wish to speak of now.

THE other evening, Brown decided to go along and see "Mr. Pim" pass by. At the interval he felt unaccountably bored; being a married man, it is quite possible that there was not sufficient novelty in the domestic affairs of the "Mardens" to hold his attention any longer. He left the theatre.

ACROSS the road, in another playhouse, a musical comedy was in progress. Our friend decided to sample the latter half of the programme—without the means of payment or complimentary "pass." He was refused admission.

THE doorkeeper could not see the logic of the point that because Brown had paid for one form of entertainment that had not pleased him, he had a perfect right, without further payment, to enter and enjoy the programme provided by a rival management. This, our friend considered, was a most unreasonable view-point to adopt, but the attendant was adamant, so friend Brown paid and entered—and thoroughly enjoyed himself for the rest of the evening—although it was a greatly inferior show!

LET us tell you a little more about this friend of ours. He is, as is colloquially said, "Rather well off." Among other things like a fine villa on the peaceful shores of Rose Bay, he possesses a big "Prince Henry Vauxhall," a cabinet "Aeolian-Vocalian" with hundreds of Caruso, Galli-Curci, Melba, Elman, Paderewski and Moiseiwitch records, and also a powerful and expensive "Radiola." Strangely, he being level-headed enough to have made his own fortune, he has peculiar ideas about some things. He holds, remarkable as it may seem, that because he has bought a phonograph, the

record-makers are very unreasonable in not supplying him with free records, and that because of his "Vauxhall" the different manufacturers of petrol should keep his tanks a-brim for nothing. He also thinks that as his house is wired throughout, the electric companies should supply him with power gratis.

PERFECTLY reasonable, is it not?

AS reasonable as the stand taken by those people who, after paying for one Broadcasting service, consider that they should reap the benefits conferred by other services without extra cost. In other words, something is wanted for nothing, and such a state of affairs, as a second's consideration will show, is economically unsound, and as such, impossible.

IT should be remembered that broadcasting, first, last and all the time, is a means of public entertainment and as such, must and can only exist by the moral and actual support of the people. As already shown in this article, if one wants different forms of entertainment by different people, one must pay the different concerns who provide it. The big companies who have already, or who are at the present, erecting and inaugurating broadcasting services, have sunk a great deal of money into these ventures. Incidentally, apart from the original investment for broadcasting equipment which may range from £10,000 to £20,000 or more for a high power station, the weekly cost of a first-class programme, including the operating expense, might easily be in the vicinity of £400. If then, this outlay has to be made by the companies concerned, together with the weekly running costs, how long, without commensurate return, will broadcasting endure in Australia?

PRIMARILY, this article has been written for Brown. If you happen to know him, or anyone strangely alike, will you be so good as to read it to him?

MAKE SURE

of Receiving "Radio" regularly by placing a standing order with your news agent, or sending 10/- for one year's subscription to:

THE WIRELESS PRESS, 97 CLARENCE STREET, SYDNEY.

Theatrical Entertainments Broadcasted

What the Artists Think

Special Interviews

DURING the last few weeks "listeners-in" to Farmer's broadcasting station — 2FC — have been treated to some very splendid entertainment in the shape of acts from the current shows at Her Majesty's Theatre, Sydney, by the courtesy of Messrs. J. C. Williamson, Ltd., and J. and N. Tait.

A "pick-up" microphone was placed in a certain position on the stage near the centre of the footlights and a special speech amplifier was located under the stage for regulating strength and quality of the speech and music "picked-up" and transmitted to Farmer's broadcasting studio.

From the studio it was transmitted over six miles of land line and submarine cable to the transmitting station at Northbridge, from where it was radiated all over N.S.W., as well as being heard in Melbourne, Brisbane, Adelaide and other distant points.

Just think! Simultaneously with the audience in the theatre hearing the orchestra playing and the artists singing and talking, many people scattered throughout N.S.W. and other parts of Australia, heard exactly the same music and song and just as clearly! What a boon for those living hundreds of miles away from the city!

Altogether three different plays have been broadcasted by 2FC from Her Majesty's Theatre—"A Southern Maid," "The Merry Widow," and "Sybil." All these have been played by the popular Royal Comic Opera Company.

A special representative of *Radio* paid a visit to the theatre one recent Wednesday afternoon, while a matinee was in progress and between scenes and acts, hurriedly interviewed some of the principals.

Broadcasting is not new to the popular Miss Gladys Moncrieff, as she broadcasted several songs in Melbourne some months ago. Asked what

she felt like during her first experience she said: "It was terrifying, singing into the microphone and not any other sound but my own voice being heard. And when I finished there was not a sound except 'thank you' from those at the broadcasting station. So different from the theatre! In Sydney, too, I felt rather nervous

when I first saw that microphone on the stage, but now I'm getting quite used to it."

"To think that when I am singing on the stage in Sydney," continued Miss Moncrieff, "my voice is being heard hundreds of miles away at the same moment is, to say the least, absolutely marvellous."



Here is Miss Moncrieff as she appeared in one of the scenes of "A Southern Maid." It would appear, to judge by her expression, that trouble was brewing for someone. However, the microphone heard all about it.

Miss Cecil Bradley had also experienced the "thrill" of broadcasting like Miss Moncrieff in Melbourne, prior to the plays in Sydney being put "on the air."

"I felt terrible," said Miss Bradley, "when I first broadcasted in Melbourne. That unresponsive micro-



Despite the hat (O.S.), the moustachios and the cloak, you can still recognise Mr. Claude Flemming. He also has been Broadcasted lately.

Mr. Leslie Holland is an ardent wireless experimenter owning his own experimental station at his home at Rose Bay. Mr. Holland, a licensed experimenter, regularly hears Australian and New Zealand wireless stations working as well as high power American stations working to Honolulu and Japan. He is very keen about broadcasting and during the conversation he said: "I think that broadcasting has a very wonderful future and it should greatly assist the theatre."

"Splendid," answered Mr. Claude Flemming to the enquiry as to what he thought about it. "I think it will help the theatres very much."

Mr. Robert Chisholm also thinks it will be a boon for the inland dweller. Mr. Chisholm broadcasted in Melbourne last September during the Ideal Homes Exhibition. "There is one thing about broadcasting," he said, "and that is *singers* can grow fat in comfort now, without thinking of their figure!"

Another popular artist very keenly interested in wireless generally is Mr. Herbert Browne, who, like several others, wishes he could hear his own voice. "I was given quite a lot of tuition in wireless by Mr. Leslie Holland during one of our visits to Adelaide," said Mr. Browne, "and ever

since I have been keenly interested."

Practically every one of the artists interviewed regretted the fact that they could not hear their own voice over the radio. Well, it would be a hard job, eh?

Mr. Andrew MacCunn, musical director of Her Majesty's Theatre, whose orchestra has been delighting many thousands of "listeners-in" also thinks that broadcasting will do theatres a lot of good.

The stage manager, Mr. Dick Shortland, considers broadcasting will greatly assist productions, because when people hear a part of the play they will want to see the whole show.

There is one thing that performers over radio broadcasting do not get from their audience and that is applause. Of course, it is not possible to give it to them like we do in a theatre, but there is another way.

A small note of appreciation addressed to the artist means a whole lot to the recipient—so everybody who hears someone they like and appreciate should send a few lines expressing that feeling. It will be greatly appreciated by the artist.

If you do not know where to write, send your letter to the Editor of *Radio*, 97 Clarence Street, Sydney. He will see that it reaches the addressee.



Evidently Mr. Arthur Stigant has doubts as to the virtues of the liqueur recommended to him by Mr. Leslie Holland. The above is a scene from "Sybil," and those who "listened-in" say it was very thirsty work.

phone was not at all pleasant! However, I think that broadcasting is very wonderful, and I am happy to know that I have helped to entertain an audience scattered throughout New South Wales."

The popular Mr. Arthur Stigant when asked what he thought about broadcasting said, "I believe its great but unfortunately I can't hear myself!" Mr. Stigant, who lived for a time on a farm outside Perth, knows a little about country life where there's no telephone and letters only once a week.

"Broadcasting," continued Mr. Stigant, "is a Godsend to country people, who will now feel that they are actually in touch with civilisation."

Highlights on Radio Broadcasting

When Wireless Controls Wireless

By ALFRED N. GOLDSMITH, B.S., Ph.D., Fellow I.R.E.,
 Director of Research, Radio Corporation of America
 (Special to "Radio.")

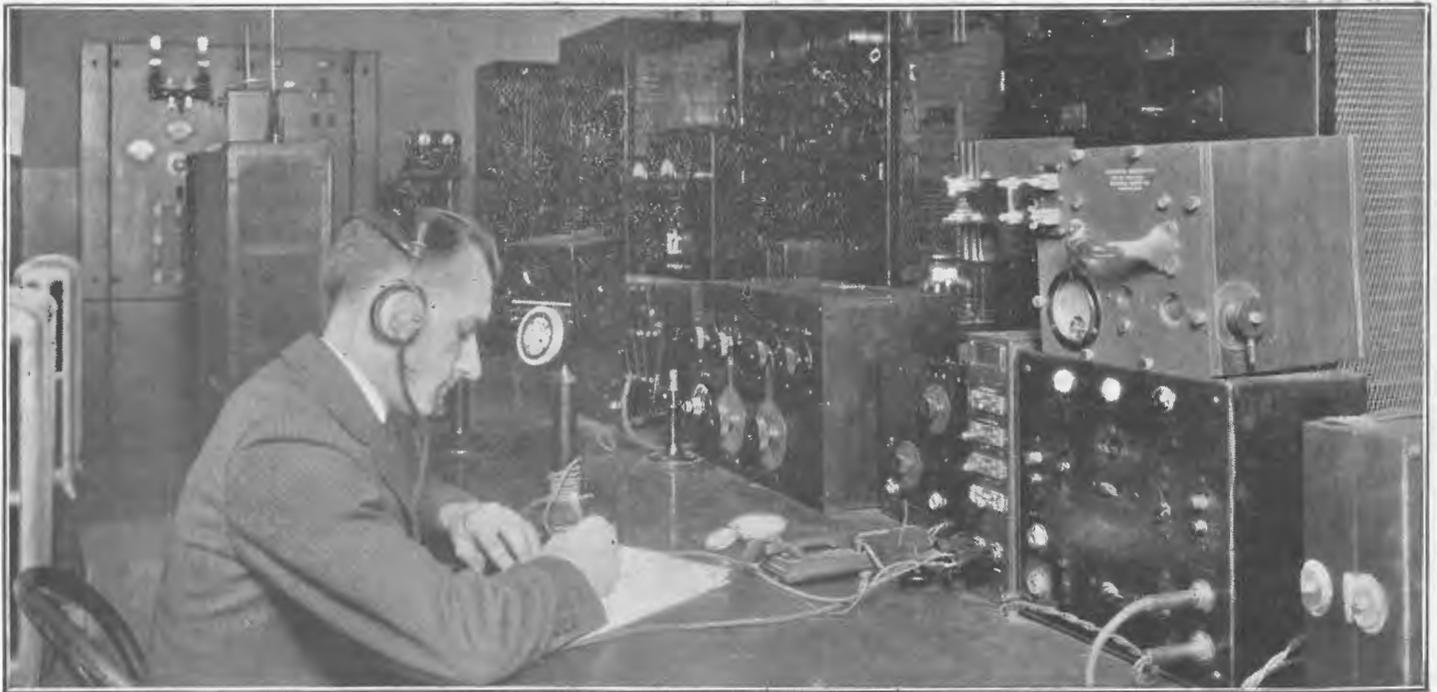
IN a busy age like the present, everyone appreciates the value of time. The rough idea of the time of day given by ancient and picturesque devices like the sundial will not meet the requirements of a hurried civilization. Modern watches and clocks must be accurate to within a few seconds a day, and chronometers and standard clocks must be still more precise in their readings. The furnishing of correct time to the people of a great country like the United States calls for considerable planning and organization, and the use of the most recent scientific methods. Radio has stepped into the breach, and is meeting the demands for standard time signals in a thoroughly satisfactory way. The manner in which radio broadcasting is used to give time signals is of general interest, and is in addition so peculiar a use of broadcasting in

several ways that it is worth considering in detail.

The official time for the United States is obtained primarily from the Naval Observatory at Georgetown. Here an extremely accurate astronomical clock is used as the standard, and is properly regulated and controlled by observations of the stars. So far as man now knows, the time given by such clock is accurate to within a very small and known error. Indirectly this clock is used to control an electrically operated switch or relay which is capable of closing a circuit once every second. From Georgetown, a wire line runs to the great naval radio station at Arlington, Virginia. The electric currents passing over this wire line from the master clock at Georgetown control the sending key of a high power radio telegraph transmitter at Arlington. This transmitter is a so-called con-

tinuous wave transmitter operating at a frequency of 113 kilocycles (for a wave-length of 2650 meters). The accompanying drawing shows the general arrangement schematically.

It would, of course, be possible for an appropriate radio receiver to receive the Arlington time signals directly, but there are several objections to such direct reception. In the first place, the frequency or wave-length of the Arlington time signals is far outside of the tuning range of the vast majority of radio broadcast receivers, so that it would be necessary for most broadcast listeners to purchase a new receiver in order to hear the time signals direct from Arlington. In the second place, the time signals, being continuous wave signals, are receivable only on an appropriate regenerative receiver which is in the oscillating condition through bringing the tickler or in-



THE RADIO RELAY CONTROL EQUIPMENT AT WJZ, NEW YORK CITY.

Photograph shows time signal transfer apparatus in transmitter room at station WJZ, with operator with microphone in front of him handling the receiver, etc.

tensity control up to the point where the set would produce musical notes ("birdies") on ordinary broadcast stations. This is, however, an undesirable condition for existing receivers, because it also converts them into small very low power transmitters, and may cause local interference with reception by other listeners. And, in the third place, the weather reports and other interesting information at the end of the time signal transmission from Arlington are appropriately in Continental telegraph code, and therefore would not be directly understood by the great majority of broadcast listeners who cannot read such telegraphic code.

It is therefore highly desirable that the Arlington time signals should be sent out on a frequency or wave-length which the average broadcast receiver is capable of receiving, that the signals should be so sent out that they can be received by the ordinary regenerative receiver in the same unobjectionable and non-oscillating condition as is used for normal radio telephone reception, and, that the additional information, such as weather forecasts, should be in the form of spoken words which will be universally comprehensible.

All of this can be done by suitably using the local broadcast transmitting station as shown in the accompanying drawing. A high-grade receiving set which is quite capable of reliably picking up the Arlington time signals is installed, for example at station WJZ of the Radio Corporation of America at Aeolian Hall, New York. The loud time signals coming from this receiving set are then sent directly into the power amplifier of the broadcast transmitter at WJZ and thus control the transmitter itself, being sent out by it at the frequency of 660 kilocycles (wave-length of 455 meters) which can be readily received by the usual listener. Considerable care has to be taken to prevent the powerful signals which are being sent out from the station WJZ from affecting the local receiver of the Arlington time signals, which is picking up the incomparably feebler signals coming hundreds of miles from Arlington. A highly selective receiver, carefully installed and shielded, is necessary for the purpose.

Examination of the drawing will show clearly that the master clock at

Georgetown is controlling the radio transmitter at WJZ by means of a radio connection between Arlington and New York. In other words, we have the interesting situation of a radio signal in turn controlling another radio signal on a different frequency or wave-length. The method is known as radio relaying of signals, and has been successfully used as well for the transmission of broadcast concerts from one broadcasting station to another, and the subsequent automatic and practically simultaneous re-transmission of the same concert from a second station on a new frequency or wave-length.

The method promises to have some useful applications in the future.

The requirement that the weather forecasts and the like shall be comprehensible by every listener is readily met by having these first copied by a skilled receiving operator at WJZ, and then read to the radio

audience by one of the announcers. The equipment for receiving the time signals from Arlington and for sending them into the broadcast transmitter at WJZ for re-transmission, or, alternatively to permit speech to be sent out directly, is shown in the accompanying photograph. The switching arrangements provided have proven very satisfactory in practice.

Arlington time signals are sent out at noon and ten in the evening (eastern standard time). They consist of the following:—

Announcement that the time signals are about to be transmitted.

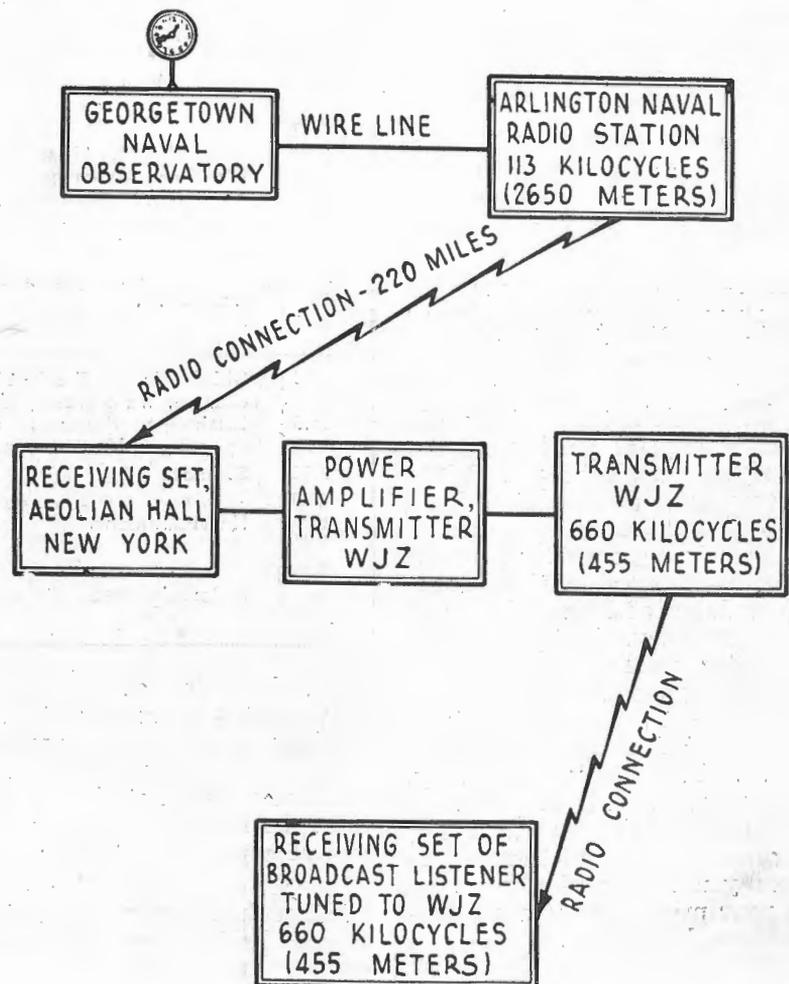
Twenty-nine dots from 11 hours 55 minutes 00 seconds to 11 hours 55 minutes 28 seconds.

A pause of two seconds.

Twenty-five dots from 11:55:30 to 11:55:54.

A pause of six seconds.

(Continued on page 591.)



How the Time Signals are sent out from radio station WJZ, New York City.



Broadcasting and Listening in

The Burgin Electric Company, Sydney, advise that their Bega (N.S.W.) agents, "Bega Radio Supplies," were particularly successful in picking up the musical comedy success "The Southern Maid" recently broadcasted by 2FC. The firm's country branch also hears daily the ordinary service disseminated from Farmer's station, and working on three valves, everything comes through, to quote the letter, "as fine and clear as a bell." For this reception a Burginphone Experimental Receiving Set was used.

Americans are lucky. Daily from a big New York broadcasting studio they can hear Sergie Rachmaninoff and Rimsky Korsakov playing over their own compositions. In popularity, it is perhaps needless to state, "The Prelude" and "Song of India" are far from the least of these.

It may be possible, soon, to turn over some household tasks to the radio broadcaster, such as putting out the cat at night at a given hour. WGV at Schenectady, says the *New York Evening World*, recently broadcasted a farmers' programme. The numbers simulated a celebration of the fiftieth wedding of Josh Quinby and his wife Samantha. Instead of signing off in the usual manner, "Josh," after speeding the departing guests, called to the cat preparatory to locking the kitchen door and blowing out the lights. His call, "Kitty, Kitty, Kitty" was carried to a great many homes with the following result as related in two letters:—"To convince you how perfectly we received your programme," wrote Mollie Chesbrough, of Addison, N.Y., "I will tell you that our pet Kitty was lying on the sofa asleep. When the groom of fifty years ago was calling Kitty to put her out, our Kitty im-

mediately got up to see who was calling him and for two or three minutes did not remove his gaze from the loud speaker." Charles J. Chase, general storekeeper at Sebec Station, wrote:—"Our cat heard you call and knew it was bedtime and hid away and did not want to be put out."

platforms and connected by a special line to a microphone in front of the speaker. The voice could be heard across the Champ de Mars, and promenaders within many metres were able to hear the speaker with surprising ease.

Mexico City was the scene the other day of the opening of two broadcasting stations. Up to this time the Government had been chary in granting concessions, but there, nevertheless, seems to be great enthusiasm for the new wonder in the turbulent country. It is believed that the market there for the purchase of apparatus is very favourable.

Plans for the erection of relay radio stations by the British Broadcasting Company are now being drawn up. These will be built at Belfast, Hull, Liverpool, Leeds, Edinburgh, Dundee and Plymouth. Ships as far away as Port Said will be able to hear the concerts.

During the recent visit to the United States of General Gourand a receiving set was installed in his private car. On the tour by automobile many broadcasting stations were heard.

The Government director of the French radio service recently said in a public statement that broadcasting will not be allowed to develop there as it has done in the United States. France's motto where wireless is concerned is to be quality, not quantity. The inspector recently prohibited a newspaper from broadcasting a daily news service, the authorities deciding that the law should grant the whole telegraphic monopoly to the Government, and that those behind the scheme must cancel their arrangements instant or face heavy penal terms.

2FC

BROADCASTING TIMES.

Sydney Mean Time.

P.M.	
12.55	Chimes.
1.00	Time Signals; News Items; Weather Reports; Stock Exchange News; and Produce News.
to	
1.45	
3.00	Chimes.
3.05	General News and Orchestral Items.
to	
4.00	
6.30	Chimes.
6.33	Children's Bed-time Stories; Late News; Stock Exchange Reports; Late Sporting & Market Reports.
to	
7.15	
7.55	Chimes.
8.00	Entertainment.
to	
8.45	
9.05	Entertainment.
to	
10.00	

The formation of a broadcasting company has been frequently mooted in Hobart during the last month. It would supply Tasmania with concerts which many are not able to pick up from the mainland without installation of expensive receiving sets.

When the Pasteur Celebration was recently held in Paris a loud speaker of enormous power was installed in the French Army station, situated on the Eiffel Tower. The speaker was placed on the first of the Tower's

Australia's Broadcasting Scheme Commended

MR. E. T. FISK, Managing Director of Amalgamated Wireless (Australasia) Ltd., recently received two spontaneous tributes from Sir Henry Jackson, Admiral of the Fleet and Chairman of the Radio Research Board in Great Britain, and M. Ferrie, Chief of the Wireless Services of the French War Department.

Admiral Jackson, after stating that he is familiar with radio broadcasting conditions in Australia, says: "I find so little to criticise adversely that I cannot but feel you are starting on a sound basis, and wish your endeavour every success. In such a large and uncongested area, as you will serve, the value of the information broadcasted will surely be great for those who 'listen-in.' In this you will contrast very favourably with Great Britain, and also with the United States, and I think you have probably very carefully considered the state of broadcasting in these two countries, and made your regulations after this study."

In the course of the letter from the Chief of the French wireless stations, M. Ferrie says: "It (the scheme for Australian radio broadcasting management) appears to be deserving of the closest study as a model by the broadcasting organisations of the various countries. I wish you, dear sir, to accept my best wishes."

Book Review

"Wireless Telephony"

UNTIL recently, the study and manipulation of wireless apparatus outside professional circles has been limited to a comparatively small class of the public known as amateurs, many of whom possess a high degree of technical knowledge. The literature published for their benefit has been to a large extent of a technical character, assuming at least an elementary knowledge of electrical and physical phenomena on the part of the reader.

With the advent of "broadcasting," many thousands of people have provided themselves with receiving apparatus, who have neither the taste nor the time for technical study, but who, nevertheless, may wish to acquire a sufficient general knowledge of the whole subject to give them an intelligent interest in the apparatus they use, and in the laws and forces of nature which the ingenuity of mankind has converted to their amusement and benefit.

With the object of filling this want, the author has endeavoured to cover as wide a field as possible without losing the reader in a labyrinth of technical detail which would tend to confuse, rather than elucidate, the fundamental principles involved.

The book is well printed, and contains 79 drawings and diagrams, and is confidently recommended to all interested in broadcasting, and who wish a clear and simple explanation of the subject. By R. D. Bangay, The Wireless Press, Sydney. (Price, 3/6.)

At 250 Miles a "Burginphone" Receiver brings in Farmer's Service on a Loud Speaker in daylight

USING 3 VALVES.

EFFICIENCY IS OUR WATCHWORD.

All Burginphone receivers are made in our Australian Factory to suit Australian conditions and regulations. EXPERIMENTAL ACCESSORIES are stocked by us, and include such lines as KELLOGG, DE FOREST, CHELSEA, MULLARD, REMLER, MASTER, and other well-known makes.

SEND FOR PRICE LIST.

BURGIN ELECTRIC COY.

WIRELESS MANUFACTURERS AND SUPPLIERS,

1st FLOOR, 391 GEORGE STREET, SYDNEY.

Club Notes and News

NEWCASTLE DISTRICT RADIO CLUB.

The usual fortnightly meeting of the above club was held on January 30 at the club-room, 25 Winship Street, Hamilton. In the absence of Mr. Seward, the president, Mr. Harper officiated as chairman. After buzzer practice, Mr. Swan gave a short address on the club's transmitter. One new member was elected and the meeting closed with the usual general discussion.

LISMORE (N.S.W.) RADIO CLUB.

Mr. W. G. Exton, on behalf of the Lismore Radio Club, interviewed Mr. A. Bruntnell, Minister for Education, on his visit to Lismore a few days ago, with reference to the proposed establishment of a radio station in one of the rooms of the Rural School.

Mr. Bruntnell was asked to give his consent, the idea being that the radio station would be used for instruction purposes by the pupils in the day time, and by members of the local Radio Club at night.

Should the application be granted full responsibility for the care of the buildings and furniture would be taken both by the teachers and the executive of the Radio Club, and no loss of space or disorganisation of class work would be occasioned. The set was already under order—a four-valve receiving set with folding sides and a 14 inch magnavox, the approximate cost being £100. The set would permit of all wiring and working to be seen by the students, as the club was an experimental station. At a later date a trans-

mitter would be installed, and the club felt that if the permission asked for were granted it would be a distinct educational asset to the Rural School. In the event of a license being obtained, the desire was that it should be in the name of the Lismore Radio Club and the Rural School.

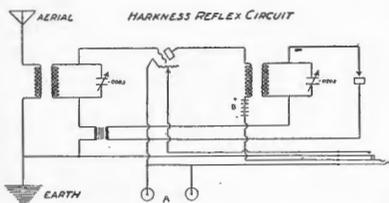
Mr. Bruntnell, in reply, said that the proposal was just what he desired, as it would tend still further to bring the parents and citizens into close touch with the teachers and scholars and the work of the school. On his return to Sydney he would immediately refer the application to a committee which had been specially appointed, and this committee in turn would communicate the decision to the Radio Club. Personally, he was very much in favour of the proposal.

Broadcasting Receivers Passed by P.M.G.'s Department

To January 3, 1924

Manufacturer.	Type No. of Receiver.	Wave-length Metres.	Brief Description of Receiver.
Ramsay Sharpe, 217 George St., Sydney	16	350 ..	Single Valve
W. G. Best, Vaucluse, Sydney ..	17	350 ..	" "
C. P. Thomas, Sussex Street, Sydney ..	18	350 ..	" "
W. G. Best, Vaucluse, Sydney ..	19	350 ..	" "
Western Electric Co., Sydney ..	8	1100 ..	Crystal and Valve
Burgin Electric Co., Sydney ..	9	1100 ..	Two Valve
United Distributing Co., 28 Clarence St., Sydney ..	46	1100 ..	Single Valve
Western Electric Co., Sydney ..	10	1100 ..	Crystal and Valve
Western Electric Co., Sydney ..	11	1100 ..	Two Valve
C. P. Thomas, Sussex Street, Sydney ..	20	350 ..	One Valve
L. Keller, 20a Cooper Street, Redfern ..	21	350 ..	One Valve
Home Electric, 106a King Street, Sydney	22	350 ..	Crystal and Valve
C. K. Rollins, 167 George Street, Sydney	23	350 ..	Crystal
C. P. Thomas, Sussex Street, Sydney ..	24	350 ..	Two Valves
MELBOURNE (UP TO 7.1.24).			
Western Electric Co., Melbourne ..	5	1100 ..	Single Valve
British General Electric Co. ..	6	1100 ..	2 Valve Geco 'Phone
British General Electric Co. ..	4	1100 ..	2 Valve
Amalgamated Wireless (A/sia.) Ltd. Melbourne ..	1	1100 ..	2 Valve Radiola
New System Telephones, Ltd., Melbourne	31	350 ..	3 Valve
P. H. McElroy, Melbourne ..	32	1720 ..	2 Valve
P. H. McElroy, Melbourne ..	33	400 ..	"
Millswood Radio Co., Adelaide ..	34	850 ..	"

Seek the advice of
Mr. F. BASIL COOKE, F.R.A.S.,
on the
"HARKNESS"
REFLEX CIRCUIT.



A great deal of interest is now being taken in the famous "Harkness" Circuit. It is simple to operate and very effective, combining the purity of crystal reception with the loudness of the Valve. Mr. Cooke's advice about this Circuit is at your disposal.

The following material is required:—

- 2 ½ Tubing Each 9d.
- No. 26 Covered Wire, 4-oz.
- Spools 1/3
- 2 .0005 m.f. Variable Condensers Gilfillian .. Each 26/-
- Argentite Crystals, 2/-, 3/-, 3/6
- Standard A.F. Transformer 25/-
- 90-Volt B Battery 25/-
- Filament Control Jack 6/-
- 1 Valve Socket 6/6

DAVID JONES'
RADIO DEPARTMENT,
22 YORK STREET, SYDNEY.

PLACE YOUR HOME ON THE AIRLINE.

Instal a broadcast receiving set, and a high-class programme of music, news and information will be available each day and evening for a whole year — and as long after as you wish. You owe it to yourself and family to help in the grand ideal of having "A Receiving Set in every Home."

Automatic Printing Telegraphy

Creed's High-Speed System

MR. GAVIN L. CREED, a director of Creed & Co., London, telegraph engineers, and a son of the inventor of the Creed telegraph equipment, arrived in Australia recently to demonstrate the apparatus to the Commonwealth Postal authorities.

Mr. Creed, in a special interview with a representative of *Radio*, stated that his father, the inventor, had his early experience in different parts of the United States, and also in South America, and it was whilst working as a telegraph operator in South America that, at the age of 23, he had the first idea of the system. Though he had no mechanical training, he invented a wonderful apparatus, which he showed to Lord Kelvin, who rejected it on the grounds that the inventor did not fully appreciate the mechanical difficulties which confronted him. But Mr. Creed steadily improved the apparatus, until it was adopted by the British Post Office in 1898. By the system at that period sending and receiving were possible at the rate of about 100 words per minute. Since then it has been developed, so that it can send over 200 words per minute. It is now in use in the principal telegraph systems and newspaper offices of the world, and has been adapted for use in different high-speed wireless stations throughout the world. The highest average speed attained in

commercial wireless for the year 1923 was with the use of this apparatus on the London and Paris system, where for the whole year the average was 95 words per minute sent and automatically received.



Mr. G. L. Creed.

The apparatus has been so developed that it is both simple and efficient. The messages to be sent are perforated on paper by means of an apparatus furnished with the ordinary typewriter keys. This message is put on the telegraph wires, and sent through

at the rate of 200 words per minute. It is received at the other end automatically at the same rate by an apparatus which punches holes in paper exactly corresponding with the holes in the paper used in sending the message. This perforated slip is put on another machine, and it automatically prints the messages in Roman characters, also at the rate of 200 words per minute.

This system has revolutionised the sending of Press messages in the United Kingdom and America. All the leading newspapers, Mr. Creed stated, of the British provincial cities are directly connected with the office of the Press Association or the Central News in London, and by means of this apparatus receive nightly from 200,000 words down to 20,000 words, according to the size and importance of the paper. Many of the London papers use this system for duplicating their papers in provincial centres, so that the same paper is published simultaneously in London and Manchester or other provincial city.

Mr. Creed was emphatic that wherever the system had been introduced in Great Britain or Europe it has been found most effective, and has aided greatly in commercial and industrial development by improving the communications between different countries and between the main commercial centres of each country.



STROMBERG-CARLSON

SUPER No. 2-A Radio Headset SENSITIVE

£2/5/-.

Why buy a cheap inferior set when you can obtain a high efficiency No. 2-A at half the cost of an equal set? It is built by Telephone Manufacturers of 30 years' standing. DURABLE, COMFORTABLE, ACCURATELY REPRODUCES VOICE and MUSIC. Permanent adjustment, unaffected, by climatic and temperature changes. Also RADIO PLUGS and JACKS; MICROPHONES, all types.

Ask your dealer or write us direct.

Aust. L. P. R. BEAN & CO. LTD., 229 Castlereagh St., Sydney Reps.

Interstate:—BRISBANE: S. H. Smith, Radio House. ADELAIDE: Chas. Atkins & Co.
PERTH: T. Muir & Co., 99 William Street. MELBOURNE: Homecrafts, 211 Swanston Street.

Broadcasting Begins in Melbourne

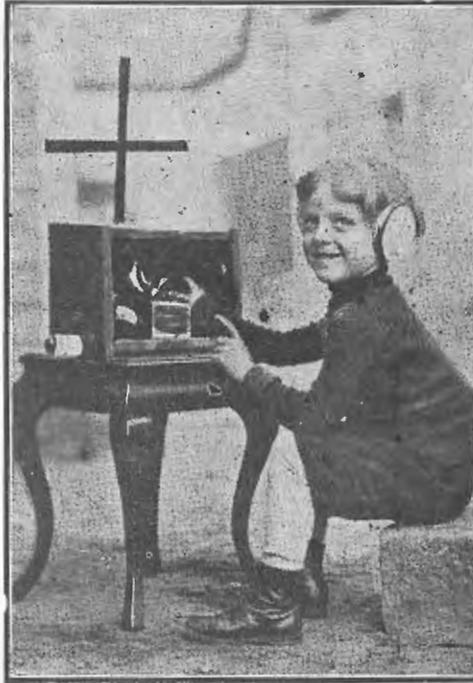
Associated Radio Co. Inaugurates Service

AS forecasted some little time ago, the first Melbourne wireless broadcasting station was opened on Saturday, January 26 last, by the Chief Secretary, Dr. Argyle.

The station has been erected by the Associated Radio Company, and is situated at the company's factory for the manufacture of wireless apparatus in a Beckett Street.

In declaring the station open, the Chief Secretary said that, although he had spoken to many audiences in his time, he had, hitherto, never spoken to an invisible one and one which was so many miles away. To him, as a member of Parliament, it was a strange experience, and he felt at a disadvantage because if the listeners-in did not agree with what he was saying they could disconnect: (Laughter.) On the other hand, they could not ask him any questions. He urged those who were listening-in not to rest content with the enjoyment broadcasting had brought them, but to try and improve the results already obtained. He hoped that radio telephony, as a public asset, would become as popular with Australians as it had with people in other parts of

the world, and that the service would enlarge and add further to the enjoyment of city and country dwellers.



Where imagination goes a long way!

Mr. J. Malone, Chief Manager of Telegraphs and Wireless in Australia, wished prosperity to radio broadcasting. Wireless experimenters' work was invaluable in the advancement of broadcasting. Had it not been for wireless experimenters whose fine work had interested the public in early days, there would be no broadcasting now. Experimenters could rest assured that their status would remain uninterfered with.

At the conclusion of the speeches, a musical programme was disseminated from the station.

By March the company's powerful broadcasting station being erected at Sunshine (Vic.) will be completed and the service continued from there.

The power supply has been designed and made in the Victorian capital with a wave-length of 480 metres, enabling all amateurs and experimenters to tune in with the station easily, as their existing receivers have been designed to cover this wave-length. Three hundred watts will be the power eventually used and this should insure clear reception at considerable distances on even a crystal set.

Wireless Institute, N.S.W. Division

Proposed Co-ordination of Radio Clubs

The meeting of club delegates to consider what steps shall be taken for the co-ordination of amateur and experimental interests in N.S.W. has been arranged to take place at the Royal Society's Hall, 5 Elizabeth Street, Sydney, on Wednesday, March 19. The time has now arrived when it is thought some action be taken, and it is particularly desired that every club in N.S.W. should send a delegate to this meeting fully empowered to act on behalf of his body. The

duty of those present at the meeting will be to evolve some scheme whereby a central body, or council may be formed which will be able to act and speak authoritatively on behalf of the various radio clubs and societies in N.S.W. Official invitations will be issued to the various clubs so far as they are known, and all club secretaries, particularly those in country centres, are requested to immediately forward their names and addresses,

together with the name of their club to the Hon. Secretary of the Wireless Institute, Box 3120 G.P.O., Sydney. Suggestions will also be welcomed, and it is hoped that all clubs will take this matter seriously and combine to strengthen the experimental movement.

The next meeting of the N.S.W. Division of the Wireless Institute will be held at the Royal Society's Hall on Thursday, February 21, at 7.45 p.m.

Miss Josie Melville Sings for Radio

New Melbourne Service Starting

THE other morning in the Melbourne offices of Amalgamated Wireless (Australasia), Ltd., at Collins House, circumstances veered. It is an uncanny way they have—from the sublime to the ridiculous—all for the sake of a couple of inches.

In other words, Miss Josie Melville was about to tell Tasmania all about "Wild Rose" and "Whip-Poor-Will" through the medium of that tuneful voice of hers, when it was found that the microphone and Miss Melville had a Difference. It was only a matter of inches, but, nevertheless, the Difference remained, and until it was remedied or "patched-up" listening Tasmania hadn't a hope. As a matter of fact, somebody who possessed a clear brain in a crisis, sprang forward and laid down three mats, one on top of the other, and the Difficulty was overcome. Miss Melville stepped upon the mats, her face came on a

level with the microphone, the accompanist drifted through the opening bars, and wireless telephony did the rest. Everything in the ether was lovely.

Miss Melville sang three songs altogether, and these were heard by listeners-in on various ships at sea, and also at King Island and Flinders Island. Hobart reported faint reception.

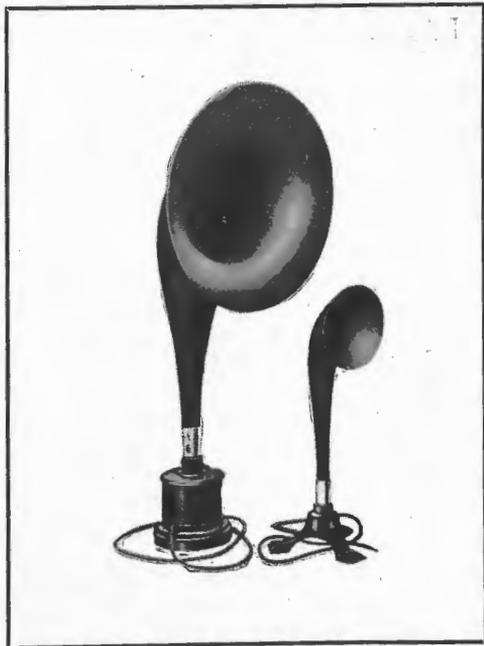
The studio used for the trials was a small room about 20 feet square, the sole furniture being the microphone on a stand and the piano—oh, yes! and the mats! The power used for transmission was a quarter kilowatt, while for the purposes of the tests Mr. J. Malone, Director of Wireless Telegraphy, allotted a special wave-length of 950 metres.

During the course of the morning, Mr. F. Cutler, Amalgamated Wireless (Australasia), Ltd., and Mr. Phil. Finkelstein (J. C. Williamson, Ltd.),

outlined the broadcasting scheme shortly to be put into operation in the southern capital. It was stated that the service will be similar to that of 2FC (Farmer's station, Sydney). Under arrangement with the Australian Broadcasting Company, microphones were being installed in all the Melbourne theatres controlled by "the Firm," i.e., Her Majesty's, Royal and King's.

It is expected that a definite start will be made by the end of this present month.

A studio is to be fitted out at the top of a tall building, and from there the concerts will be disseminated. Mr. Cutler declined to state what wave-length would eventually be used, or where the studio would actually be located, but it is thought that the wave-length will be of 1720 meters, and that the station will be built at Footscray.



CLEAR AND TRUE *Western Electric* LOUD SPEAKERS

When used with a correctly designed and adjusted radio receiving set, Western Electric Loud Speakers give a clear and true reproduction of speech and music over the entire musical range, including the low bass notes of a pipe organ and the high tremolo notes of a violin.

Western Electric Radio Equipment can be obtained direct and also from Radio dealers in town & country. We are at all times pleased to give expert advice and help regarding Radio installations and equipment.

Western Electric Company
(Australia) Ltd.

192-194 Castlereagh Street,
SYDNEY.

'Phones: City 336, 356.

The Celoron Panel

Its Many Advantages

AS the radio panel is, so to speak, the "front-door" of the set it is as well to make sure when purchasing it that it possesses certain definite attributes. It should be of good dielectric strength to insure the retention of electric current, for, of course, if it is a bad insulator the efficiency of the best instruments can be nullified by leakage and by the effects of body capacity.

Radio enthusiasts in Australia and England find that of the many different lines of panels on the market Celoron Standard Radio, manufactured by the Diamond State Fibre Company seems to give the most satisfactory service.

Celoron is a product of bakelite and is strong, hard, smooth and watertight. A deep, highly-polished black,

it adds greatly to the spick and span attractiveness of one's set, or, if desired, a dull finish can be secured by rubbing down the face with sandpaper. Celoron can also be had finished in mahogany or oak.

Another of the many advantages of Celoron is that it can be had in nine different sizes. Hitherto if one required a panel from a dealer, one had to wait while it was cut to the desired dimensions from sheet stock. As it is, Celoron may be had in any convenient size, already cut and wrapped in a "glassine" envelope to protect its surface from scratches.

The standard sizes of the panels are:—

6 x 7	7 x 21
7 x 9	7 x 24
7 x 12	7 x 26

7 x 14	9 x 14
7 x 18	12 x 14
12 x 18	

Thicknesses: 1/8in.; 3/16in. or 1/4in.

Of course, for special hook-ups, other sizes can be furnished, but these sizes should serve all the ordinary needs of the set builder.

Celoron lends itself readily to all working. It can easily be tapped, milled, sawn or turned and it will also engrave clearly without "feathering."

In short, the radio worker who has a Celoron panel has a reliable foundation on which to build his set, and with such he can feel that it will do all that a good panel should in making his instruments work most satisfactorily.

OBITUARY

The Late Mr. F. L. Moore

All radio amateurs and experimenters were shocked to hear the other day of the startlingly sudden death of Mr. F. L. Moore, of Haberfield, who died as the result of coming into direct contact with a high tension wire from a transformer.

Unfortunately, at the time the rumour arose that the late Mr. Moore was electrocuted through the careless handling of his wireless telephony receiving set, which, of course, was impossible, such sets being absolutely safe.

On behalf of *Radio*, and our numerous readers, we extend most heartfelt sympathy to the deceased's relatives and friends.

However, sincere as are the sympathies that go out to Mrs. Moore and her little ones, *Radio* considers that a more tangible form of condolence would better meet the case. Through

the untimely death of her husband, the unfortunate widow has been left in a position closely approaching actual want, and it is considered that a fund inaugurated by this periodical would better meet the existing situation than any amount of verbal sympathy.

Such being the case, it has been decided to open the *Radio* Relief Fund in conjunction with Messrs. F. Basil Cooke, J. W. Robinson and Phil Renshaw, who have kindly agreed to act as trustees.

The whole proceeds will be donated to Mrs. Moore, and it is hoped that the response will be as generous as the cause deserves.

Radio then, calls upon all who are interested and connected with wireless activities to send along their mite immediately. This request applies to experts, amateurs, experimenters and

"listeners-in," in fact, any man, woman or child who has anything at all to do with radio—for pleasure or labour.

It matters not if the amounts be small, the main requirements are that they be given willingly and now!

The following donations have been received to date:—

"RADIO" RELIEF FUND.

	£	s.	d.
<i>Radio</i> Magazine	5	5	0
Amalgamated Wireless Ltd.	10	10	0
Marconi School of Wireless	5	5	0
E. T. Fisk	3	3	0
Major W. H. Newman	1	1	0
W. E. Wilson	1	1	0
L. A. Hooke	2	2	0
C. D. Maclurcan	2	2	0
Neutral Bay Radio Club	1	1	0

Total to date 31 10 0

Highlights on Radio Broadcasting

(Continued from page 583.)

Twenty-nine dots from 11:56:00 to 11:56:28.

A pause of two seconds.

Twenty-five dots from 11:56:30 to 11:56:54.

A pause of six seconds.

Twenty-nine dots from 11:57:00 to 11:57:28.

A pause of two seconds.

Twenty-five dots from 11:57:30 to 11:57:54.

A pause of six seconds.

Twenty-nine dots from 11:58:00 to 11:58:28.

A pause of two seconds.

Twenty-five dots from 11:58:30 to 11:58:54.

A pause of six seconds.

Twenty-nine dots from 11:59:00 to 11:59:28.

A pause of two seconds.

Twenty dots from 11:59:30 to 11:59:49.

A pause of eleven seconds, during which it is announced that

"The next long dash will be twelve o'clock eastern standard time."

A long dash beginning accurately at 12:00:00.

After a pause, the spoken announcement of the weather forecast for the next day.

It will be noted that the first four minutes of the time signals are alike, and that the fifth minute differs only in the length of the pause immediately preceding the long dash which gives the exact noon signal. The Government rightly requires that any broadcast station which sends out time signals shall do so by some process which will be free from any possibility of human weakness or personal error. That is, the radio relaying process for the time signals must be entirely automatic, and the process used at WJZ, as may be gathered from the description, fully meets this requirement. We have, therefore, in this method a means for bringing to the great group of broadcast listeners astronomically accurate time through the use of their regular receiving set, and thus adding one more benefit to the many which radio broadcasting has conferred on the community.



Natural Re-PRODUCTION

**Atlas
AMPLITONE
LOUD SPEAKER**

Blast and distortion conquered!!!
Patented Double-diaphragm Re-
PRODUCES the full range of musical sounds. Adjustable to varying receiving conditions.

Price Complete
£8

TRADE MARK

Multiple Electric Products Co., Inc., Newark, N.J.

Australasian Representative:

EDWARD G. TEN EYCK,

G.P.O. Box 1343.

SYDNEY, AUSTRALIA.

"A RECEIVING SET IN EVERY HOME."

No home in which it is desired to create the real "home atmosphere" should be without a broadcast receiving set. The cost is small; the value great. Investigate the matter for yourself, and you will soon follow the lead of thousands of other happy home makers.

KEEP IN TOUCH WITH
RADIO PROGRESS
IN THE MOTHER COUNTRY.

By reading

The
Wireless World
and Radio Review

6^d — WEEKLY — 6^d

"The Wireless World," which commenced publication in 1913, is universally recognised as the Leading Authority on Wireless Matters.

It caters not only for the amateur, but also for the advanced worker.

Packed from cover to cover with really useful articles and diagrams, every week readers find something new and interesting, and, what is more important—RELIABLE.

"The Wireless World" still maintains its high reputation for being the

LEADING WIRELESS JOURNAL.

THE WIRELESS PRESS,

97 Clarence Street, Sydney, N.S.W.

TWO THINGS WHICH GO WELL TOGETHER—

a broadcast receiving set and "RADIO" magazine. Both are necessities in every Australian home.

TEN SHILLINGS

is the cost of one yearly subscription to "Radio." Send yours to-day to:—

The Circulation Manager,
"RADIO,"

97 Clarence Street, SYDNEY.

For Service

Telephone: 1180 City

**The RAPID FREIGHT
DESPATCH CO.**

CUSTOMS, SHIPPING &
FORWARDING AGENTS
Broughton House, King Street
SYDNEY

Queensland Notes

A novel way of counter-balancing the effect of "static" was seen in No. 3 ward of the Rosemount Military Hospital on a recent Thursday night. Messrs. P. C. Thomas, of New Farm, and Frank Sharpe, of Clayfield, two local amateurs, in conjunction with 4CM, had arranged an indoor concert for the patients. Unfortunately atmospheric conditions were unfavourable, as a particularly heavy thunderstorm was playing over the city during the early hours of the evening.

Mr. C. Daly, operating 4CM, was working well, but the two three-valve sets in the ward lost a good deal of their attraction to the sick through the "static." Prompted suddenly by the good angel to whom the care and welfare of all radio enthusiasts is specially relegated, Mr. Thomas pushed his pocket handkerchief down the mouth of the Amplion loud speaker. A distinct change for the better was immediately noticeable, and an even greater improvement was secured by the substitution of a large wad of cotton wool in place of the handkerchief. Thereafter, everything—and everybody—in the ward was lovely!

If permission is secured from the Commonwealth Lighthouse Service, the New Farm Club will take up its quarters on a vacant piece of land owned by that body. If permission is granted a club-house and aerial are to be erected in the near future.

The East Brisbane Radio Club is reported to have been permitted to use Mowbray Park band pavilion as a club-room and experimental station.

At the meeting of the Queensland Institute of Radio Engineers held on February 8, Mr. J. Sandercock lectured on inductance, capacity and aerial construction. He laid stress on

the essential ground work of all amateurs—a thorough technical knowledge of the apparatus handled.

The Radio Relay League has changed its name to that of the Radio Society of Queensland. The Society has now entered into possession of its new premises. A library of current wireless periodicals, as well as text books is in process of compilation, while a badge of distinctive pattern has been designed and will soon be in the possession of members. A full syllabus of lectures, demonstrations, etc., has been drawn up for the year, and with such and other steps being taken, the Radio Society is looking forward to a successful and interesting year of wireless activity.

The departure of Mr. Tom Elliott, who for so many months has operated 4CM for Dr. Val McDowall, from Brisbane to take up his new duties in Sydney, was marked by a farewell gathering of representative radio enthusiasts in the Y.M.C.A. rooms recently. His cheery "Hullo" has served to introduce the periodical experimental broadcast from Preston House to thousands of "listeners-in," and his departure has been regretted by a host of unknown friends. In presenting Mr. Elliott with an inscribed address, bearing the signatures of a large number of experimenters, Dr. McDowall eulogised the services he had rendered to radio advancement in Queensland, and in this he was supported by Messrs. J. C. Price and W. Finney. Mr. Elliott briefly responded.

In the Y.M.C.A. rooms recently, at the conclusion of the presentation ceremony to Mr. T. M. B. Elliott, the question of the newly-formed Radio Relay League was broached, with

gratifying results to the amateurs, who have, to the present, been the energising force behind the movement, for the League has now been firmly placed on its official feet.

With a view to gaining the fullest possible membership, it was decided, on the motion of Mr. Sachs, that the secretary circularise every license-holder throughout the State, outlining the aims and objects of the League, and soliciting support.

On the matter of membership qualification Mr. Daly was of the opinion that all persons interested in the science should be eligible for membership, and he moved a motion to this end. As an amendment, Mr. Underwood moved that all holders of Commonwealth Government licenses be admitted as full members, and that other interested persons be granted membership on an associate basis. He found a seconder in Mr. Thomas, but withdrew his amendment in favour of a further amendment which provided that all transmitting or receiving license-holders be eligible for either full or associate membership, and that all others interested be restricted to associate privileges. This was declared carried on the vote being put, and the previous motion then lapsed.

As a working committee, Messrs. W. Fairley, J. Milner, J. C. Price, F. Sayce, W. A. Wilson, R. C. Thomas, W. Finney (secretary), A. E. Dillon (treasurer), and N. B. Harper (organising secretary) were appointed, with instructions from the meeting to draw up a constitution and set of rules for consideration.

Since this meeting the membership has increased to 46, while several phases of the inauguration of the League have been discussed to a point of finality for submission to the members at a later date.

Australian Broadcasting Stations

In *Radio*, issue No. 22, a list of licenses issued to Australian broadcasting stations was published. Since then we have received from the Chief Manager of Telegraphs and Wireless an amendment list which is as follows:—

License No. 1	Call letters to read	2FC
" "	3 " " "	2BL
" "	5 " " "	3LO
" "	6 Wave-length,	770 metres

The following additional license has now been granted:—

License No. 7.—Associated Radio Company of Australia, Ltd., Melbourne. Wave-length, 480 metres; Power, 1600 watts; Call Letters, 3AR. Financial guarantee, £1000 Fixed Deposit. Subscription to be charged,

Radio Doings in New Zealand

The proposed broadcasting scheme for the Dominion recently propounded by the Postmaster-General, Mr. J. G. Coates, and which is likely to receive the attention of the Cabinet shortly, has been exhaustively discussed by Radio associations and clubs throughout the Dominion, and

on the whole, has been favourably entertained. It is to be regretted that greater interest has not been taken in the proposals by the "listeners-in" seeing that the programmes broadcasted are provided for them, and that it is their money which will provide the main source of income. As a matter of fact, most of the meetings have been attended chiefly by representatives of the trade, but as they are really the delegates for the public it may be taken for granted that their approval will encourage the Minister, and facilitate the passage of the necessary legislation.

The advantages of having a ship fitted with wireless apparatus was strikingly shown in connection with the wreck of the Commonwealth and Dominion liner *Port Elliott*, which ran aground in thick weather near Te Araroa in the vicinity of the East Cape. The reports in the daily press spoke volumes for the proficiency displayed by the operators. Mr. Furneaux, wireless officer on the *Port Elliott*, states that he was on watch at the time the vessel struck. The night was pitch dark and the vessel was travelling about thirteen knots, and without warning she went over the reef. Ten minutes after the *Port Elliott* ran ashore a message was despatched to Auckland, stating what had occurred. Mr. Furneaux stated that no S.O.S. messages were sent, there being little or no cause for anxiety.

It is a remarkable coincidence that Mr. Furneaux was also on the ill-fated *Wiltshire* when that vessel was wrecked in 1922 on the Great Barrier, and that this was his first visit to New Zealand since the previous disaster.

The speeches made at the Auckland Town Hall on the occasion of the civic reception to the Prime Minister (Mr. W. H. Massey) were broadcasted by wireless, so that listeners-in in all parts of New Zealand and the South Seas could hear them. A system of microphones had been installed on the platform of the Town Hall, and by the courtesy of the

Telegraph Department, a special wire connected the microphones with the Scots Hall Broadcasting Station, 1YA. The innovation used for the first time in New Zealand in connection with public affairs was a great success, and is likely to be repeated on similar occasions.

Modern Printing



Keeping in touch with all that is new and good in type faces and modern printing machinery makes us think

we can satisfy your printing wants.

We wish to announce that we can furnish everything it is possible to print and bind. Our charges, quality considered, are surprisingly low. We turn out work as quickly as you want it.

□

North Sydney Printing Co.

66 Arthur Street
North Sydney

Tel. North 429

CELORON

FOR RADIO PANELS.

Radio instruments should be mounted on panels or bases which insulate as nearly perfect as possible.

Celoron is an ideal material for radio panels. It is strong, hard, and waterproof, with a high degree of surface and volume resistivity, high dielectric strength and low dielectric losses.

Celoron may be easily sawn, drilled, turned, tapped or milled, and will admit of sharp, clean-cut engraving.

Mount your instruments on Celoron

Diamond State Fibre Company

Bridgeport, Pa.

(near Philadelphia), U.S.A.

Cable Address: "Dymnfybr," Norristown.



Representative:

WILLIAM J. HOWATT,
40 King Street, Sydney.



High Tension from Lamp Socket

With the advent of the low temperature thermionic valve the ordinary tungsten filament type is gradually being displaced in go-ahead experimental stations. The usual caveman method is to sell the unwanted tubes to some beginner, but a more interesting way of putting them to use is to instal them in the circuit shown in Fig. 1 of this article. It is a well known fact that alternating current can be used for the heating of the filament of a valve with more or less success, but few realise that an abundant supply of direct current at

transformer should have a voltage of ten to twelve volts. The filaments are connected in series, and are controlled by one rheostat. The centre connection of the positive high tension lead serves to draw off the current without impressing an alternating current ripple upon the rectified supply.

The electron emission from a receiving valve varies according to the maker, but with the well known Marconi "R" the saturation current is 16 milliamperes, with 4.5 volts on the filament. When the grid and plate elements of the valve are connected

external and 2in. by 2in. internal dimensions with a depth of one inch. Approximately two hundred will be required, and they should be varnished to prevent eddy current losses.

Primary Winding.—To consist of 2000 turns of No. 24 enamel wire (for a 240 volt supply), wound as evenly as possible on a former, as described in issue No. 15 of *Radio* for 17/10/23 and taped with half inch Empire tape.

Secondary Windings.—For a direct current output of 250 volts at maximum output each winding will have to deliver 300 volts. They must be wound in two sections separately taped and tapped, with 2500 turns of No. 30 enamel wire. Taps should be taken at turns No. 1000, 1500, 2000, and 2500, which will give a d.c. output of 100, 150, 200, and 250 volts. The mechanical details of construction and mounting have been dealt with fully in a previous issue of *Radio*, describing the construction of small transformers.

For the lighting of the filaments a transformer can be constructed as described above, but with a secondary of 100 turns of No. 18 d.c.c. wire. This will give a terminal voltage of approximately 12 when the primary

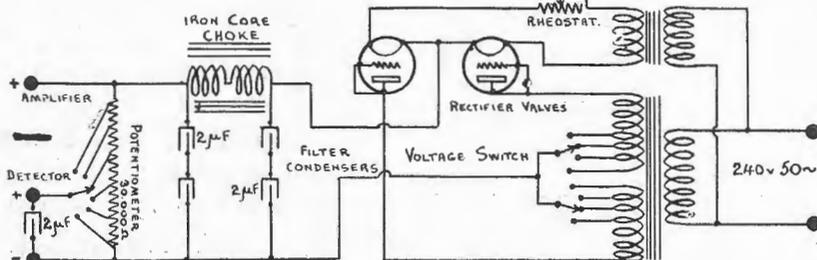


Fig. 1.

a potential up to several hundred volts can be obtained from the same source with very little trouble. Dry batteries are very handy where small quantities of direct current at relatively low potentials are required for the high tension supply of valve amplifiers, but the maintenance, as well as initial cost, becomes a serious item when power amplification for loud speaker work is attempted.

As will be seen by referring to Fig. 1, the valves are connected up as rectifiers, and are used in conjunction with high and low tension transformers, and a filter system. Two transformers should be used instead of combining the filament and high tension windings on the same core. To operate the filaments of the valves the secondary winding of the low tension

together to form a two electrode rectifier there will be 50 volts absorbed by the valve in passing this current. This means that if a supply voltage of 100 volts is required at the full load current of 16 milliamperes there will have to be impressed by each half winding of the rectifier transformer a voltage of 150 volts to allow for the internal drop in the valve. With the small amount of current consumed this inefficiency is a negligible factor.

The transformer to supply the high tension voltage to the rectifiers should have the following dimensions:—*Core* to consist of laminated iron sheet not more than 16 mils thick (No. 26 gauge) cut into strips three inches long by one inch wide. Sufficient of these laminations should be cut to form a rectangular core 4in. by 4in.

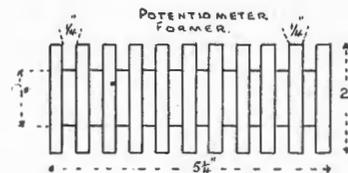


Fig. 2.

potential is 240. The ratio should be altered accordingly for other primary voltages. Owing to the small current required it is hardly worth while to construct a special transformer.

(Continued on page 600.)

Recent Wireless Patents

by GEORGE APPERLEY
(Radio Engineer)

THE following are abridgements of complete specifications of wireless patents recently notified in the official journal of patents, as accepted at the Commonwealth Patents Office, Melbourne:—

No. 11328/23.—Inventor: Ernest Green, England. In Valve Generators, particularly those used for transmission purposes, a reduction of efficiency occurs when currents flow in the film of deposit usually

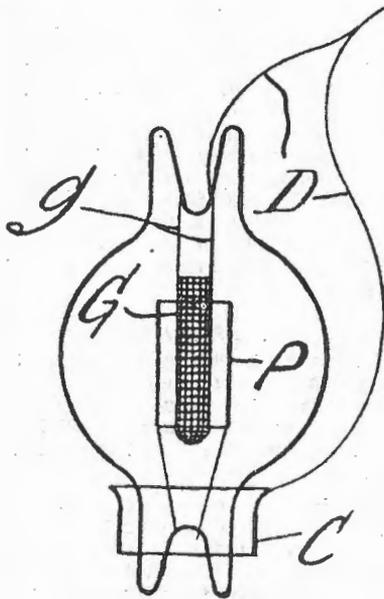


Fig. 1.

to be found on the interior surface of these devices. To reduce or eliminate these losses a strip or ring of metal is placed inside or outside the bulb and connected to one or other of the valve electrodes, so that the electric field which gives rise to the undesired film currents is appreciably weakened or destroyed. Fig. 1 illustrates one application of the invention where C is a metallic ring surrounding the anode end of the valve containing a plate P and grid G, the latter being metallicly connected to the ring by conductor C. In other applications a ring is placed at the grid end or at each end of the valve or the anode supports arranged to screen the grid supports in cases where the two members are sealed into the bulb at same end.

No. 11378/23.—Applicant: Amalgamated Wireless (Australasia) Ltd. assignee of Marconi's Wireless Telegraph Company and others: With the circuit arrangement shown in Fig. 2, there are generated short oscillations of a certain range of frequency depending on the difference of potential introduced between the filament F and grid G to which a battery B is connected and the optimum wave-length can be secured by adjusting the electrical length

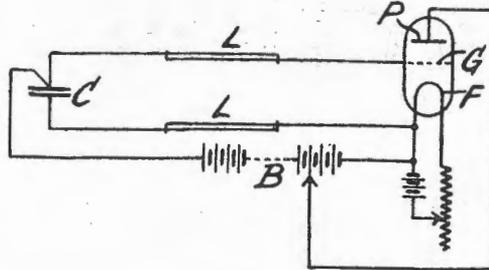


Fig. 2.

of the parallel wires L L, which are preferably arranged to be telescopic. To produce maximum oscillations for a given filament brilliancy the plate P is made slightly positive with respect to the filament and the grid voltage is gradually increased. The oscillations may then be further improved by varying both the plate potential and the filament current. The condenser C prevents short-circuiting of the battery B. The invention is also applicable to a two electrode valve and to other circuit arrangements with a three electrode valve.

No. 11989/23.—Inventor: E. Y. Robinson, England. Has for its object the reduction or elimination of power losses represented by the currents induced in the supporting members of an antenna and the provision of means whereby the insulation of the antenna is made efficient and effective. When an antenna system is energised, oscillatory currents, opposite in phase to the antenna currents, are induced in the supporting masts and guys, and if the masts and guys are electrically connected to earth a maximum potential stress will occur at the points where the antenna is supported. According to this invention currents are induced in the supporting members in phase with the antenna currents and of such an amplitude

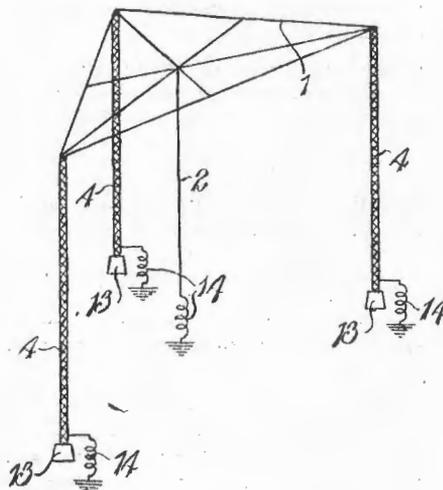


Fig. 3.

as to entirely balance the antenna voltage at the points of support so that insulators are no longer necessary. Fig. 3 shows one application of the invention in which the antenna (1) having a down lead (2) and loading coil (14) is supported by three masts (4), each having an insulated base (13) and tuned to resonance with the antenna by loading coils (14). The system may be excited in the usual manner by an inductive coupling, to the loading coil in the downlead coil of one of the masts. Other methods are disclosed for inducing the requisite currents in the supporting members, and a further application of the principle to masts and guys is described.

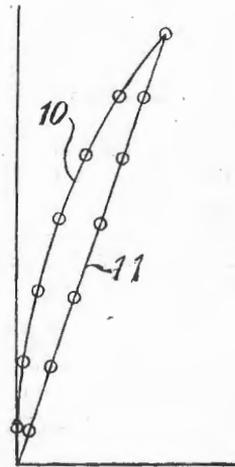


Fig. 4.

No. 11990/23.—Inventor: E. Y. Robinson, England, describes a method of constructing supporting structures of antenna systems whereby effective insulation is obtained. The supporting member or mast (4), Fig. 4, is constructed in sections, each section being insulated from the others by suitable insulators (7). The antenna (1) provided with a down lead (2) is excited from a source (13) through the inductive coupling (14, 15). Alternating potentials substantially in phase with the aerial potential grading of the mast along its length does not appreciably affect the distribution of the electrostatic field round the antenna. The magnetic field round the antenna also remains unaffected, because the insulators (7) prevent mast currents from flowing. The potential of the mast sections is such that it increases as the antenna top is reached and preferably the top section is at the same potential as the antenna. The total potential stress is therefore distributed over the insulators (7), each of which may be suitably designed to withstand the voltage to which it is subjected. The principle is also applied to mast guys, which are also constructed in sections having insulating breaks between them and electrically graded as described above.

Report of Trans-Pacific Tests

OWING to the success obtained in the first—May—Trans-Pacific Tests, it was decided by the American organization and the W.I.A. to repeat the test in October. The first test laid the foundation stone of long distance low-powered short-wave Trans-Pacific communication. It was hoped that in this the second test useful observations could be made. With this end in view it was decided at an early stage to institute an official observation station, and a combination of 3BM, 3BY, 3JU, with three separate receivers, located under the aerial at 3BM, East Malvern, Victoria, undertook these observations.

It will be found that logs from other stations both in New Zealand and Australia will agree fairly accurately with the general observations of 3BM, JU, BY.

APPARATUS.

The aerial which is of the trumpet cage type, 65 feet at high end and 55 at the lower end, is switchable to any of the three receivers. 3BM, a single stage of tuned radio frequency and detector, 3JU, a two tuned radio frequency stages detector and a reflex audio. 3BY, two steps of tuned anode and one audio.

The amplified signals were then transmitted over about ninety feet of land line to the house where a loud speaker, a pair of Baldwin 'phones and a dictagraph were installed. In this room, on the few occasions when conditions were good, signals could be read in comfort. The dictagraph was used in the endeavour to obtain a permanent record of American stations. The operators were able on two occasions to make a very fair record of the signals of 6KA (Mr. T. E. Nikirk). Had it not been for intolerable atmospheric conditions and persistent interference 6KA could have been copied and recorded on almost every night they were transmitted.

ATMOSPHERIC CONDITIONS.

A careful study of the logs of all stations will show that abnormal atmospheric conditions were not only experienced at 3BM. With the exception of three nights, the conditions in Australia were not fit for long distance.

FADING.

On the few nights which were comparatively free from atmospheric, careful observations were made on fading effects. It was found that fading could be divided into two different classes, the first, periodic fading, and the second, prolonged dead periods.

INTERFERENCE.

Although experimental stations were working their transmitters during the test period, on wave-lengths from 380 to 400 metres, no interference whatever from

this source was experienced. Experimenters throughout the Commonwealth after an appeal had been made to them, loyally helped the Wireless Institute by closing down transmitters approximating 200 metre wave-length. Violent interference was experienced from spark stations.

RECEPTION.

The times of American transmission were 5.45 p.m. to 8.45 p.m. Melbourne time; and at this time of the year included about one and a half hour's daylight. It was considered that very few stations would be heard in Melbourne between 5.45 and 7.15. It was anticipated that reports from New Zealand would cover this period. Observations at 3BM proved that many stations came in particularly well during the daylight period.

TYPES OF RECEIVER.

Most of the work at the observation station was done on 3JU, whose apparatus has been previously described. It was found by experiment that the two stages of tuned anode, used by 3BY produced the greatest amplification of signals, but was far too critical for general purposes. The single stage of tuned radio and detector used by 3BM gave excellent results and should prove to many experimenters that this type of receiver, with the possible addition of one or more note amplifiers when conditions permit, is all that is required to pick up the American signals. It was found that the logging of American stations resolved itself into very careful tuning and skilful handling of the radio frequency circuits.

OTHER STATIONS.

At the time of writing this report logs have been received from two stations in New South Wales, one station in Tasmania, eight stations in Victoria and three stations in New Zealand. Very excellent work is acknowledged at all of these stations as is amply demonstrated by the logs submitted.

NEW ZEALAND ORGANISATION.

The test committee at rather short notice, communicated with Mr. Bell, who willingly and quickly organised for the reception and transmission periods in New Zealand. We wish to express our appreciation of the willing co-operation and help rendered by our neighbours.

AMERICAN END OF THE TEST.

Very few experimenters in Australia and New Zealand realise what the organisation of these tests has meant in America. The organisation work was primarily taken up by the *Radio Journal*, Los Angeles, California, and the A.R.R.L. Australian experimenters wish to express their deep appreciation of the willing co-operation and hard work undertaken by these bodies. The American experimenters themselves are due for great praise for the wonderful manner in which they

stuck to their transmitters during the whole test period. Australasian experimenters will do well to remember that while they were receiving the signals of our enthusiastic American friends during the early part of the evening, the Americans were nodding over their keys at anywhere between one and five o'clock in the morning. It is this spirit which will put the amateur radio man in the forefront of all big radio moves.

ACKNOWLEDGMENTS.

We have to thank Messrs. O. J. Neilsen, of Bourke Street, Melbourne, for the loan of a two-step Federal Audio Amplifier. This was used at the official station to make the wax records of 6KA signals. We also wish to thank the Dictaphone Company of Market Street, Melbourne, for the co-operation and help and the loan of one of their dictaphones which was used to record signals. Lastly, we wish to thank all experimenters in Australasia who either took part in the test or co-operated by standing by during the reception period.

FINAL REMARKS.

We have no hesitation in stating that the tests have been an unqualified success, and we trust that those American stations which have been logged will be rewarded for the time they have spent in preparing to get across.

It will be well here to say that should many American transmitters be disappointed in not having been logged, they will be repaid in any future tests if they will remember that their signals have to be read in many cases through strong QRN and QRM. The guide words for American transmitters in the next test should be **SEND SLOWLY, REPEAT CALL SIGNS FREQUENTLY, AND KEEP IN MIND THAT THE RECEIVER IS SEVEN OR EIGHT THOUSAND MILES FROM HOME.** Every station that was read by Australian receivers was taken through intense static and interference, and had it not been that the transmitting operators had frequently repeated their calls these stations would not have been read at all.

By mail the record of 6KA's transmission will be sent to Los Angeles. This record would have been a good deal better but for persistent fading and bad static. We hope that it will serve, to American experimenters generally, to show at what strength a really efficient experimental station comes in over here. 6KA's note is a bad one to carry out an experiment of this nature on. We have proved that high pure CW notes, if strong enough, record remarkably well.

(Signed) H. KINGSLEY LOVE,

For and on behalf of the Test Committee for the Wireless Institute of Australia (Victorian Division).

Romance of Radio

THOUGH the past of radio is but as yesterday, the records of its achievement surpass the pages of romance.

Barely twenty-five years have elapsed since the wizard of wireless—Marconi—succeeded in telegraphing without wires over a distance of a few miles.

To-day ether waves from giant wireless stations encompass the globe and radio messages are flashed over great distances with the speed of light, annihilating time and facilitating trade, commerce and social intercourse.

Every ship at sea is a floating telegraph office, handling radio traffic to and from all parts of the world. A touch of the Morse key and the ether—invisible, intangible, immaterial—is set vibrating, and its tremors awaken similar response in instruments thousands of miles away.

Amalgamated Wireless (Australasia), Ltd., maintain a staff of technical and research engineers, and operate modern radio-electric works for the manufacture and installation of every type of wireless apparatus, enabling it to offer an unrivalled service at sea or on land.

Amalgamated Wireless
(Australasia) Ltd.





Queries Answered



L. M. (Berry's Bay) asks natural wave-length of aerial (particulars submitted).

Answer: About 100 metres with a capacity of about .0015 m.f., which in conjunction with your single slide tuner, which has an inductance of 1360 m.h., will tune approximately between 250 and 800 metres.

L. M. (Randwick) submits particulars of apparatus he has, and asks for most suitable circuit to assemble them.

Answer: Your collection of apparatus is admirably suited for use in the "Crystal Reflex Circuit" described in *Radio* Nos. 13 and 22.

J. W. N. (Urana) submits particulars of a three-valve receiver which he proposes constructing and asks: (1) What distance should telephony be received with ear-phones and loud-speaker? (2) Would three valves of the same make be more satisfactory than three valves of different make? (3) What type of coils would be required to tune from 180 to 25,000 metres? (4) Most suitable aerial for long distance broadcasting reception?

Answer: (1) No estimate can be given regarding range of reception, as so much depends upon local conditions and the skill of the operator. (2) For all practical purposes three valves of similar make will work satisfactorily, such as D.E.R., UV201A, UV199 or "R" type. (3) Choose suitable coils from the table published on page 360, *Radio* No. 15. (4) 30 to 50 ft. high and 120 ft. long for all round work.

R. F. R. (Broken Hill) asks: (1) Wave range of basket coils of the following dimensions used as a variocoupler and as a

variometer: Stator 8in. diam. wound with 50 turns No. 26 gauge wire, Rotor 5in. diam. wound with 50 turns using first a .001 m.f. variable condenser, second a .0005 m.f. variable. (2) Which is preferable for reception with a crystal set, a single or twin wire aerial, inverted L type? (3) Wave range of two honeycomb coils, each wound with 350 turns No. 30 gauge wire centre diameter $1\frac{1}{2}$ in., using above-mentioned condensers? (4) Would 12 ft. 70/36 wire be efficient as a lead-in? (5) Size of double slide coil to tune up to 2,500 metres?

Answer: (1) The inductance of the Stator is 750 m.h. the Rotor 440 m.h. and the maximum mutual inductance 300 m.h. Used as a variometer with a 180 degree movement of the Rotor a uniform variation of inductance from 590 to 1790 m.h. will be obtained. The wave range depends upon the value of the capacity in the circuit and can be calculated from the formula $WL = 1885 \sqrt{L.C}$ where L = microhenries and C = microfarads. Assuming an aerial of 0.003 m.f. the maximum wave obtainable with the Stator will be 185 metres when a shunt capacity of 0.001 m.f. is used. The maximum wave-length of the Rotor with 0.0005 m.f. in parallel, will be 880 metres. The minimum efficient wave in both coils is dependent upon so many factors that only a very rough approximation can be made. This will be about 250 metres. (2) The twin wire is preferable for crystal reception. (3) As a variometer the two honeycomb coils will give a maximum inductance variation of approximately 6500 to 20,000 m.h. As a vario-coupler each coil will tune respectively from 1500 to 3500 and 1500 to 5000 metres with a 0.0005

and a 0.001 m.f. variable condenser. (4) Yes, if all strands are cleaned and soldered. (5) Using only the capacity of the aerial for tuning, a coil with 210 turns of No. 24 D.S.C. wire on a 6-inch former 8 inches long, will be required.

Wireless Institute

W.A. DIVISON.

The February meeting was held at the University of Adelaide. In future, bi-monthly meetings are to be held, the second gathering being intended for members who are not sufficiently advanced technically to take full advantage of the lectures given at the general meetings. The second meeting will be held on February 27.

In a letter received from the Victorian Division it was stated that in conjunction with the New South Wales branch, a trans-Continental relay test will be carried out on February 29 and March 1 at 10.30 p.m., Melbourne time. Co-operation was asked for.

An offer made by the Mail Newspapers Ltd., in which it was stated that the publication of a bi-monthly paper devoted to radio matters was contemplated, and that it would serve as the division's official organ, was accepted.

Four new members were admitted and a further four applications were received.

Broadcasting is Here. We are Ready!

CRYSTAL SETS—	VALVE SETS—TWO:
£3/10/- £5/10/- £7/10/-	£17/10/- £20 £25
VALVE SETS—SINGLE:	VALVE SETS—THREE:
£10 £15 £20	£27/10/- £30 £35

Complete with Aerial Wire, Phones, Batteries, and All Accessories.

We can supply all parts to build your own if required.

ORDER NOW AND AVOID THE RUSH.
Catalogue, 50 Winning Diagrams, 9d.

ELECTRICITY HOUSE

387 George Street, Sydney.

J. S. MARKS (Radio 2GR), General Manager.

We are the accredited Agents for all Broadcasting Companies. Service fees on application.

EDWARD WATERS & SONS

(Established 1859.)

PATENT AND TRADE MARK ATTORNEYS.

Cathcart House,

11-13 Castlereagh Street, Sydney.

Tel.: B 5937.

(And at Melbourne).

STERLING PLATING & MFG. CO

(Late Stokes & Sons)

225 CLARENCE ST., SYDNEY.

ELECTRO, SILVER, NICKEL AND BRASS
PLATERS.

All kinds of Lacquering, Gilding, Bronzing
and Oxidising Done.

'Phone: City 6085.

How to Save!

"Radio" will help YOU!

Did you get your last number of "Radio?"

You did not?

You did not have time to buy it on the date of publication, and when you did get along your newsagent had sold out?

Or—

You were holidaying away from the city, and the local agent did not stock it.

Or—

You forgot it—worse luck?

Or—

You have decided to save money this year?

Listen!

You can save money and buy "Radio" too.

By buying "Radio" weekly at your newsagents it costs you 13/- a year. To this outlay you must add the risk of possible disappointment, and if you are interested in radio you cannot afford to miss a single issue of this publication.

If you order your copy direct from us you save MONEY, TIME, and DISAPPOINTMENT.

MONEY, in that "Radio" sent for 12 months to any address in Australia and New Zealand, post free, will only cost you 10/-.

TIME, in that "Radio" will be safely in your hands on the very date of publication.

And—

DISAPPOINTMENT, in that we have an efficient staff whose sole business it is to see that you are NOT disappointed, either in contents, appearance or delivery.

To save these three things, then, fill out this coupon and mail it NOW!

The Circulation Manager,

"Radio,"

97 Clarence Street, Sydney, N.S.W.

Please find enclosed cheque/money order/postal note, value 10/-, in payment of 12 months' subscription to "Radio."

Signed

Full address

Date

Movements of Wireless Officers

Mr. W. H. Harris relieved Mr. T. Bannister on s.s. *Marella* as senior operator, at Sydney, January 19.

Mr. T. Bannister signed on s.s. *Mataram*, at Sydney, January 25.

Messrs. A. C. Jackson and M. Sherwood-King signed on s.s. *Tatyuan* as 2nd and 3rd operators respectively, at Sydney, January 21.

Mr. R. E. Haddock relieved Mr. J. E. Cleary on s.s. *Kowarra*, at Sydney, January 21.

Mr. J. E. Cleary signed on s.s. *Barambah* as senior operator, at Sydney, January 21.

Mr. C. Coldwell-Smith relieved Mr. J. Carew, as 3rd operator on s.s. *Gascoyne*, at Fremantle, January 18.

Mr. H. F. Harman relieved Mr. T. Laidlaw on s.s. *Melbourne*, at Newcastle, January 23, and was relieved by Mr. P. C. Gillon, at Sydney, January 24. Mr. Harman terminated service.

Messrs. W. J. Croft and J. H. Pullan signed off s.s. *Booral*, at Melbourne, January 23, and proceeded on Home Port leave.

Mr. J. F. McGinley relieved Mr. C. H. A. Kidman on s.s. *Wyreema*, at Sydney, January 25. Mr. Kidman proceeded on Home Port leave.

Mr. N. W. Leeder relieved Mr. F. N. Davidson on s.s. *Dimboola*, at Fremantle, January 18.

Mr. J. H. Pullan signed on s.s. *Aeon*, at Melbourne, January 25.

Mr. I. R. Hodder signed on s.s. *Goulburn*, at Melbourne, January 24.

Messrs. A. M. Ellison and D. Lynch signed off s.s. *Arafura*, at Sydney, January 29.

Mr. D. Lynch signed on s.s. *Esperance Bay* as 3rd operator, at Sydney, January 29.

Mr. C. L. J. Coley signed off s.s. *Boorara*, at Sydney, January 29 and relieved Mr. K. J. Dines on s.s. *Waimarino*, at Newcastle, January 30. Mr. Dines terminated service.

Messrs. R. B. Lowry and A. Truscott signed on s.s. *Boorara* as 3rd operators, at Sydney, January 31.

Mr. T. G. McEwan was relieved by Mr. A. M. Ellison on s.s. *Wairuna*, at Sydney, January 31, and proceeded on Home Port leave.

Mr. J. K. Overbury signed on s.s. *Wolum*, at Melbourne, January 21.

Mr. A. B. Sharland relieved Mr. C. Drew on s.s. *Eugowra*, at Sydney, February 1.

Messrs. W. J. Croft and J. E. Hutchinson signed on s.s. *Barambah* as 3rd operators, at Melbourne, January 29.

Mr. J. Carew signed on s.s. *Cycle*, at Melbourne, February 1.

Messrs. A. H. Jeremy and R. E. Mann signed off s.s. *Victoria* as senior and junior operators respectively, at Sydney, February 5.

Messrs. R. T. Murray, W. R. Tonkins and E. W. Baker signed on s.s. *Booral* as senior and 3rd operators respectively, at Sydney, February 6.

Mr. A. V. Zoppi signed on s.s. *Eureña*, at Sydney, February 6.

HUGHES & CO.

CIVIL and NAVAL TAILORS

SPECIALISTS IN NAVAL AND Mercantile Marine Uniforms All work executed on our premises BY EXPERTS

One Quality Only—The Best

70-72 Erskine Street, SYDNEY

Established 1882

MODELS

Small Bolts and Nuts, Rivets, Boiler and Engine Fittings, Propellers and Ship Fittings for Model Makers.

Illustrated List, 9d.

O. BURNABY BOLTON,

Daily Telegraph Building, KING STREET, SYDNEY.

BACON & Co. Ltd.

PROCESS ENGRAVERS and ILLUSTRATORS

31a PITT STREET SYDNEY

'Phone: B 3368

High Tension from Lamp Socket

(Continued from page 594.)

The best plan is to purchase a ready-made article as sold for operating bells or toy trains. These usually are supplied with a terminal voltage adjustable from 6 to 18 volts.

The filter choke winding is one of the main items in the rectifier, and upon its construction depends the successful operation of the whole outfit. Its inductance must be as high as possible. A choke constructed from the following design will have an inductance of 100 henries, and be suitable for use in filter circuits passing as high as 50 milliamperes. (Transmitters please note). The core is similar in size to that specified for the high tension transformer. The winding consists of 16,000 turns of No. 36 enamel arranged in two former wound sections of 8000 turns on opposite legs of the core. These are joined in assisting series, and connected in the positive leg of the supply lead from the rectifier.

Between the positive and the negative wire on each side of the filter choke is connected two 2 m.f. telephone condensers. Each of these condensers will withstand a terminal

voltage of 300, but as it is not safe to operate them too close to the breakdown potential, two are connected in series. Additional condensers have not been found necessary.



This rectifier was designed primarily for use in connection with power amplifiers connected to loud speakers, but it was soon found that the detector valve could also be operated from the same source if the voltage was reduced to a suitable value.

The potentiometer illustrated in Figure 2 will enable the full plate voltage as supplied to the amplifiers to be tapped at points giving increments of 10 per cent. A large capacity condenser should be connected across the tapped portion of the resist-

ance to provide a by-pass for the audio and radio component of the detector plate current. The winding for the potentiometer consists of two ounces of No. 38 enamel-covered A1 or Eureka resistance wire. This will give a resistance of approximately 30,000 ohms, and is wound in ten sections on a former of the dimensions given in Fig. 2. Alternate sections should be wound in opposite directions to keep the whole unit as non-inductive as possible. This potentiometer resistance unit also makes an excellent adjustable grid leak for low power valve transmitters up to 100 watts, the resistance being variable in steps of 3000 ohms. Each section should be wound with 1000 turns of the above-mentioned wire.

All the apparatus should be mounted in a cabinet with snap switches and electric light adapters at one end, and the high tension output terminals at the other. Two rotary switches enable voltage changes to be made with great rapidity if connected according to Fig. 1.

If the experimenter possesses a transmitting station the high tension transformer used in conjunction with the kenotrons or electrolytic rectifier can be used for the preliminary tests if a high impedance or resistance of suitable value is placed in series with the primary winding to reduce the output voltage.

IT is an old saying, but a true one, "that the quality will be remembered long after the price is forgotten." Our printing is readable, well-balanced, correctly displayed, and has a pleasing touch of individuality that will reflect credit upon your business.

SHEPHERD & NEWMAN LTD
COMMONWEALTH & HUNT STS.

PHONE
CITY
1876



**SHEPHERD
& NEWMAN**

COMPLETE PRINTING SERVICE

TYPOGRAPHIC ARTISTS
COMMERCIAL COLOR AND
HALF TONE PRINTERS.

INSURE WITH

The Liverpool and London and Globe Insurance Co. Ltd.

ASSETS EXCEED £20,000,000

LOWEST RATES

FIRE - ACCIDENT - MARINE

Head Office for Australasia: 62 PITT STREET, SYDNEY

C. DANVERS, Manager for Australasia
W. B. CLARKE, Local Manager for New South Wales

P. HEATH, Assistant Manager for Australasia
T. M. DOUGLAS, Deputy Assistant Manager for Australasia